2680A TROUBLESHOOTING HANDBOOK

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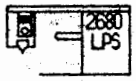

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NOTICE

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SECTION I.
GENERAL INFORMATION

1-1. INTRODUCTION

The HP 2680A Troubleshooting Handbook is designed as a companion document to the HP 2680A Service Manual (P/N 02682-90904). As such, the handbook provides the service representative an additional means to isolate printer failures. It does not, however, contain detailed adjustment and repair procedures and it does assume that the service representative has a basic understanding of the procedures inherent to the machine.

Section I of this manual provides the reader a troubleshooting approach for solving printer problems. This approach is designed to help the troubleshooter analyze a printer problem and logically troubleshoot an printer error condition.

Section II of the manual is an alphabetical listing of the error messages detected by the printer's diagnostics and/or miscellaneous error conditions which may or may not be detected by the printer diagnostics. An explanation of the nature of each message along with a possible cause(es) and a recommended troubleshooting approach is listed for each message.

Section III of the manual provides the service representative a list of adjustments, considerations and print quality symptoms which could aid the service representative in determining the nature of a print quality problem. Also found in Section III is a table summarizing print quality symptoms and related causes along with several examples of print quality problems.

Section IV provides an explanation of the parameters listed in the Self Test diagnostic printout. Typical values for each parameter are provided along with the parameter definition.

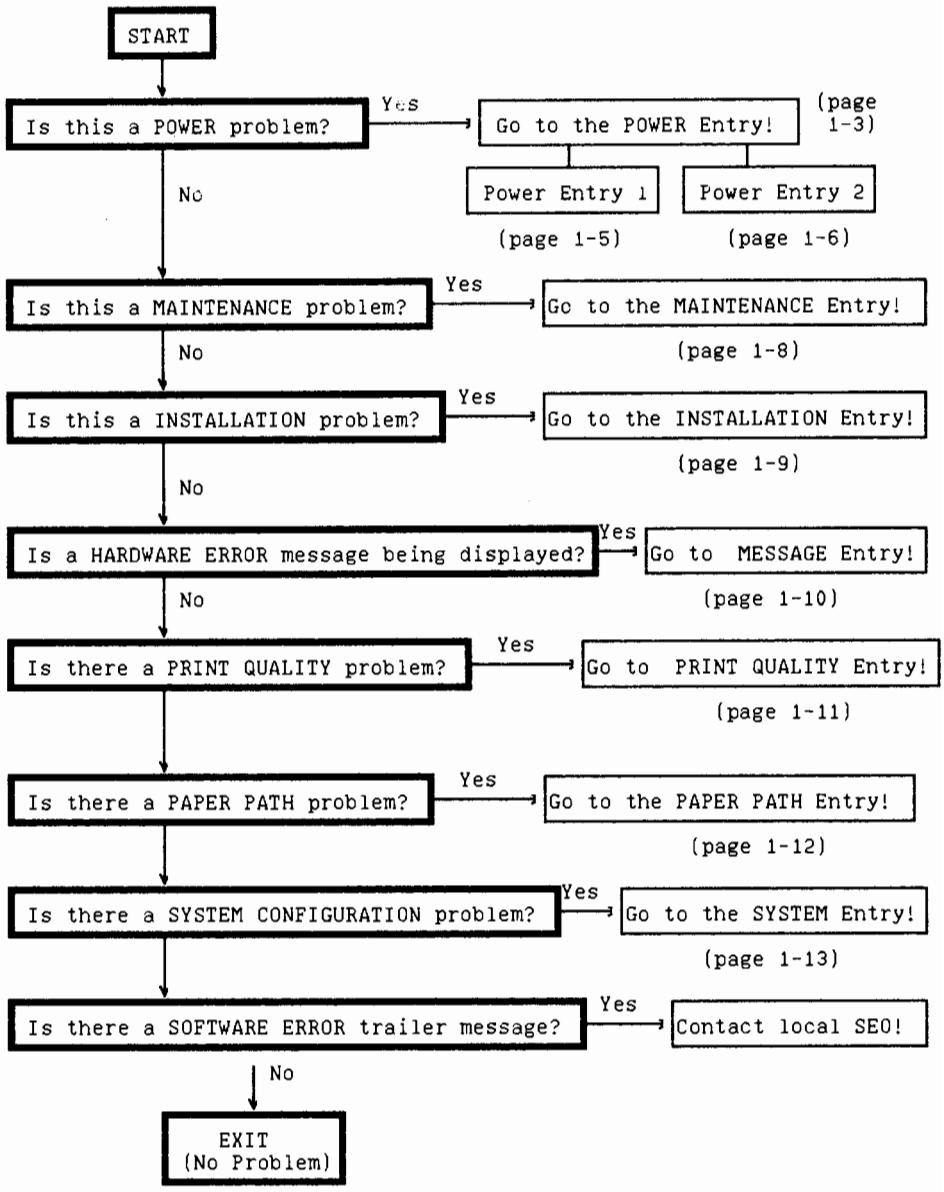
Section V references and identifies various printer components and connectors.

Section VI provides simplified logical diagrams and signal paths for several of the printers major functional systems.

1-2. TROUBLESHOOTING APPROACH

The following general flow chart provides a basic approach to troubleshooting printer problems. Eight secondary troubleshooting entries branch from the general flowchart and provide information, general hints and general procedures for troubleshooting that specific entry. Always proceed sequentially through through the general flowchart and never assume an area of the printer is functioning correctly without fully investigating the area or its operation

GENERAL TROUBLESHOOTING TABLE



WEP RELATED PROBLEMS

General Hints

* Categories of Power Problems

+5 Vdc Supply

+/-12 Vdc Supply

+28 Vdc Supply

AC Contactor Circuitry

Input Line Voltage Problems

* Visual Checks and Aids

Four LEDS (DS1) are located on the Power Distribution PCA (see figure 5-7). When illuminated these LEDs indicate that the DC Power Supplies are functional.

LED (DS5) on the AC Power PCA; the illumination of this LED indicates that the AC Contactor has been energized.

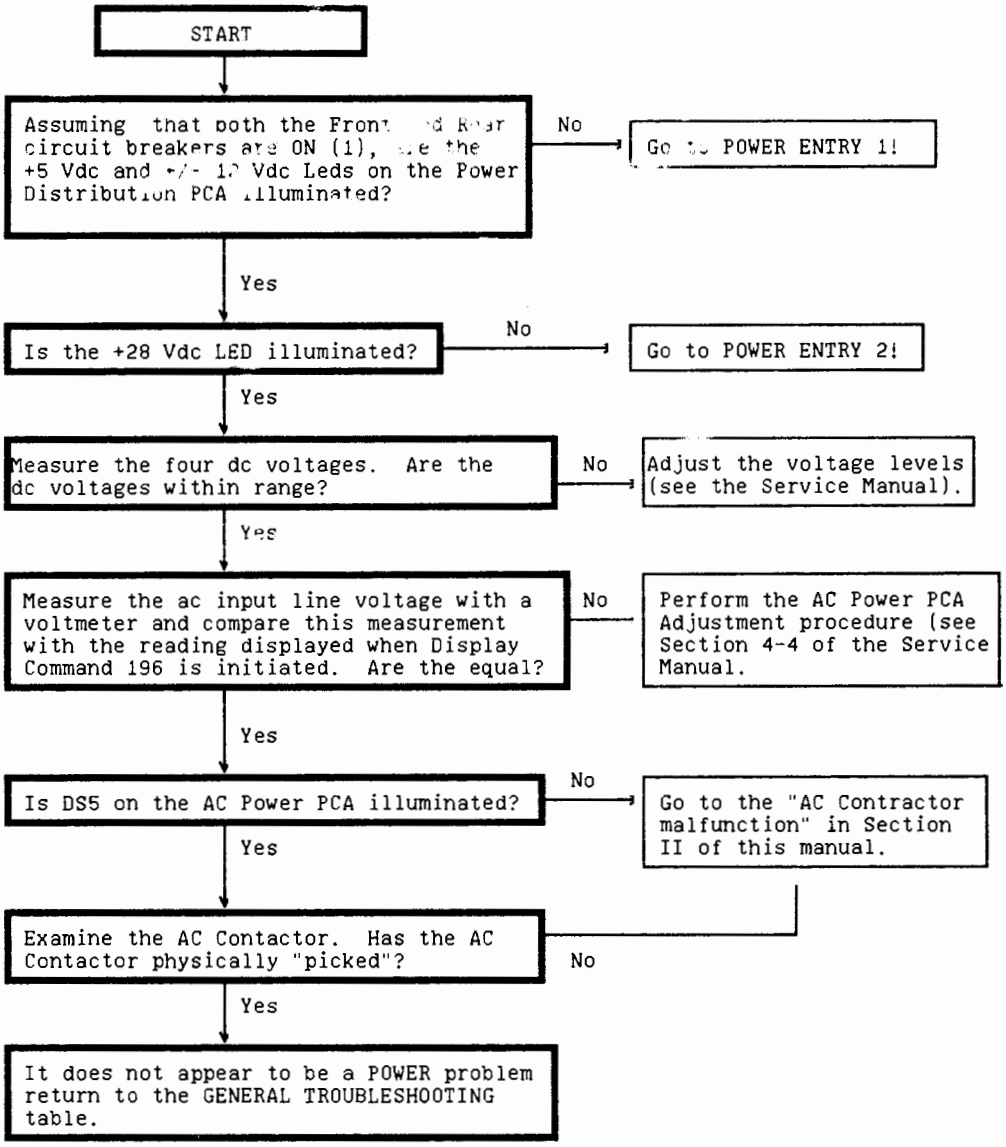
Display Command 196 (Line Voltage); this command may be initiated from the service control panel and provides a visual display of the line voltage in counts.

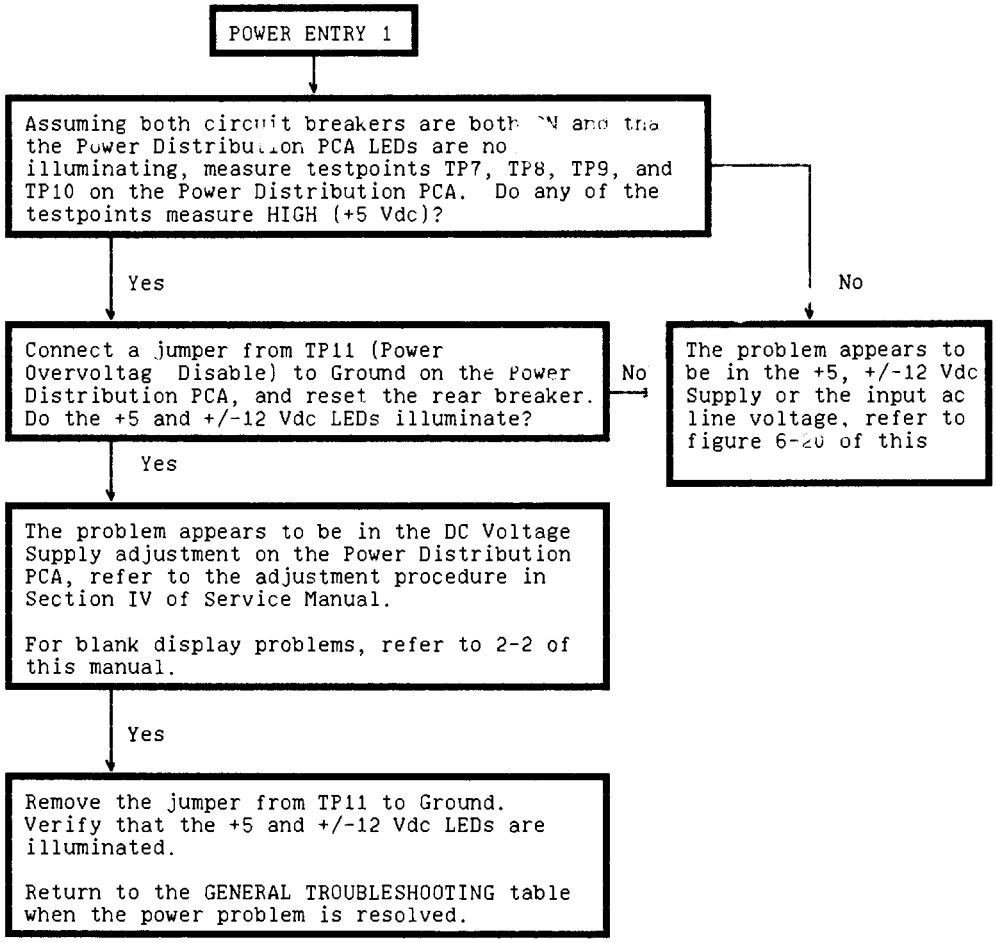
* General Information

A Blank display could be a result of power failure or a Machine Control Processor PCA failure.

The AC Contactor is energized by the Machine Control Processor; if the processor detects a power failure the processor de-energizes the AC contactor.

The +28 Vdc Power Supply is activated by the Machine Control Processor. There is no relationship between the AC Contactor and the +28 Vdc Power Supply.


START
Assuming that both the Front and Rear circuit breakers are ON (1), are the +5 Vdc and +/- 15 Vdc Leds on the Power Distribution PCA illuminated?
No
Go to POWER ENTRY 1!
Yes
Is the +28 Vdc LED illuminated?
No
Go to POWER ENTRY 2!
Yes
Measure the four dc voltages. Are the dc voltages within range?
No
Adjust the voltage levels (see the Service Manual).
Yes
Measure the ac input line voltage with a voltmeter and compare this measurement with the reading displayed when Display Command 196 is initiated. Are the equal?
No
Perform the AC Power PCA Adjustment procedure (see Section 4-4 of the Service Manual.
Yes
Is DS5 on the AC Power PCA illuminated?
No
Go to the "AC Contractor malfunction" in Section II of this manual.
Yes
Examine the AC Contactor. Has the AC Contactor physically "picked"?
No
Yes
It does not appear to be a POWER problem return to the GENERAL TROUBLESHOOTING table.


POWER ENTRY 1
Assuming both circuit breakers are both ON and the the Power Distribution PCA LEDs are no illuminating, measure testpoints TP7, TP8, TP9, and TP10 on the Power Distribution PCA. Do any of the testpoints measure HIGH (+5 Vdc)?
Yes
No
Connect a jumper from TP11 (Power Overvoltag Disable) to Ground on the Power Distribution PCA, and reset the rear breaker. Do the +5 and +/-12 Vdc LEDs illuminate?
No
The problem appears to be in the +5, +/-12 Vdc Supply or the input ac line voltage, refer to figure 6-20 of this
Yes
The problem appears to be in the DC Voltage Supply adjustment on the Power Distribution PCA, refer to the adjustment procedure in Section IV of Service Manual.
For blank display problems, refer to 2-2 of this manual.
Yes
Remove the jumper from TP11 to Ground. Verify that the +5 and +/-12 Vdc LEDs are illuminated.
Return to the GENERAL TROUBLESHOOTING table when the power problem is resolved.

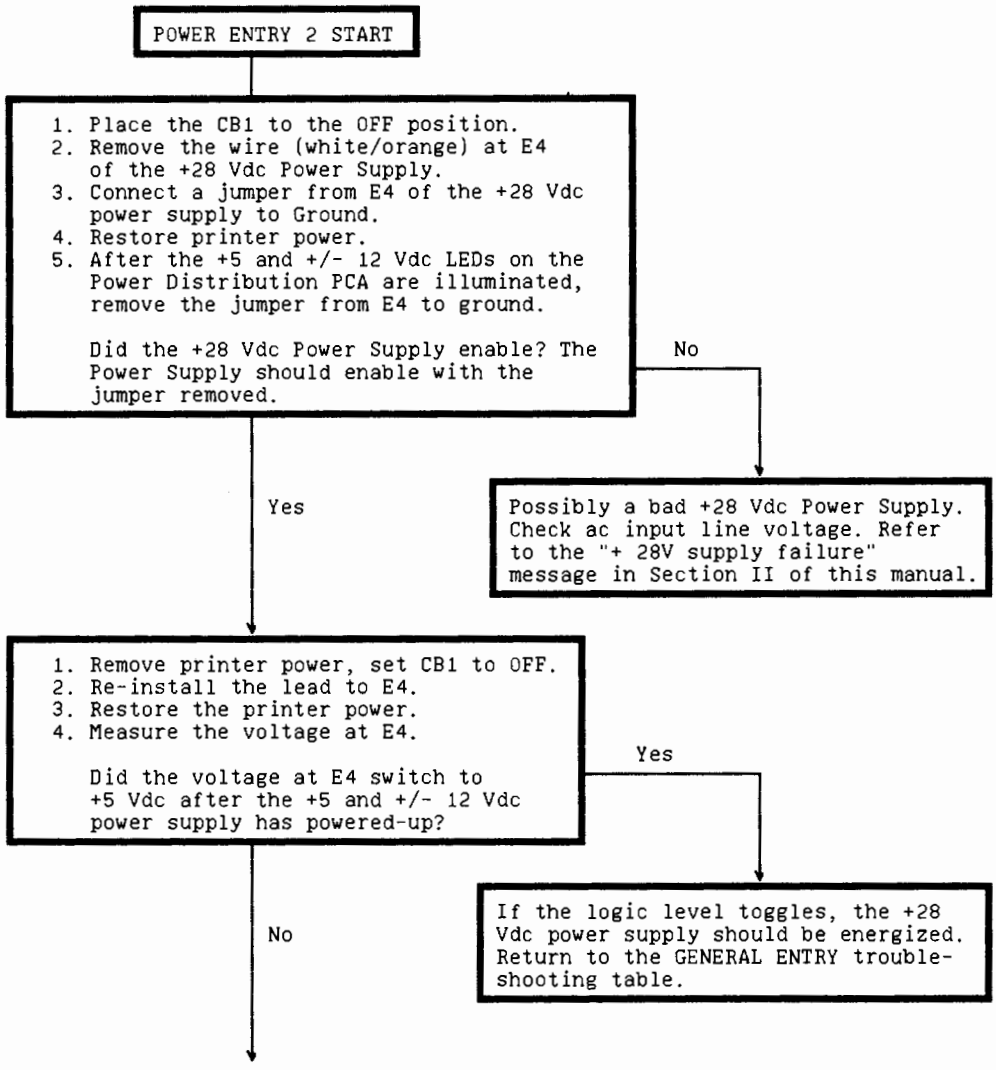
POWER ENTRY 2

The Machine Control Processor controls the enabling of the +28 Vdc Supply. A logic low (0 Vdc level) on E4 of the +28 Vdc Power Supply disables the supply, a logic high (+5 Vdc) enables the supply.

The following error messages result in the disabling of the +28 VDc power supply by the Machine Control Processor:

Front door open
No drum
Prim cor supply 2
Phtr overtemp X
RF driver stuck on
Simul cor supply 2
Trfr cor supply 2

The +28 Vdc power supply is normally OFF when the AC Contactor is NOT energized.



The Machine Control Processor has detected an error which prevents the power supply from being enabled, refer to the Power Distribution (figure 6-22) and the "+28V supply failure" message in Section II of this manual.

Return to the GENERAL TROUBLESHOOTING table.

[... ANCE ENTRY]

General Hints

* If a problem has occurred which is the result of the lack of proper preventive maintenance, take corrective action.

* Do NOT wait until a component breaks to perform preventive maintenance.
  Preventive maintenance means that you take time NOW to carefully inspect all areas of the printer to try to predict future breakdowns.

* It is imperative maintenance records be kept for each printer; it is also important that all Service Notes for the HP 2680A be filed with your service documentation.

The following is a list of areas (items) which should be inspected each time a printer PM is performed.

1. Corona wires
2. Corona resistors
3. Corona end caps
4. Corona High Voltage Cables
5. Overall Illumination Lamps
6. Erase Lamps
7. Vacuum Motor Belt
8. Vacuum bag door seal
9. Preheater vacuum
10. Vacuum system piping
11. EL Strip
12. Electrostatic Monitor (ESM)
13. ESM solenoid and linkage
14. AC input line voltage
15. DC Power Supplies Adjustment
16. Developer Assembly Voltage
17. Densitometer Adjustment
18. Fuser Bulb (cleanliness)
19. Fuser End Blocks
20. Fans
21. Filters
22. Retraction Blade Adjustment
23. Retraction Solenoid
24. Drum to Developer Roll Spacing
25. Tension Motor Speed
26. Chainbox (for excessive wear)
27. First Order Power Level (laser)
28. Proper Fusing (inspect printed output)
29. High Solid Reflectance Average
30. Primary Corona Setting (190 normal)
31. Simultaneous Corona Setting (90 normal)
32. Dark Potentials
33. Light Potentials
34. Excessive toner contamination

Return to the GENERAL TROUBLESHOOTING table when all maintenance areas have been throughly inspected.

INSTALLATION ENTRY

If a problem is encountered during installation, verify that the following items are checked:

* Verify that all PCAs are correctly seated and that all cables are firmly seated to their connectors (check cables on the power supply, backplane, coronas etc...).
* Verify that all assemblies (i.e. drum, coronas, cleaner station, electrostatic monitor, developer, etc...) are properly seated and aligned.
* Verify that all electrical adjustments have been performed (see Section IV of the service manual).
* Verify that the ac input line voltage is correctly strapped. Resecure input circuit breaker screws if necessary and all other screws securing electrical wiring.
* Verify that the HP-IB cable connection is good. Verify that the proper HP-IB address has been correctly set and the HP-IB loading is correct for the printer configuration.
* Verify that the system configuration is correctly set.

Verify that all hardware failure messages are corrected before proceeding.

Return to the GENERAL TROUBLESHOOTING table when all errors have been corrected.

MESSAGE ENTRY

All hardware error messages (see section 2-1) are a result of an internal printer diagnostic which has failed. The following types of diagnostics are performed by the printer:

* Power-On/Reset diagnostics
* Continuous operating system diagnostics (performed while the printer is in the idle state.
* Operating system diagnostics which are performed in the active state (after the RUN key has been pressed).
* Self Test diagnostics (performed only when the Self Test key has been pressed).
* Diagnostics which are exclusively executed at the CE's request (see CE Command Summary in Appendix A of the Service Manual).

Error Message Hints

The following troubleshooting hints should be kept in mind when troubleshooting diagnostic error messages:

* When multiple error messages are encountered, research each error individually and try to determine if a commonality exists between messages. In many situations multiple errors can be both the cause and effect of a signal failure (i.e., Beam Detect Failure/Warning, ES Loop 2, and ES Loop 4 error messages can all be a result of low laser First Order Power).
* Often various diagnostics and diagnostics loops can be disabled to bypass error messages. The "overriding" of diagnostic loops should only be practiced if several printer errors are interacting and halting the printing of the SELF TEST. By disabling the diagnostic loops the service representative can manually enter various settings and "freeze" the electrophotographic process forcing the printer to operate in an almost normal mode. In doing so, the true source may be more easily isolated.
* The error messages are listed in Section 2-1 of this manual. Listed with each message is the fault ID number listed as decimal value. The fault ID number is transferred to the host system when a failure occurs during system printing. The system error log (LISTLOG2) records this ID number in an octal value and their provides the service representative a history of the printer's errors.
* Many false errors often result from an arcing corona. High Voltage system operation should always be verified when troubleshooting.
* DC voltages levels should always be verified early in the troubleshooting process.
* Low laser power (less than 70 counts) can aggravate many other areas in the EP Process as well as cause complete EP Loop failure. Do NOT ignore the laser power level when troubleshooting.

PRINT QUALITY HINTS

Introduction

Print quality is one of the most difficult problems to troubleshoot since print quality is based on what the customer perceives as quality print. The customer's perception of print quality should be set early and he should be able to determine when his printed output is deviating from normal.

No two printers exhibit identical print quality. As print components within the printer wear, the automatic diagnostic (adjustment) loops within the printer's operating system vary to compensate for the wear. This compensation is often displayed in the Self Test printout. Because of this, the printout can be a valuable tool for predicting future print quality and hardware errors. Print quality deteriorization is usually the first symptom prior to a hardware error.

Print Quality Troubleshooting Hints

* During normal operation, operate the printer with as low as possible Dark Target without getting background.
* Change the drum when drum potentials can not be maintained (normal potentials: "Dark Target" = 175 counts, "Doc Pot DD" greater than 135, and "Light Pot LL" less than +30).
* Verify that all electrical and mechanical adjustments are properly set.
* Change the developer mixture when the "Solid Rfl Avg" is greater than 350.
* The efficiency of the vacuum system greatly affects fusing, paper output tension, and print quality (leading edge smearing). Also leaking vacuum door seals and hoses can result in excessive toner build-up in the cleaner station. Verify that the vacuum system is good operating condition prior to troubleshooting a print quality problem.
* Paper is a constant variable in print quality. Washouts, poor fusing, and smearing can be caused by various types of papers. Do NOT overlook paper types when troubleshooting a print quality problem.
* Developer assembly adjustments greatly affect print quality; ensure all developer assembly adjustments are correct when troubleshooting print quality problems.
* Worn, dirty, or misadjusted transfer station (transfer corona, transfer brush, retraction linkage) components can result in intermittent print quality problems.

Proceed to Section III of this manual for correcting print quality problems. It is highly recommended that you read Section IV (Self Test) before performing detailed print quality troubleshooting.

PAPER PATH ENTRY

The major causes of paper path problems are first the paper, and secondly the printer hardware.

PAPER

Paper is a continuous variable when dealing with paper path problems since no two boxes of paper are identical. To avoid many paper path problem a high quality must be used, and this paper must be properly handled and stored (see the HP 2680A Paper Specification Guide P/N 02682-90913)

Moisture is the greatest contributor to paper related, paper path problems Paper stored in a high moisture environment causes the paper to warp preventing it from laying flat against the drum thus preventing proper image transfer (i.e. washouts). Paper which has been incorrectly manufactured (improperly cut) has a tendency to lean in the stacker and curl.

HARDWARE

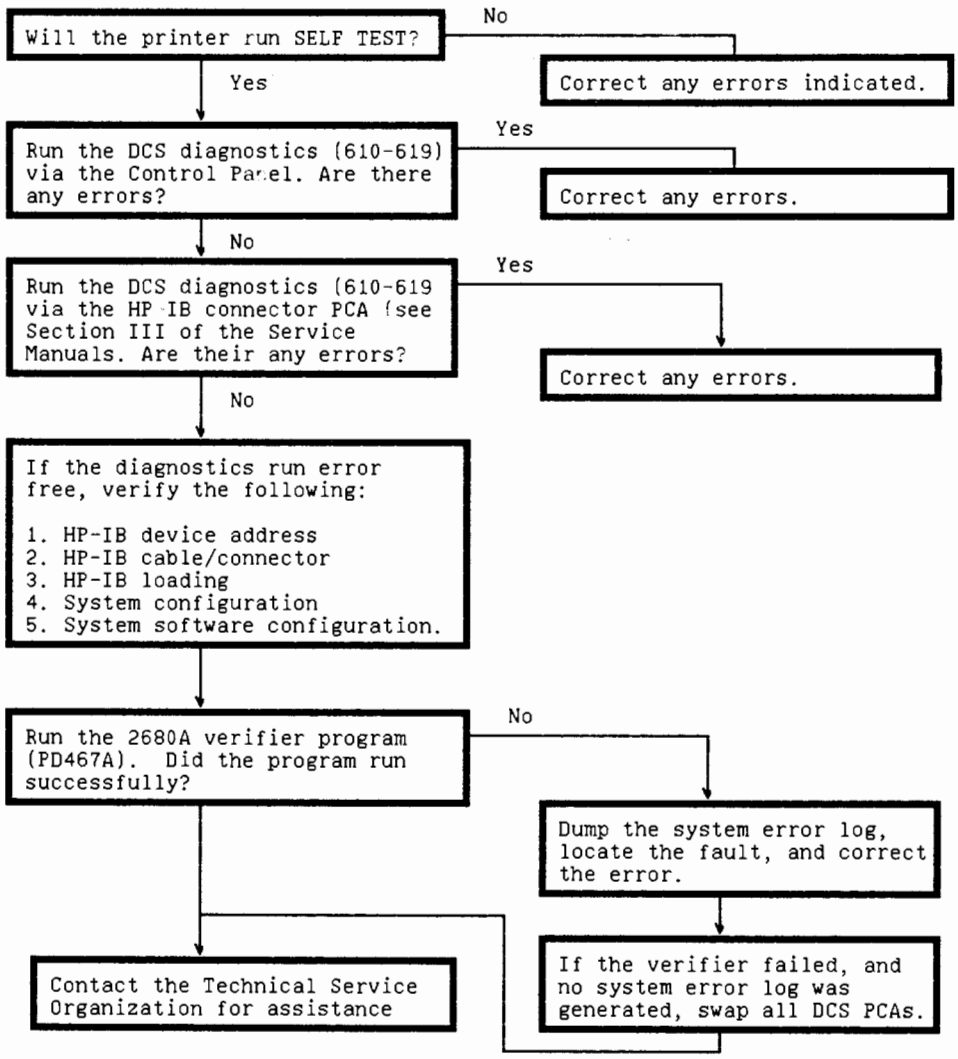
The following is a list of hardware items and areas which should be inspected when troubleshooting a paper path problem:

* Tension Motor Speed
* Output Tractor wear/alignment (tractor alignment can be identified by paper tractor hole deformation)
* Chainbox wear
* Stacker Safety Switch sensitivity
* Preheater alignment
* Preheater vacuum (either too high or low)
* Obstructions in the paper path (top cover hanging down)
* Retraction Blade adjustment/wear
* Input tractor alignment/wear

Inspect the preceding areas of the printer. Perform the maintenance routines and perform the required adjustments in the paper path.

SYSTEM ENTRY

System errors are difficult to isolate since most system errors cause the system to "hang". If a system error should occur, proceed as follows



SECTION II.
PRINTER DISPLAY MESSAGES

2-1. Diagnostic Error Message Listing

The following messages are displayed by the printer during error situations. The three digit number to the right of each message represents the error code sent to the host system and recorded in the printer's error log. The Fault Type and Operator Message designations are defined below.

FAULT TYPE
- A. Failure requiring repair - print stopped
- B. Unrecoverable fault - print stopped
- C. Warning - failure imminent
- D. Operator attention required - print stopped
- E. Warning - operator attention required
- F Machine halted by letting one-shot time out

OPERATOR MESSAGE
- A. Hardware malfunction
- B. Advisory condition
- C. Not displayed in operator mode
- D. same message
- E. Process adjusting

ALPHABETICAL MESSAGE INDEX

FAILURE MESSAGE	ID #	FAULT TYPE	OPERATOR MESSAGE	
AC Contactor Short	-	B	A	
AC triac short	267	B	A	
ADC hung up	210	A	A	
A/D data invalid	240	A	A	
Advisory Condition	-	-	-	
A/O modulator fail/warn	200	A	A	*
	300	C	B	*
Beam detect warning/failure	201	A	A	
	301	C	B	
Cant maintain target	-	-	-	
Can't turn off +28V	328	C	C	
Cardcage overtemp	241	A	A	
	305	C	B	
Char processor fail	341	C	B	
DCS main memory fail	343	C	B	
DCS mem parity error	282	A	A	
DCS power on	233	A	A	
DCS ROM read err	326	C	B	
Densitometer fail 1	242	A	A	
Densitometer fail 2	253	A	A	
Densitometer warn 1	335	C	B	
Density is too low	-	-	-	
Developer full	315	C	C	
Developer overfull	254	A	A	
Dev supply fail	214	A	A	
Developer short cct	243	A	A	
DMA failure	342	C	B	
Drum not in sync	244	A	A	
Drum top switch err	235	A	A	
Encoder edge error	270	B	A	
Encoder res error	271	B	B	
Erase lamp warn	309	C	C	
ES loop warn/fail 1	220	A	A	
	230	C	B	
ES loop warn/fail 2	221	A	A	
	321	C	B	
ES loop warn/fail 3	222	A	A	
	322	C	B	
ES loop warn 4	323	C	C	
ESM door reference	347	C	B	

ESM open door tes F	231	A	A
ESM shut door test F/W	229	A	A
	306	C	B
ESM supp[illegible]ailure	230	A	A
External [illegible]eg fail	344	C	B
Firmware trap XX		F	D
FOP out of range		-	
FOP peak used	-	-	-
Front door is open	-	D	D
Fuser circuit ope	209	A	A
Fuser switch short	264	B	A
[illegible]er/PAMM fan fail	250	A	A
[illegible]gh reflectance	252	A	A
High screen V warn, fail	280	A	A
	301	C	B
High sim corona warn/fail	[illegible]	A	A
	346	C	B
High transfer I fail	227	[illegible]	A
High ZOP laser off	274		A *
Hopper motor warn	311		B
Illegal dev comb	-	-	-
Illegal DCS command	255	A	A
Illegal MCS command	249	A	A
Illegal NVR # XX	278	B	A
Interrupt fail X		F	D
Invalid phtr target	313		C
Invalid stepper pos	277	B	A
Job active pwr fail	-	D	D
Laser warning/failure	-	A	A *
	302	C	B *
Line overvoltage	-	D	D
Low line voltage		D	D
Low primary I warn/fail	225	A	A
	325	C	B
Low primary V warn/fail	224	A	A
	324	C	B
Low reflectance	245	A	A
Low screen V warn/fail	226	A	A
	330	C	B
Low sim corona warn/fail	223	A	A
	332	C	B
Low transfer I fail	228	A	A
Low transfer V fail	281	A	A
MCS/DCS loop-back	213	A	A
Mem controller fail	340	C	B
No drum	268	B	A
No FOP peak found	-	-	-
No response from DCS	212	A	A
No top of drum	251	A	A
No Top of Stack	-	D	D
Noisy signal gnd	232	A	A
NVR failure	276	B	A
Out of paper	-	D	D
Output door is open	-	D	D
Output paper misfold	-	D	D
Overall illum warn	310	C	B
Pad/area fail XX	307	C	B
Paper jam	-	D	D
Paper width sensor	312	C	B
Preheat fail X	206	A	A
Phtr area0 X	205	A	A
Phtr I sensor X	308	C	B
Phtr overtemp X	265	B	A
Phtr temp sensor	262	B	A
Prim cor supply 2	260	B	A
Print lost on left	-	E	D
Print lost on right	-	E	D
Purge pump, fan fail	211	A	A
RAM failure X X X X	-	F	D
Ready for data	-	-	-
Relay failure X	207	A	A
Relay warning	314	C	C
RF driver warning/failure	203	A	A
	303	C	B
RF driver stuck on	266	B	A
ROM failure X X X X	-	F	D
Scanner failure	204	A	A

Scanner start fail	215	A	A
Simul cor supply 2	263	B	A
Stack safety switch	275	B	A
Stacker full (False)	-	D	D
Step phase error	272	B	A
Stepper init error	273	B	A
Stopped by op ator (Fal	-		-
Toner hopp low/empty		E	D
	-		D
Top of form error	-	E	D
Trfr co upply 2	261	B	A
Triac/fuse X	208	A	A
Unrecoverable faul	-	B	D
Use custom shield		E	D
Use no shield	-	E	D
Use shield # X		E	D
Vacuum bag f l	329	C	
Vacuum System Fail	-	-	-
VDP Controller Error	-	-	-
Volume sensor warn	233	C	B
Waiting for data (False)	-	-	-
Warming up (false)	-	-	-
Wiper blade is up	283	A	A
+28V supply failure	247	A	A

* Message is eliminated when MCS firmware date code 2141 or greater is installed in the printer.

AC Contactor Short

This message occurs when current is measured by the firmware diagnostics at the ac contactor when the the ac contactor is presumed to be de-energized (open

Possible cause:

a. AC Contactor (movement physically hindered)
b. Triac PCA
c. AC Power PCA
d. Control PCA
e. AC Power PCA Transformer

Recommended Procedure

NOTE

Verify that all other error messages have been corrected prior to troubleshooting this message. Refer to the "Unrecoverable fault" message listed in this section of the manual.

a. Perform a printer reset (0 ENTER) from the printer's Operator Control Panel. If the message persists, proceed to step b.

b. With the printer's power disconnected, verify that all PCAs are seated, that the wiring is in good condition (not shorted or open), and that nothing is hindering the mechanical movement of the AC Contactor (refer to figure 6-5).

c. Visually observe DS1 on the AC Power PCA while powering up the printer. The illuminating of DS1 indicates that the MCP firmware is trying to energize the AC Contactor. If DS1 is NOT illuminated, yet the error persists (AC Contactor Short), the source of the error lies in circuitry after DS1.

d. Replace the following comonents is the order listed:

AC contactor
Triac (or Triac PCA)
AC Power PCA
AC Power PCA Transformer

AC triac short

This message occurs when greater than 20 counts are measured during the AC loads diagnostic when the loads are presumed to to be off. Use display command 188 (AC Loads Current with Loads Off) to verify the message.

Possible cause:

a. Loose ribbon connector (J7 of the AC Power PCA to J2 of slot 17 of the backplane)
b. AC Power PCA
c. Triac PCA
d. Control PCA
e. Developer motor SSR

NOTE

An "AC triac short" message may also be caused by an arcing primary corna assembly. Also some types of line conditioners and motor generators may also cause the error message to be displayed.

Recommended Procedure:

a. Ensure that all PCAs and ribbon connectors are seated properly (refer to figures 6-1 and 6-2).

b. Perform a hard Reset on the printer (toggle the Front Power Breaker OFF/ON) and visually verify that the following ac loads are off:

Erase lamp
Overall illumination
Purge pump and fan
Hopper motor
Fuser/PAMM fans
Developer motor

NOTE

To more easily view the lamp assemblies, initiate service tool command 676 (Enable High Voltage System) and open the printer front door within three seconds. This allows the printer front door to be open without de-energizing the AC Contactor. Close printer front door to exit the High Voltage enable mode.

If it is difficult to visually determine if the ac loads are OFF, perform the following procedures as needed.

1. Refer to figure 6-1 and 6-2; measure the following testpoints on the AC Power PCA to determine if the loads are being turned on by part of the control circuitry:

ON = Low
OFF = High

Erase Lamp	= TP38
Overall illumination Lamp	= TP36
Purge Fan/Pump	= TP35
Hopper Motor	= TP34
Fuser/PAMM Fans	= TP40

2. Refer to figure 6-8, if the Developer motor is on, measure the voltage across pins 3(+) and 4(-) of the Developer Motor SSR on the back of the EP panel. If the voltage measures 1 Vdc the SSR is shorted, replace the SSR. If the voltage is greater than +3 Vdc, replace the Control PCA.

ADC hung up

This message occurs when the analog/digital converter on the Monitor PCA fails to initiate its conversion.

Recommended procedures:

a. Reseat Monitor and MCP PCAs.
b. Replace Monitor PCA
c. Replace MCP PCA

A/D data invalid

This message occurs when the 5 volt reference from the Power Distribution PCA measures greater than 138 counts or less than 118 counts (2.7 Vdc and 2.31 Vdc). Initiate display command 195 (Reference Voltage) to verify the message.

Probable cause:

a. Monitor PCA
b. Power Distribution PCA

NOTE

All A/D measurements are made with respect to the +5 Vdc reference supply on the Monitor PCA. The +5 volt reference supply is used on on the Power Distribution PCA for under and over voltage protection; this same line is then routed to the Monitor PCA on a separate connector and compared with +5 volts which comes directly from the power supply. If any difference between these two five volt lines is detected, the MCP posts an error.

Recommended procedures:

a. Verify test point TP9 on the Monitor PCA measures +5 Vdc +/-.02 volts. If the measured value is not within this range, replace the Monitor PCA.

b. Verify test point TP14 on the Power Distribution PCA measures +5 Vdc +/- 0.2 volts. If the measured value is not within this range replace the Power Distribution PCA.

c. Verify that all PCAs and ribbon cables are seated properly (see figure 6-22 for Power Distribution PCA cabling).

Hints

Signal Path - J2-2 Power Distribution PCA - J7-3 Backplane - J1-16 Monitor PCA

Advisory condition

This message warns the operator of a possible failure. This message does not cause the printer to stop printing.

Recommended procedure:

a. The service representative should press 5 ENTER at the Service Control Panel to determine the nature of the advisory condition.

A/O modulator fail
A/O modulator warn

These messages occur when the measured difference of Zero Order Power (ZOP) with the Beam On and with the Beam Off is less than 50 counts. Initiate display commands 163 (ZOP, Beam On) and 164 (ZOP, Beam Off) to verify the "A/O modulator fail/warn" messages

Probable cause:

a. Optics Casting
b. Monitor PCA

Recommended procedures

a. Verify that the A/D converter on the Monitor PCA is working as follows:

   1. Measure test point TP16 (ZOP) on the Optics PCA while executing display command 163; this provides a measurement of ZOP with the Beam On. Measure test point TP16 while executing display command 164; this provides a measurement of ZOP with the Beam Off.

   2. Initiate service tool command 623. Compare the ZOP values measured with the values of ZOP displayed by the service tool command. If the values compare (in counts), the Monitor PCA's A/D converter is working properly.

      Note

      Use the A/D Conversion Table in Appendix A to convert the measured values of ZOP to count values.

Beam detect failure
Beam detect warning

These messages occur when the measured First Order Power (FOP) with the RF driver on, is equal to or less than 50 counts.

Possible causes:

a. Ribbon connector (J6 of Backplane to Optics PCA)
b. Laser/Power Supply and Power Supply Filter
c. Ribbon connector (J2 Slot 17 of Backplane to AC Power PCA)
d. Control PCA
e. AC Power PCA
f. Optics PCA
g. Optics Casting

Recommended procedures:

a. Verify that all ribbon connectors and PCAs are seated.

b. Recalibrate the laser, initiate service tool command 623. The the beam setting should be adjusted until the First Order Power "FXXX" reads between 90 to 95 counts.

c. Initiate the printer Self Test and verify that the laser power supply is being turned on at TP 49 on the AC Power PCA (see figure 6-1).

WARNING

Do NOT attempt to measure the voltage at the output of Laser Power Supply.

The following procedure may be used to isolate the problem, refer to figure 6-24:

NOTE

The scanner motor and the laser circuitry must be enabled before Beam Detect is generated; in addition, Beam Detect is used to enable the Video signal. The complexity of this closed loop system should be taken into consideration before troubleshooting.

a. Access the Optics PCA as follows:

1. Remove the right side panel of the printer; the panel is secured by two quarter-turn fasteners, one behind the toner hopper and one behind the upper left-hand corner of the back panel

2. Loosen the 15 cross-hatched screws which secure the Optics PCA cover to the lower left-hand corner of the Optics Casting.

b. Perform the following commands to disable various diagnostic routines in the printer. The disabling of these diagnostic routines allow the printer to presume all circuitry is functioning correctly and therefore, that printing normal. This, will thereby provide the service representative the opportunity to check various testpoints within the Optics PCA circuitry.

Initiate 460 (Disable Optics Diagnostics)
430 (Disable Electrostatic Loop Diagnostics)
441 (Disable Reflectance Loop Diagnostics)

1. Initiate service tool command 622 (Calibrate Laser Power) while observing the signals on testpoints TP11 and TP 2 of the Optics PCA (Modulated Power Out and Modulated Power In). These signals should vary from 0 to 5 volts as the laser is calibrating.

2. Initiate service tool command 623 (Measure Optics Parameters) while observing the signals on testpoints TP 19, TP 17, and TP 18 (Beam Detect, Bean Detect NOT, and First Order Power). These signals should be similar to those shown on the bottom of figure 6-24.

3. Initiate the printer Self Test while observing the signal on testpoint TP 12 (Video). The signal should be similar to that shown on the bottom of figure 6-24 as the self test data is sent to the Optics PCA.

Cant maintain target

This message occurs if the density target is set too high for the printed output; i.e., the printed output contains several pages of material with a high percentage of print coverage (ratio of printed area to non-printed area). The print demand is greater than the the toner hopper's ability to keep up. The T Duty cycle value is greater than 32K or three drum rotations of the toner hopper.

Possible causes:

a. The Density Target is too high.

Recommended procedures:

a. The Operator should lower the Density Target via the 50 (Density Target) command.

Can't turn off +28V

This message occurs when the +28 volt power supply is measured at greater than 32 counts when the +28 Vdc supply is presumed to be off. Initiate display command 194 (+28 Supply Voltage) to verify the message. Normal count measured : 158 - When the supply on.
2 - When supply is off.

Possible cause:

a. Ribbon cables
b. Power Distribution PCA
c. +28 Vdc Power Supply (63312F-R03)
d. Control PCA
f. MCP PCA

Recommended procedures:

a. Verify all wiring between the Power Distribution PCA and the +28 Vdc Power Supply is in good condition (not shorted or opened) and that all ribbon connectors are properly seated.

b. Verify the +28 Vdc Power Supply as follows.

   1. Ground E4 "+ 28 Control" on the +28 Vdc Power Supply and measure the power supply's output. If the power supply was not turned off by the grounding of E4, replace the power supply.

c. Verify the +28 off control line (P2-45 Backplane) between the Control PCA and the Power Distribution PCA is not open or shorted as follows:

   1. Open the printer front door (this action disables the the +28 Vdc supply) while measuring testpoint E4 at the supply. The following measurements should be observed while opening and closing the front door:

      0.6 Vdc - Front door opened
      2.4 Vdc - Front door closed

      If the enable line does not work, replace the Power Distribution PCA and then the Control PCA.

Cardcage overtemp

This message is displayed when the cardcage temperature is greater than 196 counts. Use display command 197 (Cardcage temperature) to verify message. At count 205, the printer goes into HALT mode.

Probable cause:

a. Cardcage fan failure
b. Excessively dirty air filters
c. Room ambient temperature too high
d. DC Power PCA (temperature sensor)
e. Monitor PCA (A/D subsystem failure)

Recommended procedure:

a. Verify that all fans are operating correctly, refer to paragraph 5-7, Fan and Blower Operation in section V of the HP 2680A Service Manual.

b. Verify that the air filters are clean; replace if necessary.

c. Verify that the printer's operating environment is within the specifications established, refer to HP 2680A Site Preparation Guide (HP P/N 02682-90906).

d. Replace the DC Power PCA

e. Replace the Monitor PCA

Hints

The following table relates cardcage temperature in A/D counts to degrees:

A/D Counts	Degrees Celsius +/- 5	Fahrenheit +/- 9
165	27	81
170	30	86
175	33	91
180	35	95
185	38	100
190	40	104
195	42	108
200	45	113
205	47	117

Char processor failure

This message is displayed when the Character Processor diagnostic has failed.

Possible cause:

a. Character Processor PCA
b. Print Control PCA
c. DCS I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Execute all data control system memory diagnostics (service tool commands 610 through 619), refer to section III of the Service Manual. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed.

DCS main memory fail

This message is displayed when the DCS main memory diagnostic fails. The "D" status LED on the Memory Controller PCA illuminates for single bit memory errors. The "E" status LED illuminates for multiple bit memory errors.

Probable cause:

a. Front Plane Connectors
b. Memory Arrays
c. Memory Controller PCA
d. Data Processor PCA

NOTE

Do not perform a power-on or system reset. These actions clear the memory controller error log which contains information about the parity error.

Recommended Procedure:

a. Initiate service tool command 619 (Dump DCS Memory Error Log) to display faulty memory chip information. Refer to DCS Self Test Diagnostics in section III of the HP 2680A Service Manual. If more than five chips are indicated as faulty on one Memory Array, replace the array.

b. If the error message persists, replace the PCAs in the order listed under possible cause.

DCS mem parity error

This message is displayed when a DCS main memory parity error is detected. Multiple bit parity errors are uncorrectable.

Probable cause:

a. Front Plane Connectors
b. Memory Arrays PCAs
c. Memory Controller PCA

Recommended procedure:

Note

Do not perform a power-on or system reset. These actions clear the memory controller error log which contains information about the parity error.

a. Initiate service tool command 619 (Dump DCS Memory Error Log), refer to section III of the Service Manual.

b. If the error message persists, replace the PCAs in the order listed under possible cause.

DCS power on

This message is displayed whenever the DCS operating system attempts to initialize any time other than during initial power on or system reset.

Possible cause:

a. DCS I/O PCA
b. Data Processor PCA
c. Print Control PCA
d. Machine Control Processor PCA

Recommended procedure:

a. Execute all data control system memory diagnostics (service tool commands 610 through 619), refer to section III of the HP 2680A Service Manual.

b. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed under possible cause.

DCS ROM read err

This message is displayed when a checksum error is detected during the reading of the default character set PROMs.

Possible cause.

a. Integrated Circuits U56, U66 on the Data Processor PCA
b. Data Processor PCA

Recommended procedure

a Initiate service tool command 610 (DCS Self Test,Host Connected) and service tool command 611 (DCS Self Test, Host Disconnected), refer to section III of the Service Manual.

b. Replace the Data Processor PCA.

Densitometer fail 1

This message is displayed whenever the clean drum measurement is less than 600 counts. Initiate display command 225 (Clean Drum Measurement) to verify message.

Possible cause:

a. Densitometer Assembly
b. Monitor PCA
c. Ribbon cable (Densitometer Assembly to J10 of the Backplane)

Recommended procedures:

Note

Ensure the wiper blade is down when performing the Clean Drum Routine.

a. Ensure that all PCAs and ribbon cables are properly seated (refer to figure 6-21).

b. Verify densitometer operation and adjustment. Refer to Densitometer PCA Adjustment in section IV of the HP 2680A Service Manual.

c. If the error message persists, replace the assemblies in the order listed as a possible cause.

Densitometer fail 2

This message is displayed when the densitometer LED current is less than 128 counts or greater than 230 counts. Use display command 129 (Densitometer LED Control Voltage) to verify message.

Possible cause:

a. Densitometer Assembly
b. Monitor PCA
c. Ribbon connector (Densitometer Assembly to J10 of backplane)

Recommended procedure:

a. Follow the recommended troubleshooting procedure listed for the "Densitometer fail 1" error message.

Densitometer warn 1

This message is displayed when the clean drum reflectance is equal to or greater than 765 counts.

Possible cause:

a. Monitor PCA
b. Densitometer Assembly

Recommended procedures

a. Recalibrate the densitometer gain (see Densitometer PCA Adjustment in section IV of the Service manual).

Density is too low

This message is displayed if insufficient development is taking place during the New Drum/Wiper Routine (service tool command 661). Insufficient development is a reflectance measurement of less than 75 counts.

Hints

Remove the paper from the printer and inspect the drum under the densitometer assembly. If heavy development is occuring on the drum (toner), the problem is probably not related to a faulty densitometer.

Recommended procedures:

a. Verify the densitometer is correctly adjusted, refer to Densitometer PCA Adjustment in section IV of the Service Manual.

b. Display the following parameters and verify the settings are valid (refer to the last Self Test print-out):

   1. Primary corona setting (display command 231)
   2. Simultaneous corona setting (display command 241)
   3. Developer bias setting (display command 236)
   4. Laser setting (display command 261)

c. Enable and display the following loads to verify their operation:

   1. Primary corona - 731 (Device On) - 131 (Display)
   2. Simultaneous corona - 741 (Device On) - 141 (Display)
   3. Developer bias - 736 (Device On) - 136 (Display)
   4. Optics - 623 (Measure Optics Parameters)

Developer full
Developer overfull

The "Developer full" message occurs when the average developer volume is between 189 to 210 counts (initiate display command 134, Average Developer Volume, to verify the message). The "Developer overfull" message occurs when the average developer volume is greater than 210 counts. The latter message results in stopping the printer

Possible causes:

a. The developer assembly is too full.
b. Defective Developer Volume Sensor (DVS)
c. DVS circuitry (Monitor PCA)
d. Developer Magnet Angle out of adjustment

NOTE

Because the composition of the developer mixture is ferro-magnetic and therefore conductive, the developer volume sensor is capable of measuring the volume of developer mixture in the developer assembly.

NOTE

An "Developer full" message may also be caused by an arcing primary corona assembly.

Recommended procedure:

a. Verify that the developer assembly is not too full as follows:

   1. Remove the developer assembly from the printer (refer to paragraph 5-12 of the Service Manual).

   2. The DVS is located on the inside rear wall of the developer housing near the developer drive gears. Under normal operating conditions the DVS is usually only about half covered with developer mixture. Verify that the developer mixture is not completely covering the sensor. If the sensor is covered remove some of the mixture, re-install the developer assembly, and perform the Developer Run-In routine (refer to paragraph 5-17 of the the Service Manual.

b. The DVS circuitry may be verified as follows (refer to figure 6-8A):

   1. Remove the developer assembly and fill the cavity in front of the DVS with developer mixture. Re-install the developer assembly and intiate display command 135 (Instantaneous Developer Volume); if the sensor is working correctly, the count should be approximately near 240.

      Remove the developer assembly and remove all developer mixture from in front of the DVS. Re-install the developer assembly and initiate display command 135 (Instantaneous Developer Volume). If the sensor is working correctly the count should read near zero.

      Perform the Developer Run-In routine.

c. Verify that the developer magnet angle alignment is correct (refer to paragraphs 5-12 through 5-14 of the Service Manual.

Dev supply fail

This message is displayed when the developer voltage is less than 100 counts and the door bias voltage is less than 20 counts. Initiate display command 119 (Multiple ESM Display) to display the developer bias voltage (D=xxx) and the developer door bias (B=xxx)

Possible cause:

a. Fuse F4 on the High Voltage Supply PCA
b. Monitor PCA
c. High Voltage Supply PCA

Recommended procedures:

a. Initiate device on command 736 (Developer Bias, enable) and then display command 136 (Developer Voltage); note if the error message persists.

NOTE

The normal developer bias voltage should be approximately 190 counts.

b. Initiate display command 194 (+28V Supply Voltage) and verify the power supply measures greater than 148 counts.

c. Verify fuse F4 on the High Voltage PCA is not open.

d. Verify that all wiring in the developer bias circuitry is in good condition (not pushed pins or, cut and or frayed wires); see figure 6-15.

Developer short cct

This message is displayed when the developer voltage is less than (2 X the developer bias setting) - 287. Initiate display commands 136 (Developer Voltage) and 236 (Developer Bias Setting) to verify the message.

NOTE

The displayed voltage is proportional to, but not equal to the voltage on the developer.

Recommended procedures:

a. Initiate device on command 736 (Developer Bias, enable). Verify that the error message is valid by displaying the developer voltage (display command 136) and comparing it to the calculated error message limit (two times the bias setting minus 287).

b. Perform service tool command 676 (Enable High Voltage System) and open the printer front door.

NOTE

The front door must be open within three seconds after entering the command.

Press 1136 at the Service Control Panel to continuously display the developer voltage.

c. Open the toner hopper. If the developer voltage increases above the limit, the toner hopper is probably the source of the error message; investigate. If the voltage does not change, proceed to step d.

d. Disengage the developer assembly by turning clockwise on the Developer Engage Control Lever while monitoring the developer voltage. If the voltage increases above the limit a developer short probably exists between the developer top seal and the drum Remove and clean the developer assembly and seal Refer to section IV of the HP 2680A Service Manual. If the short persists, proceed to step e.

e. Remove the Developer Motor (see Section IV of the service manual) and clean the output drum drive gear This gear should be isolated from frame ground.

f. Unplug the developer assembly connector while monitoring the developer voltage. If the developer voltage changes, the short may exist between the developer assembly or tray, and the frame proceed to step f If the voltage does not change, proceed to step g.

f. Inspect the developer top seal rollers and the right and left mylar seals, replace if they appear worn or damaged.

g. Remove the developer table, developer engaging assembly, and control lever (8 screws). Clean the base of the EP cavity and the table assembly.

h. Replace High Voltage Supply PCA.

DMA failure

The direct memory access controller failed the DCS Self Test diagnostic.

Possible cause:

a. DCS I/O PCA
b. HP-IB internal ribbon cable
c. HP-IB interconnect cable (front plane)
d. Memory Controller PCA
e. Data Processor PCA

Recommended procedure:

a. Ensure that the DCS I/O PCA and ribbon connectors are properly seated.

b. Perform service tool command 615 (Direct Memory Access) to verify the error message. Refer to section III of the Service Manual.

c. Replace the assemblies in the order listed as a possible cause.

NOTE

The DMA Controller diagnostic tests the PHI chip in a wrap around mode, but does NOT test the HP-IB bus transceivers, the HP-IB ribbon cable (internal), or the HP-IB external connect cable.

Drum not in sync

This message is displayed when the top of drum signal is not present or occurs at the wrong time.

Possible cause:

a. Tucked or stuck drum wiper blade
b. Top of Drum Switch
c. Fuses F1 through F4 on the DC Power PCA
d. DC Power PCA
e. Drum Drive Motor
f. Control PCA
g. Drum Drive Transformer

Recommended procedure:

a. Verify the photoconductive drum/wiper blade pressure adjustment (refer to section IV of the HP 2680A Operator's Handbook).

b. Verify that the drum is turning, as follows:

   1. Initiate service tool command 676 (Enable High Voltage) System) and open the printer's front door

      NOTE

      The printer front door must be open within three seconds after initiating this command.

   2. Initiate device on command 701 (Vacuum Motor Enable) and 702 (Drum Drive Motor Enable). Visually inspect to see if the drum is turning.

      If the drum is not turning, proceed to step d. If the drum is turning, proceed to step c.

c. If drum motion is not being detected, investigate the operation of the following:

   1. Top of Drum Sensor and its wiring (refer to drawing).
   2. Control PCA
   3. Machine Control Processor PCA (Top of Page Synchronization Circuitry)

d. If drum motion is not occuring, verify the following:

   1. Ensure that drum motion is not being hindered i.e., tucked wiper blade, paper, etc.

   2. Ensure that both drum bearings are in place and that the drum engages on the drum drive gear pin.

   3. Verify that fuses F1 through F4 on the DC Power PCA are not open (these fuses supply the voltages to drive the drum drive circuitry).
   4. Refer to figure 6-7 and verify that all the components in the drum drive circuitry are in place (all connectors secure with no broken or frayed wires) and are operational. The following assemblies comprise the drum drive circuitry:

      (a) Control PCA
      (b) DC Power PCA
      (c) Drum Drive Transformer
      (d) Drum Drive Motor
      (e) Drum Drive Capacitor
      (f) Drum Brake Capacitor and related circuitry

Drum top switch err

This message occurs when the Top of Drum signal occurs outside the expectant time window

Possible cause.

a. Drum locked at top of drum position
b. Top of Drum switch (shorted)
c. Control PCA

Recommended procedure:

a. Verify the drum is turning, refer to the recommended procedure given for "Drum not in sync".

b. Verify that the Top of Drum switch is correctly wired and operating correctly.

Encoder edge error

The paper stepper tachometer (encoder) output did not change (TTL Level) as the paper is advanced.

Possible cause:

a. Paper input stepper encoder
b. Control PCA
c. Fuses F2 and F3 of the DC Power PCA
d. DC Power PCA
e. Input Tractor Stepper Motor

Recommended procedure:

a. Verify the stepper encoder is turning, as follows:

   1. Remove the printer rear panel.

   2. Remove the encoder cover plate (refer to the Input Stepper Registration Alignment procedure in the HP 2680A Service manual for cover plate location).

   3. Visually observe the encoder while depressing the PAPER FORWARD key.

      If the encoder is turning forward, proceed to step b. If the encoder is NOT turning, turning the wrong direction, or is weak (low torque), proceed to step c.

b. Encoder movement is not being detected, verify the operation of the encoder detection circuitry on the following PCAs (see Stepper Motor circuitry in section VI of this manual).

   1. Encoder Sensor and Stepper Encoder PCA
   2. Sensor PCA
   3. Control PCA

c. Encoder movement is not occurring, verify the following:

   1. That nothing is hindering encoder disc movement.

   2. That the encoder disc is securely attached to the encoder shaft.

   3. Verify that Fuses F2 and F3 (+12 and -12 Vdc supplies) on the DC Power PCA are not open.

   4. Investigate the operation of the following (refer to the Stepper Motor circuitry figure 6-9).
      (a) Input Stepper Motor
      (b) DC Power PCA

(c) Control PCA
(d) All associated connectors and cabling

Encoder res error

This message is displayed when a paper stepper encoder resolution error is detected. A fixed relationship between the paper encoder output and the stepper motor step number count must exist so that the paper can be moved at an known rate. If this relationship is lost, an error is displayed.

Possible cause:

a. Loss of paper stepper registration
b. Paper Jam

Recommended procedures:

a. Re-intialize the input paper steppers refer to Input Stepper Registration Alignment in section IV of the Service Manual.

b. Verify the paper stepper encoder is securely mounted to the paper stepper drive motor.

c. Verify that the input tractor movement is not inhibited.

NOTE

When loading paper in the printer, ensure that it is positioned directly under the splice table and parallel to the input tractors so not to cause any "pull" on the input tractors. It is advisable to remove the paper from its container when loading it into the printer.

d. Refer to recommended troubleshooting procedure given for the "Encoder edge error" message.

Erase lamp warn

This message is displayed when the erase lamp current is less than 33 counts. Initiate display command 180 (Erase Lamp Current) while executing the printer Self Test to verify the message.

Possible cause:

a. One or more defective erase lamps.
b. Damaged lamp assembly edge connector
c. Triac PCA
d. AC Power PCA
e. Control PCA

Recommended procedure:

NOTE

Ensure the AC contactor is operating properly before executing the erase lamp diagnostics. If not refer to "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify that the ribbon cable from J7 of the AC Power PCA to J2 Slot 17 of the backplane is properly seated and there are no shorted or opened wires.

b. Verify the wiring from the AC Power PCA to the erase lamp connector is properly seated and there are no shorted or opened wires).

c. Verify lamp operation as follows:

   1. Initiate service tool command 676 (Enable High Voltage System) and open the printer front door.

      NOTE

      The printer front door must be opened within three seconds of initiating this command.

   2. Initiate device on command 722 (Erase Lamp On) to illuminate the erase lamp assembly. Visually observe if all lamps are illuminated. If any lamps are defective, replace all ten lamps.

      If the error message persists after the defective lamps have been replace, proceed to step 3.

   3. Inspect the lamp assembly's edge connector; replace assembly if connector contact pins are worn.

   4. Remove printer rear panel and check lamp assembly wire connectors.

   5. Interchange the erase lamp and overall illumination assemblies. If the "Overall illum warn" message is displayed, the problem has followed the assembly. Change the lamp assemblies back to their original positions and replace all lamps in the erase lamp assembly.

d. If the erase lamps fail to turn on, initiate device on command 722 (Erase Lamp On) while measuring test point TP38 on the AC Power PCA. If the test point measures a logic low (less than 0.4 Vdc), replace the AC Power PCA. If the test point measures +5 Vdc, the Control PCA or the AC Power PCA may need to be replaced.

ES loop fail 1
ES loop warn 1

These messages occur when the primary corona setting is operating at the maximum primary corona setting (255) and the simultaneous corona is operating at a value within its normal operating range (64 to 255). Initiate display commands 231 (Primary Corona Setting) and 233 (Maximum Primary Corona Setting) to verify the messages.

Possible causes:

a. Broken corona wires
b. Contaminated corona wires
c. Improperly strung corona wires
d. Defective endblocks
e. Damaged primary corona connector cable
f. High Voltage PCA
g. Photoconductive drum

NOTE

For secondary causes refer to the "ES loop fail 2" error message.

Recommended procedures:

NOTE

Verify that all other process error messages have been corrected before proceeding.

a. Place the Front Power Breaker to the OFF position, open the printer front door, and remove the primary corona assembly.

   1. Visually inspect the primary corona for signs of electrical discharge or for electrical arcing.

   2. Inspect corona assembly for damaged or broken wires; restring wires if detected.

   3. Inspect primary corona wires and primary screen for contamination; clean if necessary.

   4. Verify that the primary corona interconnect wires are not too long and/or bent up touching the primary corona grid.

   5. Verify the resistor endblock connector as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the "D" washer is approximately 100 K ohms.

b. Visually inspect the high voltage connector from the High Voltage Supply PCA to the primary corona assembly connector for signs of damage or electrical breakdown.

c. Verify that the electrostatic monitor assembly is operating correctly; proceed as follows:

   1. At the Service Control Panel press 701 ENTER, 702 ENTER, 731 ENTER and then RUN. This sequence of commands enables the vacuum motor, drum drive motor, and the primary corona.

   2. Allow approximately ten seconds to elapse and press HALT. Press 674 ENTER (Take ESM Reading). A high positive should be observed at this time if the ESM is working correctly (this being the result of the primary corona's affect on the drum's surface).

3. Press 831 ENTER (Primary Corona, disable), 741 ENTER (Simultaneous Corona, enable) and RUN

4 Allow approximately ten seconds to elapse and press HALT Press 674 ENTER (Take ESM Reading). A negative charge should be measured at this time if the ESM is working correctly (this being the result of the simultaneous corona's affect on the drum surface).

d Execute printer Self Test and inspect the self test diagnostic printout If the "Dark poten = XXX" count is 20 counts or more greater than the "Doc poten DD= XXX" count, replace the drum

ES loop fail 2
ES loop warn 2

These messages occur if the simultaneous corona setting is at the upper limit (255) while the primary corona setting is operating at a stable value within its operating range (128 to 255)..

Possible cause:

a. Damaged or broken simultaneous corona wire
b. Contaminated simultaneous corona wire
c. Defective endblock
d. Damaged high voltage connector cable
e. Low power or beam misalignment
f. Simultaneous power supply transformer

NOTE

For secondary causes, refer to the "ES loop fail 1" error message.

Recommended procedure:

NOTE

Verify that all other process error messages have been corrected before proceeding.

a. Place Front ON/OFF switch to the OFF position, open printer front door, and remove the simultaneous corona assembly.

1. Visually inspect simultaneous corona assembly for signs of electrical discharge or arcing.

2. Inspect corona wires for damage; if damaged or broken replace.

3. Inspect simultaneous corona wires and simultaneous grid for contamination; clean if necessary.

4. Verify the resistor endblock as follows:

(a) Visually inspect connector for any signs of electrical breakdown.

(b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify the simultaneous power supply transformer is correctly installed and that all connections to and from the transformer are in good condition (not shorted or open).

ES loop fail 3
ES loop warn 3

These messages occur if the primary and simultaneous corona settings are at their limits.

For possible causes and recommended troubleshooting procedures, see the "ES loop fail 1" and the "ES loop fail 2" messages.

ES loop warn 4

This message occurs if during printer startup, the drum potentials are not achieved (within ten counts of their target) within ten drum rotations.

Possible cause:

a. Any problem associated with an "ES loop warn/fail 1 and 2" error.
b. Rapid ambient room temperature change.
c. Corona contamination
d. Defective drum
e. Low Beam Power

Recommended procedure:

a. Allow printer to run; the problem is likely to correct itself after a short interval of time.

b. Initiate the printer Self Test; compare all parameters listed on the diagnostic print-out with those from a known good diagnostic print-out.

c. Clean the corona assemblies.

d. Verify the operation of the electrostatic monitor, see step d in the ES loop warn troubleshooting procedure.

e. Investigate all possible problem areas associated with other ES loop warn/fail problems.

ESM door reference

This message occurs when the electrostatic monitor door bias voltage is either greater than 100 counts or less than 40 counts. Initiate display command 119 (Multiple ESM Display, B=door bias) to verify message.

Possible cause:

a. Electrostatic Monitor Assembly
b. High Voltage Supply PCA
c. ESM Probe Connector

Recommended procedure:

a. Verify the ESM power supply cable from the High Voltage Supply PCA to electrostatic monitor assembly is in good condition (no short or open wires).

b. Verify the electrostatic monitor operation, see step d of the ES loop warn/fail troubleshooting procedure.

c. Remove the electrostatic monitor assembly and execute the printer Self Test. Initiate display command 119 (Multiple ESM Display). If the door bias measurement (BXXX) is within the 40 to 100 count range, the problem is probably with the ESM assembly. If the measurement is outside the operating range (40 to 100) the source of the problem is either with the wiring J3 of the High Voltage Supply PCA to the ESM Probe Connector or the High Voltage Supply PCA (see figure 6-16).

ESM open door test F

This message occurs when the ESM control voltage does not exceed 50 counts. Initiate display command 119 (Multiple ESM Display, C = Control Voltage) to verify message.

Possible cause

a. Electrostatic Monitor
b. Monitor PCA
c. DC Power PCA
d. ESM solenoid, solenoid shaft and linkage
e. Control PCA
f. ESM Cable assembly

Recommended procedure:

NOTE

Verify the ESM connector is installed to J1 of the Monitor PCA and that all pins are making good contact to the assembly and the mounting rail.

a. Initiate service tool command 674 (Take ESM Reading) and visually verify if the ESM solenoid is being activated.

NOTE

The ESM solenoid is located to the left of drum drive motor. Enter the command and press the RUN key while observing the solenoid.

1. If the ESM solenoid is NOT activated, disconnect the solenoid and verify the solenoid control signal (J2-6 DC Power PCA) is being initiated (+12 = On). Replace the DC Power PCA if solenoid control is not present.

2. If the solenoid control is present and the solenoid is correctly aligned and adjusted but still does not operate correctly; replace the solenoid.

b. Replace the ESM assembly.

c. Replace the Monitor PCA.

ESM shut door test F
ESM shut door test W

These messages occur when the ESM measurement is not within six counts of the door bias voltage Initiate display command 1119 (Multiple ESM Display, E=ESM Measurement, B=Door Bias Voltage) to verify the message.

Possible cause:

a. ESM assembly
b. ESM Solenoid and solenoid spring, shaft, and linkage
c. Monitor PCA
d. High Voltage Supply PCA

NOTE

Ensure that the ESM connector is installed on J1 of the Monitor PCA and that the J5 connector is installed on the High Voltage Supply PCA Ensure that the mounting rail connector is in good condition and that all pins are making good contact.

Recommended procedure:

a. Verify the Electrostatic Monitor assembly is properly installed (seated) in the printer.

b. Ensure that the door bias cable (J3 of the High Voltage Supply PCA) to Electrostatic Monitor is seated and in good condition.

c. If the message persists, replace the components in the order listed as possible cause.

ESM supply failure

This message occurs when the Electrostatic Monitor power supply fails. The power supply is located on the Monitor PCA.

Possible cause:

a. Fuses F1 and F2 on the Monitor PCA
b. Monitor PCA

NOTE

Ensure that the ESM connector is install to J1 of the Monitor PCA.

NOTE

LED DS1 on the Monitor PCA is illuminated when the ESM power supply is operational.

Recommended procedure:

a. Verify that fuse F1, the +12 Vdc input voltage for the Monitor PCA, is not open.

b. Verify that fuse F2, the -12 Vdc input voltage for the Monitor PCA, is not open.

NOTE

If the fuses are open, verify that there are no short circuits between the ESM cable and ground (see figure 6-16 for correct cable wiring).

c. Replace the Monitor PCA

d Replace Machine Control Processor PCA (4.8 KHz clock).

External reg fail

This message occurs when the DCS External Self Test Diagnostic fails. Initiate service tool command 613 (DCS External Register Diagnostic) to verify the message

Possible cause

a. Data Processor PCA

Recommended procedure:

a. Initiate all DCS Self Test Diagnostics (service tool commands 610 through 619) refer to section III of the HP 2680A Service Manual.

b Replace the Data Processor PCA.

Firmware trap XX

A firmware error has been detected.

Possible cause:

a. MCP PCA

Recommended procedure:

a. Record firmware trap error number in printer maintenance log.

b. Reset the printer by toggling the Front ON/OFF switch.

c. Initiate service tool command 671 (Display RAM Location).

1. If the "Firmware trap XX" message persists, replace the MCP PCA. All error message information should be recorded and returned with the failing PCA.

FOP out of range

This message occurs if during the RF Modulator Calibration routine, the first order power (FOP) is measured at greater than 255 counts.

Possible cause:

a. Optics PCA
b. Laser Power Supply
c. Laser
d. Monitor PCA

Recommended procedure:

a. Measure test point TP18 on the Optics PCA while initiating service tool command 623 (Measure Optics Parameters). Compare the FOP value measured with the value for FOP being displayed by the service tool command (use the A/D Conversion Table in Appendix A).

1. If the values do NOT compare, the Monitor PCA A/D subsystem is not correctly converting the FOP to a representative digital value. Replace the Monitor PCA.

2. If the values DO compare and the "FOP out of range" error message persists, replace the assemblies in the order listed.

b. Refer to the recommended troubleshooting procedure listed for the "Beam detect warning" failure message.

FOP peak used

This message occurs when the requested laser power level is not achieved during RF Modulator Calibration.

Possible cause:

a. Laser Assembly
b. Beam Setting misadjusted
c. Optics PCA

Recommended procedure:

a. Initiate service tool command 622 (Calibrate Laser Power).

b. Execute service tool command 623 (Measure Optics Parameters). Adjust the beam setting to a value which provides a First Order Power ("FXXX") level, of between 90 to 95 counts.

c. Refer to the recommended troubleshooting procedure listed for the "Beam detect warning" failure message.

Front door is open

This message occurs when the printer senses the front door is open.

Possible cause:

a. Front door is not securely latched
b. Faulty front door switch.
c. Control PCA

Recommended procedure:

a. Ensure that the printer front door is securely latched (i.e. contact is being made on the interlock prongs).

b. Verify the front door switch is correctly wired (plugged in) and that the wires are not shorted or open.

NOTE

To access the front door switch remove the two screws on the left-hand wall of the corona cleaning tool storage area.

c. Verify the front door driver control is functioning correctly. If the "Front door is open" message persists after verifying steps a and b, replace the Control PCA.

Fuser circuit open

This message occurs when the fuser current is measured at less than 32 counts when the fuser is presumed to be on.

NOTE

A typical fuser current measurement is approximately 200 counts while printing.

Possible cause:

a. Fuser contacts and Fuser lamp
b. Triac (Q8)
c. Current sensor failure (Triac PCA)
d. AC Power PCA
e. Control PCA

Recommended procedure:

a Initiate device on command 775 (Fuser on for 2 seconds) to verify if the fuser is turning on (illuminating).

NOTE

To more easily observe the fuser, remove the the printer backpanel and observe the fuser from the back of printer while initiating the device on command.

b. If the fuser did not illuminate, place the rear MAIN POWER breaker to the OFF position and disconnect fuser connector (the two pin center connector), located above the AC Power PCA.

1. Inspect the fuser bulb contacts for burned or pitted areas; clean if necessary. Verify that the contact "spring tension" is sufficient enough to hold the fuser bulb securely in position. A loose bulb may result in excessive heat build-up at the bulb/contact surface. If the contacts can not be throughly cleaned or if the "spring tension" is weak, replace the contacts.

NOTE

The resistance between pins 1 and 2 of the fuser connector should approximately 3 ohms.

2. Reseat fuser bulb and re-intiate the device on command on command.

c. Measure test point TP31 "Fuser" on the AC Power PCA while initiating device on command 775. The measured output should be negative going square waves.

1. If pulses are present and the error persists, proceed as follows:

(a) Verify that all the connectors between J4 of the Triac PCA and Q8 on the Triac Bracket are seated. (see figure 6-1). Ensure that the Fuser Bracket connector (see figure 5-3) is fulled seated and that the wires are not shorted or open.

(b) Replace triac Q8 on the Triac Bracket (the triac connected to J10 on the Triac PCA).

(c) Replace the AC Power PCA.

(d) Replace the Triac PCA.

2. If no pulses are present and the error persists, proceed as follows:

(a) Verify the ribbon connector between J2 Slot 17 of the backplane and J7 of the AC Power PCA is seated.

(b) Replace the Control PCA.

(c) Replace the AC Power PCA.

Fuser switch short

This message occurs when the fuser current is greater than 32 counts when the fuser is presumed to be off

Possible cause:

a. AC Power PCA
b. Control PCA
c. Monitor PCA
d. Triac PCA
e. ANY TRIAC on the Triac Bracket (Q8 or Q9 most probable)

Recommended procedure:

a. Ensure that all PCAs and ribbon cables are properly seated (see figure 6-4 for fuser system circuitry)

NOTE

It may be necessary to Reset the printer (press 0 ENTER). This allows the AC contactor to be closed until the error condition is sensed. This provides the service representative an opportunity to view the fuser.

b. Remove the printer backcover and run Self Test. Observe if the fuser is on (illuminated). If the fuser is ON, proceed to step c. If the fuser is NOT on proceed to step d.

c. Replace the following assemblies in the order listed:

NOTE

It is recommended that all Triacs on the Triac Bracket be replaced at one time since the effects of one bad triac (excessive noise on a common line) is difficult to detect.

1. Triac Q8 on the Triac Bracket
2. All Triacs on the Triac Bracket
3. AC Power PCA
4. Control PCA

d. Place the printer Front Power Breaker to Off. Connect a jumper to short TP17 to TP18 on the Triac PCA. Restore printer power.

1. If the "Fuser switch short" message does NOT occur, replace the Triac PCA.

2. If the "Fuser switch short" message persists, proceed to step e.

e. Replace the following PCAs in the order listed.

1. AC Power PCA
2. Control PCA
3. Monitor PCA

Fuser/PAMM fan fail

This message is displayed when the fuser/PAMM fan current is less than 81 counts. Initiate display command 182 (PAMM and Fuser Fan Current) to verify the message.

Possible cause:

a. Loose or disconnected ribbon cables
b. Faulty fans

c. Triac PCA
d. AC Power PCA
e. Control PCA

Recommended procedure

a. Ensure that all ribbon cable connectors and that the AC Power and Triac PCAs are seated properly.

b. Initiate device on command 776 (Fuser/PAMM Fans and Chainbox motor) and visually inspect the three PAMM fans, fuser fan, and chainbox are operational.

   1. Replace the fans that are not operating.
   2. If NONE of the fans are operating proceed to step c.

c. Measure the voltage at test point TP40 on the AC Power PCA while initiating device on command 776.

   1. If test point TP40 measures a logic low (less than 0.4 volts), replace the the following PCAs in the order listed.

      (a) AC Power PCA
      (b) Triac PCA

   2. If test point TP40 measures a logic high (+5.0 volts), replace the following PCAs in the order listed.

      (a) Control PCA
      (b) AC Power PCA

High reflectance

For standard density printers this message occurs when the average reflectance is at least 60 counts over target and the toner hopper empty bit is NOT set. For printers with the variable density option, message occurs when the average reflectance is greater than a pre-set value for a given density target.

Possible cause:

a. Toner hopper is empty
b. A toner bridge in the hopper is preventing toner from exiting the hopper.
c. Malfunctioning toner hopper (excessively worn)
d. Developer Assembly binding
e. Developer Motor Drive Circuitry
f. Transfer Solenoid always engaged

Recommended procedure:

a. Stir the contents of the toner hopper or add toner to the hopper, if empty. Press 441 ENTER (disable Reflectance Diagnostics) and then press 1125 ENTER (display Average Reflectance). Allow the printer to run (either printing actual data or Self Test) until the average reflectance is within 60 counts of the reflectance target. Enable the reflectance diagnostics (541 ENTER) and continue normal operation.

b. Initiate device on command 724 (Toner Hopper) to verify the operation of the toner hopper.

   If the toner hopper does NOT run:

   1. Verify that all toner hopper wiring is correct and in good condition, no shorted or opened wires (see figure 6-2).
   2. Verify that the toner hopper microswitch is being closed (activated).
   3. Measure test point TP34 on the AC Power PCA to determine if the toner hopper is being turned on:

ON = less than 0.4 Vdc
OFF = +5 Vdc

c. To verify if the toner hopper is operating adequately (the gears are not binding or broken), perform the following steps:

   1. Initiate command 676 (enable high voltage system) and open the printer front door. Press 1 ENTER RUN at the printer control panel to run a continuous Self Test

   2. Visually observe the end of the metering drive shaft while the printer is printing. The end of the shaft is located on the toner hopper housing to the upper right-hand side of the toner hopper spout. The end of the shaft is slotted and surrounded by a large white bushing.

      Under normal operation, the shaft should rotate between eight to nine times a minute. While printing count the number of rotation the shaft makes in one minute Observe if the shaft starts and stops without any indication of binding or slipping.

      If the shaft is not rotating or is binding and/or slipping, replace the toner hopper.

d. Initiate device on command 735 (Developer Motor) to verify the operation of the developer motor.

   If the motor does NOT run:

   1. Verify that nothing is hindering the movement of the developer roll.

   2. Verify the operation of the developer motor drive circuitry (see figure 6-8).

High screen V fail
High screen V warn

These messages occur when the primary screen voltage is greater than (1.5 X the primary corona setting) - 95. Initiate display command 133 (Primary Screen Voltage) and 231 (Primary Corona Setting) to verify the message.

Possible cause:

a. Primary Screen PCA
b. High Voltage Supply PCA
c. Monitor PCA (faulty A/D subsystem)

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the primary corona assembly.

   1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

   2. Clean corona wires and corona screen.

b. If "High screen V warn/fail" message persists, replace the following items in the order listed.

   1. Primary Corona Assembly
   2. Primary Screen PCA
   3. High Voltage Supply PCA

High sim corona warn
High sim corona fail

These messages occur when the simultaneous current is 32 counts greater than the expected count. The expected simultaneous current count is (5/4 times the Simultaneous Setting) - 64. Initiate display commands 141 (Simultaneous corona current) and 241 (Simultaneous Corona Setting) to verify these messages.

Possible causes:

a. Simultaneous Corona Assembly
b High Voltage Supply PCA
c. Simultaneous Transformer Assembly

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the simultaneous corona assembly.

    1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

    2. Clean corona wires and corona grid

b. Replace the High Voltage Supply PCA.

High transfer I fail

This message occurs when the transfer current is measured at 32 counts greater than the expected count. The expected transfer count is equal to (3/2 times the transfer current setting) - 127. Initiate display commands 151 (Transfer Corona Current) and 251 (Transfer Corona Current Setting) to verify the message

Possible causes:

a. Transfer Corona Assembly
b. High Voltage Supply PCA

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the transfer corona assembly.

    1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

    2. Clean the corona wires.

    3. Verify the resistance from the corona connector ball to the "D" shaped washer is approximately 100 K ohms.

b. Replace the High Voltage Supply PCA

Hopper motor warn

This message occurs when the measured current of the toner hopper motor is less than 21 counts.

NOTE

If this error occurs, the printer will continue to print until the printer detects that the density of toner on the developed drum is starting to decrease, at that time the printer would stop printing due to a "High reflectance" error.

Possible causes.

a. Toner Hopper Interlock Switch
b. Triac PCA
c. AC Power PCA
d. Toner Hopper Motor
e. Control PCA

Recommended procedure:

NOTE

Ensure that no other error messages are displayed in conjunction with this message and that the AC Contactor is closed.

a. Verify that the toner hopper interlock switch is closed and operating correctly. The toner hopper switch is located to the right of the developer engage control lever; when the toner hopper is closed, a stopblock at the base of the hopper closes the interlock microswitch.

b. Ensure that the toner hopper cable is installed and that the wires are not shorted or open (see figure 6-2 for hopper motor circuitry).

c. Verify that the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane is properly seated and that the wires are not shorted or open.

d. Ensure that the Control PCA is properly seated.

WARNING

Damage may occur if the toner hopper motor is on for more than one minute while the machine is not printing.

e. Measure testpoint TP34 on the AC Power PCA while initiating device on command 724 (Toner Hopper Motor, on continuous).

NOTE

Toner Hopper OFF = High
Toner Hopper ON = Low

If TP34 measures a logic level high (+5 Vdc), the problem can be isolated to either the Control PCA or the AC Power PCA.

If TP34 measures a logic level low (less than 0.4 Vdc), the problem can be isolated to either the AC Power or the Triac PCAs.

Illegal device comb

This message occurs if an illegal combination of Device On/Off commands is attempted. Refer to the HP 2680A Service Manual for the correct listing of Device ON/Off commands.

Illegal DCS command

This message occurs when the Machine Control System receives an undefined Data Control System command.

Possible causes:

a. Data Processor PCA
b. Print Control PCA
c. Machine Control Processor PCA
d. DCS I/O PCA
e. Memory Arrays

Recommended procedure:

a. Ensure that all PCAs and DCS front plane connectors are properly seated.

b. Execute all DCS self test diagnostics (Service Tool Commands 610 through 618), refer to section III of the HP 2680A Service Manual.

c. Execute Service Tool Command 619 (Dump DCS Memory Error Log), replace any memory chips that have been flagged by the memory controller.

d. Verify that the DC power supplies are adjusted properly, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

e. If the problem persists, replace the PCAs in the order listed as possible causes.

Illegal MCS command

The Data Control System has received an undefined Machine Control System command.

Possible causes:

a. Machine Control Processor PCA
b. Print Control PCA
c. DCS I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Follow steps a through d of the recommended troubleshooting procedure for "Illegal DCS command".

b. If the problem persists, replace the PCAs in the order listed.

Illegal NVR #XX

This message occurs when an invalid parameter is being entered in nonvolatile RAM. The XX corresponds to the 2XX level display command which is attempted to be loaded.

Possible causes:

a. The operator attempted to enter an illegal value via a 3x0 level modify command.
b. NVR failure

Recommended procedure:

a. In the situation where an invalid entry is the cause of the error message, the entry of the valid NVR parameter clears the error message. Refer to the Non-Volatile RAM Initialization Procedure in section IV of the HP 2680A Service Manual. Note, several NVR parameter values can be obtained by examination of a previously successful Self Test diagnostic print-out.

b. If the message persists, replace the Machine Control Processor PCA.

Interrupt fail X

This message occurs at power-on when the Machine Control Processor is unable to reset an interrupt generated during the internal power-on diagnostics.

Recommended procedure:

a. Refer to the following table to determine which PCA may be the possible cause of the error message:

Type of Interrupt	Possible Faulty PCA
0	Machine Control Processor
1	DCS I/O
2	DCS I/O
3	Monitor
4	Machine Control Processor
5	Machine Control Processor
6	Optics
7	AC Power or Control PCAs

b. If the error message persists and the Machine Control Processor PCA has not been replaced, replace it.

Invalid phtr target

This message occurs when the DAC reference level generated on the AC Power PCA is measured below 50 counts. This message is stored in the CE error log; initiate service tool command 651 to display the log.

Possible causes:

a. AC Power PCA
b. Monitor PCA (A/D subsystem channel)
c. Control PCA (Filter network)

Recommended procedure:

a Reseat the Monitor and Control PCAs and the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane.

b. Rotate switch S1 on the AC Power PCA through the six positions listed in the following table, and measure test points TP 1 (DAC) and TP13 (DAC REF). All measurements should be +/- 0.2 volts of the value listed. Use Appendix A to determine the A/D count values.

NOTE

The A/D counts are not determined until the printer attempts to run (either actual data or Self Test).

S1	TP1 DAC	TP13 DAC REF	A/D Counts (+/-10)
0	- 3.09 Vdc	+ 3.09 Vdc	144
1	- 3.37	+ 3.37	157
2	- 3.64	+ 3.64	169
3	- 3.98	+ 3.98	185
4	- 4.27	+ 4.27	198
5	- 4.52	+ 4.52	210

If the measured values are not within +/- 0.2 Vdc range, replace the AC Power PCA.

NOTE

If test point TP 13 measures approximately 0 Vdc, verify that the ribbon connector from the AC Power PCA to J2 Slot 17 of the backplane is not pinched or damaged.

c. Shorted or open filter network on the Control PCA, replace the Control PCA.

d. Failure of the A/D subsystem to correctly measure the DAC signal, replace the Monitor PCA.

Hints

Signal Path - Rotary switch on the AC Power PCA - TP1 (DAC) on the AC Power PCA - TP13 (DAC REF) on the AC Power PCA - J7-30 AC Power PCA - P1-30 Control PCA (filter network) - P2-27 (Control PCA) - P2-6 (Monitor PCA)

Invalid stepper pos

This message is displayed while operating in the Stepper Registration Mode, when the desired stepper position is too close the stepper encoder edge.

Recommended procedure:

a. When this error message is displayed, either a new stepper position must be selected or the encoder disc must be mechanically realigned. Refer to the Input Stepper Registration Alignment procedure in section 4-4 of the HP 2680A Service Manual.

Job active pwr fail

The message indicates that power was lost during a print job. If this message occurs, the operator should investigate to determine if

all jobs were completed. If not, the job(s) should be rerun. This message is cleared by pressing RUN at the operator's panel.

Line overvoltage

This message occurs when the line voltage has exceeded 252 Vac within the printer. Initiate display command 196 ENTER (Line voltage) to verify the message

Possible causes:

a. Input power improperly strapped
b. AC Power PCA
c. Zero Crossing Transformer
d. Monitor PCA (A/D subsystem failure)

Recommended procedure:

a. Measure the line voltage at the input to the AC Contactor. If the line voltage is consistently above 250 Vac, verify that the printer has been correctly configured. Refer to the Power Configuration in section II of the HP 2680A Service Manual.

b. Verify that all cabling to the AC Power PCA is in good condition (no pushed pins or broken or frayed wires). Specifically verify that J5 (DC power input for the AC Power PCA) and J4 (AC Power PCA Transformer and Zero Crossing Transformer inputs) to the AC Power are seated. For power module explanation, see figure 6-20.

c. Verify the line voltage adjustment, refer to the AC Power PCA Adjustment in section 4-4 of the HP 2680A Service Manual.

NOTE

If test point TP22 "Vline" does not change while adjusting the Line Voltage Adjust potentiometer, replace the AC Power PCA.

d. Verify that test points TP17 and TP18 (reference to ground) on the AC Power PCA measure between 6.00 to 7.50 Vac. If the measured values are not within this range, replace the Zero Crossing Transformer.

e. The A/D subsystem may not be correctly converting the line voltage into a representative digital value; replace the Monitor PCA.

Low line voltage

This message occurs when the line voltage is below 214 Vac within the printer. Initiate display command 196 (Line Voltage) to verify the message.

Possible causes:

a. Input power improperly strapped
b. AC Power PCA
d. AC Power PCA Cabling
e. Zero Crossing Transformer
f. Line Voltage Adjustment (AC Power PCA Adjustment)

Recommended procedure:

Follow the recommended troubleshooting procedure listed for "Line overvoltage".

Low primary I fail
Low primary I warn

These messages occur when the primary current is less than (2/3 X the primary current setting) - 129 or if the primary current is less than 40 counts Initiate display commands 131 (Primary Corona Current) and 231 (Primary Corona Setting) to verify the message.

Possible causes:

a. Arcing in the Primary Corona Assemby System (corona, cable, connector, Primary Screen PCA, etc ...)

NOTE

An arcing corona may be caused by:
1. The corona assembly not being fully seated to it's connector.
2. Damaged corona assembly (the screen flange may be bent too close to ground of to the grid).
3. The High Voltage Screen PCA may be installed without adequate clearance between the PCA and the cable and ground.

b. Fuse F1 High Voltage Supply PCA
c. High Voltage Supply PCA
d. Monitor PCA
e. Primary Screen PCA
f. Simultaneous Corona System

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open printer front door, and remove the primary corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect the corona wires for damage. If damaged or broken, replace.

   3. Inspect the primary corona wires and primary screen for contamination and clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that fuse F1 on the High Voltage Supply PCA is not open.

c. Inspect the primary corona cable (J2 of the High Voltage Supply PCA to the connector of the EP backpanel) for loose connections and corrosion. Tighten all loose connections and replace any corroded cables.

d. To verify that the corona is not arcing, proceed as follows:

   1. Initiate device on command 731 (Primary Corona) at the Service Control Panel (enter the command press ENTER, and then RUN).

   2. Initiate command 676 (enable high voltage system), and open the printer front door.

   3. Press HALT, to temporarily disable the Primary Corona Device On command. While corona is disabled, remove the drum from the printer.

   4. Press RUN to re-enable the Primary Corona. Visually inspect the Primary Corona, Corona Cable, and connector for arcing.

   5. Press HALT, perform modify command 331 (Primary Corona Setting) and enter a setting of 255, press ENTER, and then press RUN to re-enable the primary corona. A corona setting of 255 counts would be the maximum corona setting (i.e., if the corona is going to arc, it would probably occur at this maximum setting). Visually inspect the corona area for any signs of arcing. If arcing is detected, remove power from the printer and correct the problem (see Possible Causes).

e. If the message persists after performing procedures a and b, replace the High Voltage Supply PCA and then the Primary Screen PCA.

f. Verify that the Simultaneous Corona System (assembly, cabling and circuitry) is correctly installed and operational.

Hints

If the print quality is acceptable and only the warning message is being displayed, the problem could be a primary current sensor problem; replace the High Voltage Supply PCA.

If several other high voltage related failure messages are being displayed inconjunction with the Low primary I fail/warn message, the problem may be associated with the Monitor PCA. Note: all high voltage inputs are multiplexed on the High Voltage Supply PCA and input to the Monitor PCA via a common line for A/D conversion.

Low primary V fail
Low primary V warn

These messages occur if the primary voltage is measured at less than 128 counts. Initiate display command 132 (Primary Corona Voltage) to verify the message.

Possible causes:

a. Primary Corona Assembly
b. Primary Corona Assembly (Arcing Problems)
c. Fuse F1 on the High Voltage Supply PCA
d. High Voltage Supply PCA
e. Monitor PCA

Recommended procedure:

Follow the recommended troubleshooting procedure listed for the "Low primary I fail/warn" message.

Low reflectance

This message occurs when the average reflectance is less than the target by 100 counts. Initiate display commands 224 (Reflectance target) and 125 (Average Reflectance) to verify the message.

NOTE

This message is the result of the densitometer measuring signal which indicates that too much toner is on the surface of the drum.

NOTE

For additional troubleshooting hints, refer to the "High reflectance" diagnostic troubleshooting error message.

Recommended procedure:

a. Initiate the printer Self Test; verify that the "Clean drum= XXX" under the Development Parameters heading reads between 600 to 765 counts. If the measured count does not fall within the range, recalibrate the Densitometer (refer to section IV of the HP 2680A Service Manual.

b. Press 441 ENTER (disable Reflectance Diagnostics) and then press 1125 ENTER (display Average Reflectance). Allow the printer to run (either printing actual data or Self Test) until the average reflectance is within 60 counts of the reflectance target. Enable the reflectance diagnostics (541 ENTER) and continue normal operation.

c. Check the operation of the toner hopper by initiating device on command 724 (Toner Hopper Motor, continuous). If the toner hopper does not appear to be running refer to the "Hopper motor warn" troubleshooting procedure.

NOTE

To more easily determine if the toner motor is working, initiate command 676 (enable high voltage system) and open the printer front door. Then enable the toner motor (command 724) and observe the gear shaft on the hopper chute to see if it is turning.

d. If the printer's firmware date code is greater than 2414, perform the NVR Initialization procedure, refer to Section IV of the Service Manual.

NOTE

If this error occurs after "high toner demand" print job (graphics) followed by a "low toner demand" print job (minimum text), perform step b.

e. Replenish the developer mixture (refer to section V of the HP 2680A Service Manual).

Low screen V fail
Low screen V warn

These messages occur when the screen voltage is less than (2/3 X the primary corona setting) - 159.

Possible causes:

a. Primary Screen PCA
b. High Voltage Supply PCA
c. Primary Corona Assembly
d. Primary Corona Arcing Problems

NOTE

Verify that all other primary corona error related messages have been corrected before proceeding.

Recommended procedure:

a. Place the Front ON/OFF switch to the OFF, open printer front door, and remove the primary corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect corona wire for damage; if damaged or broken replace.

   3. Inspect primary corona wires and primary screen for contamination; clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Clean the electro-luminescent strip.

c. Verify that no arcing is occurring within the Primary Corona System, see step d in the "Low primary I fail" failure message.

d. If the message still persists, replace the assemblies in the order listed as possible cause.

Hints

If the print is acceptable yet, the warning message persists, a failure in the screen voltage sensor may have occurred. Replace the High Voltage Supply PCA.

Low sim corona fail
Low sim corona warn

These messages occur if the simultaneous current is less than (4/5 X the current setting) - 96.

Possible causes:

a. Simultaneous corona assembly
b. Fuse F3 on High Voltage Power Supply PCA
c. High Voltage Supply PCA
d. Damaged or loose Wiring
e. Simultaneous Transformer
f. Primary Corona System

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open printer front door, and remove the simultaneous corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect corona wire for damage; if damaged or broken replace.

   3. Inspect simultaneous corona wire and simultaneous grid for contamination; clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that fuse F3 on the High Voltage Power Supply PCA is not blown.

c. Verify that all wiring comprising the simultaneous corona circuitry is proper connected and in good condition (no pushed pins or cut or frayed wires); see figure 6-18 for simultaneous corona system circuitry.

d. To determine if the corona wires are vibrating, proceed as follows:

   1. Press 741 ENTER RUN (Simultaneous Corona, On) to turn on the corona assembly.

   2. Press 1141 ENTER (Simultaneous Corona Current) and monitor the corona current.

   If the current count is not stable within a five count range, the corona wire is probably vibrating; clean the wire and/or replace the corona wire if the problem persists.

   If the count reads low (see an example of a previous Self Test printout to obtain an approximate count) try replacing the High Voltage Supply PCA first, and then Simultaneous Transformer.

e. Verify that the Primary Corona System (corona assembly, cabling and circuitry) is correctly installed and operational.

Low transfer I fail

This message occurs when the transfer current is less than (3/2 X the transfer setting) - 159.

Possible causes:

a. Transfer Corona Assembly
b. Fuse F2 on the High Voltage Supply PCA
c High Voltage Supply PCA

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open the printer front door, and remove the transfer corona assembly.

    1. Visually inspect corona assembly for signs of electrical discharge or arcing.

    2. Inspect corona wire for damage; if damaged or broken replace.

    3. Inspect the transfer corona wires for contamination; clean if necessary.

    4. Verify the resistor endblock connector is in good condition.

        (a) Visually inspect connector for any signs of electrical breakdown.

        (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that the transfer corona assembly is correctly installed (inserted completely). Verify that the Transfer Corona Assembly power cable (black connector) is connected to the High Voltage Supply PCA and that the cable is not damaged (shorted or open wires).

c. Verify that fuse F2 on the High Voltage Supply PCA is not open.

d. To determine if the High Voltage Supply PCA's current sensor is a possible source of the error message, proceed as follows:

    1. Press 431 ENTER (Disable Corona Diagnostics).

    2. Press 1 ENTER RUN (Self Test) and run several copies of the self test.

    3. Press 531 ENTER (Enable Corona Diagnostics).

    Examine the self test print-out. If the print appears to be transferring correctly (from the drum to the paper) yet, the the error message persists after the corona diagnostics has been enabled, the High Voltage Supply PCA current sensor may be faulty. Replace the High Voltage Supply PCA.

Low transfer V fail

This message occurs when the transfer voltage is less than 100 counts. Initiate display command 152 (Transfer Corona Voltage) to verify the message.

Possible causes:

a. Transfer Corona Assembly
b. Fuse F2 on the High Voltage Supply PCA
c. High Voltage Supply PCA

Recommend procedure:

Follow the recommended troubleshooting procedure listed for "Low transfer I fail".

Hints

If this message occurs in conjunction with a "Low transfer I fail", the problem is usually associated with the High Voltage Supply PCA; replace the High Voltage Supply PCA.

MCS/DCS loop-back

This message occurs when the Data Control System does not return the diagnostic word sent by Machine Control System.

Possible cause:

a. Print Control PCA
b. Machine Control Processor PCA
c. Data Control System I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Verify that all Data Control System and Memory PCAs are seated and that the interconnect ribbon cables between the Memory Controller and Memory Array PCAs are seated and in good condition (no short or open wires).

b. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the Service Control Panel (see Section III of the Service Manual).

c. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the HP-IB Connector PCA (see Section III of the Service Manual).

   If the diagnostics run successfully from the DCS I/O PCA, but do not from the Control Panel, the error could probably isolated to the backplane (MCP/DCS buses).

d. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed as a possible cause.

Mem controller fail

This message occurs when the memory controller can not log memory errors or when the memory controller can not detect and/or flag memory parity errors.

Possible cause:

a. Memory Array front plane interconnect cables
b. Misadjusted DC Power Supplies
c. Memory Array PCA(s)
d. Memory Controller PCA

Recommended procedure:

a. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), refer to section III of the HP 2680A Service Manual.

b. Verify that the Memory Controller and Memory Array PCAs are seated and that the interconnect ribbon cables between these PCAs are seated and have no shorted or open wires.

c. Verify that the dc power supplies are correctly adjusted, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

d. If the message persists, replace the PCAs in the order listed.

No drum

This message occurs when the printer senses that no drum is installed.

NOTE

The Machine Control System verifies that a drum is installed each time the front door is closed, at power-up, and after a reset.

Possible cause:

a. No drum is installed.
b. Invalid Densitometer measurement
c. Misadjusted Densitometer
d. Very dense layer of toner on the drum's surface directly below the Densitometer (this is often caused by an incorrect sequence of events during the New Drum/Wiper Routine.

Recommended procedure:

a. Verify that the photoconductive drum is installed.

b. Re-adjust the densitometer, refer to the Densitometer PCA Adjustment procedure in section IV of the HP 2680A Service Manual.

c. If the message persists, refer to the recommended troubleshooting procedure listed for the "Densitometer fail 1" error message.

No FOP peak found

This message occurs during execution of the RF Modulator Calibration Routine, when the highest First Order Power (FOP) is measured at less than 50 counts.

NOTE

Ensure that all other error messages displayed in conjunction with the "No FOP Peak found" message are corrected before proceeding.

Recommended procedure:

a. Recalibrate Laser Power, refer to service command 622 in section III of the HP 2680A Service Manual.

b. If the message persists, refer to the recommended troubleshooting procedure listed for the "Beam detect failure" error message.

No response from DCS

This message occurs at power-on or system reset when the Data Control System does not respond to the first command received from the Machine Control System within a specified time interval.

Possible cause:

a. Print Control PCA
b. Data Processor PCA
c. DCS I/O PCA
d. Character Processor PCA
e. Machine Control Processor PCA
f. DCS front plane connectors

Recommended procedure:

a. Verify that the Memory Controller and Memory Array PCAs are seated and that the front plane connectors are seated; ensure that all DCS PCAs are fully seated.

b. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the Service Control Panel (see Section III of the Service Manual).

b. Verify that the DC power supplies are adjusted properly, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

c. If the message persists, proceed as follows:

   1. Remove the printer backpanel.

   2. Ground the "Self Test" testpoint on the DCS I/O PCA, and execute each DCS self test diagnostic, refer to paragraph 3-28 of the HP 2680A Service Manual. Repair all faults encountered.

      If the diagnostics run successfully from the I/O PCA, but failed when executed from the Control Panel, the error could be isolated to the backplane (MCP/DCS bus).

   3. If the "No responce from DCS" message persists, replace the PCAs in the order listed as a possible cause.

No top of drum

This message occurs when the drum has not been sensed at its top position.

NOTE

The Top of Drum is sensed as a magnet located on the drum drive gear passes a detector on the EP panel.

Refer to the "Drum not in sync" error message for a possible cause and a recommended troubleshooting procedure.

No Top of Stack

This message occurs when the MCP frimware fails to sense the position of either the Top of Stack microswitch (on the flapper box), the Elevator at Top (elevator at top sensor) or a stack safety switch within a specified time interval.

Possible cause:

a. Elevator Motor Circuitry
b. Elevator Top Sensor
c. Top of Stack Switch (and circuitry)
d. Sensor PCA
e. Control PCA

Recommended procedure:

a. Verify that the elevator motor works in both direction (use device ON/OFF command 793 (elvator up) and command 794 (elevator down).

b. Referring to figure 6-14, measure testpoints TP4 and TP5 on the Sensor PCA while using the elevator device ON/OFF command to move the elevator table to it's bottom most and top most positions.

c. Referring to figure 6-2A, verify the Top of Stack microswitch functions correctly.

NOTE

During normal printer operation, once the printer detects the top of stack position the motion of the stacker table is reversed and the table is lowered one inch.

d. Verify the flapper safety switches (refer to figure 6-2A) and the chainbox safety switches (refer to figure 6-14) function correctly. Under normal operation, when these switches are opened (for less than two seconds) the elevator lowers the stacker table.

Noisy signal gnd

This message occurs when ground is measured at greater than 10 counts. Initiate display command 190 (Signal Ground) to verify the message.

Possible cause:

a. Monitor PCA
b. Control PCA
c. AC Power PCA
d. Optics PCA
e. DC Power PCA
f. Optics PCA

Recommended procedure

If the error message occurs intermittently it probably is a true error; replace the PCAs in the order listed. If the message is always present it is probably a false message; replace the Monitor PCA.

NVR failure

This message occurs when the checksum value generated during the initial printer power-up diagnostics fails to compare with the value previously calculated and stored in non-volatile RAM.

NOTE

A nickel-cadmium battery is used as the power source for non-volatile RAM. The approximate battery life without power applied to the printer is as follows:

one week at 50 degrees Celsius
six weeks at 25 degrees Celsius

Possible cause:

a. Machine Control Processor PCA

Recommended procedure:

a. Reset the printer by toggling the Front ON/OFF switch; verify if the error returns.

b. Re-initialize non-volatile RAM, refer to the NVR Initialization procedure in section IV of the HP 2680A Service Manual. If the sevice manual is not readily available, use the most recent copy of the diagnostic Self Test printout to input values into the non-volatile RAM.

c. If the message persists, replace the Machine Control Processor PCA.

Out of paper

This message occurs when no paper is sensed at the paper-out sensor. The paper out sensor is located at the bottom of the paper guide tube below the splice table.

Possible cause:

a. No paper
b. Paper not threaded correctly
c. Sensor PCA ribbon connector
d. Defective Paper-Out Sensor

e. Sensor PCA
f. Control PCA

Recommended procedure:

a. Verify that the paper is correctly loaded in the printer (threaded around the paper guide tube), refer Paper Loading in the HP 2680A Operator's Handbook.

b. Clean the paper-out sensor lens; if the sensor lens is scratched, replace the lens.

c. Verify the sensor harness (J1 of the Sensor PCA to J9 of the backplane) is properly seated and in good condition (no short or open wires).

NOTE

This harness is subject to a high failure rate.

d. Verify the paper-out sensor adjustment, refer to the Paper-Out Sensor Adjustment procedure in section VI of the HP 2680A Service Manual.

e. If the message persists, replace the items in the order listed as possible cause.

Output door is open

This message occurs when the printer senses that the paper output door (PAMM door) is open.

Possible cause:

a. PAMM interlock switch and wiring
b. Control PCA

Recommended procedure:

a. Verify that the PAMM door is securely closed.

b. Verify the operation of the PAMM interlock switch as follows:

   1. Measure "PAMM INTLK" on the Backplane (Control PCA) while opening the PAMM door.

   2. Note the TTL logic levels: High = door closed
      Low = door open

c. Verify the wiring to the switch is in good condition (no open or short wires).

d. After performing steps a through c and the message still persists, replace the Control PCA.

Output paper misfold

This message occurs when the short focus reflective sensor, in the stacker, detects the presence of paper in the top of the stacker beyond a specified time interval.

Possible causes:

a. Misfold Sensor failed or out of adjustment
b. Sensor PCA
c. Control PCA
d. Elevator Assembly Malfunction
e. Chainbox Assembly Malfunction

f. Flapper Assembly Malfunction
g. Elevator not properly lubricated

NOTE

A majority of paper path problems are the result of poorly manufactured or stored paper. Verify that your paper meets the all requirements as stated in the Paper Specification Guide.

Recommended procedure:

a. Verify that nothing in the stacker is wedged in front of the misfold sensor.

b. Verify the misfold sensor connector is properly seated and that the wiring is in good condition (no shorts or open).

NOTE

Due to the different reflectance qualities in different types of paper, misfold sensor adjustment may be required when paper lots are changed.

c. Verify the paper sensor adjustment, refer to the Misfold Detector Adjustment procedure in section IV of the HP 2680A Service Manual.

d. Verify the operation of the misfold sensor circuitry (see figure 6-14).

e. The "Output paper misfold" message may be a result of a malfunction in the printers paper stacking system. The following checks should be performed if the error message persists:

1. Verify that the Stacker Width Adjustment is correct; the adjustment located on the paper output door (see the Paper Loading section in chapter III of the Operator's Handbook).

2. Verify that the Paper Length Adjustment is correct; the length adjustment is below the printer's Paper Control Panel (see section II of the Operator's Handbook).

NOTE

It may be of value to review the Paper Path Problem Checklist in section V of the Operator's Handbook.

3. Initiate device on command 795 (Flapper Motor) and verify that the flapper assembly is operating. If not, verify the operation of the control circuitry (see figure 6-2).

4. Initiate device on command 776 (Fuser/PAMM Fan and Chain Motor) and verify the chainbox assembly is operating. If not investigate the operation of the control circuitry (see figure 6-2).

5. Verify the operation of the Elevator Motor as follows:

(a) Place the printer in Stack Manual Mode (press the stack manual key on the Paper Control Panel).

(b) Press the Stack Up key and verify that the stacker table moves upward its full travel (to the elevator top switch on the back of the printer).

(c) Press the Stack Down key and verify that the stacker table moves downward to the extent of its travel (to the elevator at bottom switch).

6. Verify that the elevator is leadscrew is clean and properly lubricated (see paragraph 5-8 of the Service Manual).

Overall illum warn

This message occurs when the current of the overall illumination assembly is measured at less than 33 counts. Initiate display command 184 (Overall Exposure Lamp Current) to verify the message.

Possible causes:

a. Illumination lamp(s) failure
b. AC Power PCA
c. Triac PCA
d. Control PCA

Recommended procedure:

NOTE

Ensure that the AC Contactor is closed before proceeding. If not refer to "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify the lamp operation as follows:

1. Press 676 ENTER (High Voltage System Enable) on the Service Control Panel and open the printer front door.

2. Press 745 ENTER RUN (Overall Illumination, Enable) and observe whether the ten incandescent lamps are illuminated. Replace all ten lamps.

NOTE

If none of the lamps illuminate, interchange the erase lamp and overall illumination lamp assemblies. If the assembly is defective the "Erase lamp warn" message will appear; replace all the lamps in the defective assembly.

b. Verify that the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane is seated and in good condition (no short or open wires).

c. Verify that the wiring from J6 of the AC Power PCA to the Overall Illumination Assembly is properly installed and in good condition (no short or open wires).

d. Verify the overall illumination control line as follows:

1. Measure testpoint TP36 on the AC Power PCA while executing device on command 745 (Overall Illumination, Enable).

If TP36 measures a logic low (less than 0.4 Vdc), replace the AC Power PCA.

If TP36 measures a logic high (+ 5.0 Vdc), replace either the Control or AC Power PCA.

Pad/area fail XX

This message occurs when the preheater current is measured at less 32 counts when the pad/area is presumed to be ON. The "XX" refers to the preheater pad and the associated section of the pad respectively (see table listed in recommended procedure).

Possible cause:

a Preheater Assembly
b. AC Power PCA

Recommended procedure:

a. Verify that J3 on the AC Power PCA is properly seated and the that the wires are not shorted or open. Inspect the harness for defective crimps and defective (loose) harness connectors.

b. Measure the resistance (see the following table) between the testpoints on the Triac PCA and connector P3 to the AC Power PCA Replace the preheater assembly if any shorted or open are discovered

ERROR	PAD	SECTION	J3 AC POWER PCA	TRIAC PCA	RESISTANCE in ohms +/- 20%
11	1	1	P3-1	TP3	330
12	1	2	P6-6	TP3	330
13	1	3	P3-15	TP3	330
14	1	4	P3-10	TP3	320
21	2	1	P3-2	TP4	340
22	2	2	P3-9	TP4	340
23	2	3	P3-14	TP4	340
24	2	4	P3-7	TP4	330
31	3	1	P3-3	TP5	580
32	3	2	P3-12	TP5	580
33	3	3	P3-13	TP5	580
34	3	4	P3-14	TP5	560

c. If after performing steps a and b, and the error message persists, replace the AC Power PCA.

Paper jam

This message occurs when the printer senses that the paper is not moving at an uniform rate of speed (either too fast or too slow).

Possible cause:

a. Paper System Cabling
b. DC Power PCA
c. Control PCA
d. Sensor PCA
e. Tension Motor

Recommended procedure:

In troubleshooting a paper jam, judgement must be exercised to determine the source of the paper jam. The jam could result from any malfunction along the length of the paper path. The following is a list of areas and items to be checked in event of a paper jam.

Paper a. Verify that the paper used meets the HP 2680A's recommended paper standards. Refer to the Paper Specification Guide P/N 02682-90913. Inspect the paper for tractor feed hole deformation and for multiple pages being glued together. Observe paper as it enters the printer;

try to determine if the tractor strip perforations are excessively weak or torn.

Input Tractors

a. Verify that the input tractors are correctly adjusted.

NOTE

When adjusting the tractors to the paper width, adjust so that the paper web is firm in the center (showing minimal sag) but not so firm to cause tractor hole deformation

b. Verify input stepper motor operation.

NOTE

The input stepper motor controls the operation of the input tractors. Stepper motor control is initiated on the Control PCA. ROMs on the Control PCA are addressed and provide drive signals which are input to the DC Power PCA. Stepper motor drive current is input to the stepper drive motor via the J5 connector on the DC Power PCA.

Preheater

a. Verifiy the preheater is correctly aligned and not hindering the paper's movement.

b. Verify that the preheater is clean.

c. Excessive preheater vacuum may result in a paper jam. Verify that the preheater vacuum in not too excessive as follows:

1. Initiate device on command 701 (Vacuum On) and then try to move the paper on the preheater. The paper should be held firmly but not so firm that the paper can not be moved.

2. Verify that the orifice valve is installed in the preheater filter canister (refer to reference 9 in figure 7-8 of the 2680A Service Manual). If the valve is missing, too much vacuum is applied to the preheater thereby causing a possible paper jam.

Output Tractors

a. Verify that the output tractors are correctly adjusted. Adjustment of the output tractors must be performed with fused paper.

b. Verify that the pulley on the output tractor drive shaft is not slipping on the drive shaft and that the set screw is securely tightened.

c. Verify that nothing is hindering the paper's movement in the output tractor area.

NOTE

If the PAMM door is suspected of being the cause of the paper jam, try opening the door and advancing the paper with the PAPER FORWARD key. If the paper only jams with the door closed, a misadjusted door may be the cause of the paper jam.

d. Inspect the output tractor doors for toner build-up; clean the doors if necessary.

e. Verify that the output tension is correctly set as follows:

1. Initiate display commands 270,272 and 273 (Start, Run and Stop Tension Settings).

2. Compare the values displayed with those of a previous successful Self Test; re-adjust tensions if necessary.

f. Verify that the output tractors are turning as follows

1. Remove the printers rear panel.

2. Press PAPER FORWARD while observing the output tension drive pulley and drive belt; note movement.

g. Inspect the output tension drive pulley for wear.

h. Inspect the output tension drive belt for adjustment and for wear.

NOTE

Output tension drive is initiated on the Control PCA. Tension current from the Control PCA is input to the DC Power PCA where the final signal are generated and output to the tension motor.

i. Verify that all connectors to the DC Power PCA, Control PCA, Sensor PCA and Tension Motor are seated and in good condition (not shorted or opened).

Exit Guide Chute

a. Verify that the paper movement is not hindered as it exits the PAMM module.

HINTS

Consult the Paper Path Problem Checklist in section V of the HP 2680A Operator's Handbook.

Often various types of paper react differently. If no readily identifiable cause can be found for excessive paper jams, it is advisable to try a different type of paper.

Paper width sensor

This message occurs when the paper width is measured at less than 45 counts and greater than 245 counts.

Possible cause:

a. Damaged or defective Paper Width Sensor
b. Misadjusted Paper Width Sensor
c. Monitor PCA
d. Damaged cabling

Recommended checks:

a. Examine the paper width sensor potentiometer assembly and verify the following:

1. Verify the tractor follower spring is wound on the hub of the potentiometer.

2. Verify that the spring is not kinked.

3. Verify that the sensor spring is connected to the tractor follower.

4. Verify that the tractor follower movement is not hindered and that the follower slides easily along the guide shaft.

NOTE

To observe the paper width sensor initiate display command 1175 (Paper Width) while moving the tractor follower and verify the display count changes.

b. Recalibrate the paper width sensor, refer to the Paper Width Sensor Adjustment procedure in section IV of the HP 2680A Service Manual.

NOTE

The output from the paper width sensor potentiometer is input to the Monitor PCA. At the Monitor PCA the potentiometer output is converted into a digital count to be used by the Machine Control Processor.

c. Verify that all connectors to the sensor potentiometer are seated and in good condition (no short or open wires); refer figure 6-14

Preheat fail X

The "Preheat fail 1" message occurs when the preheater does not warm-up and the diagnostics are unable to measure current to isolate the failure.

The "Preheat fail 2" message occurs when the preheater does not warm-up and no current is detected.

The "Preheat fail 3" message occurs when the preheater pads are unable to stabilize within 20 counts of their target temperature while the printer is printing.

Possible cause:

a. Preheater assembly
b. AC Power PCA
c. Control PCA

Recommended procedure:

Follow the recommended troubleshooting procedure listed for "Pad/area fail XX" and "Phtr area0 X" messages.

Phtr area0 X

This message occurs when the current of the individual preheater pad is measured to be acceptable but the pad fails to warm-up. "Phtr area0 4" message is displayed when all current measurements are acceptable and no pads are warming up.

Possible cause:

a. Fuses F1-F3 on the Fuse Bracket
b. Preheater Assembly
c. Fuses F1-F3 on the Triac PCA
d. Triac PCA
e. Triac Q10 (Pad A) Q11 (Pad B), or Q12 (Pad C) on the Triac Bracket

Recommended procedure.

a. Inspect the preheater fuses on the Fuse Bracket and on the Triac PCA and verify that the fuses are not open.

NOTE

Phtr area0 1 = F1 (top fuse)
Phtr area0 2 = F2 (middle fuse)
Phtr area0 3 = F3 (bottom fuse)
Phtr area0 4 = check all fuses

b. Inspect the preheater power connector, the six pin connector above the AC Power PCA for damaged wires (short or open). Inspect the harness for defective crimps.

c. Verify the preheater pad resistance measurements as follows:

1. Set the rear MAIN POWER breaker to OFF.
2. Measure the resistance between the following points on the six pin connector located above the AC Power PCA.

pin 1 to pin 4 60 ohms +/- 20%
pin 2 to pin 5 60 ohms +/- 20%
pin 3 to pin 6 107 ohms +/- 20%

If any opens are detected, replace the preheater assembly.

d. Inspect all connectors in the preheater control circuitry (see figure 6-6) and verify that all connectors are seated and that all wires are in good condition (no damaged wires or pushed pins).

Phtr I sensor X

This message occurs when the current measured for pad "X" (either pad one, pad two, or pad three) is less than 32 counts but pad "X" warms up.

Possible cause:

a. AC Power PCA
b. Control PCA
c. Monitor PCA

NOTE

Verify that all other error messages are corrected before proceeding.

Recommended procedure:

a. Verify fuse F1 on the AC Power PCA is not open; if open replace.

b. Replace the AC Power PCA.

Hints

If any other ac switched load warning/failure message is displayed in conjunction with the "Phtr I sensor X" error message, replace the AC Power PCA.

Faulty current sensing problems may be associated with the AC Power, Control or Monitor PCAs.

Phtr overtemp X

This message occurs when the preheater pad temperatures are measured above 250 counts or when the hardware "overtemp" bit (TP3 on the AC Power PCA) is set. The "X" refers to either pad 1, pad 2 or pad 3. A "Phtr overtemp 4" indicates that the hardware overtemp (TP 3 on the AC Power PCA) has been set. Initiate display command 1117 (Multiple Preheater Display) to determine which pad(s) were the source of the error message.

Possible cause:

a. AC Power PCA
b. Triac PCA
c. Monitor PCA (faulty A/D subsystem)
d. Triac Q10 (Pad A), Q11 (Pad B), or Q12 (Pad C) on Triac Bracket
e. Preheater Thermocouples
f. Preheater Assembly

Recommended procedure:

a. Identify the faulty pad(s) as follows:

   1. Initiate display command 1117 (Multiple Preheater Display) and monitor the preheater temperatures. The warmest pad is usually the source of the error message and may be used to isolate the defective circuitry.

      AXXXX BXXXX CXXXX TXXXX

      A = Pad #1
      B = Pad #2
      C = Pad #3
      T = Preheater Target Temperature

   2. Note which pad(s) are exceeding the error message limit.

      NOTE

      If the preheater has been off for some time, the temperatures displayed will be lower than at the time of the failure.

   3. If any of the pad temperatures increase beyond the specified limit, when the printer is static (not printing), power down the printer and unplug the appropriate connector on the Triac PCA (J6-Pad A, J7-Pad B, or J8-Pad C); refer to figures 6-6A and 6-6B for preheater system circuitry. Power on the machine, if the problem persists, replace the appropriate triac. If the problem goes away, replace the AC Power PCA.

b. If the error occurs when the preheater is turned on (Device On 770) and the temperature increases beyond the 250 limit, the regulation circuitry may not be controlling the temperature; replace the AC Power PCA.

c. If the error occurs shortly after power has been applied to the printer, the source of the error maybe a faulty thermocouple. Verify the thermocouples as follows:

   1. Measure the continuity of the thermocouple pairs (the thermocouple pairs are connected to J1 of the AC Power PCA, red and yellow wire). Each pair should measure approximately 16 ohms, if any pair appears to be open or shorted; replace the preheater assembly.

      P1-1,2
      P1-3,4
      P1-5,6

d. Verify that the Preheater Assembly's yellow/green ground wire located behind the printer's front output tractor is securely fastened the frame, and that the wire is in good good condition (not frayed or cut).

Phtr temp sensor

A preheater temperature sensor has measured a reading of less than 10 counts while at least one other pad has been measured at an reading of greater than 25 counts

Possible causes

a. Faulty thermocouple amplifiers (AC Power PCA)
b. Faulty thermocouple (Preheater Assembly)
c. Ribbon connector J1 on AC Power PCA to the Preheater
d. AC Power PCA
e. Connector J7 on the AC Power PCA to J2 Slot 17 of the Backplane
f. Defective Filter Circuitry (Control PCA)
g. Faulty A/D subsystem (Monitor PCA)

Recommended procedure:

a. Ensure that all connectors are properly seated and that no wires are shorted or open.

b. Ensure that the preheater is properly grounded. Verify that the preheater ground strap above the right output tractor is securely connected.

c. If the message persists, refer to the "Phtr overtemp X" recommended troubleshooting procedure.

Prim cor supply 2

This message occurs when the primary current is measured at greater than 32 counts when the corona is presumed to be OFF.

Possible cause:

a. High Voltage Supply PCA
b. Monitor PCA

NOTE

When this message is displayed, the +28Vdc power supply is disabled.

Hints

Initiate display command 131 (Primary Corona Current), if the count displayed is approximately zero with the 28 Vdc supply off, the High Voltage PCA is probably the source of the error message.

Print lost on left
Print lost on right

This message occurs when the printed data is outside the print image area (see figure 1-1 of the 2680A Operator's Handbook).

NOTE

One-half inch margins are required at the bottom and top of each physical page (adjacent to the page perforation) and a 0.08 inch margin is required between the print image area and the tractor strip perforations.

Recommended procedure:

a. Use the ADJUST PRINT POSITION keys to reposition the printed text inside the print image area.

NOTE

The job should be rerun if any data has been truncated.

b. Verify that the job was correctly formated. It is possible to create a job that exceeds the boundaries of the print image area.

Purge pump, fan fail

This message occurs when the purge pump/fan current is measured at less than 21 counts.

NOTE

This message is eliminated when MCS firmware date code 2414 is installed in the printer.

Possible cause:

a. AC Power PCA
b. Triac PCA
c. Control PCA
d. Purge Pump Assembly
e. Purge fan

Recommended procedure:

NOTE

Ensure that the ac contactor is closed before proceeding. If not refer to the "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify that the wiring from the Triac PCA (J3 -11 and 12) to the purge pump is not shorted or open.

b. Verify that the ribbon cable from the AC Power PCA to J1 Slot 17 of the backplane is seated and not shorted or open, and that the Control PCA is seated.

c. Verify the purge fan/pump operation as follows:

1. Press 780 ENTER RUN at the Service Control Panel to enable the purge pump and fan.

2. Visually inspect the purge pump and fan to verify their operation.

If both loads are operational, yet the error message persists, proceed to step e.

If neither load is operational, proceed to step d.

If only one load is operational, verify that the other load is correctly wired. If the wiring appears to be correct and in good condition, replace the defective load.

d. Verify that the purge pump/fan is being enabled as follows:

1. Measure test point TP35 on the AC Power PCA while initiating device on command 780 (Purge Pump/Fan, Enable).

If TP35 measures a logic Low, the problem may be isolated to either the AC Power or the Triac PCAs.

If TP35 measures a logic High the problem may be isolated to either the Control or AC Power PCA.

e. Possible failure of the current sensing circuitry; the problem may be associated with the Monitor, Control or AC Power PCAs

RAM failure XXXX

This message occurs at initial machine power-up, when the MCP power-up diagnostics detect a faulty RAM location. The "XXXX" refers to the failing address location.

Recommended procedure:

a. Reseat the Machine Control Processor PCA.

b. Perform a hard reset on the printer (toggle the Front Power breaker OFF/ON) and verifiy if the message returns.

If a failing address is consistently displayed, replace the faulty RAM, refer to section 3-30 of the HP 2680A Service Manual to determine the faulty chip location.

NOTE

Two versions of the MCP PCA are installed in existing printers, the older PCA's required eight ROM, and 16 RAM chips while the newer MCP PCA's only requires eight ROM and four RAM chips. Ensure the correct table is entered when referencing the address/chip failure.

If random failure addresses are displayed, replace the Machine Control Processor PCA.

Ready for Data

Refer to the "Waiting for data" error message.

Relay failure X

This message occurs when the preheater diagnostic detects current when all preheater current is presumed to be OFF. The "X" refers to the following messages:

1 - Current less than 32 counts was detected in relay 1
2 - Current less than 32 counts was detected in relay 2
3 - Current less than 32 counts was detected in relay 3
4 - Current less than 32 counts was detected in relay 4
5 - Current less than 32 counts was detected in all relays.
6 - Current detected with all relays open.

Possible cause:

a. Fuse F1 on the AC Power PCA
b. AC Power PCA
c. Control PCA
d. Monitor PCA (A/D subsystem)

Recommended procedure:

a. Verify that fuse F1 on the AC Power PCA is not open.

NOTE

LEDs DS2 through DS5 on the AC Power PCA are illuminated when the preheater relays K1 through K4 are being energized

b. Defective relay on the AC Power PCA, replace the AC Power PCA (refer to preheater circuitry on figure 6-6A and 6-6B).

NOTE

During the preheater diagnostics, all relays should be open and then close one at a time. Then only the appropriate relays should close as determined by the paper width

c. Current sense peak detector failure, replace the Control PCA.

d. Analog/Digital subsystem failure, replace the Monitor PCA.

Relay warning

This message occurs during the preheater diagnostic, when current is detected when all relays are presumed to be open.

Refer to the "Relay failure X" message for a possible cause and a recommended troubleshooting procedure.

RF driver failure
RF driver warning

These messages occur when the difference between RF driver output with the driver on and with the driver o: is less than .25 times the beam setting. Initiate display command 162 (RF Power Instantaneous) and 261 (RF Modulator Power Setting) to verify the message.

Possible cause:

a. Optics PCA
b. RF Amplifier
c. Control PCA (D/A Converter, Modulated Power-In)
d. Monitor PCA
e. Damaged Optics Cable (Optics Casting)

Recommended procedure

a. Initiate display command 116 (Multiple Optics Display). Verify that the First Order Power, beam on ("FXXX") is between 90 to 95 counts. If the First Order Power, beam on is not in this range, execute service tool command 623 (Measure Optics Parameters, see section 3-42 of the HP 2680A Service Manual) and adjust the beam setting until FOP is in this range. Some trial and error may be required to complete this adjustment.

   If both FOP and RF Power remain low after the adjustment, the source of the error may be with either :

   Optics PCA
   RF Amplifier
   Control PCA

   If FOP can be adjusted to within the 90 to 95 count range and RF Power remains low, the source of the error may be with either the :

   Optics PCA
   Monitor PCA

RF driver stuck on

This message occurs when the RF Modulator Power is measured at greater than 16 counts when the RF driver should be Off

Possible cause:

a. Optics PCA
b. Print Control PCA
c. Optics Cable (J6 of the backplane to Optics PCA)

Recommended procedure:

a. Ground test point TP4 on the Optics PCA, if the message persists replace the Optics PCA.

ROM failure XXXX
*ROM failure XXXX

The "ROM failure XXXX" message occurs at initial printer power-up when the MCP diagnostics detect a checksum error in Read Only Memory. The "*ROM failure XXXX" message occurs at initial printer power-up when the MCP diagnostics detect that a particular ROM memory chip is installed at the wrong address.

Recommended procedure:

a. Reseat the Machine Control Processor PCA.

b. Reset the printer by toggling the Front ON/OFF switch; verify if the message persists.

   If the failing address is consistently displayed, replace the faulty ROM and/or ensure that the correct ROM is installed into the correct location, refer to section 3-30 of the HP 2680A Service Manual for determining faulty ROM location. See Service Manual for ROM correlation chart.

NOTE

Two versions of the MCP PCA are installed in existing printers, the older PCA's required eight ROM, and 16 RAM chips while the newer MCP PCA's only requires eight ROM and four RAM chips. Ensure the correct table is entered when referencing the address/chip failure.

   If random ROM failure addresses are displayed, replace the Machine Control Processor PCA.

Scanner failure

This message occurs when the scanner rotation is detected out of tolerance.

NOTE

Scanner rotation is 75 rps +/- 1%. Two Hall Effect sensors in the scanner motor provide positioning information to the MCP PCA via the Control PCA to accurately monitor the scanner rotation. During normal operation a scanner interrupt is issued to the MCP every 16 revolutions.

Possible cause:

a. 28 Vdc Fuse (F4 DC Power PCA)
b. Scanner Motor
c DC Power PCA
d. Control PCA

Recommended procedure

a. Verify that the scanner motor ribbon connector is properly seated to the scanner motor assembly and in good condition (no shorted or open wires). The scanner motor is located at the base of the optics casting and an be accessed when the printer's rear panel is removed

b. Verify that fuse F4 on the DC Power PCA is not open.

c. The failure may have occurred on the either the DC Power PCA, Control PCA, or the Scanner Motor; see figure 6-11

Scanner start fail

This message occurs when the scanner motor fails to start (an interrupt has NOT be posted to the Machine Control Processor within 40 seconds of starting the scanner motor.

Refer to the "Scanner failure" message for a possible cause and for a recommended troubleshooting procedure.

Simul cor supply 2

This message occurs when the simultaneous corona current is measured at greater than 32 counts when the corona is presumed to be OFF.

NOTE

This message causes the +28 Vdc power supply to be disabled.

Possible Cause:

a. High Voltage Supply PCA
b. Monitor PCA

Stack safety switch

This message occurs when the stacker safety switches are sensed open for more than 2 seconds

NOTE

This message causes the AC Contactor to de-energize

Possible cause:

a. Defective safety microswitch
b Triac PCA
c. AC Power PCA
d. Control PCA

Recommended procedure:

a. Verify that nothing is pressing against the top of the paper stacker i.e., paper, the auxiliary stacker tray, etc.

b. Verify the the stacker lead screw is clean and that the square shaft is proper lubricated (refer to section V of the HP 2680A Service Manual).

c. Four stacker safety switches are located in the flapper box assembly and four switches are located in the chain box assembly (see paragraph 4-43 of the Service Manual), manually verify the operation of the switch using an ohm meter; replace all defective switches.

Switch Open = High (+5 Vdc)
Switch Closed = Low (0 Vdc)

Hints

For signal and pin locations see figure 6-2. Test point TP 42 on the AC Power PCA determines the direction of the elevator:

Up = Low
Down = High

Test point TP 43 of the AC Power PCA determine if the elevator motor is enabled or not:

Enable = Low
Disabled = High

Stacker full (False)

Each time the Top of Stack microswitch is activated, the motion of the stacker table is reversed, and the stacker table is lowered one inch. At this time the Machine Control Processor monitors the "elevator at bottom" bit. If the "elevator at bottom" bit is active, the printer is taken offline and the "Stacker full" message is displayed.

Possible cause:

a. Top of Stack microswitch (Control PCA)
b. Excessive wear on Top of Switch activator finger (on Flapper Motor).
c. Elevator at Bottom Sensor (Hall Effect Sensor)
d. Sensor PCA
e. Triac PCA
f. AC Power PCA

Recommended procedure:

a. Verify that the stacker movement is not hindered or blocked. Ensure that nothing is caught in the flapper and chain box assemblies

b. Verify the operation of the Top of Stack switch as follows

1. Measure testpoint "TOS on the backplane (Control PCA, J2 pin 17, Slot 17) while manually pressing on the Top of Stack switch.

2. Note the logic level: Switch closed = Low
Switch open = High

c Verify the operation of the elevator at bottom sensor as follows (see figure 4-16):

1. Verify that all wiring to the elevator at bottom sensor (Hall Effect sensor) to the Sensor PCA is in good condition (no short or open wires) and properly connected.

2. Measure testpoint "ELVB" on the Sensor PCA while positioning the stacker at its bottom position via the STACK DOWN key.

Note the logic levels
at the Sensor PCA: Elevator at Bottom = + 5.00
Elevator NOT at Bottom = + 0.23

NOTE

Ensure that the Hall Effect sensor is aligned, refer to section IV of the HP 2680A Service Manual.

d. Verify that the Top Of Stack and Stack safety circuitry functions correctly, refer to the "Stack safety switch" message and to figures 6-2a and 6-14.

NOTE

A quick check of the stacker safe circuitry can be performed by pushing up against either the flapper box or the chainbox. Pushing up against these assemblies should cause the elevator to lower to the bottom of its travel.

Hints

If the elevator motor continues to run when the stacker table is at it's bottom position, replace the following PCAs in the order listed:

1. Triac PCA
2. AC Power PCA

In the situation of a faulty Top of Stack microswitch the stacker table will probably be at its bottom position and the table will NOT be full, or the stacker table will stop before reaching its top of stack position.

In event of a Elevator at Bottom sensor failure, the stacker table will not be at the bottom position and the table will be full.

If the "Stacker full" message fails to occur, verify the operation of the Elevator at Bottom sensor.

Step phase error

This message occurs when NO feedback information (stepnum count) is generated and/or received by the MCP when the input stepper motor is advanced.

NOTE

The stepnum count is provided so that the Machine Control Processor can accurately monitor the paper movement. This ensures that the paper movement is coordinated with the photoconductive drum rotation and that Top of Form can always be found

The step phase is checked at initial printer power-up and during input stepper registration.

Possible cause:

a. Control PCA
b. DC Power PCA
c. Sensor PCA
d. Encoder PCA

Recommended procedure

a. Re-initialize the input paper steppers, refer to the Input Stepper Registration Alignment procedure in section IV of the HP 2680A Service Manual.

b. Verify that the paper stepper encoder is securely mounted to paper stepper drive motor.

c. Initiate device on command 790 (Stepper Motor, Forward), if the tractors do not move check circuitry shown in figure 6-9.

Stepper init error

This message occurs when the input stepper registration offset value is too close to an encoder edge.

Recommended procedure:

a. Re-initialize the input paper steppers, refer to Input Stepper Registration Alignment in section IV of the Service Manual.

Stopped by operator (False)

Recommended procedure:

a. Initiate service tool command 650 (Display Machine, Offline cause) and refer to the appropriate error message listing.

Toner hopper low
Toner hopper empty

The "Toner hopper low" message is displayed when the toner hopper low microswitch is active (the toner supply is below a specified level) and the measured average reflectance is acceptable.

The "Toner hopper empty" message is displayed when the toner hopper low microswitch is active (the toner supply is below the specified level) the and the measured average reflectance is 20 counts greater than the reflectance target. All printing ceases when the "Toner hopper empty" message is displayed.

Possible causes:

a. Empty Toner Hopper
b Bridged toner in Hopper
c. Defective Toner Hopper Low Microswitch
d. Control PCA
e. AC Power PCA
f. Triac PCA
g. Toner Hopper

Recommended procedure:

a. If the toner hopper is empty, add toner; refer to "Adding Toner" in section III of the HP 2680A Operator's Handbook If the toner is bridged in the toner hopper (packed), stir the contents of the toner hopper.

b. Push in the Toner Hopper Low Reset Button, this button is located on the end of the toner hopper dispensing chute above the developer assembly. The resetting of this switch should closes the hopper low switch an action similar to adding toner, and should cause the error message to clear. If the message persists, check the toner hopper low microswitch and its associated circuitry and wiring (see figure 6-13).

NOTE

The hopper motor cover must be removed to gain access to the hopper low microswitch.

c. If the message persists, verify the toner hopper operation as follows:

1. Press 676 ENTER on the Service Control Panel and open the printer front door.

2. Press 725 ENTER RUN (Toner Hopper Motor, two seconds) and verify if the slotted shaft on the bottom left of the toner hopper is rotating.

If the hopper is rotating and the message persists, proceed to step e.

If the hopper is not rotating, proceed to step c.

d. Investigate toner hopper operation as follows (see figure 6-2):

1. Verify that the toner hopper is connected to the "Toner Hopper Conn" on the printer front panel and that all wires are in good condition (not shorted or open).

2. Measure testpoint TP34 while initiating device on command 724 (Toner Hopper Motor, continuous).

If TP34 measures a logic low, the problem may be isolated to either the AC Power PCA, Triac PCA, or the tonner hopper motor.

If TP 34 measures a logic high, the problem may be isolated to either the Control or AC Power PCAs. Toner Hopper Motor.

e. Remove the toner bag and inspect the toner hopper. Verify that the toner is not bridged or that nothing is hindering toner drive shaft rotation. If the toner is bridged, stir toner to remove the bridge.

Top of form error

This message occurs when the input steppers do not stop at the correct Top of Form base position (on an integral one-half inch increment).

Recommended procedure:

a. Verify that nothing is hindering the paper movement as it enters the printer

b. Reset the printer (0 ENTER) and then use the PAPER FORWARD key to re-establish Top of Form. If the message persists, proceed to step c.

c. Re-initialize the input paper steppers, refer to Input Stepper Registration Alignment in section IV of the HP 2680A Service Manual.

d. Investigate the operation of the input stepper motor. Observe the amount of torque the motor outputs. If the motor does not appear to be outputting enough torque try replacing either the Control or the DC Power PCAs.

e. Ensure that the stepper motor encoder disc is not loose.

Trfr cor supply 2

This message occurs if the transfer corona current is measured at greater than 32 counts when the corona is presumed to be OFF.

NOTE

This message causes the + 28 Vdc power supply to be disabled.

Possible cause:

a. High Voltage Supply PCA
b. Monitor PCA

Triac/fuse X

This message occurs when the measured current in the preheater sections measure less than 32 counts and the pads do NOT warm-up. The "X" refers to pads 1, 2 or 3.

Possible cause:

a. Fuse(s) F1 - F3 on the Triac PCA
   F1 used for Pad 1 (A)
   F2 used for Pad 2 (B)
   F3 used for Pad 3 (C)
b. Fuse F1 on the AC Power PCA
c. Fuse(s) on the Fuse Bracket
d Triacs on the Triac Bracket
   Q10 used for Pad 1 (A)
   Q11 used for Pad 2 (B)
   Q12 used for Pad 3 (C)
e. Triac PCA
f. AC Power PCA
g. Preheater Assembly

Recommended procedure:

a. Verify that all wiring to the preheater assembly is properly connected and in good condition (not shorted or open).

b. Verify fuses F1 through F3 on the Triac PCA and F1 on the AC Power PCA are not open.

c. Verify that fuses F1 through F3 on the preheater fuse bracket are not open.

d. Verify the preheater pad resistance measurements as follows:

1. Set the rear MAIN POWER breaker to OFF.
2. Measure the resistance between the following points on the six pin connector located above the AC Power PCA

pin 1 to pin 4	60 ohms +/- 20%
pin 2 to pin 5	60 ohms +/- 20%
pin 3 to pin 6	107 ohms +/- 20%

If any opens are detected, replace the preheater assembly.

e. Verify that the Triac Control circuitry is functioning correctly (see figure 6-6).

Unrecoverable fault

This message occurs when the RUN key is depressed after an unrecoverable failure has occured The following messages result in the displaying of the "Unrecoverable fault" message

NOTE

The circumstances accompanying the displaying of the "Unrecoverable fault" often result in the disabling of the + 28 Vdc power supply and/or the de-energizing of the AC contactor. Note the following listing to determine which messages result in these actions.

Error Message	Disable +28 Vdc Supply	De-energize AC Contactor
AC triac short	-	X
Encoder edge error	-	-
Encoder res error	-	-
Front door open	X	X
Fuser switch short	-	X
High ZOP, laser off	X	X
Illegal NVR # XX	-	-
Invalid stepper pos	-	-
No drum	X	X
NVR failure	-	-
Phtr temp sensor	-	X
Prim cor supply 2	X	-
Phtr overtemp X	X	X
RF driver stuck on	X	X
Simul cor supply 2	X	-
Stacker safety switch	-	X
Step phase error	-	-
Stepper init error	-	-
Trfr cor supply 2	X	-

Recommended procedure:

a. Press 5 ENTER (Display Additional Fault Information) and refer to the appropriate error message listing for a possible cause and a recommended troubleshooting procedure.

Use custom shield
Use no shield
Use shield #X

These message appear when the paper width has been changed informing the operator that a different corona shield is required.

Recommended procedure:

a. Verify that "false" shield messages are not displayed by initiating display command 1175 (Paper Width, continuous) and comparing the known paper width with the shield type (number).

Message	Paper Width* (inches)	A/D Count
Paper width sensor		0 - 44
Use custom shield	less than 6.375	45 - 50
Use shield #7	6.375 - 6.625	51 - 60
Use custom shield	6.625 - 8.375	61 - 104
Use shield #6	8.375 - 8.625	105 - 113
Use custom shield	8.625 - 9.375	114 - 129
Use shield #5	9.375 - 9.625	130 - 139
Use shield #4	9.750 - 10.100	140 - 150
Use custom shield	10.000 - 10.500	151 - 160
Use shield #3	10.500 - 10.750	161 - 170
Use custom shield	10.750 - 11.625	171 - 189
Use shield #2	11.625 - 11.875	190 - 197
Use shield #1	11.875 - 12.125	198 - 205
Use no shield	12.125 - ---	206 - 245
Paper width sensor	(failure)	

* Includes the two tractor pin feed strips.

b. If the message persists, refer to the recommended troubleshooting procedure and possible causes list for the "Paper width sensor" error message.

Vacuum bag full

This message occurs when the vacuum bag sensor detects a full bag condition continuously for 30 seconds when the vacuum motor is enabled.

NOTE

This message is eliminated when MCP firmware date code 2414 or greater is installed in the printer.

Possible cause:

a. Vacuum bag is full
b. Toner disposal bottle is full
c. Vacuum pressure switch
d. Control PCA

Recommended procedure:

a. Refer to the CE Maintenance Log Book and note the last time the vacuum bag was replaced. Replace the vacuum bag if the suggested PM interval for bag replacement has elasped. Refer to section IV of the Operator's Handbook for bag replacement.

b. Verify that the Toner Disposal Bottle has not overfilled; replace if overfilled. Refer to Toner Disposal Bottle replacement in section IV of the Operator's Handbook.

c. If both the vacuum bag and the toner disposal bottle are empty and the message persists, investigate the operation of the vacuum pressure switch (bag full sensor) and the Control PCA (see figure 6-13)

NOTE

If the vacuum bag and toner disposal bottle fill up quickly, investigate the possibility of a electrophotograhic process problem i.e., transfer corona, developer assembly cleaner station. etc... .

Vacuum System Fail

This message is displayed when the vacuum microswitch indicates that printer vacuum is less than the specified level (less than 10 inches of water) This message shuts the printer dowm.

Possible cause:

a. Vacuum Motor
b. Vacuum Belt
c. Vacuum Piping (hoses)
d. Vacuum Valve
e. Vacuum Disposal Bottle
f. Preheater Filter
g. Vacuum Bag
h. Cleaner Station
i. Vacuum Door Seal

Recommended procedure:

a. Refer to the CE Maintenance Log Book and note the last time the vacuum bag was replaced. Replace the vacuum bag if the suggested PM interval for bag replacement has elasped. Refer to section IV of the Operator's Handbook for bag replacement.

b. Verify that the Toner Disposal Bottle has not overfilled; replace if overfilled. Refer to Toner Disposal Bottle replacement in section IV of the Operator's Handbook.

c. If both the vacuum bag and the toner disposal bottle are empty and the message persists, investigate the operation of the vacuum pressure switch (bag full sensor) and the Control PCA (see figure 6-13).

NOTE

If the vacuum bag and toner disposal bottle fill up quickly, investigate the possibility of a electrophotograhic process problem i.e., transfer corona, developer assembly, cleaner station, etc... .

d. Refer to "Vacuum System Malfunctions" in Section 2-2 of this manual.

VDP Controller Error

The density controller monitors print density and compares the measured print density against the target density. This comparison is used to determine how long the toner hopper is to be turned on. The VDP controller diagnostic exercises this routine and displays an error if the diagnostic fails This is usually a recoverable error and may be cleared by pressing the RUN key. Reoccurance of this error indicates a hardware malfunction.

Possible cause:

a. Machine Control Processor PCA

Recommended procedure:

a. Perform the NVR Initialization Procedure, refer to Section IV of the 2680A Service Manual.

b. If the message persists, replace the Machine Control PCA.

Volume sensor warn

This message occurs when the instantaneous developer volume count is measured at less than 40 counts. Developer volume measurements are taken by the Developer Volume Sensor (DVS). Initiate display command 1135 (Instantaneous Developer Volume) to verify the message.

NOTE

A empty developer assembly measures approximately 70 counts, a normal developer volume count varies from approximately 100 to 150 counts.

Possible causes:

a. Developer Volume Sensor (Developer Assembly)
b. Monitor PCA

Recommended procedure:

a. Ensure the developer cable is properly seated and in good condition (no shorted or open wires).

b. Ensure the developer assembly has been properly replenished with known, good developer mixture package.

c. If the problem persists after performing steps a and b, replace the assemblies in the order listed as a possible cause.

Waiting for data (false)

or

Ready for data (false) after MCP Date Code 2414

A false error message could occur if a communications problem exists between the Machine Control System (MCS) and the Data Control System (DCS), and the DCS and the host system.

NOTE

A temporary "Waiting for data" message often occurs when a large volume of date is downloaded from the host system between print jobs.

Recommended procedure:

a. Execute all DCS Self Test diagnostics (service tool command 610 through 618). Refer to section III in the HP 2680A Service Manual.

b. Refer to the possible causes and recommended troubleshooting procedures listed for the "Beam detect fail" error message.

c. If the message persists, replace the Machine Control Processor PCA.

d. Replace the Print Control PCA or the DCS I/O PCA

Warming up (False)

Under normal circumstances, when the PRINT key is pressed or when a print command is received from the host system, the printer displays the "Warming up" message. This message is displayed for approximately 40 seconds and then cleared when all of the printer start-up conditions have been satisfied. A false "Warming up" message (where the message is never cleared) indicates that something is faulty in the printer.

Possible cause:

a. Elevator motor failure
b. Defective Top Of Stack switch
c. Defective Stacker Safety switch
d. Triac PCA
e. AC Power PCA

Recommended procedure:

NOTE

Under normal circumstances if the Scanner circuitry were faulty the "Scanner failure" message would be displayed.

a. Press STACK MANUAL on the paper control panel to put the printer in the stack manual mode. Press STACK UP and verify that the stacker moves up to the extent of its travel. Press STACK DOWN and verify the stacker moves down to the extent of its travel. If the stacker is not operational refer to the recommended troubleshooting procedure for the "Stacker full" message and to figures 6-2 and 6-14.

NOTE

If the "Warming up" message is cleared when the STACK MANUAL key is pressed, the printer probably still faulty. Verify that the printers Top of Stack and Stacker Safety Circuitry operates correctly. The printer must be able to operate in the automatic stacking mode.

Wiper blade is up

This message occurs when the wiper blade is NOT sensed in it's operating position (down).

NOTE

The wiper blade interlock switch is located behind the bracket which locks the cleaner station handle in position. The Machine Control Processor checks to see if the wiper blade is down each time the RUN key is pressed.

Possible cause:

a. The wiper blade is not down.
b. Defective interlock switch.
c. Control PCA

Recommended procedure:

a. Ensure that the cleaner station handle is down, and locked in the correct position (the knurled knob should be pushed in until the metal tab, behind the locking bracket, is depressed.

b. Verify that the wiper blade interlock switch connector is properly seated and that all wiring is in good position (no shorted or opened wires).

c. Using an ohmmeter, verify the operation of the wiper blade interlock switch (see figure 6-13).

d. Replace the Control PCA.

+28V supply failure

The +28 Vdc supply has been measured at less than 26 volts (149 counts). Initiate display command 194 (+28V Supply Voltage) to verify the error message

Possible cause:

a. +28 Vdc Loads (Transfer Corona Simultaneous Corona Primary Corona, ESM Supply, Developer Bias Supply, Drum Drive Motor, Scanner Motor, RF Modulator)
b. High Voltage Supply PCA
c DC Power PCA
d +28 Vdc Power Supply
e. Power Distribution PCA
f. Control PCA
g. Machine Control Processor PCA

NOTE

Note all error messages which have occured which may be related to the +28 Vdc power supply.

The opening of the printer front door disables the +28 Vdc power supply, ensure that the front door is closed before proceeding.

Recommended procedure:

a. Toggle the Front ON/OFF switch to OFF, wait 20 seconds, and set the switch to ON. If the error message persists, proceed to step b. If the supply is enabled (no error message) begin executing the following steps to determine which load may have caused the failure.

   1. Initiate device on command 701 and 702 (Vacuum and Drum, enable) and verify their operation. If the error message reappear, investigate all circuitry associated with the drum drive circuitry.

   2. Remove the corona assemblies and inspect the assembly for signs of arcing; correct if arcing is detected.

   3. Initiate the following commands and if they cause the +28 Vdc power supply to be disabled.

      731 (Primary Corona, enable)
      741 (Simultaneous Corona, enable)
      751 (Transfer Corona, enable)
      736 (Developer Bias, enable)

      If the execution of any of these commands cause the error message to reappear, investigate the operation of the individual assembly and it's associated circuitry (corona cabling and High Voltage Supply PCA).

   4. Initiate device on command 760 (Scanner, enable). If the execution of this command causes the error message to appear, replace the DC Power PCA.

   5. Initiate service tool command 623 (Measure Optics Parameters). If the execution of this command causes the error message to reappear, replace the RF Amplifier.

b. Verify that the +28 Vdc Power Supply is being enabled. The +28 Vdc Power Supply is enabled by the Machine Control Processor PCA, Control PCA and Power Distribution PCA (see figure 6-22).

c. Disconnect all output voltage lines on the power supply, then measure the power supply's output. If the output measures less than +28 Vdc or if ac voltage is present at the output, replace the power supply.

A/D CONVERSION TABLE

Count	Volts	Count	Volts	Count	Volts	Count	Volts
0	0.00	64	1.25	128	2.51	192	3.76
4	0.08	68	1 33	132	2.59	196	3.84
8	0.16	72	1.41	136	2 67	200	3.92
12	0.24	76	1.49	140	2.75	204	4.00
16	0.31	80	1.57	144	2 82	208	4 08
20	0.39	84	1.65	148	2.90	212	4 16
24	0.47	88	1.73	152	2.98	216	4.24
28	0.55	92	1 80	156	3.06	220	4.31
32	0.63	96	1.88	160	3.14	224	4.39
36	0.71	100	1 96	164	3.22	228	4.47
40	0.78	104	2 04	168	3.29	232	4.55
44	0.86	108	2.12	172	3.37	236	4.63
48	0.94	112	2.20	176	3.45	240	4.71
52	1.02	116	2.27	180	3 53	244	4.78
56	1.10	120	2.35	184	3.61	248	4.86
60	1.18	124	2.43	188	3.69	252	4.94

2-2. Miscellaneous Error Conditions

AC Contactor malfunctions

The AC Contactor must operate correctly to ensure protection of several printer subassemblies. If the contactor clatters, or if the contactor does not energize or de-energize, a problem exists.

NOTE

AC Contactor operation can be verified by opening the printer front door. Assuming no "Unrecoverable fault" condition exists and that the power breakers are ON, opening the front door de-energizes the contactor and closing the door energizes the contactor.

Possible cause:

a. Control PCA
b. AC Power PCA
c. Triac PCA
d AC Contactor Assembly
e. AC Power PCA Transformer (24 Volts)
f. Machine Control Processor PCA

Recommended procedure:

a. Verify that the Control PCA, AC Power PCA, and the Triac PCA are seated and that the wires to the AC Contactor are not shorted or open.

b. Refer to figure 6-5, measure testpoint TP33 on the AC Power PCA while opening and closing the front door:

   Contactor closed = Low
   Contactor open = High

c. Ensure that the AC Power PCA Transformer connector is installed on J4 of the AC Power PCA. The transformer provides 24 Volts for the contactor relay.

Display Blank (Keyboard Malfunctions)

The non-operational printer is defined as a printer which does not post a display (the display is blank) or where the keyboard does not respond to the commands of the user.

Possible causes:

a. Power Supply Problems
b. Display PCA
c. Display Ribbon Cable
d. Machine Control Proccessor (MCP) PCA
e. Print Control PCA
f. Monitor PCA
g. Control PCA

The following assumptions should be made prior to investigating the cause of a non-functional printer problem:

~ The printer rear MAIN POWER breaker is ON.

~ The printer Front ON/OFF switch is ON.

~ All printer PCAs are installed and all connectors are properly connected.

NOTE

Refer to the General Troubleshooting Table in Section 1-2 of this manual

Recommended procedure:

a. Verify that AC power is present at the printer. The presence of AC power is easily identified by noting the operation of the cardcage fans. The fans should operate when the rear MAIN POWER breaker is ON.

b. Verify that DC power (+12 -12 and +5 Vdc) is present. The presence of these voltage may be easily identified by observing LED indicators on the Power Distribution PCA. If these LEDs are not illuminated it may be necessary to isolate the power supply, refer to the "Hints" section of this message.

c. Verify that 50 pin ribbon cable from J2 Slot 12 of the backplane to the Display PCA is properly seated and in good condition (no cut or damaged wires).

d. The only cardcage PCAs required to illuminate the printer display are the Print Control and the MCP PCAs. For complete control over the display (i.e., entering CE access mode or displaying parameters) the MCP, Print Control, and Monitor PCAs are required. To isolate a display problem, remove all cardcage PCAs except the MCP and the Print Control PCAs. If the display does not illuminate , the display problem may be isolated to one of the following PCAs:

    1. Machine Control Processor PCA
    2. Print Control PCA
    3. Display PCA

If the printer display illuminates, install the Monitor PCA and verify if keyboard commands may be performed.

Hints

DC Power Supply (+/- 12 and + 5 Vdc)

Check testpoints TP 7, TP 8, TP 9, and TP 10 (overvoltage and undervoltage testpoints); if any of these testpoints are High an error condition exists. Verify the dc voltage level adjustments from the respective power supplies. An overvoltage/undervoltage error can be overridden by grounding testpoint TP 11 (you must perform a hard reset on the printer, power the printer OFF then ON, after you override this circuitry.

To isolate +/- 12 and +5 Vdc Power Supply problems, the supply may be unloaded by disconnecting J5 of the AC Power PCA and J4 of the DC Power PCA, and removing all PCAs from the cardcage except the MCP and Print Control PCAs.

DC Power Supply (+28 Vdc)

The +28 Vdc Power Supply is under the control of the MCP, refer to the "+28V supply failure" message for troubleshooting +28 Vdc problems.

AC Contactor

The AC Contactor is under the control of the MCP and is energized after the Front ON/OFF switch is ON (refer to figure 6-5 for contactor control circuitry).

Electrostatic Monitor Malfunctions

The Electostatic Monitor (ESM) functions as a non-contact, self-calibrating voltmeter and is used to measure the voltages on the surface of the photoconductive drum. The measurements taken by the ESM are applied to an algorithm which in turn controls the currents supplied to the corona assemblies. A defective ESM (inacurrate voltage measurements) results into the wrong current levels being supplied to the corona assemblies. Print quality problems (i.e., excessive carryout, background, streaking) may be the result of a defective ESM. To determine if the ESM is functioning correctly, proceed as follows:

NOTE

Prior to performing any of these procedures, closely inspect the ESM Assembly for damage. Verify that the assembly is seated, that the coupling and solenoid shaft is in good condiition. Verify that the connectors are in good condition (no bent or broken wires).

a. Initiate the printer Self Test (1 ENTER RUN); initiate continuous display command 1119 (Multiple ESM Display). Compare the parameters displayed with those from a previously know good Self Test printout (see Sensor and Development Parameters).

NOTE

119 Multiple ESM Display (EXXXX BXXXX DXXXX CXXXX)
wherein
E = ESM Reference Measurement
B = Door Bias Measurement
D = Developer Voltage
C = ESM Control Voltage

If the parameters vary significantly, investigate the operation of the ESM circuitry (see figure 6-16). Verify that the ESM assembly is clean and that no pins or connectors damaged (see ESM maintenance in paragraph 5-19 of the Service Manual).

b. If the print quality is acceptable (background and/or carryout), the following procedure may be used to isolate the problem:

1. Initiate the printer Self Test (1 ENTER RUN).

2. Disable the printer electrostatic diagnostic loop (430 ENTER).

3. Alternately monitor the Multiple Corona Diagnostics (1115) and the Multiple Drum Potentials (1113); the diagnostics display commands are defined as follows:

Multiple Corona Diagnostic 115 (PXXXX VXXXX SXXXX TXXXX)
wherein
P = Primary Corona Voltage
V = Primary Screen Voltage
S = Simultaneous Corona Current
T = Transfer Corona Current

Multiple Drum Potentials 113 (DXXXX LXXXX PXXXX SXXXX)
wherein
D = Dark Potential of Drum
L = Light Potential on the Drum
P = Primary Corona Setting
S = Simultaneous Corona Setting

If the Light and Dark Potentials on the drum readings are unstable, the Electrostatic Monitor may be faulty; investigate all ESM circuitry (see figure 6-16 of this manual and paragraph 5-16 of the Service Manual).

If the light and dark potentials are stable yet, the simultaneous and primary corona currents are unstable, the suspected source of the problem may a corona system problem (see figures 6-17 and 6-18).

4. The following procedure may be used to verify the operation of the ESM/Corona System circuitry:

   (a) With the ES Loop disabled initiate modify command 341 (Simultaneous Corona Setting) and 331 (Primary Corona Setting).

   (b) Verify that the following conditions result as the the settings are modified

      (1) Increasing the Primary and Simultaneous Corona Settings should result in the increase of Primary and Simultaneous Currents.

      (2) As the Primary Corona Setting is increased, the Dark and Light Potentials should increase.

      (3) As the Simultaneous Corona Setting is increased the the Dark and Light Potentials should decrease.

   If the corona currents do NOT change as the settings are increased, a problem may exist in the corona system's high voltage circuitry (see figure 6-17 and 6-18).

   If the currents changed, yet the dark and light potentials readings do NOT change, the ESM may not be correctly measuring the drum potentials, investigate the ESM circuitry.

   If the currents and dark and light potentials correctly track the settings, the problem may exist with either the drum or the corona assemblies.

Vacuum System Malfunctions

The printer's vacuum system is used in the electrophotographic process for cleaning the photoconductive drum, and is used in the fusing system for holding the paper to the preheater surface and for collecting fumes given off by the paper.
If the vacuum system is malfunctioning, a wide range of problems could result i.e., "blotches" in the printed output, poor fusing, excessive paper jams, print smears on the printer top cover and on the leading and trailing edges of the printed output.

Possible causes:

a. Broken Vacumm System Belt
b. Clogged Vacuum Line
c. Overfilled Waste Disposal Bottle
d. Vacuum Motor
e. Clogged Cleaner Station Assembly
f. Vacuum Door Seal (leaks)
g. Vacuum Hose (leaks)
h. Vacuum Control Circuitry
   - Control PCA
   - AC Power PCA
   - Triac PCA
   - Q9 Triac Bracket

Recommended procedure:

a. Initiate service tool command 676 (Enable High Voltage System) and open the printer front door; the printer front door must be opened within three seconds of initiating the command.

   Initiate device on command 701 (Vacuum Motor). The enabling of the vacuum motor should apparent due to the loud noise emitted by the vacuum system. If the motor did NOT start, investigate the operation of the vacuum control circuitry (see figure 6-3). If the vacuum motor is operational, perform the following vacuum system checks:

1. Try to open the vacuum system door (see figure A Para 5-9 of the Service Manual). If the door can not be opened easily the vacuum system is correctly working.

2. Visually verify if the toner disposal bottle being lifted at its coupling. If the bottle is near empty the vacuum system should create sufficient vacuum to lift an empty disposal bottle

3 Open the printer top cover, note if there is sufficient vacuum to hold the paper to the preheater surface.

4. If the unit has a vacuum splice feature, check for the presence of vacuum at the splice table.

Close the printer front door. If insufficient vacuum is detected after performing any of the above checks, the vacuum system may be blocked and it may be necessary to disassemble the vacuum piping.

b. Remove the drum cleaner station (see section V of the Service Manual). Inspect the station checking for any signs blockage; clean if necessary. If the cleaner station indicates any signs of insufficient vacuum, perform the following steps:

1. Remove the cleaner station from the printer.

2. Remove the EP Top Close Out Cover. The panel is to the right of the review window and is secured by four screws. When the cover is removed and the cleaner station is removed, the cleaner station vacuum port is revealed on the interior side of the back EP wall.

3. Initiate device on command 701 (Vacuum On) and check for vacuum by placing thumb over the cleaner station vacuum port. If no vacuum is present, the vacuum piping may be blocked; clean if necessary.

SECTION III.
PRINT QUALITY

3-1. Introduction

The quality of the printed output produced by the HP 2680A Page Printer is dependent on the interaction of several components and subsystems within the printer. The correct adjustment and operation of each component and subsystem in the printer is critical for providing quality output.

If a print quality problem is suspected, the Service Representative should first initiate Self Test and compare the diagnostic printout with a printout of a previous known good Self Test. If the print quality problem is not readily identifiable, the Service Representative should verify that all the proper operating conditions and adjustments have been performed. The following assumptions and adjustments should FIRST be considered prior to investigating a print quality problem:

Assumptions

~ That no other error message is displayed when a print quality problem occurs.

~ The Developer Mixture meets all Hewlett-Packard standards.

~ The Drum Heater is functioning properly and the printer has been operating at temperature for at least one half hour.

~ The Paper used in printing meets all Hewlett-Packard guidelines in terms of quality and physical characteristics.

~ The Electrostatic Monitor assembly is functioning correctly.

~ The Densitometer assembly is functioning correctly.

~ The Photoconductive Drum is free of extraneous physical defects and contamination.

~ Verify that both drum bearings are installed on the drum shaft.

~ Verify that the cleaner blade is installed and in the "down position".

Adjustments

~ Verify the Wiper Blade/Photoconductive Drum Pressure is correctly adjusted. (Refer to section V of the HP 2680A Service Manual.

~ Verify that the corona assemblies are clean.

~ Verify that the developer assembly's Magnet Angle and Orientation is adjusted correctly. (Refer to section V of the HP 2680A Service Manual)

~ Verify the developer assembly's Doctor Blade Height is adjusted correctly. (Refer to section V of the HP 2680A Service Manual.)

~ Verify that the Drum/Developer Roll Spacing adjustment is correct. (Refer to section V of the HP 2680A Service Manual.)

~ Verify that the Retraction Blade is correctly adjusted. (Refer to the Retraction Blade adjustment procedure in section V of the HP 2680A Service Manual.)

~ Verify that the Dark Potential Target has been correctly adjusted. (Refer to section V of the HP 2680A Service Manual.)

~ Verify that First Order Power (see Self Test "1st ord beam= xx") is correctly adjusted (approximately 90 counts). See the recommended troubleshooting procedure listed for the "RF driver failure" message in section II of this manual

Most print quality problems are "analog" in nature wherein the source of the problem is not a single bad component but several marginal components. In troubleshooting these type problems it is important to observe the total operation of entire EP system and try to establish a cause-effect approach towards troubleshooting the problem.

Table 3-1 summarizes various print quality problems which could occur in the HP 2680A. Listed with each print quality fault is a brief description of each fault along with an examples number. The example number refers to the print quality examples following table 3-1

3-2. Troubleshooting Print Quality

In troubleshooting a print quality problem the service representative must exercise judgement and thoroughly analyze the problem to determine which component or subsystem is causing the degradation of the printed output. The following is a list of printer components and subsystems which the service representative must consider in analyzing the cause of a print quality problem.

~ Drum/Wiper Blade
~ Corona Assemblies
~ Developer Mixture
~ Data Control System
~ Optics System
~ Fusing System
~ Vacuum System
~ Miscellaneous
~ Misadjustments

The following is an explanation of possible checks to make when investigating the print quality symptom.

DRUM/WIPER BLADE FAILURE

Symptoms	Recommended Checks
Background	a. Verify the drum/wiper blade pressure adjustment is correct (see paragraph 5-26 of the Service Manual).
	b. Run printer Self Test; compare "Dark poten = XXX" with "Doc poten= XXX". If the difference is consistently greater than 20 counts, replace the drum.
Regular pattern of spots, lines or faded and light spots in the printout.	a. Thoroughly examine the printed output; if the spot, line or light and/or faded area is consistently in the same position on every other page of the printed output, a defect in the drum may have occured. If the blemish is highly noticeable, replace the drum.
Carryout	a. Verify that the drum dark target potential is correctly adjusted (see paragraph 5-27 on the Service Manual).

CORONA ASSEMBLIES

Symptoms

Background	a. Remove corona assemblies and clean thoroughly with alcohol swabs. A dirty Primary Corona, in particular, causes high background
	b. Inspect all components of the Simultaneous Corona System (i.e., cabling, connectors, transformer, and assembly), refer to figure 6-18. Corrosion of any of the connectors within the system, in particular the simultaneous transformer, leads to background in the print.
Streaking, sharp white lines in the direction of raster scan.	a Loose Simultaneous Corona Grid wires tend to vibrate. Inspect grid wires; if they appear loose, restring the grid wires.
	b. Ensure that the Simultaneous Corona wire is clean.

DEVELOPER MIXTURE

Symptom

Background Loss of print density (especially in printed solids)	a. Initiate display command 205 (K rotations on developer). If the normal developer mixture lifetime has elaspe, replace the developer mixture.
Print sharpness	b. Execute the printer Self Test and examine the self test print-out; if the "Solid rfl avg=XXX" is greater than 450, replace the developer mixture.
	c. Examine the self test print-out, if toner is scattered along the trailing edge of printed solids, replace the developer mixture.

DATA CONTROL SYSTEM

Symptom

Garbled print Spurious dots or lines in print.	a. Perform a reset on the printer (0 ENTER). If the problem still persists proceed to step b.
	b. Execute the printer Data Control System diagnostics (service tool commands 610 through 619); refer to paragraph 3-28 of the Service Manual.

FUSING SYSTEM

Symptoms

Printer image smeared	a. Inspect the fuser bulb for built up deposits of toner; clean bulb in necessary.
	b. Verify that vacuum is present at the at the preheater and that the vacuum is sufficient to hold the paper down to the top of the preheater (refer to Vacuum Motor Malfunctions in section 2-2 of this manual).
	c. Verify that the Paper Run Tension is set correctly (see paragraph 4-45 of the Service Manual).

OPTICS SYSTEM

Symptoms

Loss of print density	a. Execute the printer Self Test and compare the optical system values with those from a previous known good Self Test print-out. If the parameter values differ significantly from those of the known good self test, proceed to step b. b. Perform service tool command 623 (Measure Optics Parameters) and adjust the beam setting until a First Order Power of between 90 to 95 counts is achieved (refer to command 623 in paragraph 3-43 of the Service Manual).

VACUUM SYSTEM

Symptoms

Blotches	a. Verify that the Vacuum System's cleaner station is operating correctly (see Vacuum System Malfunctions in section 2-2 of this manual).
Smears	a. Verify that vacuum at the preheater surface is sufficient to hold the paper (refer to Vacuum System Malfuctions in section 2-2 of this manual).

MISCELLANEOUS

Symptom

Background	a. The Electrostatic Monitor may lead to several print quality problems refer to Electrostatic Monitor Malfunctions in section 2-2 of this manual. b. Verify that Overall Illumination Lamps are not dirty and that they are functioning correctly (refer to paragraph 5-4 of the Service Manual).
Blank Pages	a. Verify that the transfer solenoid is functioning correctly (initiate device on command 752 Transfer Engage), open the paper input door and watch the retraction mechanism operate.
Carryout	a. Carryout results if the developer bias voltage at the developer assembly is less than 302 volts +/- 10 volts. Verify that the voltage is within this range as follows: 1. Initiate service tool command 676 (Enable High Voltage System) and open the printer front door. 2. Adjust a voltmeter to read between 200 to 400 volts and measure the voltage on the developer housing. If it is not within the desired range, a high resistence short circuit exists. Refer to the recommended troubleshooting procedure for the "Developer short cct" error message

and figure 6 15 for isolating the problem.

White lines Dropouts	a. Using a ohm meter, measure the resistance of the retraction assembly's static brush to frame ground The static brush is easily accessed by opening the paper input door adjacent to the splice table. The resistance should, at all positions along the bristles of the brush, should be less than 100 kohms. If the resistance is greater than the limit, replace the brush NOTE The resistance of the brush should vary from about 70 K ohms from the back of the printer to about 20 K ohms towards the front of the printer.
Ghosting	a. Ensure that the Electro-Luminescent (EL) strip is functioning (initiate device on command 722). b. Ensure that the EL strip clean of all paper dust and waste toner; the strip may be cleaned with alcohol (see paragraph 5-22 of the Service Manual).
Smeared streak in the scan direction every other page *	a. Verify that the transfer solenoid is functioning correctly (initiate device on command 752 (Transfer Engage), open the paper input door and watch the retraction mechanism operate. b. Verify that the lower retraction blade is properly adjusted (refer to paragraph 4-40 of the Service Manual).
Smeared print	a. Ensure that the unfused print is not rubbing against the printer top cover near the review window area.
Edge of print is missing	a. Verify that the correct Transfer Corona Shield is being used as required by the paper width (refer to section III of the Operator's Handbook).
Toner on top and bottom edges of the paper.	a. Verify that the developer assembly's top seals and end seal are not defective (refer to paragraph 5-13 of the Service Manual).

MISADJUSTMENTS

Symptoms

Background	a. Verify that the Drum/Blade Pressure Adjustment is correct (refer to paragraph 5-26 of the Service Manual). b. Verify that the Doctor Blade Height is correctly set (refer to paragraph 5-15 of the Service Manual).
Carryout	a. Verify that the Dark Target Potential is correctly adjusted (refer to paragraph 5-27 of the Service Manual).
Faded Areas Sharpness	a. Verify that the Doctor Blade Height is correctly adjusted (refer to paragraph 5-15 of the Service Manual).

b. Verify that the Drum Roll Spacing (DRS) correctly adjusted (refer to paragraph 5-16 of the Service Manual).

Table 3-1
PRINT QUALITY
Common Symptoms

	EXAMPLES	DRUM/ WIPER BLADE	CORONA ASSEMBLIES	DEVELOPER MIXTURE	DATA CONTROL SYSTEM	OPTICS SYSTEM	FUSING SYSTEM	VACUUM SYSTEM	MISCELLANEOUS	MISADJUSTMENTS
BLOTCHES BLOTCHES OF BLACK IN THE PRINT	39,40									
BACKGROUND THE PAPER LOOKS GREY OR APPEARS DIRTY	1,2,3, 4,5,6, 7,8,9									
BLANK PAGES PRINTER MOVING PAPER BUT PRINT IS NOT APPEARING										
CARRYOUT DARK SPECS IN THE PRINT; PAPER APPEARS DIRTY	41									
COMPRESSED PRINT PRINT SMALLER IN SCAN OR DRUM ROTATION DIRECTION	27,28, 29,30									
GARBLED PRINT DESCRIPTION?	17,18, 19,20, 21,22									
MISSING PRINT PARTIAL CHARACTERS OR BLANK SCANS	30,31 32,33									
STREAKS/SMEARS DESCRIPTION?	34,35 36,37, 43									
SPURIOUS DOTS/LINES DESCRIPTION?	10,11 12,13 14,15 16,44									

Table 3-1
PRINT QUALITY
Common Symptoms

	EXAMPLES	DRUM/ WIPER BLADE	CORONA ASSEMBLIES	DEVELOPER MIXTURE	DATA CONTROL SYSTEM	OPTICS SYSTEM	FUSING SYSTEM	VACUUM SYSTEM	MISCELLANEOUS	MISADJUSTMENTS
PRINT QUALITY LOSS	23,24 25,26									
THE PRINT DARKNESS IS LESS THAN NORMAL										
POOR FUSING										
PRINT IS EASILY RUBBED OFF OF THE PAPER										
REPEATED MARKS/SPOTS*	42,45									
REPEATED EVERY DRUM ROTATION										
DISTORTED PRINT	38									

*WHEN PRINTING ON PAPER WITH 8.5 INCH PAPER LENGTH,THE SPOTS,LINES,SMEARS OR FADE AREAS CAUSED BY A DEFECTIVE DRUM WILL APPEAR REPEATEDLY IN THE SAME POSITION EVERY OTHER PAGE OF THE PRINTED OUTPUT.

BACKGROUND (1)

\ T I O N M A N U A L

Page Printer:

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BACKGROUND (1)

This form of background is a result of the Developer Voltage being set too high; the failure became apparent at approximately 30K drum rotations.

HEWLETT PACKARD

BACKGROUND (2)

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BACKGROUND (2)

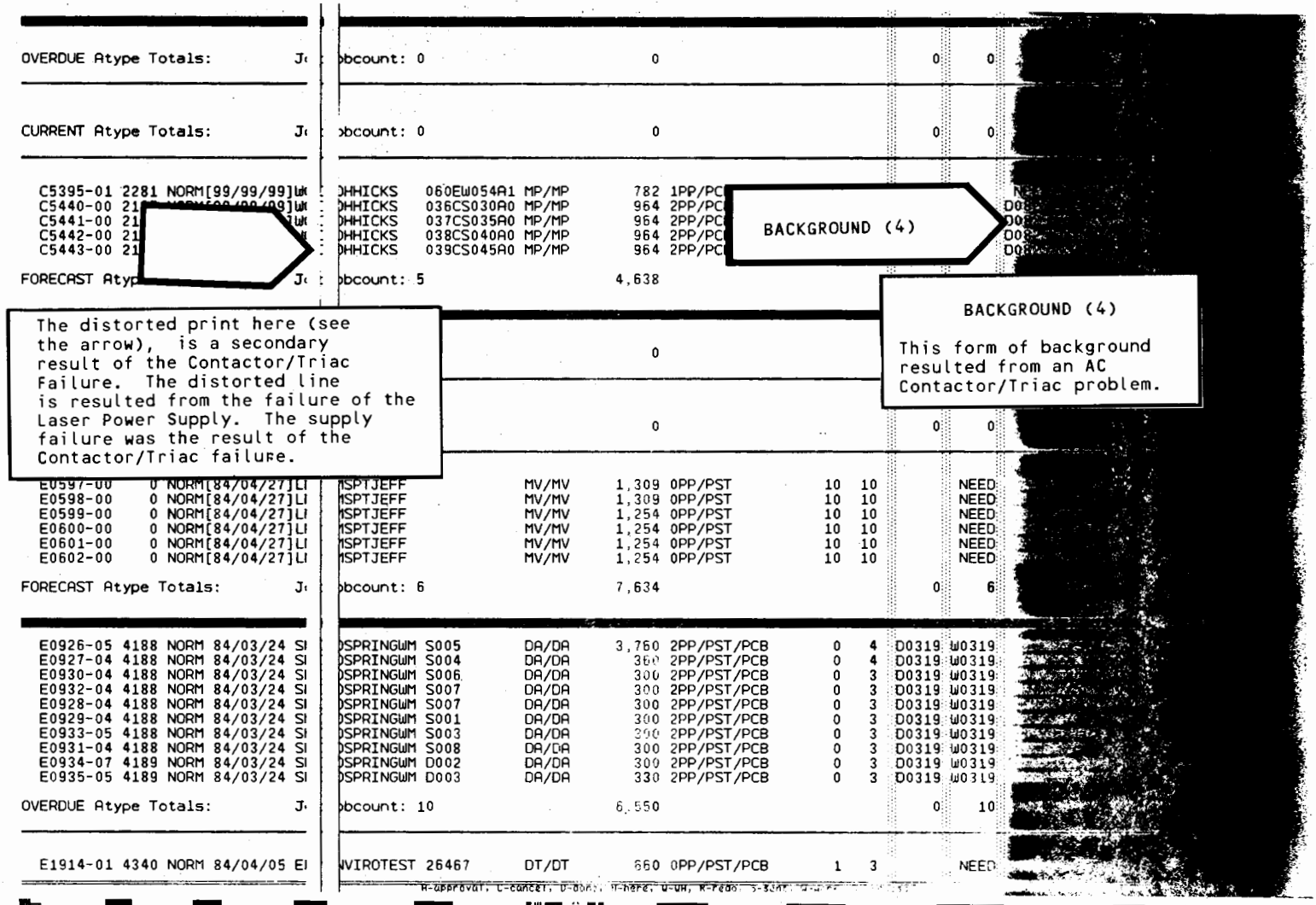
This form of background (dense black streak) is the result of Primary Corona Arcing.

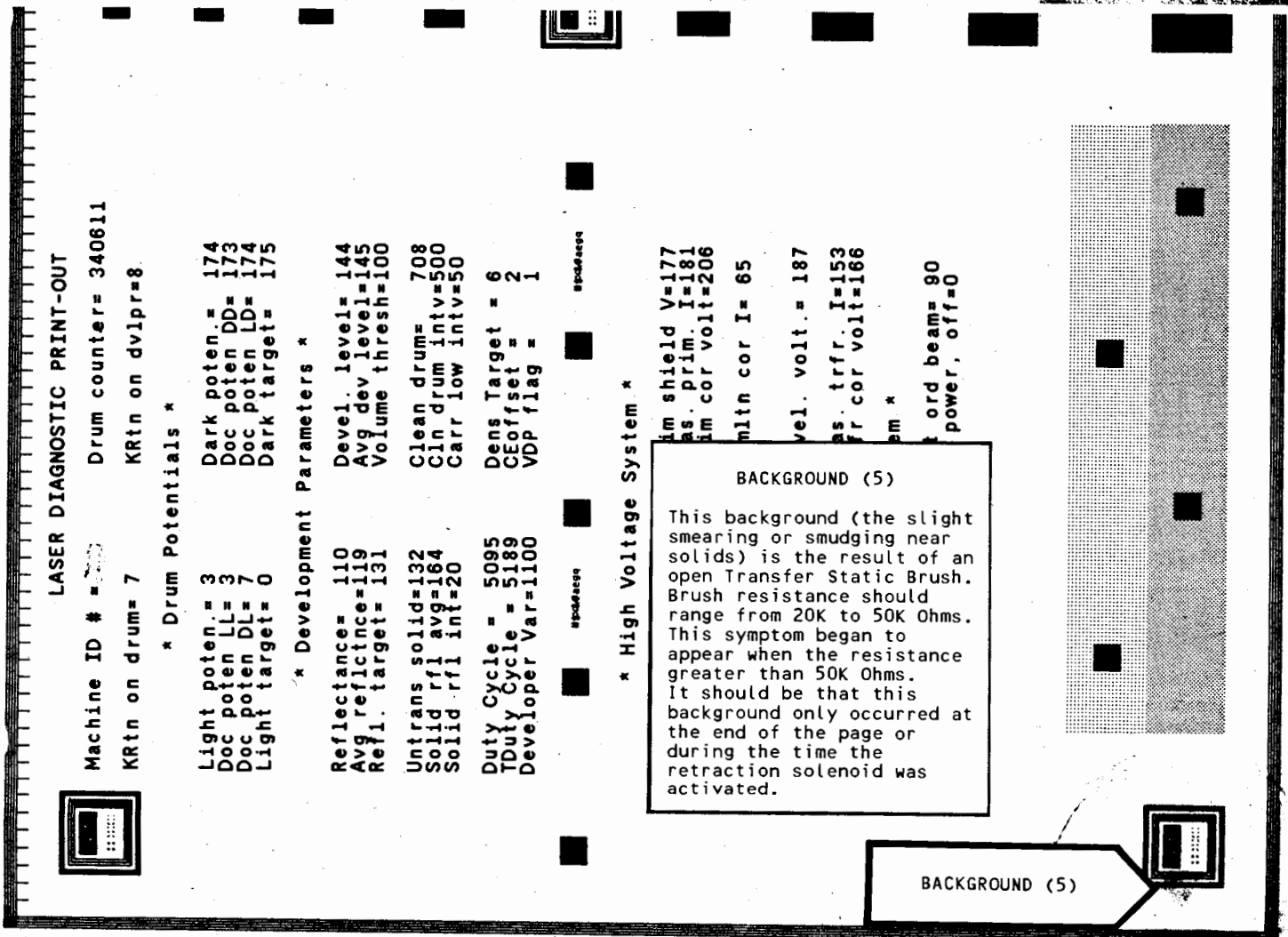
```
                                *** TEXT BLOCK REDEFINITIONS (+TEXTBL) ***

01236 AMFSR010+ 003500              07  AMF-TRAN-FUND-ETX    PIC X.
01237 AMFSR010+ 003600          05  FILLER REDEFINES AMF-FUND-AREA.
01238 AMFSR010+ 003700              07  AMF-TRAN-ETX         PIC X.
01239 AMFSR010+ 003800              07  FILLER               PIC X(3).
01240 AMFSR010+ 003900          05  FILLER                   PIC X(2544).
01241 AMFSR010+ 004000*
01242 AMFSR010+ 004100*      AMFINQ FORM 403
01243 AMFSR010+ 004200*
01244 AMFSR010+ 004300      03  AMFINQ-TX10 REDEFINES TEXT-BLOCK.
01245 AMFSR010+ 004400          05  INITIATOR-TX10           PIC X(45).
01246 AMFSR010+ 004500* PROTECTED DATA
01247 AMFSR010+ 004600          05  DATE-TX10                PIC X(6).
01248 AMFSR010+ 004700          05  TIME-TX10                PIC X(4).
01249 AMFSR010+ 004800          05  EDJ-ACCT-TX10            PIC X(10).
01250 AMFSR010+ 004900          05  SSN-TX10                 PIC X(9).
01251 AMFSR010+ 005000          05  AMF-ACCT-TX10            PIC X(8).
01252 AMFSR010+ 005100          05  TYPE-TX10                PIC XX.
01253 AMFSR010+ 005200          05  LAAC-TX10                PIC X(8).
01254 AMFSR010+ 005300          05  EDJ-RR-TX10              PIC XXX.
01255 AMFSR010+ 005400          05  EDJ-RR-NAME-TX10         PIC X(30).
01256 AMFSR010+ 005500          05  AMF-BRCH-TX10            PIC X(4).
01257 AMFSR010+ 005600          05  AMF-RR-INFO-TX10         PIC X(20).
01258 AMFSR010+ 005700          05  LADC-TX10                PIC X(8).
01259 AMFSR010+ 005800          05  NAME-1-TX10              PIC X(30).
01260 AMFSR010+ 005900          05  NAME-2-TX10              PIC X(30).
01261 AMFSR010+ 006000          05  LETTER-TX10              PIC XXX.
01262 AMFSR010+ 006100          05  NAME-3-TX10              PIC X(30).
01263 AMFSR010+ 006200          05  DSCNT-TX10               PIC XXX.
01264 AMFSR010+ 006300          05  ADDR-1-TX10              PIC X(30).
01265 AMFSR010+ 006400          05  ADDR-2-TX10              PIC X(30).
01266 AMFSR010+ 006500          05  FROZ-HDR-TX10            PIC X(14).
01267 AMFSR010+ 006600          05  FROZ-TX10                PIC X(20).
01268 AMFSR010+ 006700          05  ADDR-3-TX10              PIC X(30).
01269 AMFSR010+ 006800          05  MAIL-HDR-TX10            PIC X(24).
01270 AMFSR010+ 006900          05  MAIL-DATE-TX10           PIC X(8).
01271 AMFSR010+ 007000          05  FUND-TX10                PIC X(30).
01272 AMFSR010+ 007100          05  OPEN-MM-TX10             PIC XX.
01273 AMFSR010+ 007200          05  OPEN-DD-TX10             PIC XX.
01274 AMFSR010+ 007300          05  OPEN-YY-TX10             PIC XX.
01275 AMFSR010+ 007400          05  SHR-ISS-TX10             PIC X(9) JUST RIGHT.
01276 AMFSR010+ 007500          05  SHR-ISS-DEC-TX10         PIC X(4).
01277 AMFSR010+ 007600          05  DIVIDENDS-TX10           PIC X(10).
01278 AMFSR010+ 007700          05  SHR-UNIS-TX10            PIC X(9) JUST RIGHT.
01279 AMFSR010+ 007800          05  SHR-UNIS-DEC-TX10        PIC X(4).
01280 AMFSR010+ 007900          05  CAP-GNS-TX10             PIC X(10).
01281 AMFSR010+ 008000          05  SHR-ESC-TX10             PIC X(9) JUST RIGHT.
01282 AMFSR010+ 008100          05  SHR-ESC-DEC-TX10         PIC X(4).
01283 AMFSR010+ 008200          05  TOT-SHR-TX10             PIC X(9) JUST RIGHT.
01284 AMFSR010+ 008300          05  TOT-SHR-DEC-TX10         PIC X(4).
01285 AMFSR010+ 008400          05  AUTO-INV-TX10            PIC X(40).
01286 AMFSR010+ 008500          05  YTD-DIV-TX10             PIC X(9) JUST RIGHT.
01287 AMFSR010+ 008600          05  YTD-DIV-DEC-TX10         PIC X(3).
01288 AMFSR010+ 008700          05  FREQ-HDR-TX10            PIC X(9).
01289 AMFSR010+ 008800          05  FREQ-COLON-TX10          PIC X.
01290 AMFSR010+ 008900          05  FREQ-TX10                PIC X(11).
01291 AMFSR010+ 009000          05  YTD-CAP-GNS-TX10         PIC X(9) JUST RIGHT.
01292 AMFSR010+ 009100          05  YTD-CAP-GNS-DEC-TX10     PIC X(3).
```

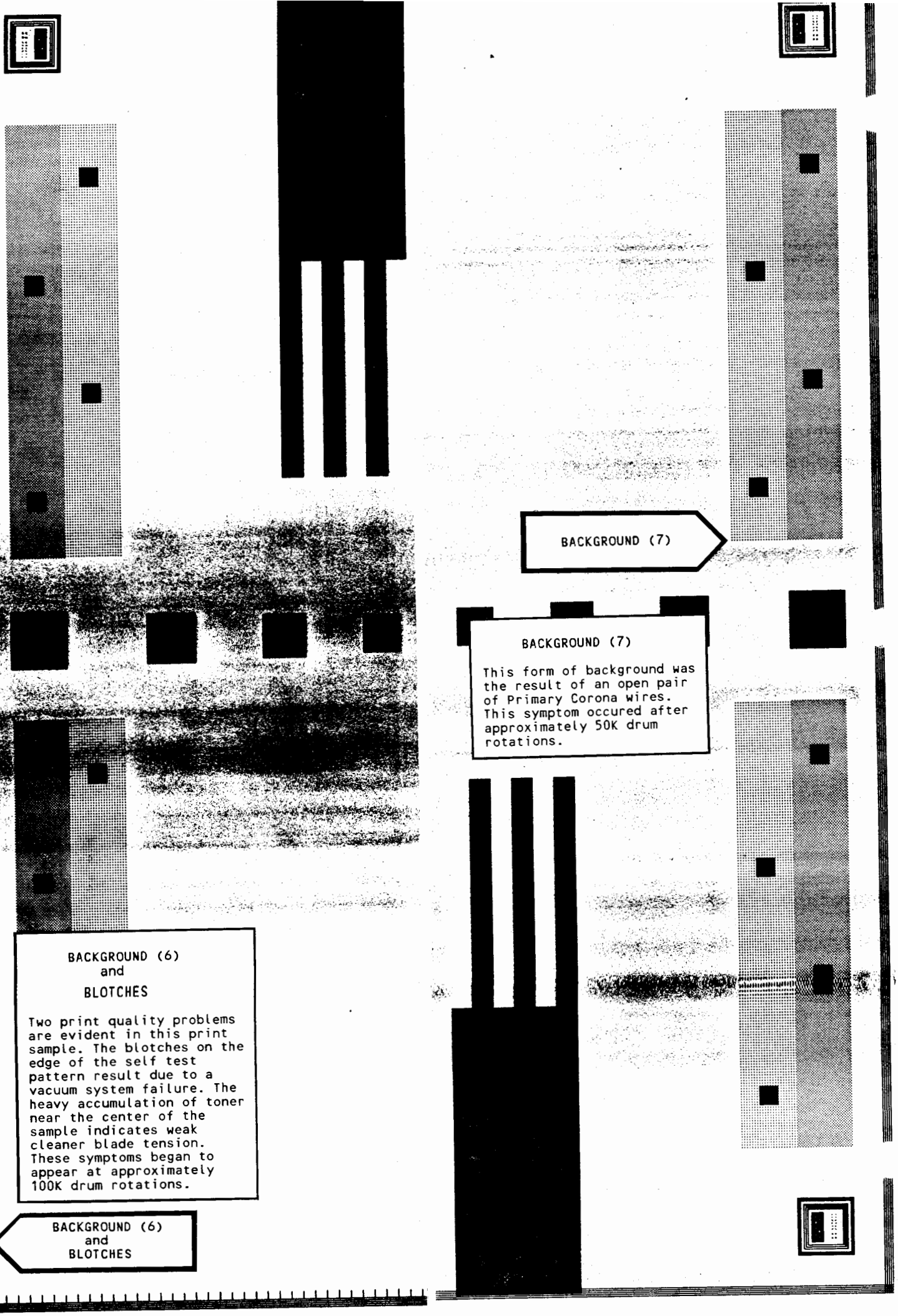
BACKGROUND (3)

This form of background (the light shading especially near the edges of the paper) is a result of the Cleaner Blade Tension being set too low. This symptom began to appear at approximately 20K drum rotations.

BACKGROUND (3)


OVERDUE Atype Totals:
CURRENT Atype Totals:
FORECAST Atyp
FORECAST Atype Totals:
OVERDUE Atype Totals:
BACKGROUND (4)
The distorted print here (see the arrow), is a secondary result of the Contactor/Triac Failure. The distorted line is resulted from the failure of the Laser Power Supply. The supply failure was the result of the Contactor/Triac failure.
BACKGROUND (4)
This form of background resulted from an AC Contactor/Triac problem.


LASER DIAGNOSTIC PRINT-OUT
Machine ID # =
Drum counter= 340611
KRtn on drum= 7
KRtn on dvlpr=8
* Drum Potentials *
Light poten.= 3
Doc poten LL= 3
Doc poten DL= 7
Light target= 0
Dark poten.= 174
Doc poten DD= 173
Doc poten LD= 174
Dark target= 175
* Development Parameters *
Reflectance= 110
Avg reflctnce=119
Refl. target= 131
Untrans solid=132
Solid rfl avg=164
Solid rfl int=20
Duty Cycle = 5095
TDuty Cycle = 5189
Developer Var=1100
Devel. level= 144
Avg dev level=145
Volume thresh=100
Clean drum= 708
Cln drum intv=500
Carr low intv=50
Dens Target = 6
CEoffset = 2
VDP flag = 1
* High Voltage System *
im shield V=177
as. prim. I=181
im cor volt=206
mltn cor I= 65
vel. volt.= 187
as. trfr. I=153
r cor volt=166
em *
t ord beam= 90
power, off=0
BACKGROUND (5)
This background (the slight smearing or smudging near solids) is the result of an open Transfer Static Brush. Brush resistance should range from 20K to 50K Ohms. This symptom began to appear when the resistance greater than 50K Ohms. It should be that this background only occurred at the end of the page or during the time the retraction solenoid was activated.
BACKGROUND (5)



BACKGROUND (7)

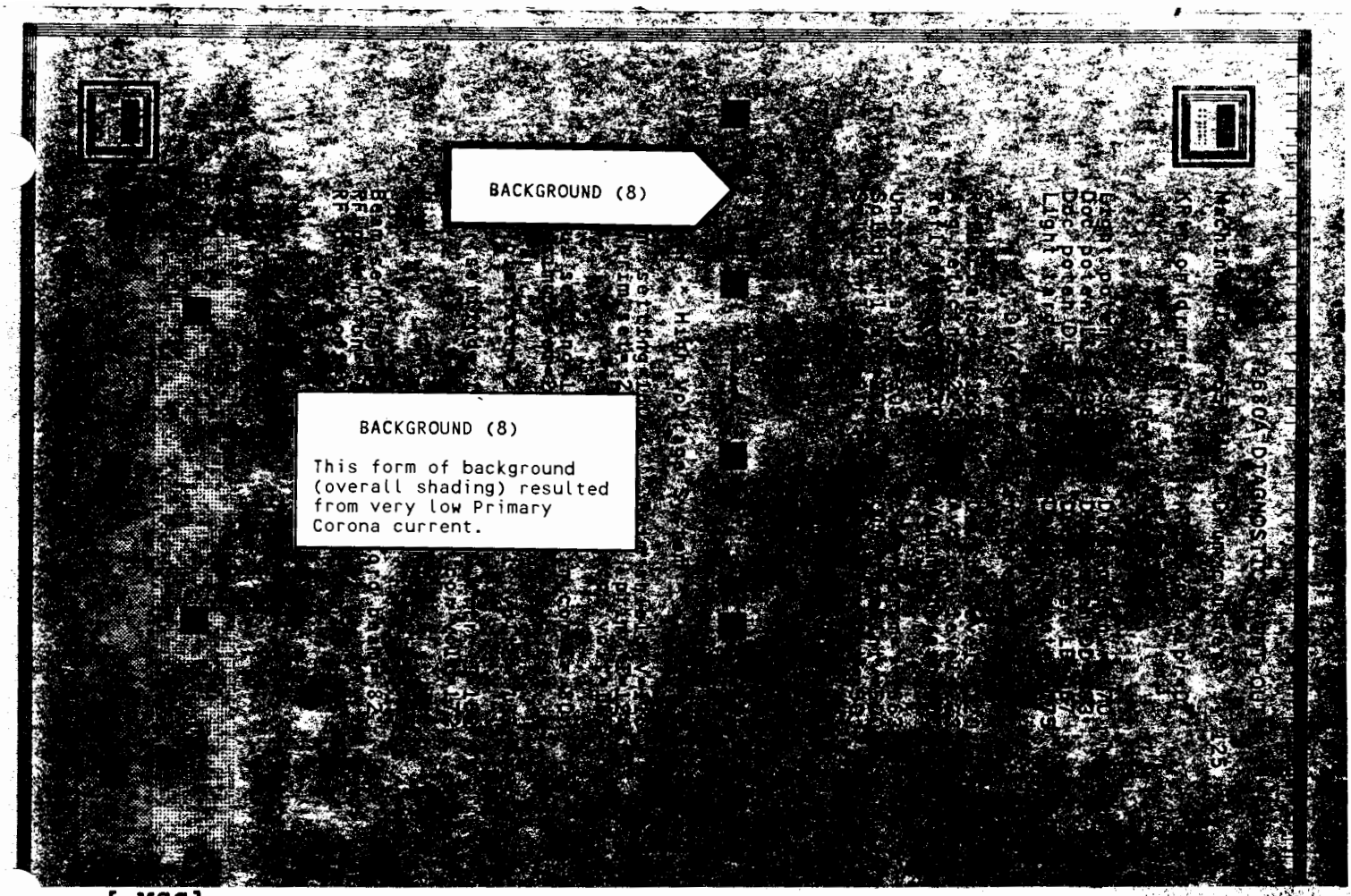
BACKGROUND (7)

This form of background was the result of an open pair of Primary Corona wires. This symptom occured after approximately 50K drum rotations.

BACKGROUND (6)
and
BLOTCHES

Two print quality problems are evident in this print sample. The blotches on the edge of the self test pattern result due to a vacuum system failure. The heavy accumulation of toner near the center of the sample indicates weak cleaner blade tension. These symptoms began to appear at approximately 100K drum rotations.

BACKGROUND (6)
and
BLOTCHES



[;MSG]
[;CIR]

[;COPY]
[;NOCOPY]

BACKGROUND (9)

ACCESS PARAMETERS

NOCCTL Indicates that carriage control characters are not being specified in writes to the file. Default.

CCTL Indicates that carriage control characters are being supplied in writes to the file. Default is NOCCTL.

IN Read-access only permitted to the file. If the ACC= group is omitted, <IN> is the default with the exception of device files that are output-only.

OUT Write-access only permitted to the file. Default is read-access only.

OUTKEEP Write-access only permitted to file ... data is not deleted. Default is rea...

APPEND Append-access only permitted to the ... read-access only.

BACKGROUND (9)

This form of background (reverse images) resulted from an open Developer Bias Cable. It was interesting to note that the Self Test print-out did not fail or reveal the cause of failure.

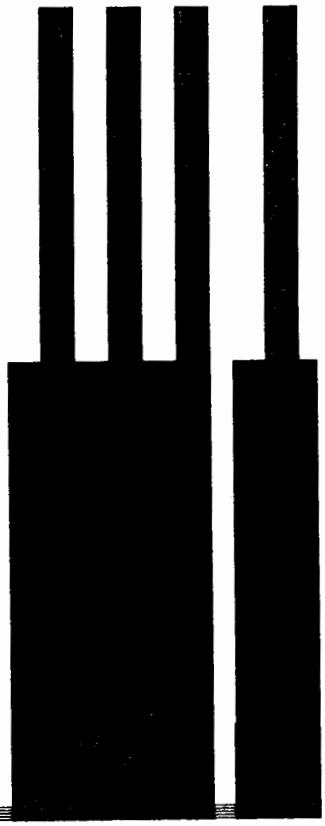
Note the reverse Self Test image.

SPURIOUS DOTS/LINES (10)

This print quality problem was the result of a defective Laser Power Supply.

(10)

SPURIOUS DOTS/LINES



HEWLETT PACKARD

S.O. Ref.#_____

HP SERVICE REQUEST FORM SR #_____(HP only)

****

Customer report no._____ Date_____

Submitted by_____

Firm name_____ Division_____

Street_____ Sys mgr_____

City,Prov,Code_____ Phone no.(___)_____ext_____

Specific location of system in plant_____

System model_____ _____

(e.g. 3000/ e.g. MPE IV C.00.20)

(11)
SPURIOUS DOTS/LINES

System serial no._____ Product name_____._._._
(e.g. COBOL C.02.02) v uu ff

Problem description (symptoms, what you were trying to do, what went wrong, action that might be helpful).

SPURIOUS DOTS/LINES (11)

This print quality problem (gutter down the center of the page) resulted from a laser defective Optics PCA.

Supportive documentation included with report.

Media	Description	

2680A DIAGNOSTIC PRINT-OUT

Machine ID # Drum counter=2193510

KRtn on drum= 127 KRtn on dvlpr=45

* Drum Potentials *

Light poten.= 147	Dark poten.= 171
Doc poten LL= 2	Doc poten DD= 151
Doc poten DL= 2	Doc poten LD= 152
Light target= 0	Dark target= 170

* Development Parameters *

Reflectance= 196	Devel. level= 130
Avg reflctnce=225	Avg dev level=131
Refl. target= 230	Volume thresh=100
Untrans solid=213	Clean drum= 672
Solid rfl avg=251	Cln drum intv=500
Solid rfl int=20	Carr low intv=50

* High Voltage System *

Prim. setting=217	Prim shield V=185
Max prim set= 255	Meas. prim. I=179
	Prim cor volt=219
Simul setting=151	Simltn cor I= 105
Max simul set=255	
Dev bias set= 220	Devel. volt.= 187
Trfr setting= 190	Meas. trfr. I=153
	Trfr cor volt=189

* Optical System *

Beam setting= 130 1st ord beam= 91

RF power, on= 71

RF power, off=0

* DC Power Supplies *

+5V reference=128	+5V supply 127
+12VQ supply= 203	-12V supply= 204
+28V supply= 158	Signal ground=0

* AC Power Supplies *

Line voltage= 237	Purge pump I= 48
Erase lamp I= 44	Hopper mtr I= 66
Overall exp I=43	Output fans I=209
	AC off curr= 8

* Fusing System *

Phtr trgt tmp=188	Pad #1 temp= 139
Fuser current=228	Pad #2 temp= 185
	Pad #3 temp= 188

* Sensor Diagnostics *

ESM voltage= 76	Dn LED cntl V=201
Door voltage= 76	ESM control V=96

* Miscellaneous *

Up registr= 0

Paper width= 200

Ten strt time=100

Stop tension= 4

Loop cnst T21=30

Loop cnst T22=-40

PM int (KRtn)=200

MCS date code 2210

SPURIOUS DOTS/LINES (12)

This quality problem was the result of an Optics failure. In this situation Beam Detect was found to intermittently missing.

SPURIOUS DOTS/LINES (12)

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

ACCOUNT= SYS GROUP= JCL (CONT.)

FILENAME	CODE	LOGICAL RECORD SIZE	TYP	EOF	LIMIT	R/B	SPACE SECTORS	#X	MX
INITT		80B	FA	17	17	3	7	1	1
JADEL1		80B	FA	36	36	3	13	1	1
JADEL3		80B	FA	180	180	3	61	1	1
JADEL4		80B	FA	496	496	16	160	11	11
JADEL5		80B	FA	663	663	16	215	15	15
JADEL6		80B	FA	1530	1530	16	485	14	14
JADEL7		80B	FA	1020	1020	16	325	13	13
JCLLIST		80B	FA	170	170	3	58	1	1
JOBS		72B	FA	46	46	7	16	1	1
JOE1		80B	UA	245	1023	1	256	2	8
K3061233	EDTCQ	256B	FA	117	2000	9	504	4	16
K3261523	EDITQ	112B	FA	36	2000	9	224	4	16
K3270937	EDITQ	112B	FA	135	2000	9	224	4	16
K3270938	EDITQ	112B	FA	162	2000	9	224	4	16
K3281020	EDITQ	112B	FA	1494	2155	9	704	11	16
K3411136	EDITQ	112B	FA	18	2000	9	224	4	16
LIST		72B	FA	17	17	3	7	1	1
LISTALL		80B	FA	215	215	3	73	15	15
LIST2		80B	FA	3	3	3	2	1	1
LIZ02	PFORM	256B	FA	20	4095	1	128	1	32
[redacted]									
LLIST		1276B	VA	7	1	1	10	2	2
LOGIN2		72B	FA	2	2	3	2	1	1
LPJCL		80B	FA	214	214	3	73	15	15
LPTASCFD		80B	FA	15	15	3	6	1	1
LPTASERD		80B	FA	15	15	3	6	1	1
LPTASEXD		80B	FA	15	15	3	6	1	1
LPTASOVD		80B	FA	15	15	3	6	1	1
LPTASRCD		80B	FA	17	17	3	7	1	1
LPTASTLD		80B	FA	15	15	3	6	1	1
LUDCPROD		80B	FA	31	31	3	12	1	1
M99		88B	FA	7	7	2	5	1	1
MEMO	1150	128W	FB	3	3	1	5	1	1
MEMO1	1150	128W	FB	7	7	1	9	1	1
MESS001		80B	FA	10	10	3	5	1	1
MF11BT01		80B	FA	19	19	3	8	1	1
MF11BT02		80B	UA	5	1023	1	128	1	8
MF11BT03		80B	UA	65	1023	1	128	1	8
MF11BT04		80B	UA	22	1023	1	128	1	8
MF11BT05		80B	FA	1090	2000	3	402	6	10
MF11BT06		80B	UA	20	1023	1	128	1	8
MF11BT07		80B	UA	24	1023	1	128	1	8
MF11BT08		80B	UA	754	1023	1	768	6	8
MF11BT09		80B	UA	492	1023	1	512	4	8
MF11BT10		80B	UA	116	1023	1	128	1	8
MF11BT11		80B	UA	756	1023	1	768	6	8
MF11BT12		80B	UA	18	1023	1	128	1	8
MF11BT13		80B	UA	98	1023	1	128	1	8
MF11BT14		80B	UA	27	1023	1	128	1	8
MGINVITE	P2680	512W	FB	46	4092	1	512	1	32
MREPORTA		80B	FA	7	7	3	4	1	1
MRJEIN		72B	FA	4	4	3	3	1	1
MRJEPROD		72B	FA	4	4	3	3	1	1

(13)
SPURIOUS DOTS/LINES

SPURIOUS DOTS/LINES (13)

The source of this problem was determined to be a defective (intermittent or missing) Video signal generated on the Print Control PCA.

CAUSE: NEW POLICY RECORD

G1. BASIC DETAILS.
ID=35 TITLE=MRS
FORENAME=RETA JUNE
NAME=ASLIN
ADDRESS=FULFORD COTTAGE*CULWORTH*
ADDOFLW=BANBURY*OXON
DOB=010729 AGE=54 ADMSIC SEX=F
OCCUPATI

C	1	5.88	530
D	1	5.88	530
E	1	5.88	530
F	1	5.88	530
G	2	5.88	530
H	2	5.88	530
I	6	5.88	530

PLANDUR FUNE FUNE FUND

BENEF=80 LAW=F MEDCAT=NM

MRKTPROFL=14 BRANCH=3002 SUBMITTEDNAC=
AGENTI SHAF AGE

(14)
SPURIOUS DOTS/LINES

SPURIOUS DOTS/LINES (14)
The source of this problem was found to be a defective A/O Modulator.

WPRATIN WPSPELL
ADDR AGE
GIDAM ADSST

G2. PREVIOUS POLICY
POLCROSS
LASTPREM LASTPI

2680A DIAGNOSTIC PRINT-OUT

Machine ID # = Drum counter= 9590

KRtn on drum= 8 KRtn on dvlpr=8

* Drum Potentials *

Light poten.= 1	Dark poten.= 173
Doc poten LL= 3	Doc poten DD= 158
Doc poten DL= 3	Doc poten LD= 160
Light target= 0	Dark target= 165

* Development Parameters *

Reflectance= 209	Devel. level= 104
Avg reflctnce=229	Avg dev level=102
Refl. target= 230	Volume thresh=100
Untrans solid=207	Clean drum= 651
Solid rfl avg=267	Cln drum intv=500
Solid rfl int=20	Carr low intv=50

* High Voltage System *

Prim. setting=196	Prim shield V=170
Max prim set= 255	Meas. prim. I=172
	Prim cor volt=198
Simul setting=148	Simltn cor I= 161
Max simul set=255	
Dev bias set= 220	Devel. volt.= 188
Trfr setting= 190	Meas. trfr. I=155
	Trfr cor volt=167

* Optical System *

Beam setting= 136 1st ord beam= 90
RF power, on= 76
RF power, off=1

(15) SPURIOUS DOTS/LINES

SPURIOUS DOTS/LINES (15)

The print quality failure is result of a Simultaneous Corona Arcing problem. In this case the simultaneous corona wire was arcing the simultaneous corona grid wires. In this situation the arcing symptoms appeared on every printed page of output.

* DC Power Supplies *

+5V reference=128 +5V supply 128
+12VQ supply= 203 -12V supply= 204
Signal ground=0

Supplies *

Purge pump I= 54
Hopper mtr I= 52
Output fans I=202
AC off curr= 10

System *

Pad #1 temp= 135
Pad #2 temp= 184
Pad #3 temp= 189

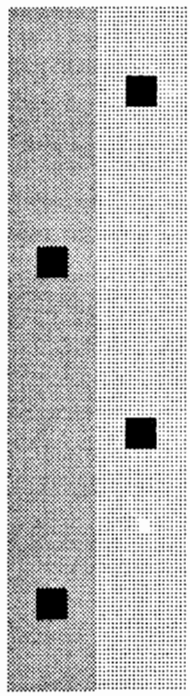
iagnostics *

Dn LED cntl V=168
ESM control V=98

* Miscellaneous *

Right registr=0	Up registr= 0
Cage temp= 157	Paper width= 201
Start tension=14	Ten strt time=100
Run tension= 10	Stop tension= 4
Loop cnst T11=50	Loop cnst T21=30
Loop cnst T12=-15	Loop cnst T22=-40
tn since PM=8	PM int (KRtn)=100
DCS date code 2214	MCS date code 2210

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~



SPURIOUS DOTS/LINES

SPURIOUS DOTS/LINES (16)

This problem was also a result of an arcing Simultaneous Corona wire and corona grid wire. In this situation the arcing only occurred during at the start of a print job.

(16)
SPURIOUS DOTS/LINES

Ordering Information
Computer/Printer Support Matrix

DIRECT COST COMPARISON

(PRICES EFFECTIVE 2/1/86)

VOLUME PER MONTH (000)	2608S	2611A	2619A	2680A
20	$270	$514	$592	$733
40	451	702	780	886
60	654	891	969	1039
80	835	1224	1158	1192
100	1015	1412	1346	1345
120	1262	1781	1530	1498
140	1443	1970	1906	1651
160	1623	2400	2094	1804
180	1804	2589	2263	1957
200	1985		2699	2110
220	2166		2887	2263
240	2346		3076	2416
260	2527		3571	2969
280	2707		3759	3122
300			3948	3275
320				3428
400				4410
550				5918
700				7065

AVERAGE USAGE LEVEL

PAGES $

STD U02 U03 U04 U08

MAINTENANCE STRUCTURING

FIXED MAINTENANCE COST

USAGE

FIGCOMPR

AVERAGE USAGE LEVEL

OPERATING COSTS

TONER, CARRIER, ETC. $1906 $3470 $2475

RIBBONS

PAPER

MAINTENANCE

PRINTER	LPM	PEAK PAGES/ HOUR	MAINT. CONTRACT MAX. HRS.
2608A/S	400	800*	360
2611A	600	2000*	165
2619A	1000	2000*	165
2680A	3000	2700	N/A

2619A 2680A

9.9 MILLION LINES PER MONTH
40 LINES PER PAGE
247,500 PAGES

4000 3000 2000 1000 0

0 LINES PER PAGE

GARBLED PRINT (17)

This garbled print resulted from a Data Control System memory error problem.

USED PRINTE COST OF PROGRAM OWNERSHIP

OBJECTIVE:

PROVIDE HP SOLUTION IN PRICE SENSITIVE PRINTER SITUATIONS.

INCLUDES:

DIRECT COSTS

PRINTER US FACTORY BASE

PAPER $7500

RIBBONS OR TONER,ET AL 8000

MAINTENANCE 12000

DIRECT LABOR (MAYBE) 12000

INDIRECT COSTS

OPERATOR PRODUCTIVITY

PRINT QUALITY

RELIABILITY

FORMS MGMT COSTS

*PRICE INCLUDES STANDARD INSTALLATION

*PRICE DOES NOT INCLUDE INTERFACE

*P/A DISCOUNTABLE

*STD 90 DAY WARRANTY

*MUST CONTACT FACTORY FOR QUOTE

*INTERFACE—ISOLATED AT LAST PRICE

FIGUSED

FIGOWNER

2680 UPGRADE PROGRAM

PRINTER TRADE-IN ORDERING OPTION

	2608S	2611A/2619A	2680A
PAPER (PER PAGE)	$.00077	$.00077	$.00495
RIBBONS, TONER, ETC.	$8000	.00173	U08
	10500		U11 .0027
	3500		U13
TOTAL	$.00903	$.00943	$.00765
	6500		U17
MAINTENANCE (SMMC)	14500		U19

		STD	U02	U03	U04
2608S	HRS	69	130	360	
	PAGES	55K	104K	288K	
	$	90	118	150	
2611A	HRS	86	100	132	165
	PAGES	75K	110K	145K	182K
CONTRACT	$	325	469	649	891
2619A	HRS	86	100	132	165
	PAGES	121K	184K	242K	303K
	$	403	585	812	1118
2680A	PAGES	250K	400	550	700
	$	580	980	1350	1710

*APPLIES TO 2680 SALES ONLY (NOT 2685)

*MAXIMUM OF 2 PRINTER TRADE-INS PER SALE

*RETURNED PRINTERS MUST BE ON SERVICE

*NO AGE RESTRICTION ON RETURNED PRINTERS

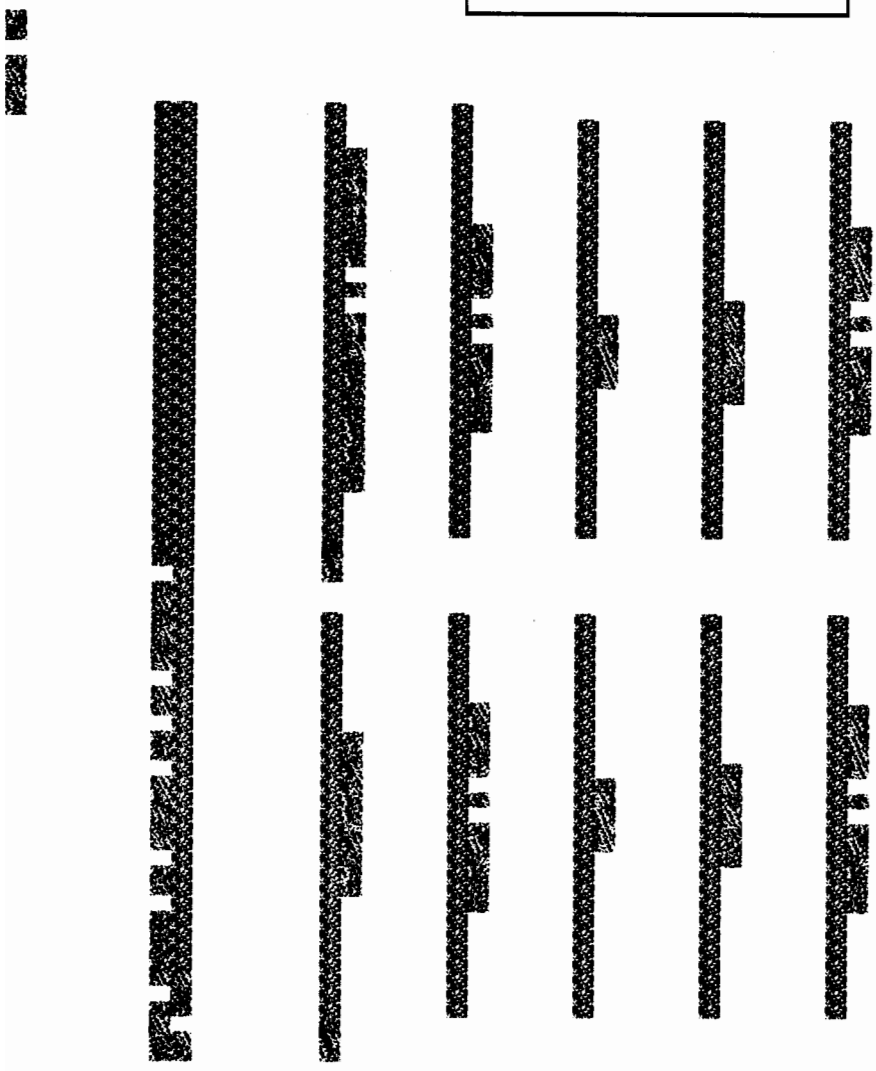
*PROGRAM EFFECTIVE THROUGH FY 83

FIGUPGR 2611A AND 2619A MAINT. PRICES INCLUDE $22 FOR 26069A.

FIGASSUM

GARBLED PRINT (18)

The cause of this garbled print was found to be a defective DCS I/O PCA.



5 -4.52V +4.52 210

All the measurements are +-.2v. If the measurement disagrees, replace the AC POWER PCA.

Note: If TP13 measures approximately zero volts, check the ribbon cable to the card cage for a short to ground.

2. Faulty filter network on the CONTROL PCA. Replace PCA.

3. Bad A/D channel on the MONITOR PCA. Replace PCA.

connection. Check cable to AC POWER PCA. Repeat MONITOR CONTROL PCAs.

stepper pos - 277

essage is displayed only in the stepper registration mode, dicate stepper position is too close to coder her position must be selected, or coder be adjusted (refer to the input er regi in the service manual).

r failu
r warn

GARBLED PRINT (19)

GARBLED PRINT (19)

This spurious pattern resulted from a defective DCS Character Processor PCA.

This message occurs if the ZOP with the beam off is less than 75 counts (164 ENT).

Possible problem areas:

1. Low laser power.
   Check the beam power with the Beam Power Tool by doing a laser calibration. If the external beam power is insufficient replace the optics casting. If the external power is OK refer to problem area #3.

2. Damaged optics cable.

3. Faulty MONITOR PCA (A/D system). Enter optics display (623 ENT) and compare the ZOP in the display with the "ZOP" TP on the OPTICS PCA using the conversion table in Appendix A. If they don't track correctly replace the MONITOR PCA. Otherwise, replace the OPTICS casting.

Line overvoltage

The line voltage has exceeded 252VAC within the machine (after the transformer). 196 ENT.

Possible problem areas:

1. Line voltage did exceed 252V as measured at the barrier block near the TRIAC assembly. If the line voltage is consistently above 252V, change strapping to next highest voltage (refer to the service manual).

2. If the line voltage is OK (< 252v) but 196 ENT indicates an overvoltage check the calibration of the AC POWER PCA "Line voltage ADJ". If unadjustable, TP22 "Vline" doesn't change, replace AC POWER PCA.

3. Failed control PCA, replace PCA and calibrate "Vline" on AC POWER PCA.

4. Failed A/D channel. Replace MONITOR PCA.

5. Failed ZC XFMR. TP17 and 18 relative to ground should have an AC signal 6v to 7.5v. If different by many volts, replace ZC XFMR (by front breaker).

Low line voltage

This message occurs when the line voltage is below 214VAC in the machine after the input XFMR (196 ENT).

Possible problem area:

1. Line voltage did fall below 214VAC as measured at the barrier block near the triac assembly. If the line voltage is consistently below 214VAC, change strapping to next lowest voltage - refer to service manual.

2. AC POWER PCA line voltage circuitry is out of calibration. If the line voltage is OK, but 196 ENT indicates low line voltage, adjust "Line voltage ADJ" to correct it. If it is unadjustable (TP22) "Vline" doesn't change, replace the AC POWER PCA.

3. Failed CONTROL PCA. Replace the PCA and calibrate "Vline" on the AC POWER PCA.

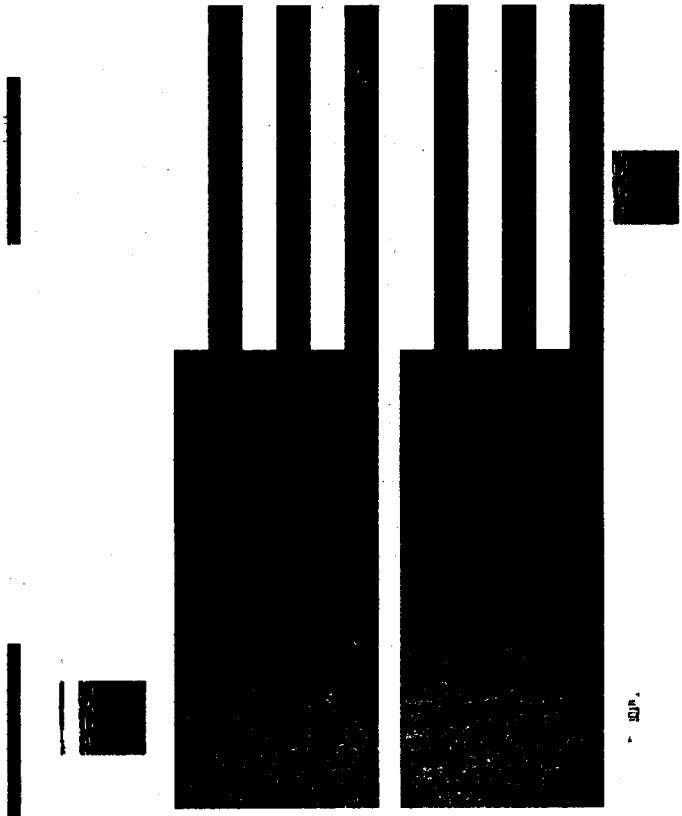
4. Failed A/D channel. Replace MONITOR PCA.

5. Failed ZC XFMR. TP17 and 18 relative to ground should have AC voltages around 6v to 7.5 VAC. If the measured voltage is not within this range, replace the ZC XFMR.

GARBLED PRINT (20)

This garbled print is the result of a defective DCS Print Control PCA.

Note that the ESM and DSM Diagnostic marks are correctly formed.



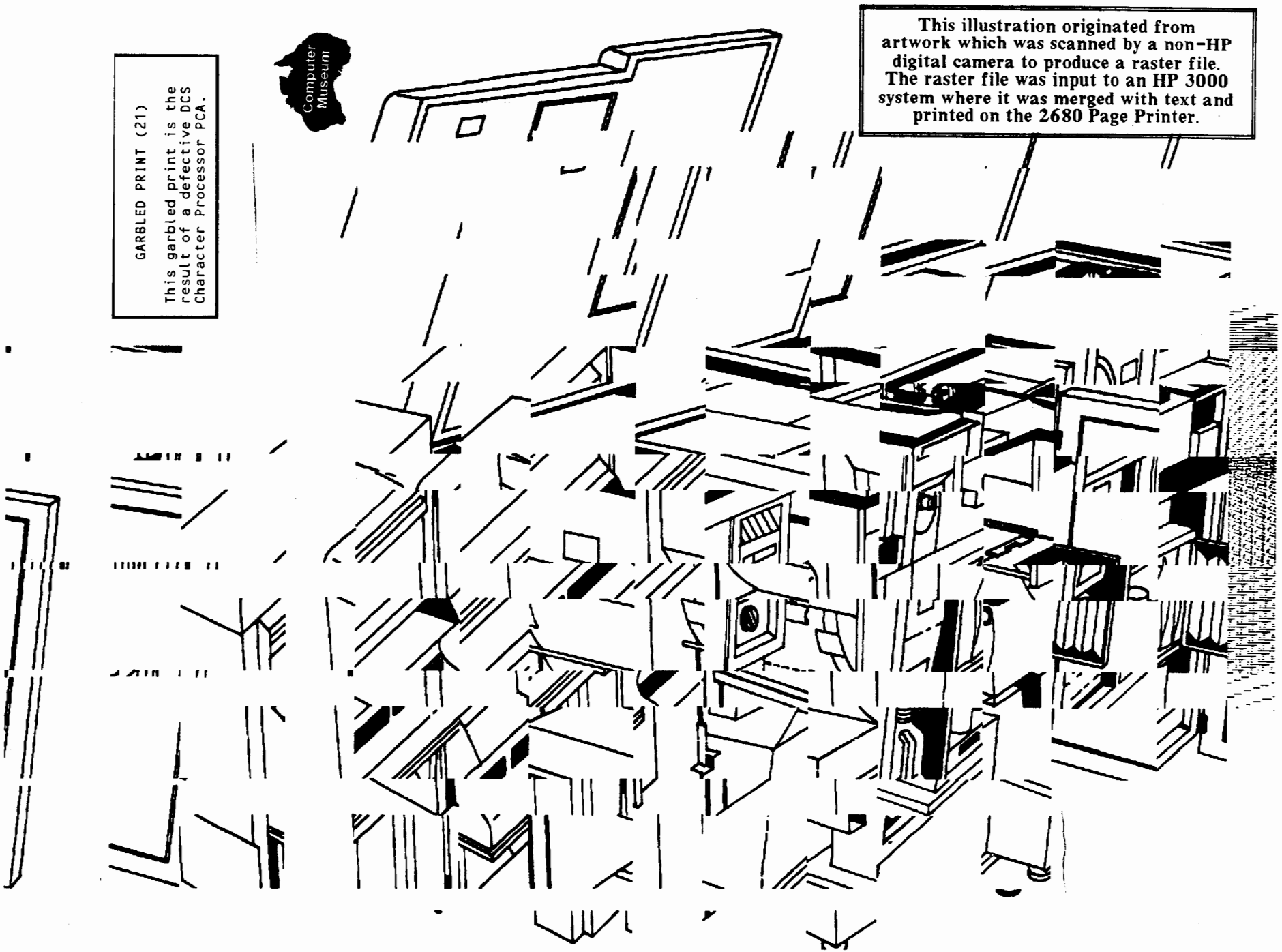


FIGURE 5-1. 2680 ACCESS DOORS

PLEASE SEND MORE INFORMATION. . .

(Please Print or Type)

Name _____

Title _____

Company _____

Company Address _____

City _____ State _____ Zip _____

Phone ( ) _____

Type of Business _____

☐ Please send more information on the HP 2688A Page Printer

☐ Please have a sales representative contact me

☐ I would like a demonstration of the HP 2688A Page Printer

-Second fold back at this line

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 141 BOISE, IDAHO

POSTAGE WILL BE PAID BY ADDRESSEE:

HEWLETT-

GARBLED PRINT (22)

This example of garbled print was the result of an defective DCS Character Processor PCA.

-First fold back at this line.

Printed in U.S.A. 8/83
5953-7134

HEWLETT PACKARD

Printed on the HP 2688A Page Printing System

. QUALITY
NG PROCESS

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TURING
ESS

→ CUSTOMER

NAL
DESIGN
'/CONTROL

PRINT QUALITY LOSS (23)

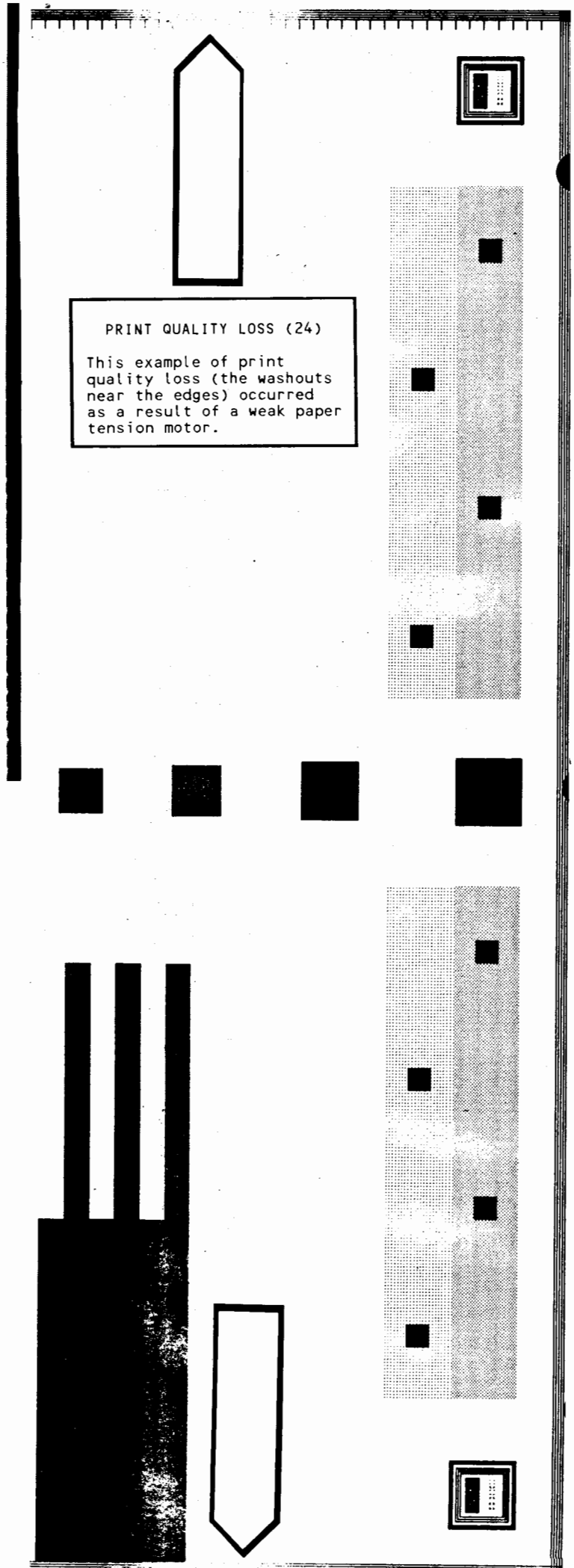
This example of print loss resulted from a weak tension motor; and appeared most often at the end of the drum rotation. This problem may result if the printer vacuum was excessively high.

(23)
PRINT QUALITY LOSS

URERS PRODUCTIVITY NETWORK

PRINT QUALITY LOSS (24)

This example of print quality loss (the washouts near the edges) occurred as a result of a weak paper tension motor.



2680A DIAGNOSTIC PRINT-OUT

Machine ID # = Drum counter=

KRtn on drum= 23 KRtn on dvlpr=

* Drum Potentials *

Light poten.= -7 Dark poten.=
Doc poten LL= -3 Doc poten DD=
Doc poten DL= -5 Doc poten LD=
Light target= 0 Dark target=

* Development Parameters *

Reflectance= 244 Devel. level= 163
Avg reflctnce=221 Avg dev level=166
Refl. target= 230 Volume thresh=100

Untrans solid=168 Clean drum= 663
Solid rfl avg=216 Cln drum intv=500
Solid rfl int=20 Carr low intv=50

(25) PRINT QUALITY LOSS

PRINT QUALITY LOSS (25)

This example of print loss was the result of defective paper. In this situation it was found that the paper was found to be excessively moist.

* DC Power Supplies *

erence=128 +5V supply 128
upply= 204 -12V supply= 203
pply= 157 Signal ground=0

* AC Power Supplies *

ltage= 237 Purge pump I= 58
amp I= 45 Hopper mtr I= 50
exp I=45 Output fans I=208
AC off curr= 9

* Fusing System *

Phtr trgt tmp=186 Pad #1 temp= 136
Fuser current=214 Pad #2 temp= 184
Pad #3 temp= 185

* Sensor Diagnostics *

ESM voltage= 72 Dn LED cntl V=178
Door voltage= 76 ESM control V=81

* High Voltage System *

* Miscellaneous *

2680A DIAGNOSTIC PRINT-OUT

Machine ID # =375 Drum counter= 864584

KRtn on drum= 137 KRtn on dvlpr=11

* Drum Potentials *

Light poten.= 31	Dark poten = 176
Doc poten LL= 42	Doc poten DD= 170
Doc poten DL= 35	Doc poten LD= 176
Light target= 0	Dark target= 175

* Development Parameters *

Reflectance= 249	Devel. level= 118
Avg reflctnce=262	Avg dev level=121
Refl target= 230	Volume thresh=100
Untrans solid=222	Clean drum= 690
Solid rfl avg=249	Cln drum intv=500
Solid rfl int=20	Carr low intv=50

* High Voltage System *

Prim setting=195	Prim shield V=168
Max prim set= 255	Meas. prim. I=175
	Prim cor volt=197
Simul setting=129	Simltn cor I= 102
Max simul set=255	
Dev bias set= 220	Devel. volt.= 188
Trfr setting= 190	Meas. trfr. I=151
	Trfr cor volt=172

* Optical System *

Beam setting= 128	1st ord beam= 88
RF power on= 55	
RF power off=0	

* DC Power Supplies *

+5V reference=127	+5V supply 127
+12VO supply= 203	-12V supply= 204
+28V supply= 157	Signal ground=0

* AC Power Supplies *

Line voltage= 231	Purge pump I= 42
Erase lamp I= 46	Hopper mtr I= 49
Overall exp I=48	Output fans I=175
	AC off curr= 6

* Fusing System *

Phtr trgt tmp=201	Pad #1
Fuser current=199	Pad #2
	Pad #3

* Sensor Diagnostics

ESM voltage= 78	Dn LED
Door voltage= 78	ESM con

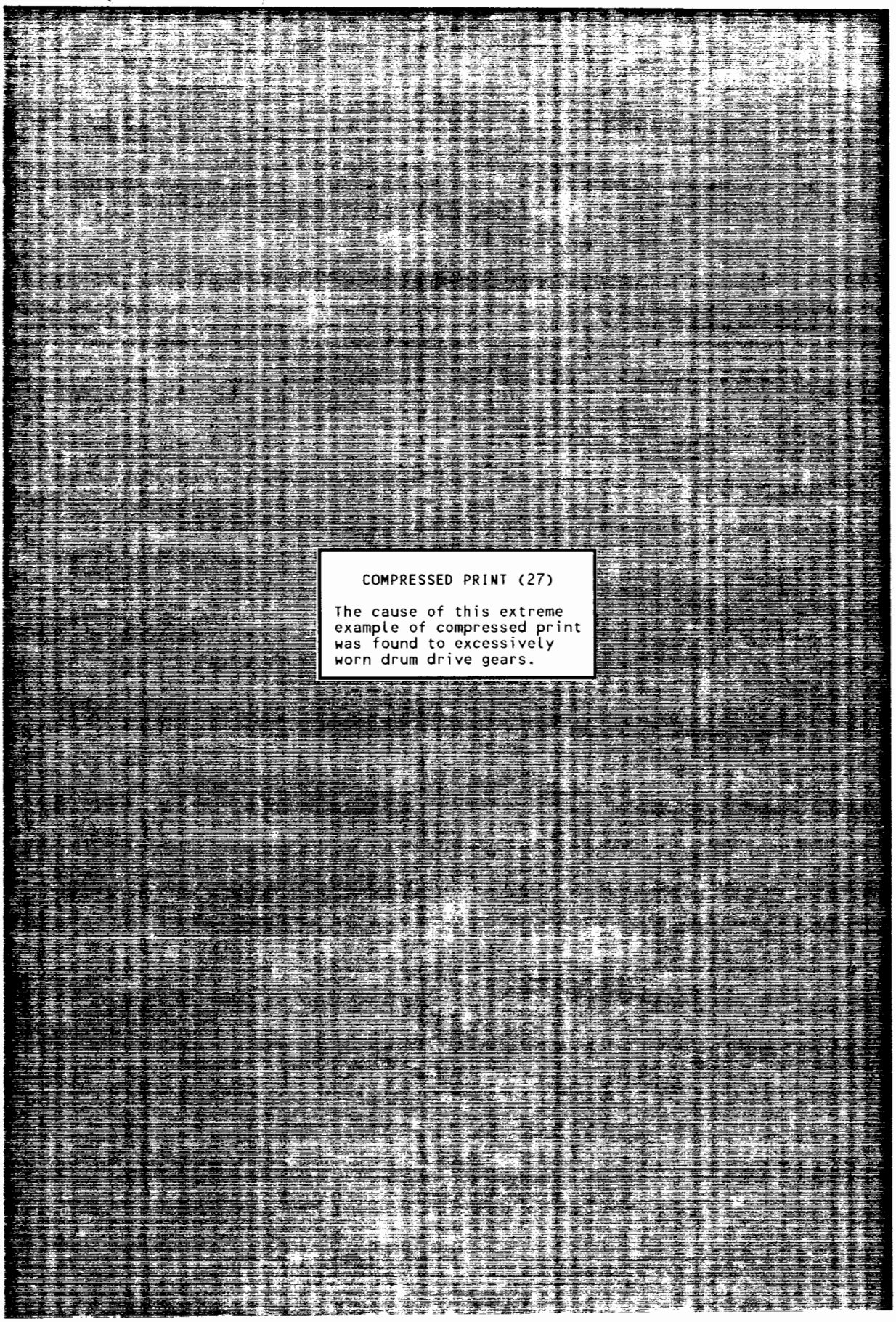
PRINT QUALITY LOSS (26)

This print example (light shades of gray and high light drum potentials) is the result of two printer problems. First it was found that the Simultaneous Corona wire was abnormally loose, and secondly it was found that the Optics Casting was not mounted securely in the printer frame.

* Miscellaneous *

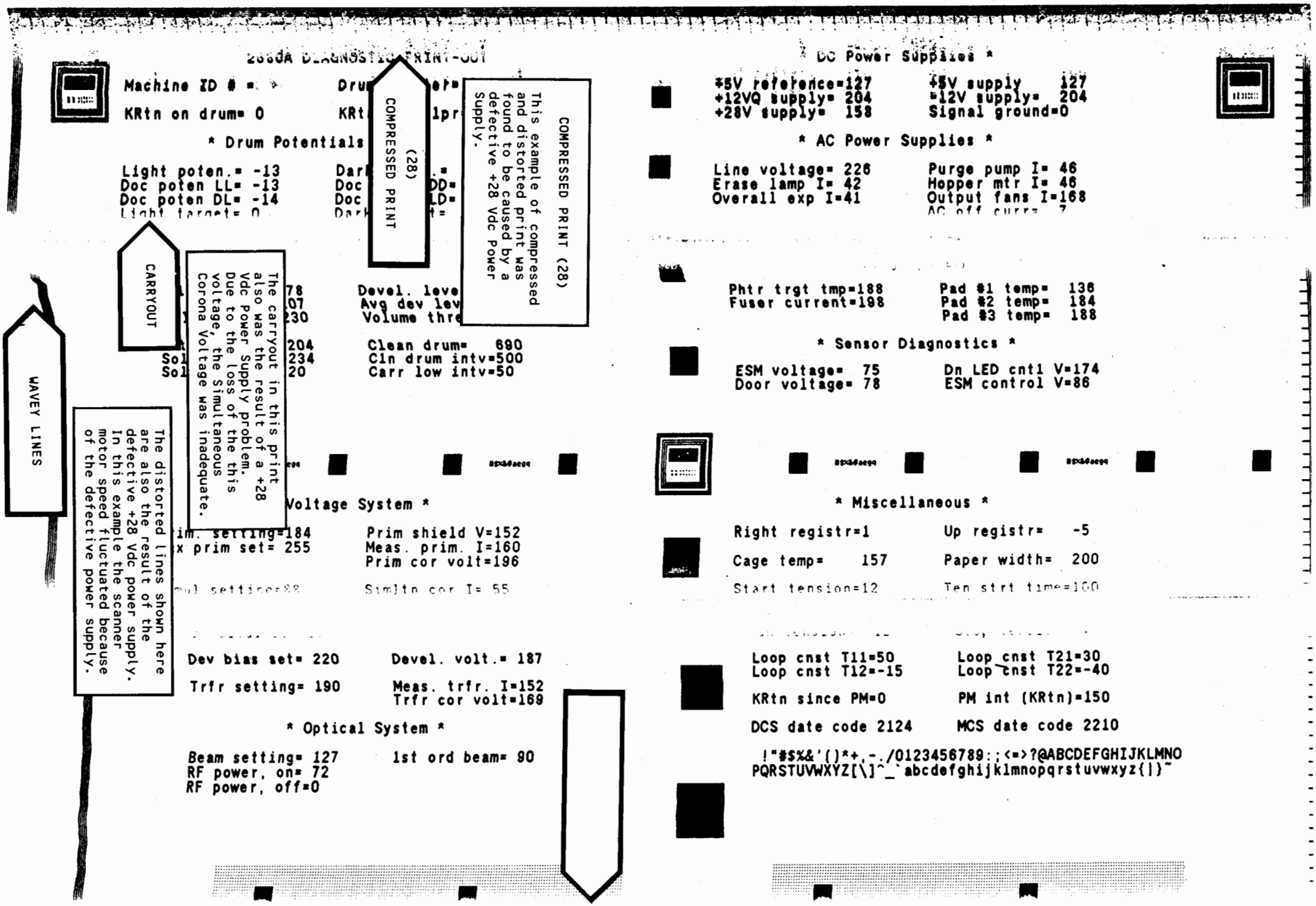
Right registr=0	Up registr= 0
Cage temp= 161	Paper width= 200
Start tension=14	Ten strt time=100
Run tension= 11	Stop tension= 4
Loop cnst T11=50	Loop cnst T21=30
Loop cnst T12=-15	Loop cnst T22=-40
KRtn since PM=82	PM int (KRtn)=150
DCS date code 2212	MCS date code 2210

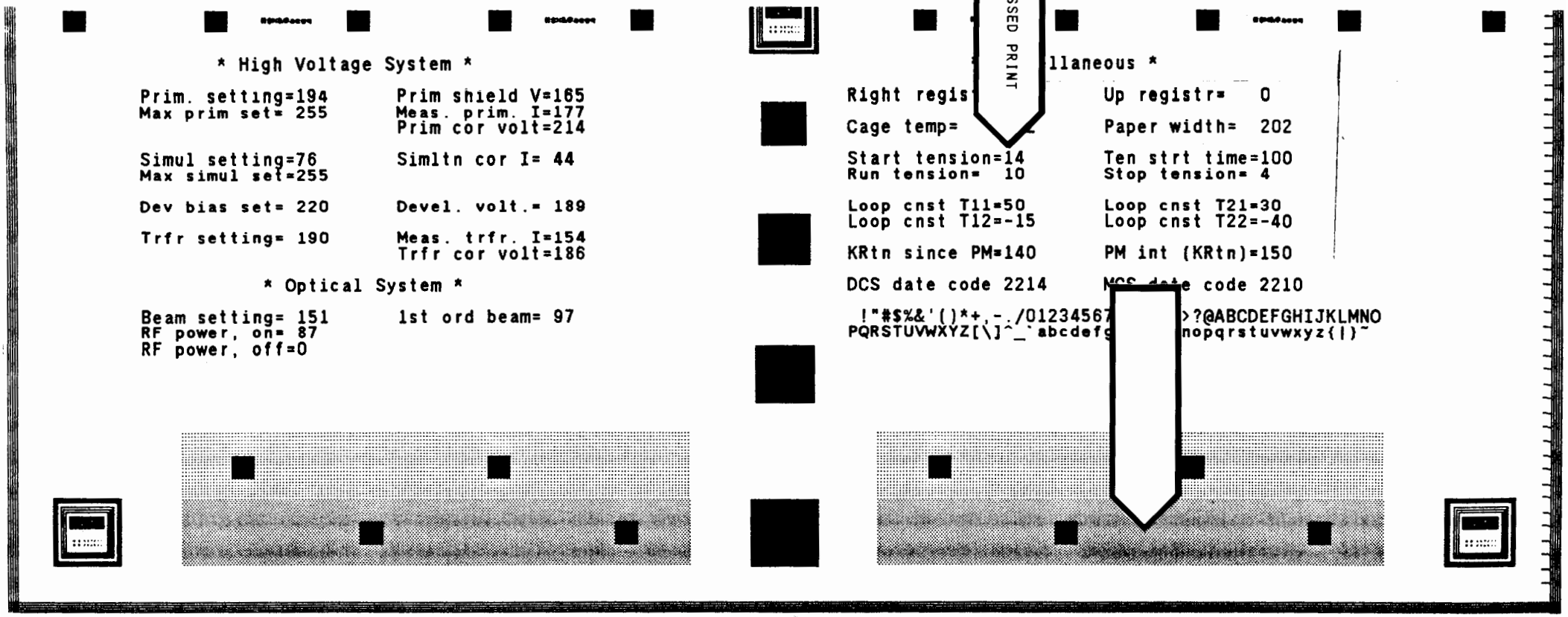
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}



COMPRESSED PRINT (27)

The cause of this extreme example of compressed print was found to excessively worn drum drive gears.


Machine ID # =
KRtn on drum= 0
* Drum Potentials
Light poten.= -13
Doc poten LL= -13
Doc poten DL= -14
Devel. leve
Avg dev lev
Volume thre
Clean drum= 690
Cln drum intv=500
Carr low intv=50
* Voltage System *
Prim shield V=152
Meas. prim. I=160
Prim cor volt=196
Simltn cor I= 55
Dev bias set= 220
Devel. volt.= 187
Trfr setting= 190
Meas. trfr. I=152
Trfr cor volt=169
* Optical System *
Beam setting= 127
1st ord beam= 90
RF power, on= 72
RF power, off=0
* DC Power Supplies *
+5V reference=127
+5V supply 127
+12VQ supply= 204
+12V supply= 204
+28V supply= 158
Signal ground=0
* AC Power Supplies *
Line voltage= 226
Purge pump I= 46
Erase lamp I= 42
Hopper mtr I= 46
Overall exp I=41
Output fans I=168
Phtr trgt tmp=188
Pad #1 temp= 136
Fuser current=198
Pad #2 temp= 184
Pad #3 temp= 188
* Sensor Diagnostics *
ESM voltage= 75
Dn LED cntl V=174
Door voltage= 78
ESM control V=86
* Miscellaneous *
Right registr=1
Up registr= -5
Cage temp= 157
Paper width= 200
Loop cnst T11=50
Loop cnst T21=30
Loop cnst T12=-15
Loop cnst T22=-40
KRtn since PM=0
PM int (KRtn)=150
DCS date code 2124
MCS date code 2210
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
COMPRESSED PRINT (28)
COMPRESSED PRINT
This example of compressed and distorted print was found to be caused by a defective +28 Vdc Power Supply.
CARRYOUT
The carryout in this print also was the result of a +28 Vdc Power Supply problem. Due to the loss of the this voltage, the Simultaneous Corona Voltage was inadequate.
WAVEY LINES
The distorted lines shown here are also the result of the defective +28 Vdc power supply. In this example the scanner motor speed fluctuated because of the defective power supply.


COMPRESSED PRINT (29)
This print example (notice the dot row variation) was found to be caused by a defective drum drive motor.
Compressed print can also recognized in the print sample to your right. Notice the variation in the ones (1) in the sample.
COMPRESSED PRINT
* High Voltage System *
Prim. setting=194
Max prim set= 255
Prim shield V=165
Meas. prim. I=177
Prim cor volt=214
Simul setting=76
Max simul set=255
Simltn cor I= 44
Dev bias set= 220
Devel. volt.= 189
Trfr setting= 190
Meas. trfr. I=154
Trfr cor volt=186
* Optical System *
Beam setting= 151
RF power, on= 87
RF power, off=0
1st ord beam= 97
llaneous *
Right regis
Cage temp=
Start tension=14
Run tension= 10
Up registr= 0
Paper width= 202
Ten strt time=100
Stop tension= 4
Loop cnst T11=50
Loop cnst T12=-15
Loop cnst T21=30
Loop cnst T22=-40
KRtn since PM=140
PM int (KRtn)=150
DCS date code 2214
e code 2210
!"#$%&'()*+,-./01234567
>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefg
nopqrstuvwxyz{|}~

HEV
PAC

TO: MARKETINC

SUBJ: FINANCIAL

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management repor
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fingertips for t

EC

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by last quarter'
industries have
overall economy
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Printing System
decision-making
gains realized t
proved our opera
est to all of ou

MISSING PRINT (30)

The missing print illustrated here was found to be caused by a Data Control System Memory error problem.

SAL
REGI

West

Midw

South

East

Euro

Inter

Japa

Cana

TOT

```
HIOCDRDO.F
HIOCIPRO.F
HIOCTAPO.F
HIOFLOPO.F
HIOLPRTO.F
HIOLPRT1.F
HIOLPRT2.F
HIOMDSC1.F
HIOMDSC2.F
HIOPPRTO.F
HIOTAPEO.F
HIOTAPE1.F
HIOTERMO.F
HIOTERM1.F
HP7260A .F
HPDRAW  .F
HPLIST  .F
HPSLATE .F
HPSLATEC.F
HPSLATEH.F
HPSLATEI.F
HPSLATEM.F
HPSLATEP.F
HPSPELL .F
HPWDBOOT.F
HPWDCATL.F
HPWDCFIG.F
HPWDECD1.F
HPWDECD2.F
HPWDEMPT.F
HPWDTCD1.F
HPWDTCD2.F
HPWDTCD3.F
HPWORD  .F
IDSCHAR .F
IDSFORM .F
IFS     .F
IFS2680 .F
IMAGECAT.F
INDIRECT.F
INFCNV  .F
INFORM  .F
ININ    .F
INITIAL .F
INPDPAN .F
INTRCAT .F
INTRDEC .F
INTRDECS.F
IOCDPNO .F
IODSO   .F
IODSTRMO.F
IODSTRMX.F
IODSX   .F
IOINPO  .F
IOM3270 .F
IOMCONSO.F
IOMPLPO .F
IOMPNLPO.F
IOMPSO  .F
IOMPTRMO.F
```

MISSING PRINT (31)

The missing print illustrated in this print example was found to be caused by a defective Character Processor PCA.

```
IOMRDRO .F
IOMRJEO .F
IOMRJE1 .F
IOPADO  .F
IOPAD1  .F
IPCLEAN .F
IPDIC   .F
K0411047.F
K0411060.F
KSAMUTIL.F
LINK100 .F
LISTDIR2.F
LISTEQ2 .F
LISTLOG2.F
LOAD    .F
LOADMAP .F
LOG     .F
LOG2460 .F
LOG2461 .F
LOG2462 .F
LOG2463 .F
LOG2464 .F
LPS     .F
LPSCAT  .F
MAKECAT .F
MAKEDICO.F
MAKERAST.F
MEMLOGAN.F
MEMLOGP .F
MEMTIMER.F
MERGE   .F
MPCAT   .F
MPCONCAT.F
MPCONFIG.F
MPECHECK.F
MPEMIT33.F
MPMON   .F
MPTEST  .F
MPTSTCAT.F
MRJE    .F
MRJECAT .F
MRJELOGR.F
MRJEMON .F
MRJEOUT .F
NETCAT  .F
NETCONF .F
NEWMAIL .F
NEWPROG .F
NEWUDC  .F
NFTCAT  .F
OFICACCT.F
OPT     .F
P01P180A.F
P02P180A.F
P03P180A.F
P119PAS .F
P119SPL .F
PALETTE .F
PART2680.F
PARTY   .F
```

2680A DIAGNOSTIC PRINT-OUT

Machine ID # = Drum counter=4223904

KRtn on drum= 105 KRtn on dvlpr=105

* Drum Potentials *

Light poten.= -2 -32 Dark poten.= 161
Doc poten LL= 7 Doc poten DD= 166
Doc poten DL= 5 Doc poten LD= 163
Light target= 0 Dark target= 160

* Development Parameters *

Reflectance= 217 Devel. level= 147
Avg reflctnce=222 Avg dev level=146
Refl. target= 230 Volume thresh=100

Untrans solid=291 Clean drum= 642
Solid rfl avg=276 Cln drum intv=500
Solid rfl int=20 Carr low intv=50

* High Voltage System *

Prim. setting=185 Prim shield V=152
Max prim set= 255 Meas. prim. I=144
                   Prim cor volt=192

Simul setting=93 Simltn cor I= 56
Max simul set=255

Dev bias set= 220 Devel. volt.= 185

Trfr setting= 190 Meas. trfr. I=154
                   Trfr cor volt=162

* Optical System *

Beam setting= 116 1st ord beam= 100
RF power, on= 51
RF power, off=0

MISSING PRINT (32)

This print example illustrates the loss of print data (diagnostic parameters on the right-hand side of the printout have been truncated); note that the self test form has been printed. The source of this missing print was determined to be a Paper Width Sensor misadjustment.

Machine ID # =402 Drum counter= 145062

KRtn on drum= 7 KRtn on dvlpr=1

* Drum Potentials *

Light poten.= -12 Dark poten.= 170
Doc poten LL= -5 Doc poten DD= 166
Doc poten DL= -8 Doc poten LD= 163
Light target= 0 Dark target= 170

* Development Parameters *

Reflectance= 232 Devel. level= 120
Avg reflctnce=255 Avg dev level=126
Refl. target= 230 Volume thresh=100

Untrans solid=192 Clean drum= 708
Solid rfl avg=253 Cln drum intv=500
Solid rfl int=20 Carr low intv=50

* High Voltage System *

Prim. setting=195 Prim shield V=166
Max prim set= 255 Meas. prim. I=155
Prim cor volt=175

Simul setting=112 Simltn cor I= 85
Max simul set=255

Dev bias set= 220 Devel. volt.= 187

Trfr setting= 190 Meas. trfr. I=0
Trfr cor volt=150

* Optical System *

Beam setting= 155 1st ord beam= 77
RF power, on= 89
RF power, off=0

+5V reference=128 +5V supply 127
+12VQ supply= 203 -12V supply= 203
+28V supply= 158 Signal ground=0

* AC Power Supplies *

Line voltage= 227 Purge pump I= 45
Erase lamp I= 43 Hopper mtr I= 47
Overall exp I=42 Output fans I=174
AC off curr= 6

* Fusing System *

Phtr trgt tmp=188 Pad #1 temp= 141
Fuser current=211 Pad #2 temp= 186
Pad #3 temp= 185

* Sensor Diagnostics *

ESM voltage= 76 Dn LED cnt1 V=196
Door voltage= 78 ESM control V=96

* Miscellaneous *

Right registr=-45 Up registr= 45

Cage temp= 155 Paper width= 201

Start tension=14 Ten strt time=100
Run tension= 10 Stop tension= 4

Loop cnst T11=50 Loop cnst T21=30
Loop cnst T12=-15 Loop cnst T22=-40

KRtn since PM=53

DCS date code 2214

!"#$%&'()*+,-./012345
PQRSTUVWXYZ[\]^_`abcde

MISSING PRINT (33)

In this example the entire form on which the Self Test diagnostic parameters are printed on is missing. This missing data occurred due to an "Operator Error". Notice Up and Right Registration indications under the Miscellaneous heading in the diagnostic printing (-45 and 45). These indicate the Print Position adjustment made at the Operator Control Panel. In this print example the image was so far out of adjustment the form portion of the printout was truncated.

TABLE OF CONTENTS

STREAKS/SMEARS (34)

This print example occurred when the developer assembly was found to be rotating sluggishly or not rotating at all.

2680A DIAGNOSTIC PRINT-OUT

Machine ID # Drum counter=

KRtn on drum= 0 KRtn on dvlpr=0

* Drum Potentials *

Light poten.= 0 Dark poten.= 145
Doc poten LL= 0 Doc poten DD= 144
Doc poten DL= 4 Doc poten LD= 140
Light target= 0 Dark target= 140

* Development Parameters *

Reflectance= 317 Devel. level= 110
Avg reflctnce=258 Avg dev level=109
Refl. target= 230 Volume thresh=100

Untrans solid=192 Clean drum= 887
Solid rfl avg=260 Cln drum intv=500
Solid rfl int=20 Carr low intv=50

* High Voltage System *

Prim. setting=202 Prim shield V=178
Max prim set= 255 Meas. prim. I=185
Prim cor volt=205

Simul setting=122 Simltn cor I= 94
Max simul set=255

Dev bias set= 220 Devel. volt.= 186

Trfr setting= 190 Meas. trfr. I=152
Trfr cor volt=173

* Optical System *

Beam setting= 127 1st ord beam= 83
RF power, on= 73
RF power, off=0

STREAKS/SMEARS (35)

This type of streak or smear is the result of an excessively worn retraction solenoid assembly.

* DC Power Supplies *

+5V reference=127 +5V supply 127
+12VQ supply= 204 -12V supply= 204
+28V supply= 158 Signal ground=0

* AC Power Supplies *

Line voltage= 228 Purge pump I= 56
Erase lamp I= 42 Hopper mtr I= 47
Overall exp I=41 Output fans I=178
AC off curr= 8

* Fusing System *

Phtr trgt tmp=188 Pad #1 temp= 136
Fuser current=201 Pad #2 temp= 184
Pad #3 temp= 187

* Sensor Diagnostics *

ESM voltage= 76 Dn LED cntl V=176
Door voltage= 77 ESM control V=86

* Miscellaneous *

Right registr=1 Up registr= -5

Cage temp= 151 Paper width= 200

Start tension=12 Ten strt time=100
Run tension= 12 Stop tension= 4

Loop cnst T11=50 Loop cnst T21=30
Loop cnst T12=-15 Loop cnst T22=-40

KRtn since PM=0 PM int (KRtn)=150

DCS date code 2124 MCS date code 2210

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

ET MONTH	NET YTD
.00	
.00	27,398.02
.00	
151,568.02	
151,568.02	3,088,638.83
543,347.82	4,242,255.21
55,917.65	
55,917.65	215,072.97
55,917.65	215,072.97
.00	
.00	1,016.45-
.00	
.00	
.00	512.20-
.00	1,528.65-
780,184.39	7,827,979.35
120,869.12	
.00	
120,869.12	351,288.73
120,869.12	351,288.73
737,713.71	
737,713.71	2,208,334.81
737,713.71	2,208,334.81
737,713.71	2,208,334.81

and handle
standard
x 11 inch
haracters
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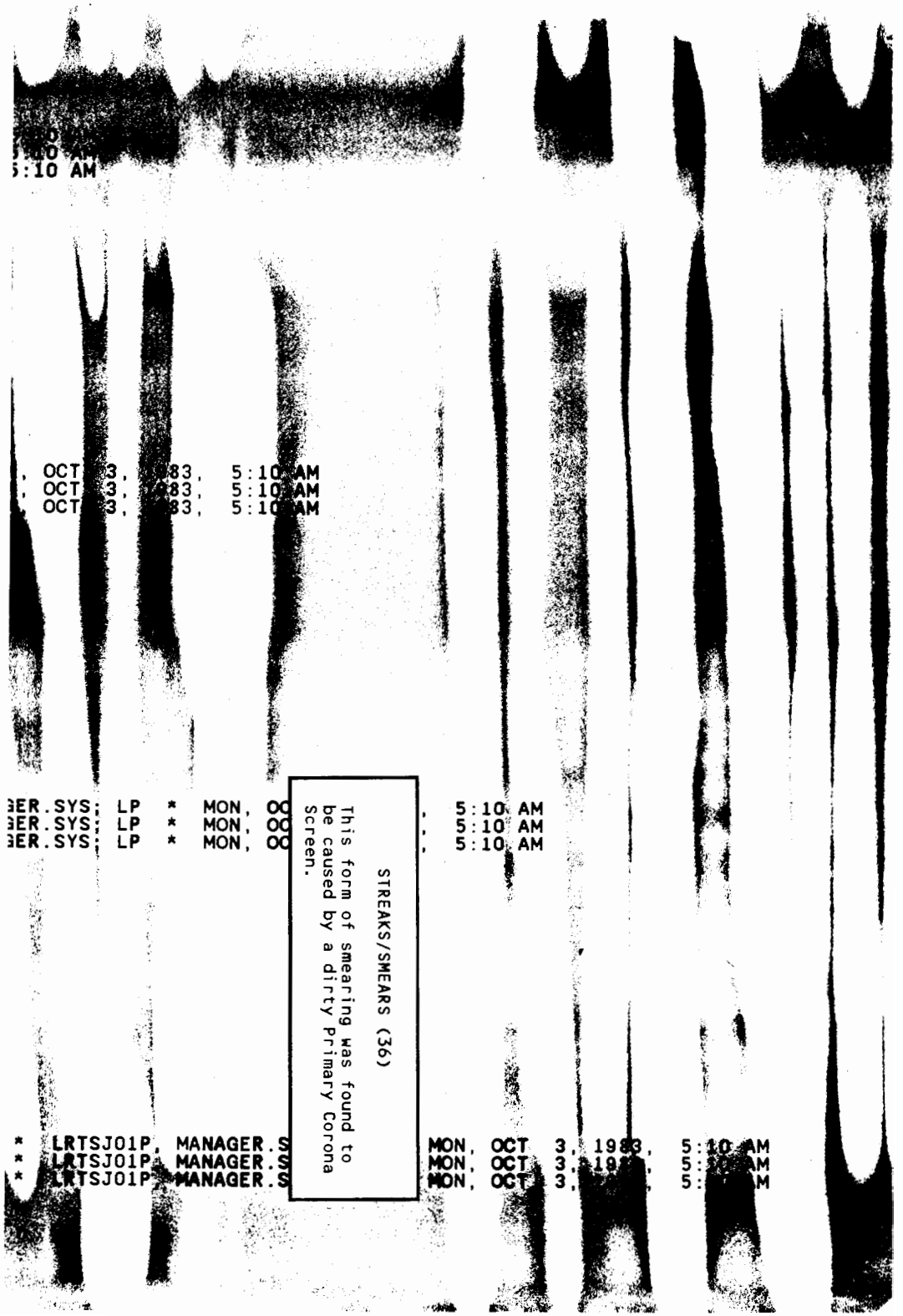
SMEARS

STREAKS/SMEARS (37)

This streaking (slight toner traces at the edges of the paper) was the result of a defective (worn or bent) Developer Seal.



SMEARS

s 30,33, 39,40 and 42 as a port on an ADCC. It is
er an ADCC or ATP.

Laser Printer is supported on all of the above
30 and 33.

to the extreme data rate limitations of the ATC.

and all components are customer installable.

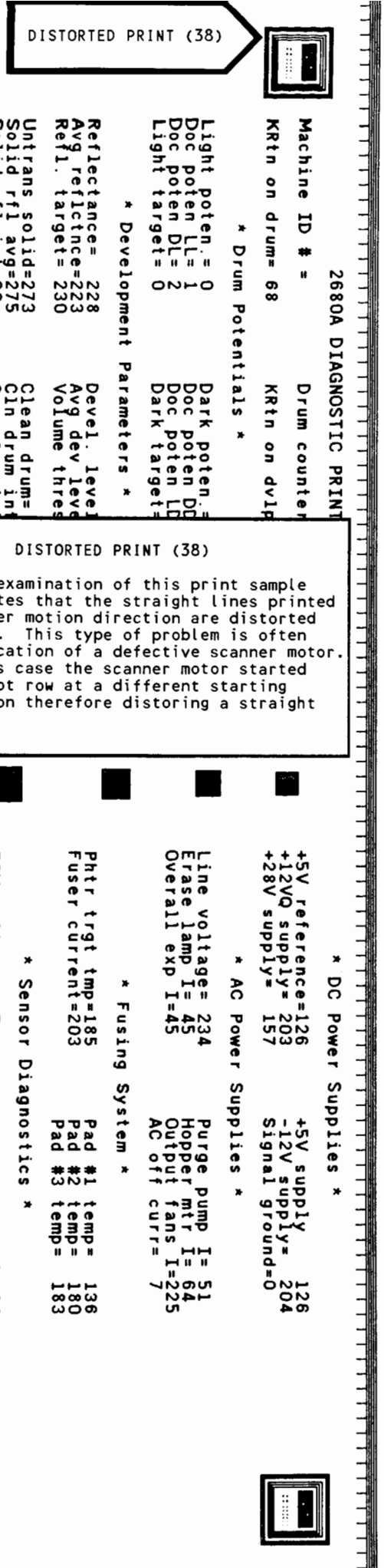
$ 84.00/mo

$ 167.00/mo

$ 235.00/mo

$ 292.00/mo

DISTORTED PRINT (38)

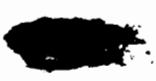


DISTORTED PRINT (38)

Close examination of this print sample indicates that the straight lines printed in paper motion direction are distorted (wavy). This type of problem is often a indication of a defective scanner motor. In this case the scanner motor started each dot row at a different starting position therefore distoring a straight line.

BLOTCHES (39)

This type of blotch was the result of a vacuum system failure.



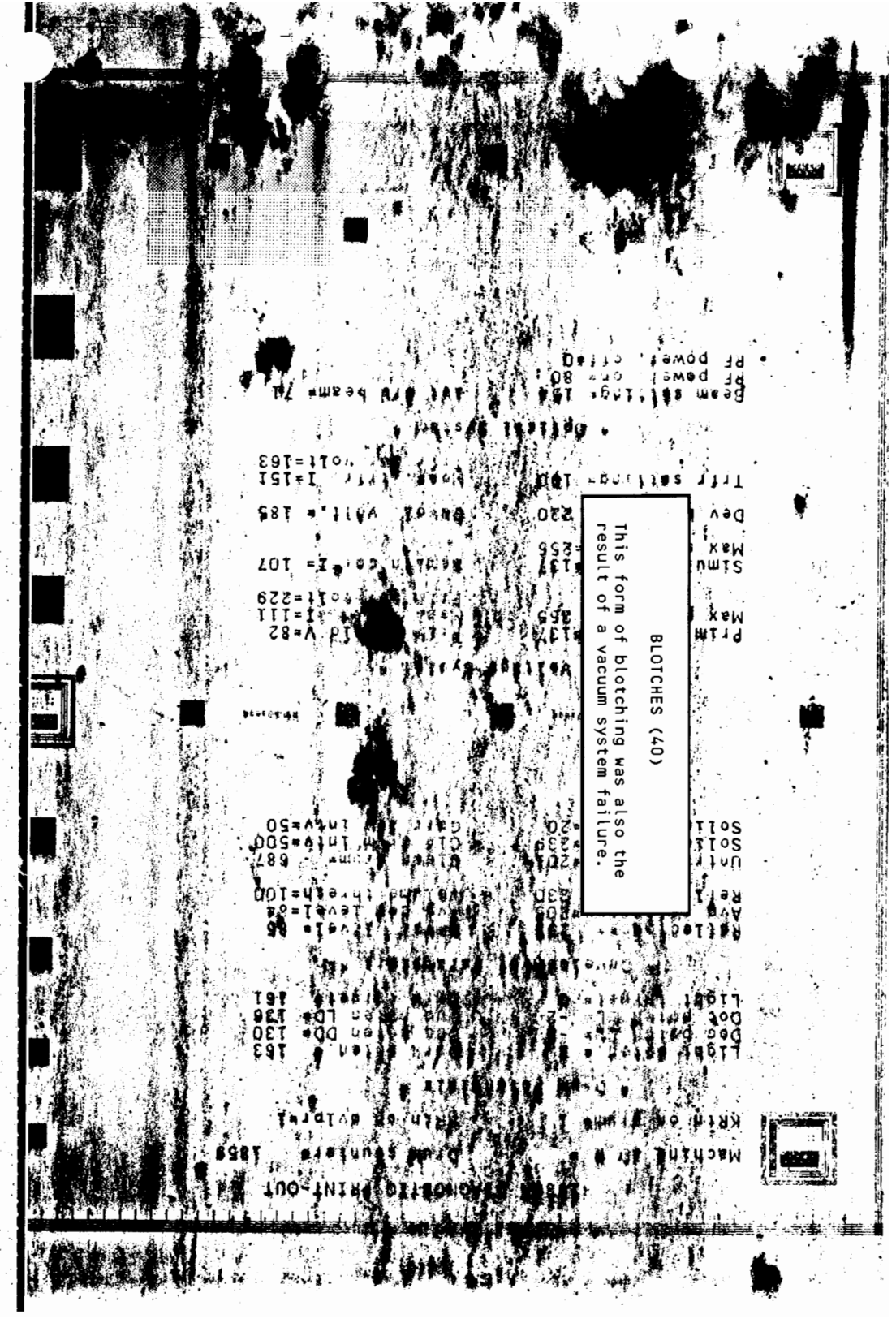
BLOTCH

KORDER REPORT

	BO	QTY	ORIG QTY	UM		DEPT				
00730		5	5	EA	80-10-04	2120	MN	09	2190	
20 AWG		51	75	FT	80-10-04	2120	MN	07	2190	

CARRYOUT (41)

This print sample illustates carryout (the appearance of dark specs in the print). The carryout illustrated here resulted due to a defective Simultaneous Corona.



BLOTCHES (40)

This form of blotching was also the result of a vacuum system failure.

MON, APR 30, 1984, 2:57 PM

REPORT:

C O S T S H E E T

PART-NO:

LL	COMPONENT	DESCRIP	UM	REPL KRDX	ACCT	PHNTM?	QTY-PER	EXTENDED LABOUR	EXTENDED MATERIAL	EXTENDED OVERHEAD
		CDSET B CEE	EA	1400	1310	N	1.0000	.0000	2.3400	.0000
						TOTAL OF DIRECT COSTS		.0000	2.3400	.0000

SPURIOUS DOTS/LINES

SPURIOUS DOTS/LINES (44)

The spurious dots indicated in this print sample are the result of a defective Optics PCA.

	STANDARD	CURRENT
SRM-CONTENT	.0000	.0000
UK-CONTENT	.0000	.0000

WHERE-USED

PARENT	DESCRIPTION	PHNTM?	QTY-PER
		N	.2500

SPURIOUS DOTS/LINES

PART HAS NO ROUTINGS

REPEATING MARKS/SPOTS

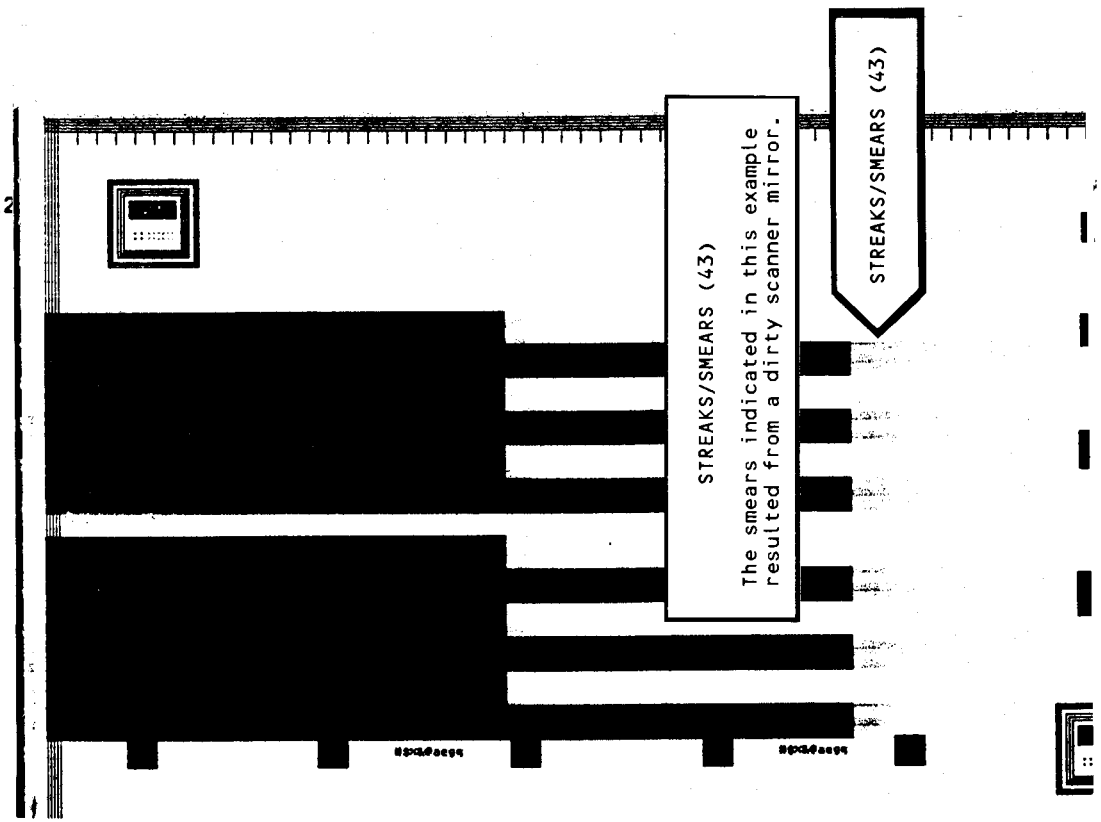
HEWLETT-PACKARD 3 B.1 WED, JAN 11, 1984, 2:12
(C) HEWLETT-PACKA 19
EOF FOUND IN FROM FTE

15 RECORDS PROCES * 0

END OF SUBSYSTEM
:PURGE
:TELL
:RENAME JOBON,JOB
:EOJ
CPU SEC. = 22. ELAPSED MI AN 11, 1984, 2:12 PM

REPEATING MARKS/SPOTS (42)

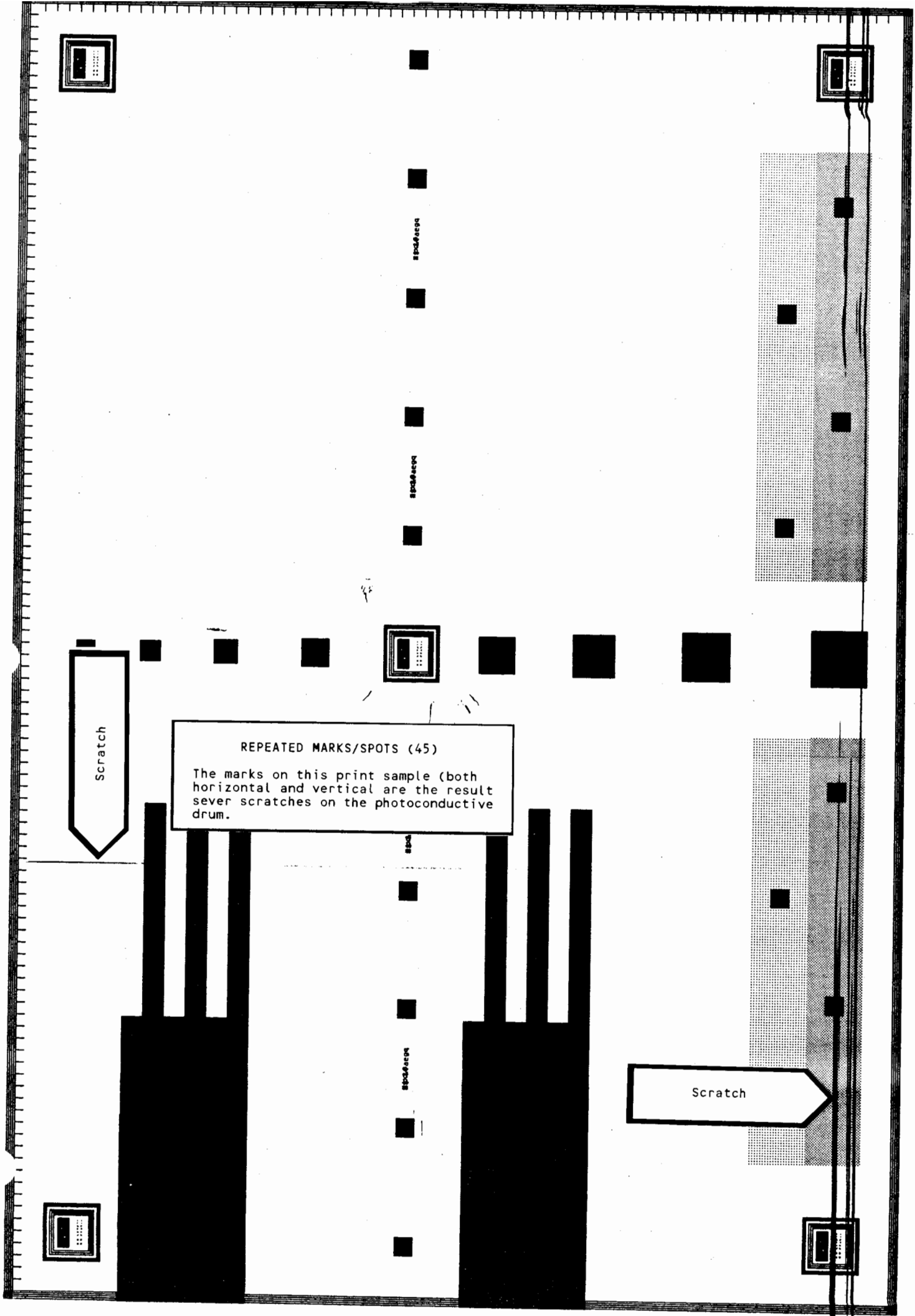
This example of a repeating mark was caused by the misadjustment of the Retraction Solenoid. In this situation the retraction blade was hitting the photoconductive drum.



STREAKS/SMEARS (43)

STREAKS/SMEARS (43)

The smears indicated in this example resulted from a dirty scanner mirror.


Scratch
REPEATED MARKS/SPOTS (45)
The marks on this print sample (both horizontal and vertical are the result sever scratches on the photoconductive drum.
Scratch

SECTION IV.
SELF TEST EXPLANATION

DRUM POTENTIALS

	Typical Value	Default Value
Light target=	0	0
Dark poten.=	140 - 175	-
Doc poten DD=	140 - 175	-
Doc poten LD=	140 - 175	-
Dark target=	160 - 175	175

All drum potentials are measured by the electrostatic monitor. The electrostatic monitor is a non-contact voltmeter which can measure the drum potential without disturbing the existing charge on the drum surface. The electrostatic monitor measurements are used in the ESM algorithm (see figure 1) to regulate the current applied to the primary and simultaneous corona assemblies. The current applied to the corona assemblies in turn determines the drum's charge.

$$\text{New Primary Corona Setting} = \text{Old Primary Corona Setting} + \text{ES Loop Matrix Constant} \times (\text{Dark Potential Target} - \text{Dark Potential Measured}) + \left(\frac{\text{ES Loop Matrix Constant}}{250} \times (\text{Light Potential Target} - \text{Light Potential Measured}) / 250\right)$$

$$\text{New Simultaneous Corona Setting} = \text{Old Simultaneous Corona Setting} + \text{ES Loop Matrix Constant} \times (\text{Dark Potential Target} - \text{Dark Potential Measured}) + \left(\frac{\text{ES Loop Matrix Constant}}{250} \times (\text{Light Potential Target} - \text{Light Potential Measured}) / 250\right)$$

Figure 1. ESM Algorithms

To aid in making the drum potential measurements an electrostatic monitor mark is written during alternate drum rotations in the inter-document zone of the drum. This provides an alternating sequence of light (laser exposed) and dark (non-laser exposed) areas on the drum surface.

During Self Test several drum potential measurements are taken in the document region of the drum area and are used for diagnosing the drum's condition. These areas consist of a dark potential (unexposed) area, a light potential (exposed) area and two areas which alternate between light and dark every twenty rotations. The drum potential parameters and their definitions follow:

Light poten = XX — The "Light potential" measurement is taken when a light (exposed) area of the inter-document region of the drum is opposite the monitor. This measurement is used in the ESM algorithm to adjust the primary and simultaneous corona current.

Dark poten = XXX — The "Dark potential" measurement is taken when a dark (unexposed) area of the inter-document region of the drum is opposite the monitor. This measurement is used in the ESM algorithm to adjust the primary and simultaneous corona current.

Doc poten LL = XX — The "Document potential light after light" measurement is taken when a light (exposed)

region in the document area of the drum is opposite the monitor

Doc poten DD = XX — The "Document potential dark after dark" measurement is taken when a dark (unexposed) region in the document area of the drum is opposite the monitor.

Doc poten LD = XX and Doc poten DL = XX — The "Document potential Light after Dark" and Dark after Light measurements are taken in the document region of the drum. These areas alternate between light (exposed) and dark (unexposed) every 20 drum rotations. Doc poten LD is the alternating area which is currently dark and Doc poten DL is the area which is currently light. The purpose of this alternation is to measure ghosting effects.

Light target = X — This is the light potential set-point for the electrostatic control loop. Under normal circumstances the light potential measured is compared to light target every other drum rotation. The primary and simultaneous corona settings are adjusted in order to maintain the light potential reading equal to the light potential target. The light target should be zero (the drum potential in an area exposed to the laser should be approximately zero volts).

Dark target = XXX — This is the dark potential set-point for the electrostatic control loop Under normal circumstances the dark potential measured is compared to the dark target every other drum rotation. The primary and simultaneous corona settings are adjusted in order to maintain the dark potential reading equal to the dark potential target. The dark potential target is normally set to 175 and then incrementally adjusted down in 5 count increments until carry-out is minimal.

DEVELOPMENT PARAMETERS

	Typical Value	Default Value
Solid rfl avg=	200 - 450	...
Devel. level=	100 - 150	...
Avg reflctnce=	230	...
Clean Drum=	650 - 700	...
Cln drum intv=	500	500
Duty Cycle	-	-
TDuty Cycle	-	-
Developer Var	-	-
Dens Target	1-10	1
CEOffset	1-4	2
VDP Flag	1,2	2

The development parameters measure print quality in terms of "blackness" of the print image created on the photoconductive drum's surface. Reflectance, the amount of light reflected from drum surface, is used as the basis for determining development parameters.

The heart of the reflectance control system is the densitometer assembly. The densitometer consists of an infrared light source and two light detectors. The first light detector is used to control the gain and output of the light source; the second detector measures the actual light reflected from the drum's surface. To aid in the reflectance testing, a densitometer mark (three bar pattern) is written on the drum's surface. The pattern consists of three bars of a solid developed print image interspersed with three nondeveloped bars. As this pattern moves under the densitometer several measurements are taken of each

developed bar. These measurements are then averaged and compared with a clean drum measurement stored in the printer's non-volatile memory. Other reflectance measurements, the solid reflectance process mark and the clean drum measurements are taken at periodic intervals and are used in diagnosing and monitoring the drum's developmental parameters. The drum development parameters and their definitions follow

Reflectance= XXX	Reflectance is measured once per printed drum rotation when the densitometer pattern passes under the densitometer. The measured reflectance is calculated and compared with the reflectance previously measured and stored in non-volatile memory. From the reflectance measurement the decision is made whether to add toner to the developer assembly. If the reflectance measured is above the reflectance target, then toner is added to the developer assembly.
Avg reflctnce=XXX	The average reflectance is a average of the reflectance measured from the twenty most recent drum rotations since the last power-on reset.
Refl. target= XXX	The reflectance target is the set-point to which the developed image reflectance is maintained. If the reflectance measured is above the target, toner is added to the developer. If the reflectance is below target no toner is added until the reflectance increases to the target value.
Devel level= XXX	The developer volume level is the instantaneous measured level in the developer assembly as determined by the developer volume sensor.
Avg dev level=XXX	The average developer level is an average of the developer volume level compiled during the twenty five most recent developer volume measurements.
Volume thresh=XXX	The developer volume threshold is the set-point used to determine when carrier needs to be added to the developer assembly. When the developer level is less than or equal to the developer volume threshold, the "Carrier low" message is displayed and carrier should be added to the developer assembly.
Untrans solid=XXX	The untransferred solid reflectance measurement occurs when a solid densitometer process mark is opposite the densitometer assembly. The value displayed is an average of six densitometer measurements of this control mark.
Solid rfl avg=XXX	The solid reflectance average is a running average of the solid reflectance measurements. The average is calculated so that the most recent measurement is the most heavily weighted.
Solid rfl int=20	The solid reflectance interval is the frequency (in drum rotations) at which the solid reflectance measurement occurs.
Clean drum= XXX	The clean drum parameter represents the reflectance of an undeveloped drum. This value is used for normalizing reflectance measurements and is automatically measured and updated on a regularly scheduled interval.
Cln drum intv=XXX	The clean drum interval represents the interval (in thousand drum rotations) which the clean drum routine is performed. The clean drum routine is also performed prior to the execution of each Self Test.

Carr low intv=XX	The carrier low interval represents the interval in drum rotations which the carrier low diagnostic is inhibited once the "Carrier low" message has been reset. This interval allows the carrier time to be thoroughly distributed throughout the developer assembly. After this interval has elasped, the developer volume is checked once per drum rotation.
Duty Cycle	Represents the duty cycle at which the toner hopper should operate to make up for the toner removed from the hopper on the previous rotation.
TDuty Cycle	Represents the accumulated amount of toner the toner hopper has yet to output to make up for the toner used. This is expressed in an integer (i.e. 10,000 equals the amount of toner that would be output by turning on the hopper for an amount of time equal to one drum rotation.
Developer Var	This is a measure of hopper efficiency for supplying toner at a given print density, for given page coverage (number of dots).
Dens Target	This represents the desired Density Target entered by the printer operator via the 50 keyboard command.
CEOffset	Since no two printers delivery identical print density output, this density offset allows the CE to "fine tune" the printers density output so that two printers, set at the same density target, to print more a consistent (identical) density output. Default CEOffset equals 2.
VDP flag	This parameter indicates whether or not the printer is equipped with the variable density print firmware a one (1) means yes, a two (2) means it is not.

HIGH VOLTAGE SYSTEM

		Typical Value	Default Value
Prim setting=		185 - 210	190
Max prim set=		.....	255
Simul setting=		80 - 150	80
Max simul set=		.....	255
Dev bias set=		.....	220
Trfr setting=		.....	190
Prim shield V=	*	.....	...
Meas. prim. I=		0 - 170	...
Prim cor volt=	**	.....	...
Simltn cor I=		50 - 160	...
Devel. volt.=		180 - 190	...
Meas. trfr. I=		0 - 160	...
Trft cor volt=	***	....	...

* The Primary Screen Voltage = (2/3 X Primary Setting) - 127 For setting between 127 and 255 counts.

low failure limit = less than 40 counts or 32 counts less than the desired primary screen voltage

high failure limit= greater than 32 counts above the desired primary screen voltage

** Primary Corona Voltage - Failure occurs when the voltage is measured at less than 128 counts.

*** Transfer Corona Voltage - Failure occurs when the voltage is measure at less than 100 counts.

OPTICAL SYSTEM

	Typical Value	Default Value
Beam setting	110 - 130	120
RF power, on=	40 - 60	
RF power, off=	0 - 5	...
1st ord beam=	90 - 130 *	...

* An auto-laser calibration routine is incorporated in MCP firmware date code 2414 and later to maintain First Order Power target of approximately 90 counts.

DC POWER SUPPLIES

	Low	Nominal	High
+5 reference	118	128	138
+5 supply	118	128	138
+12 Quiet Supply	188	204	220
-12 Supply	188	204	220
+28 supply	149	159	169
Signal Ground	0	2	10

AC POWER SUPPLIES

Line voltage	214		252
Erase lamp current	33	44	...
Overall exp current	33	44	...
Purge pump current	21	48	...
Hopper motor current	21	48	...
Output fans current	81	180	...
AC Loads off current	..	8	16

SECTION V.
LOCATION AND IDENTIFICATION

5-1. INTRODUCTION

This section of the manual assists the service representative in identifying and locating major connectors and subassemblies throughout the printer. The following areas of the printer are identified:

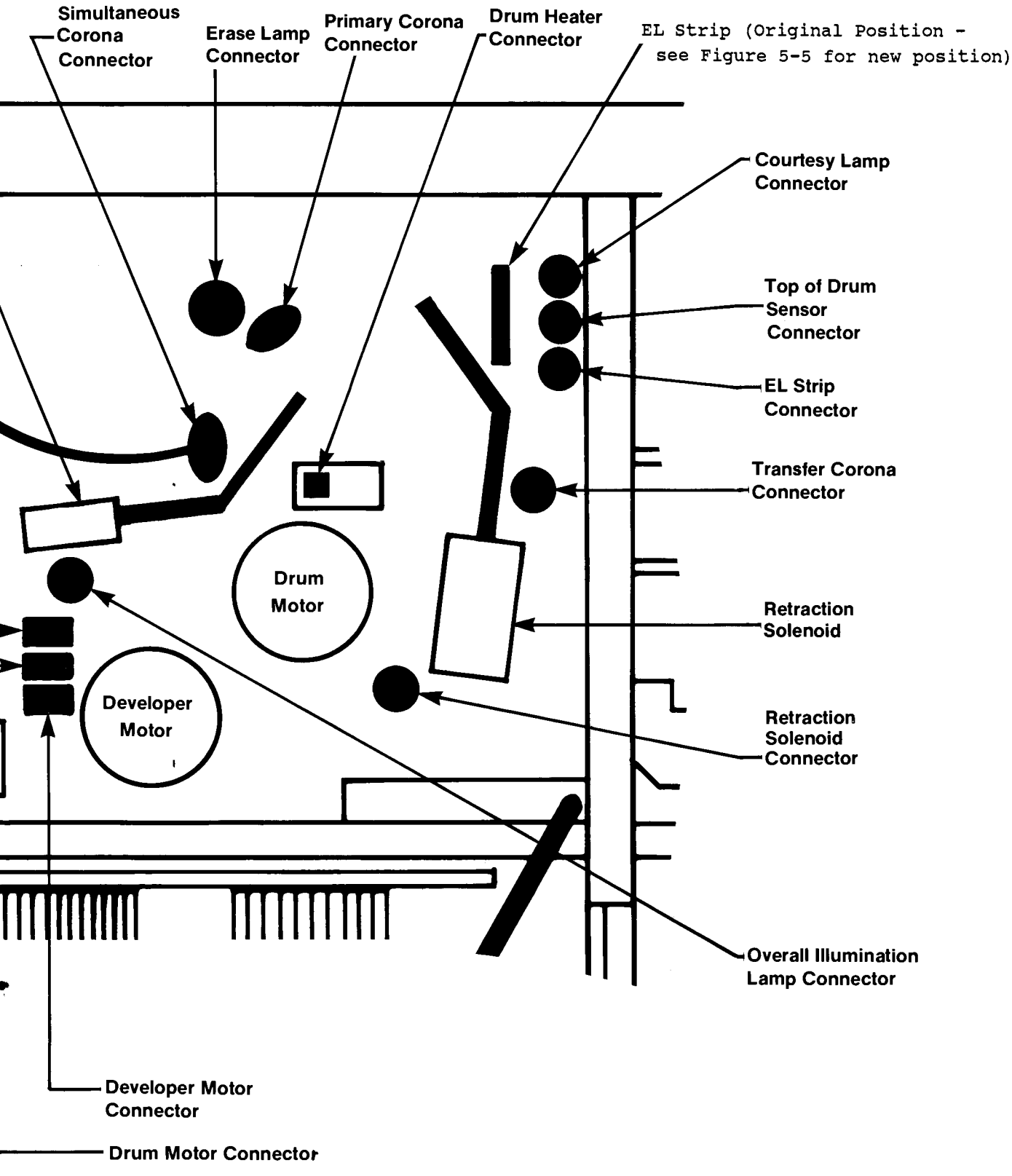
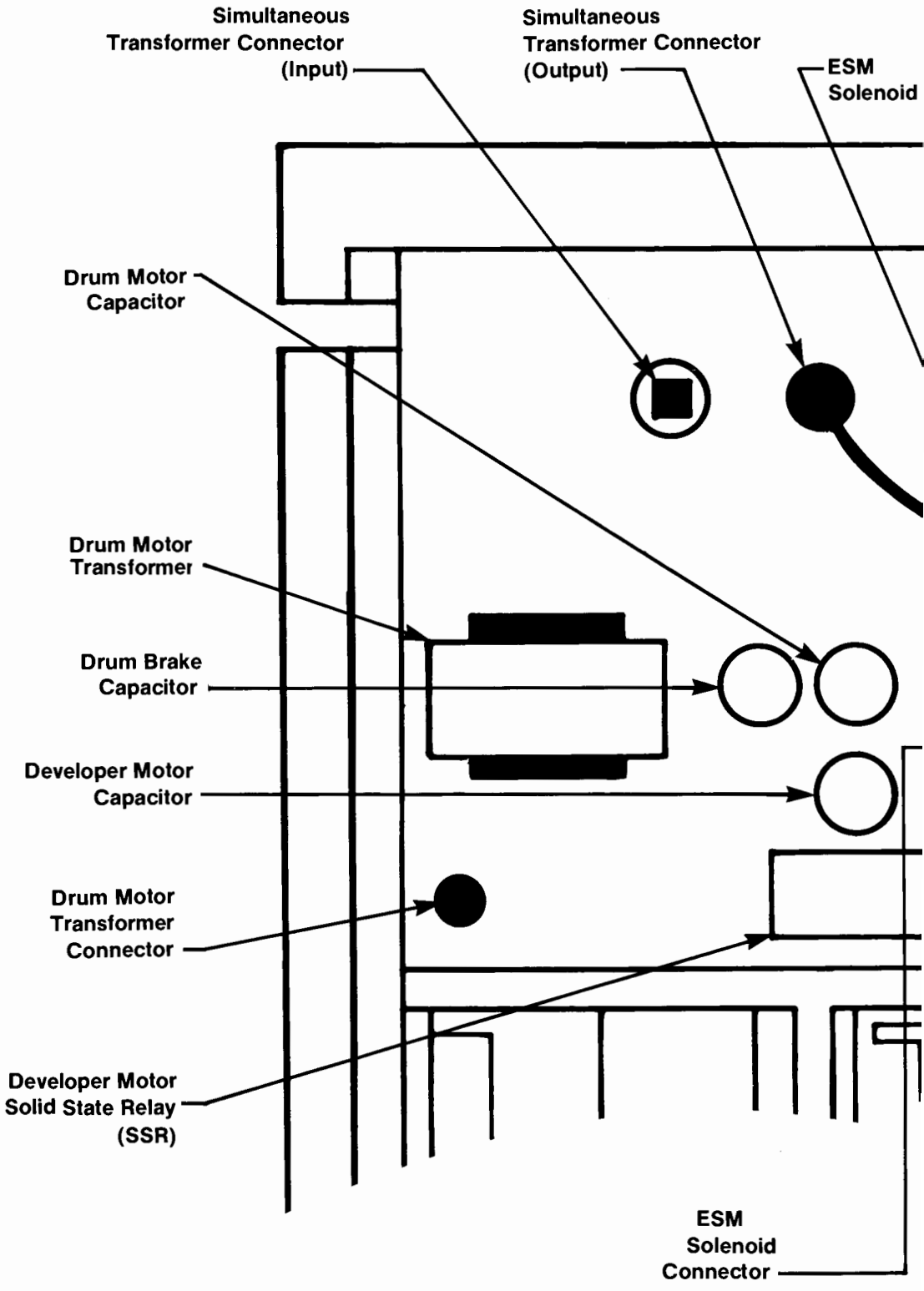


Figure 5-1. EP Backpanel


Simultaneous
Transformer Connector
(Input)
Simultaneous
Transformer Connector
(Output)
ESM
Solenoid
Drum Motor
Capacitor
Drum Motor
Transformer
Drum Brake
Capacitor
Developer Motor
Capacitor
Drum Motor
Transformer
Connector
Developer Motor
Solid State Relay
(SSR)
ESM
Solenoid
Connector

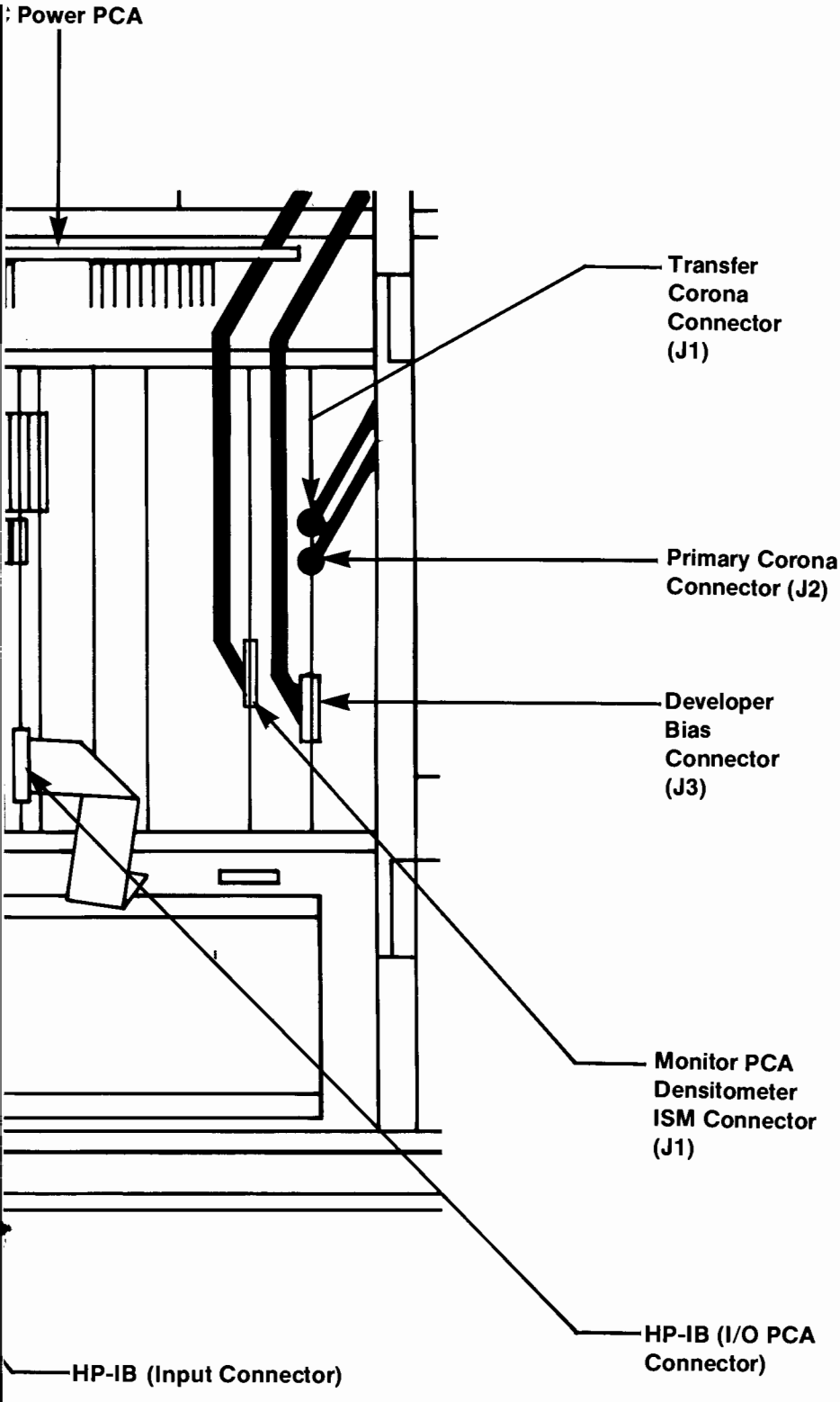
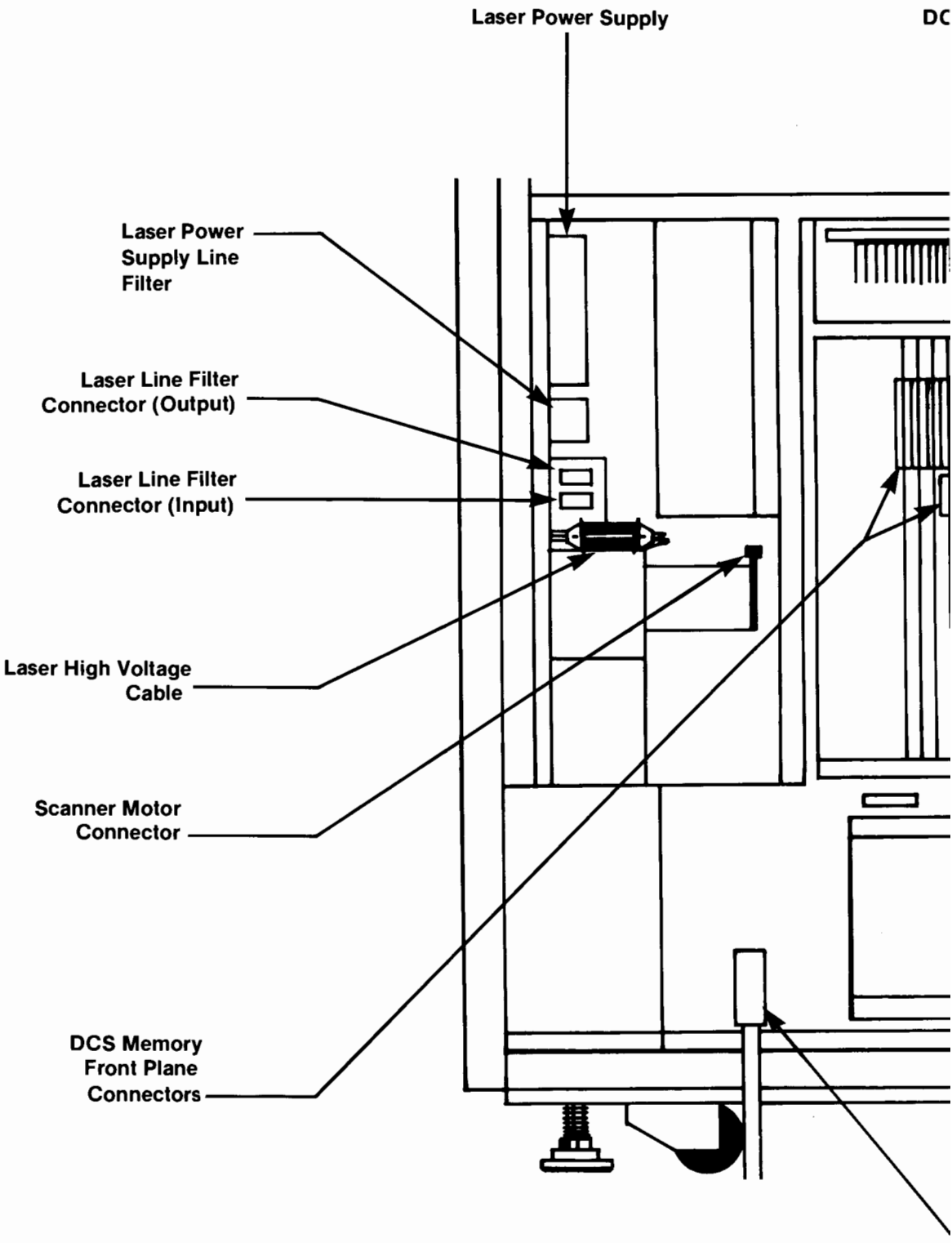


Figure 5-2. Cardcage Area


Laser Power Supply
DC
Laser Power Supply Line Filter
Laser Line Filter Connector (Output)
Laser Line Filter Connector (Input)
Laser High Voltage Cable
Scanner Motor Connector
DCS Memory Front Plane Connectors

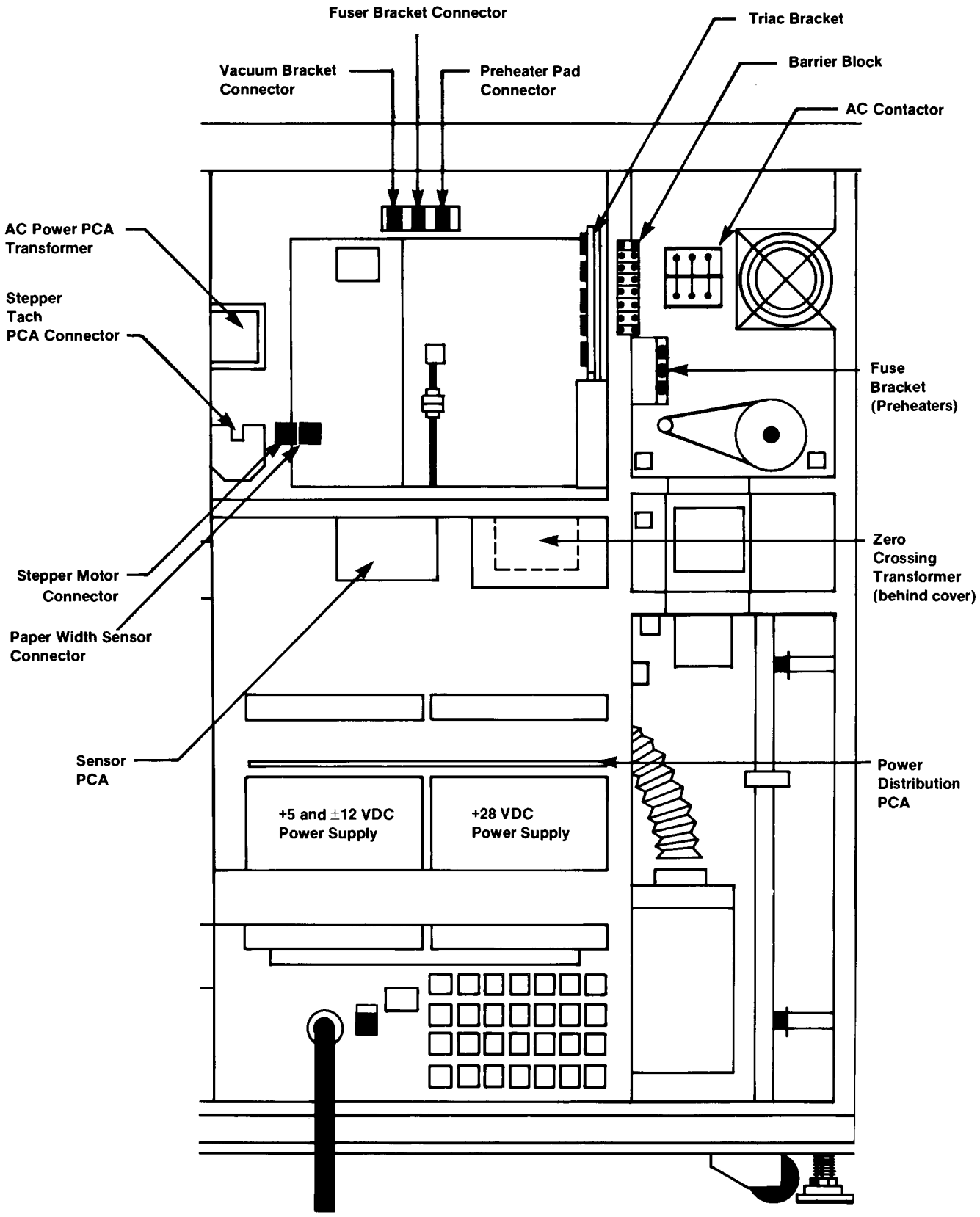


Figure 5-3. Printer
(right rear view - part 1)

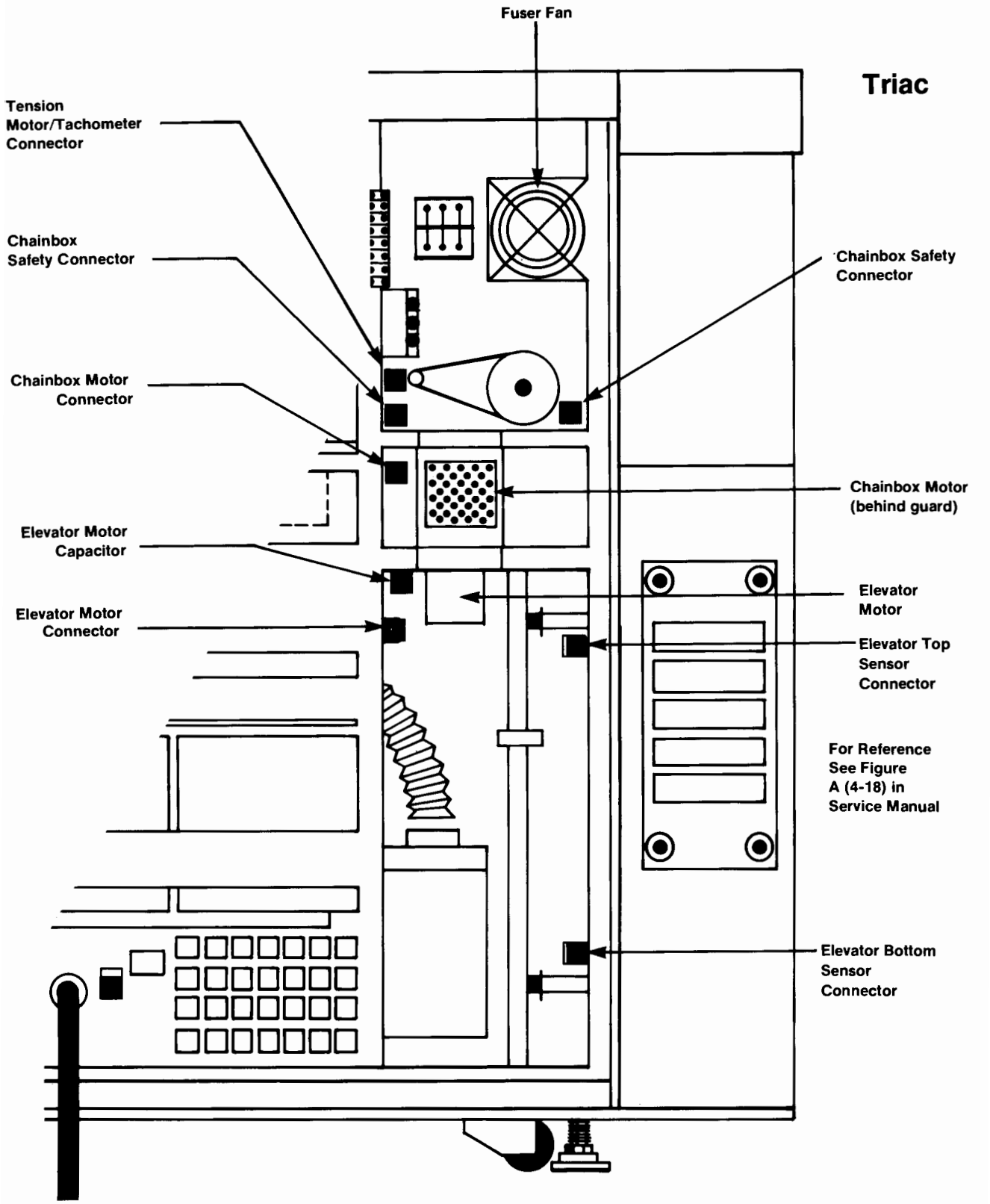


Figure 5-4. Printer (right rear view - part 2)

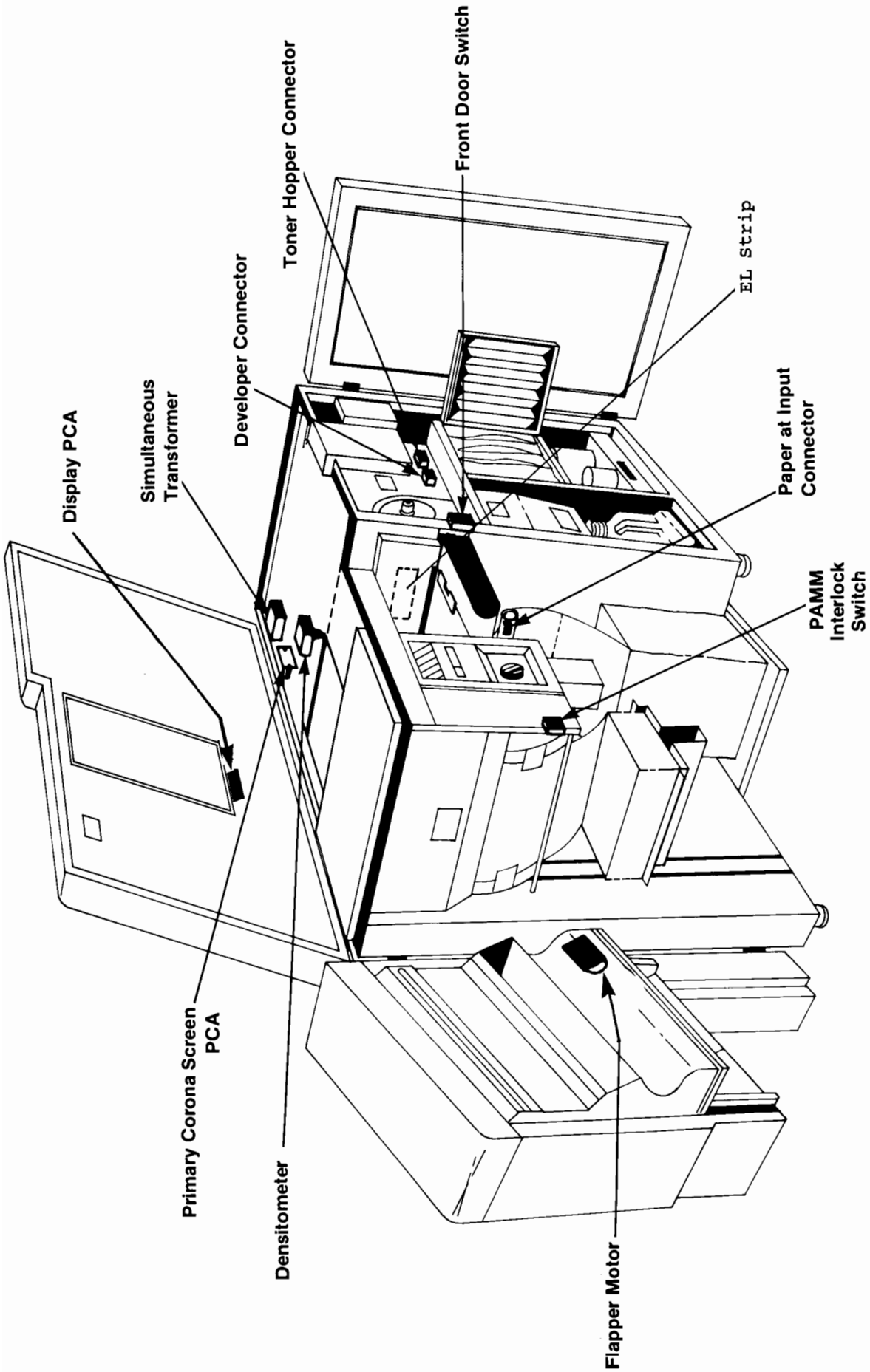


Figure 5-5. Printer (front view)

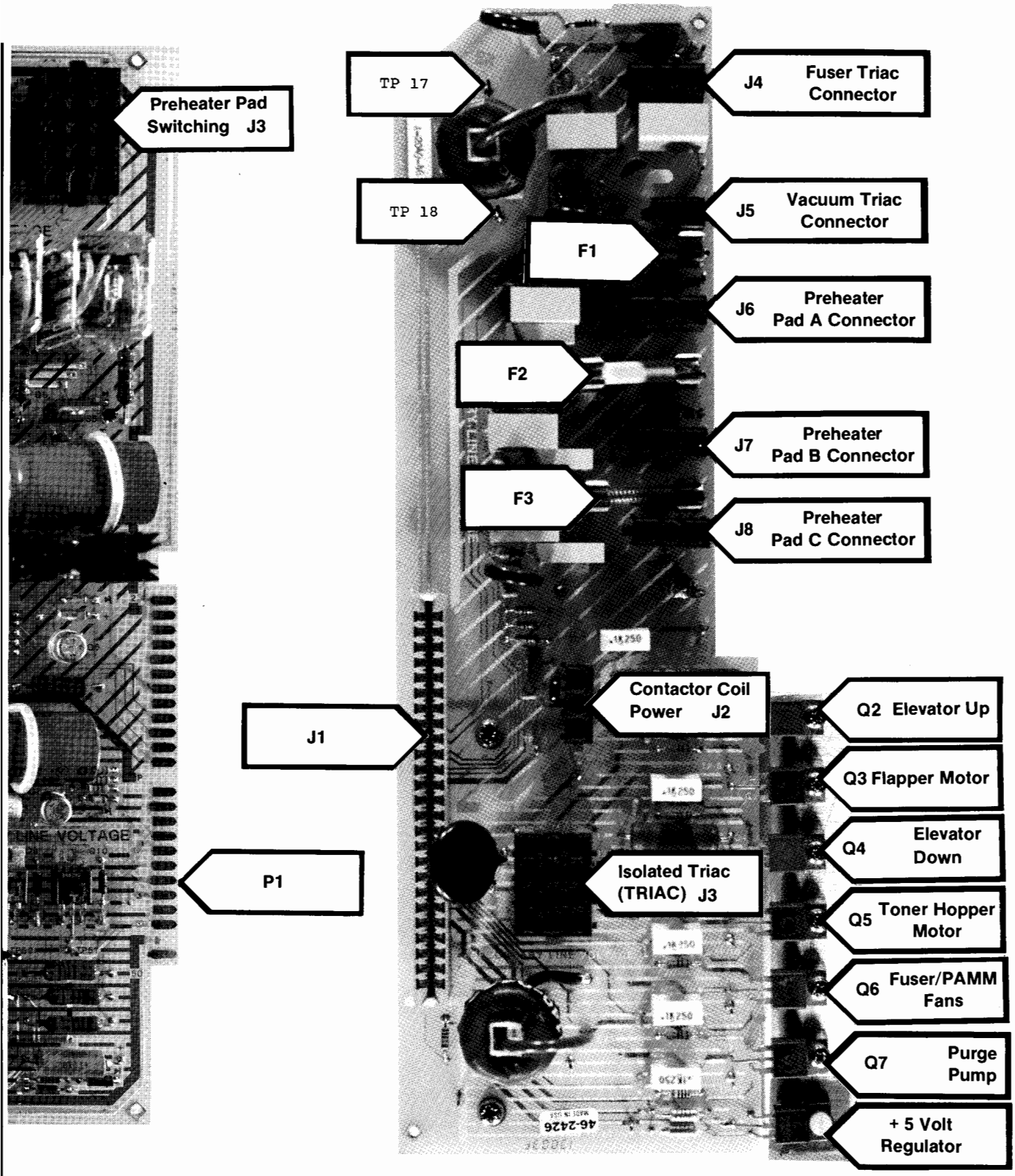
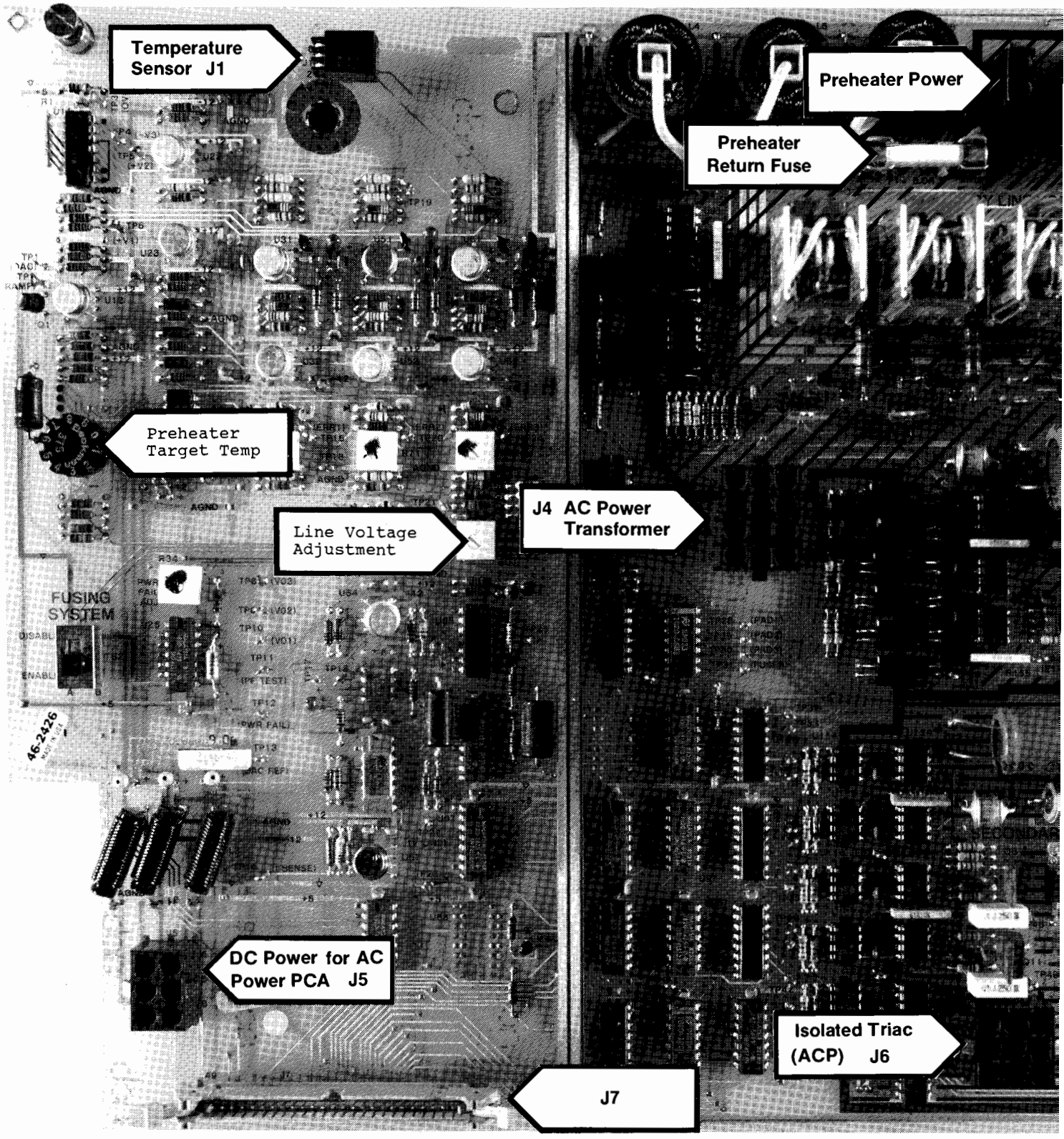


Figure 5-6. AC Power and Triac PCAs)


Temperature Sensor J1
Preheater Power
Preheater Return Fuse
Preheater Target Temp
J4 AC Power Transformer
Line Voltage Adjustment
FUSING SYSTEM
DC Power for AC Power PCA J5
Isolated Triac (ACP) J6
J7

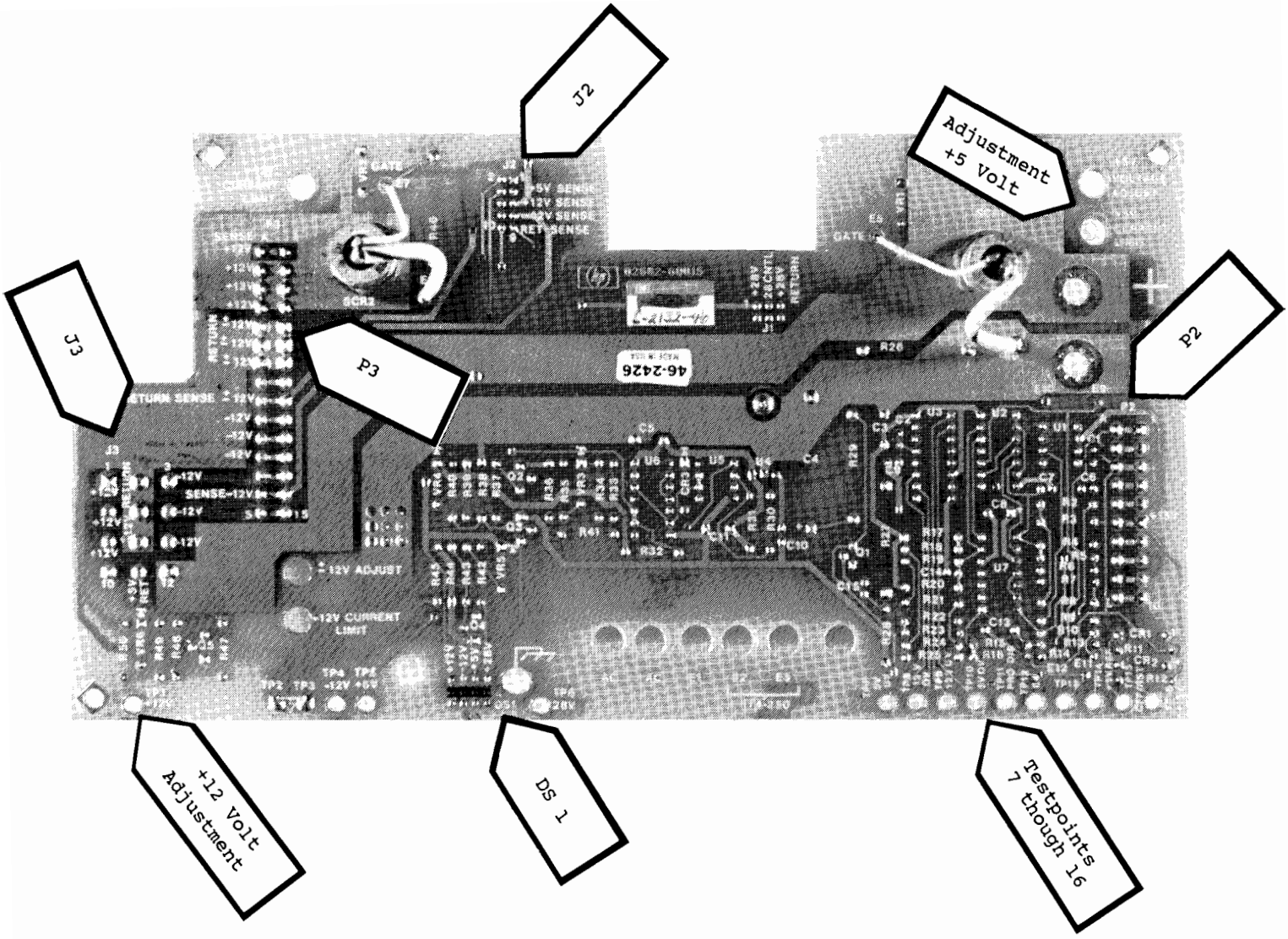


Figure 5-7. Power Distribution PCA

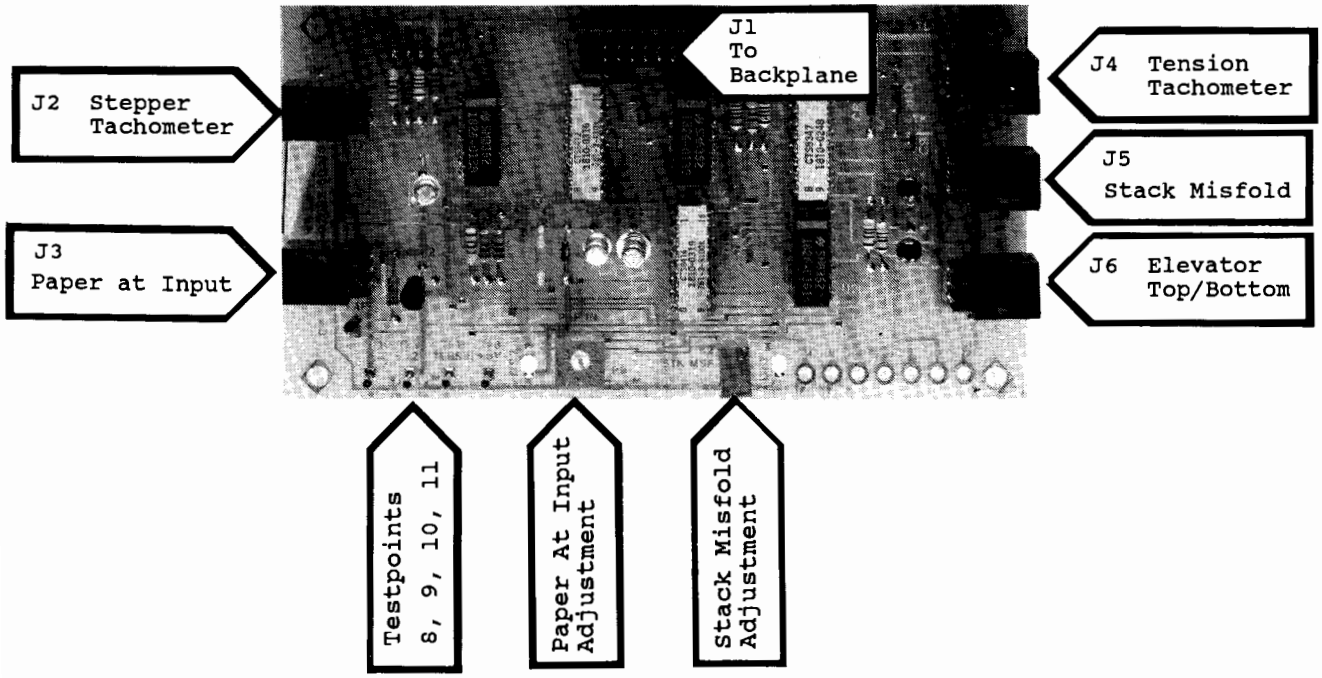


Figure 5-8. Sensor PCA

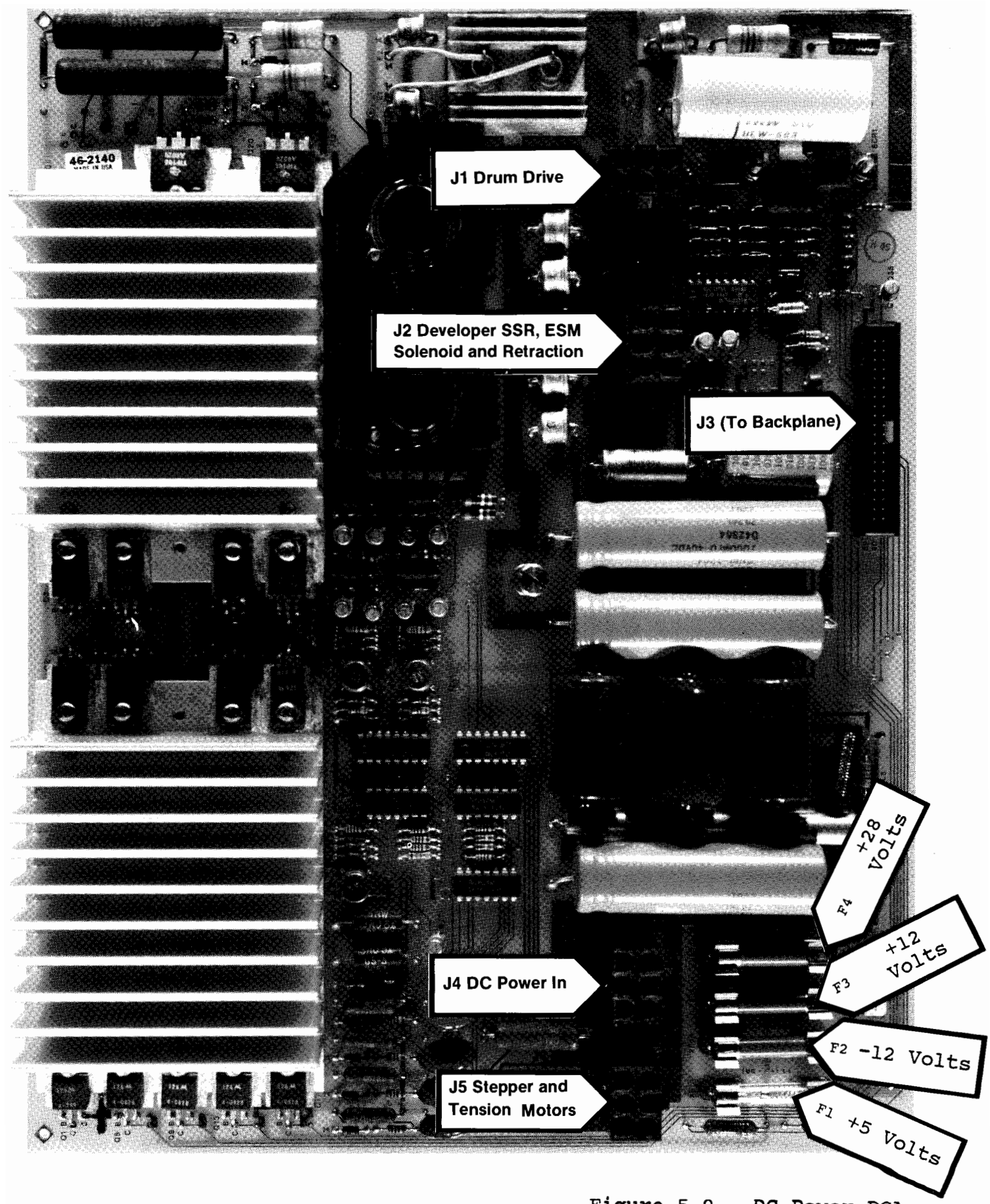


Figure 5-9. DC Power PCA

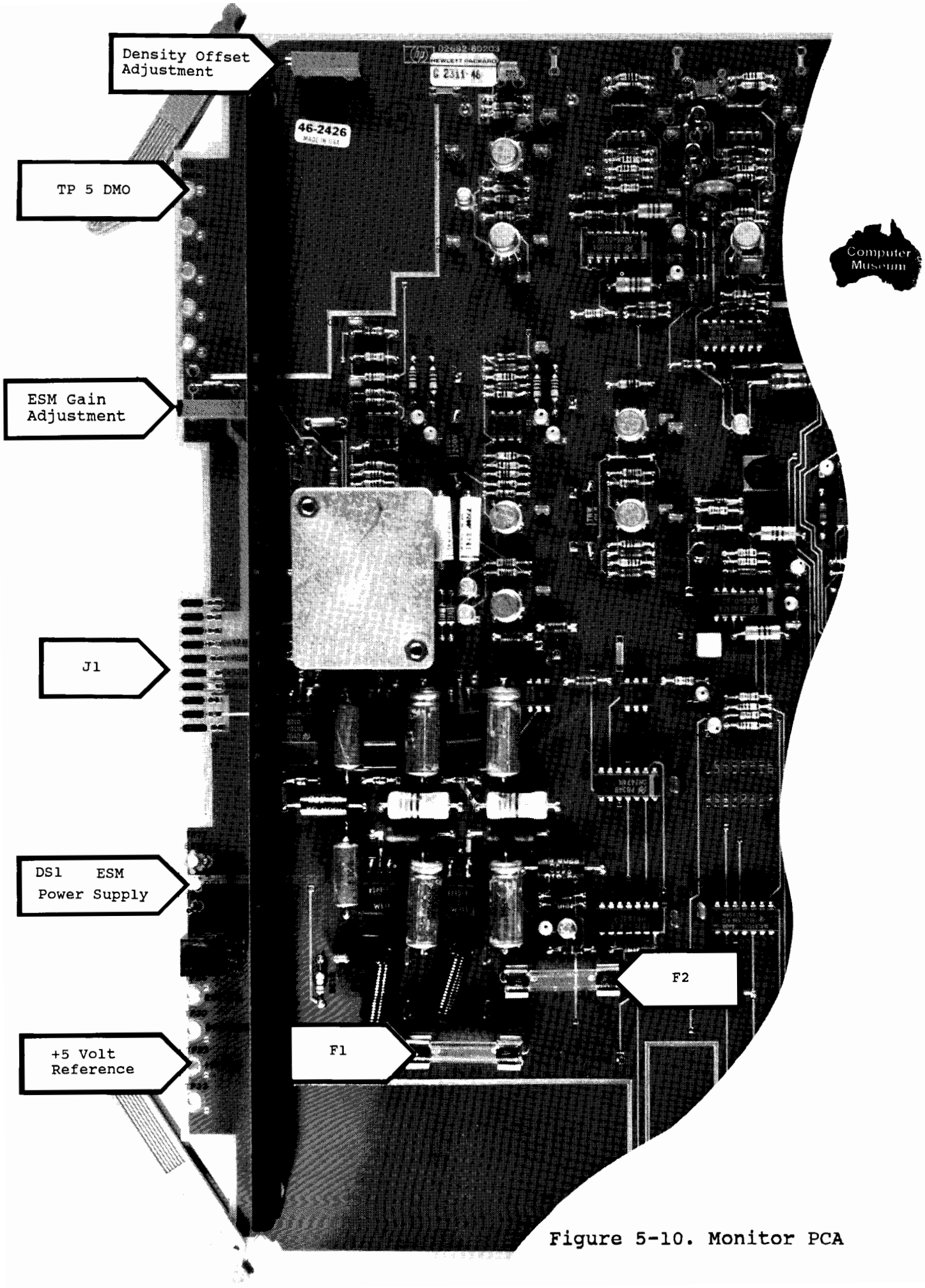


Figure 5-10. Monitor PCA

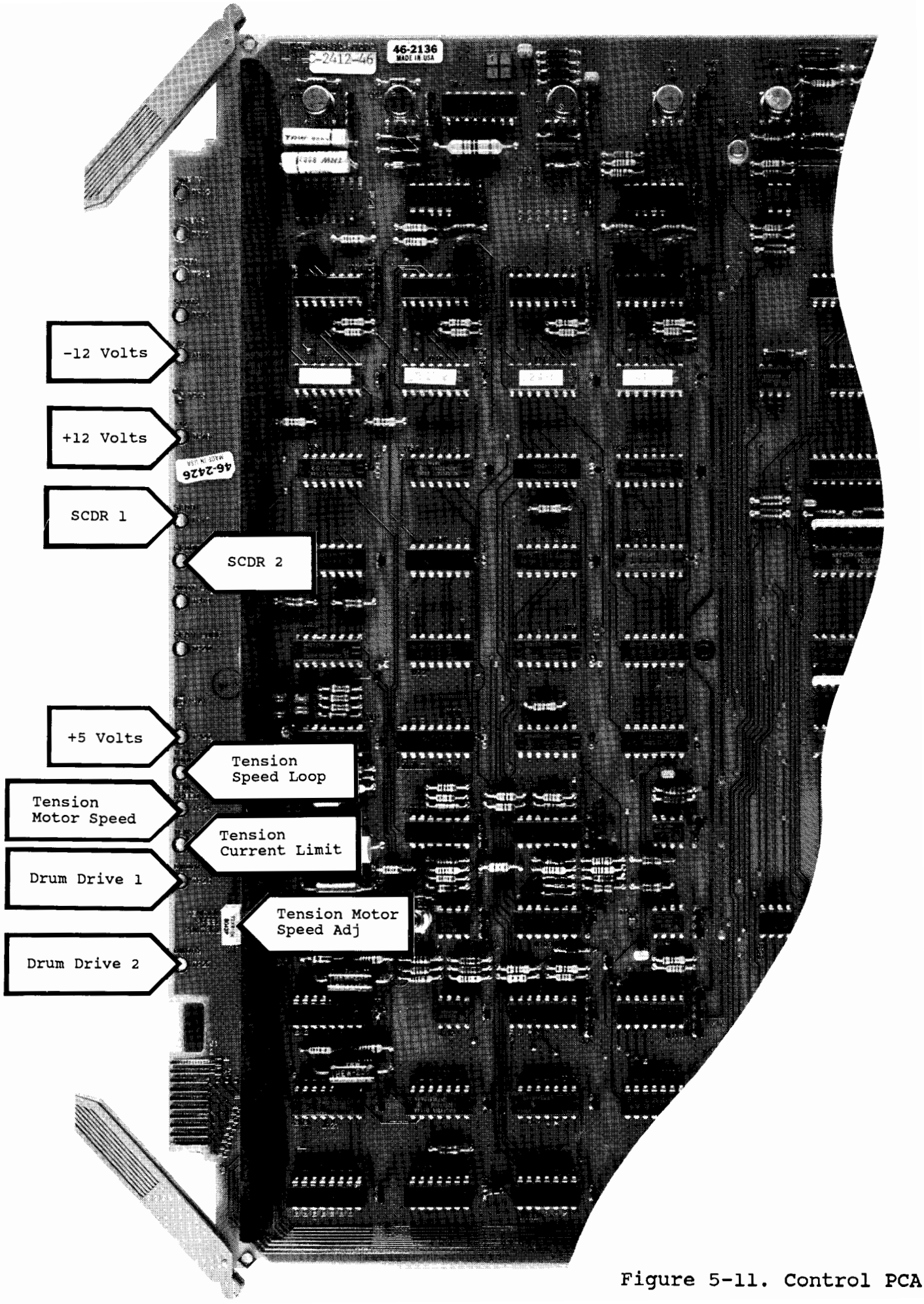


Figure 5-11. Control PCA

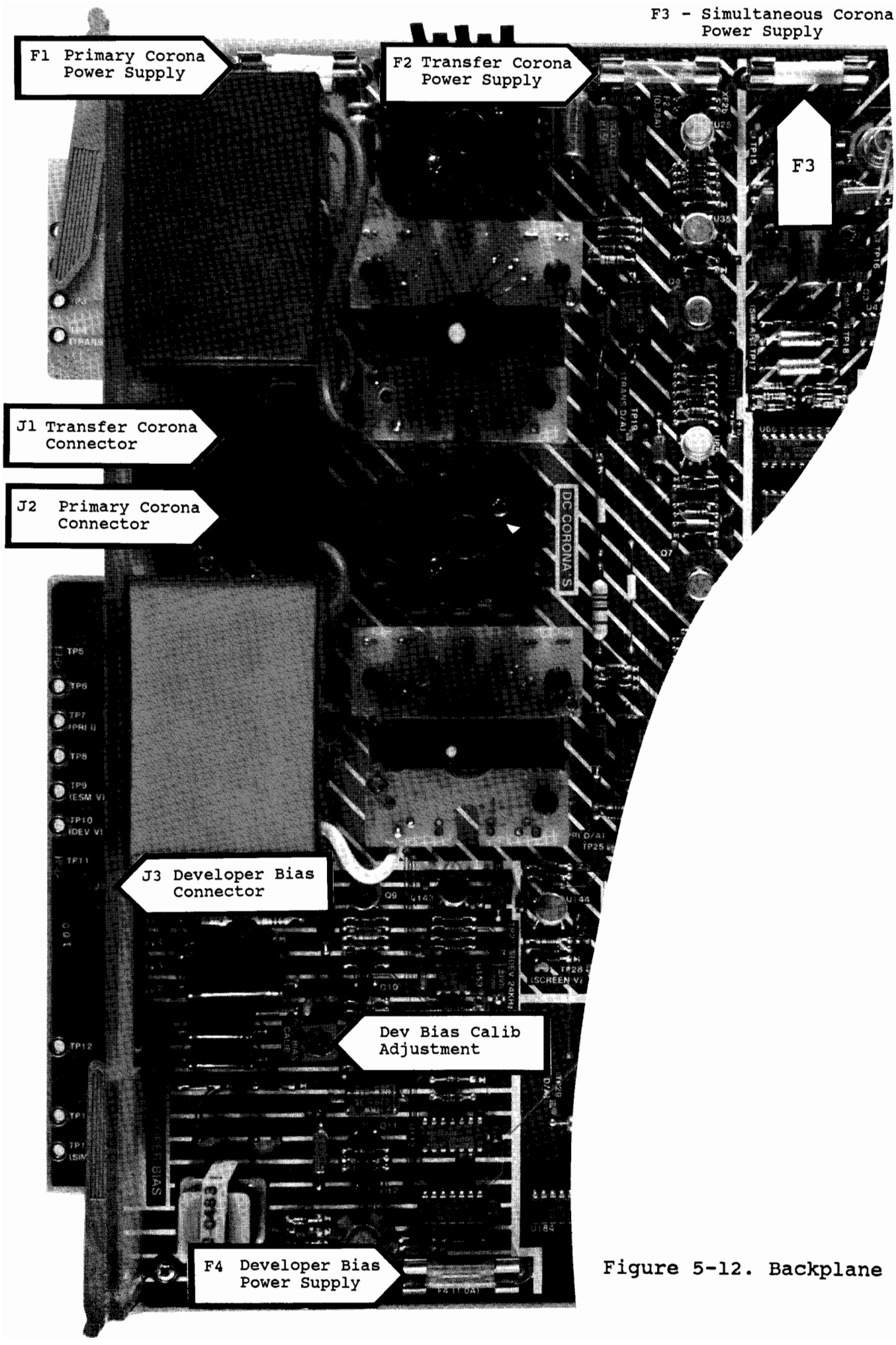


Figure 5-12. Backplane

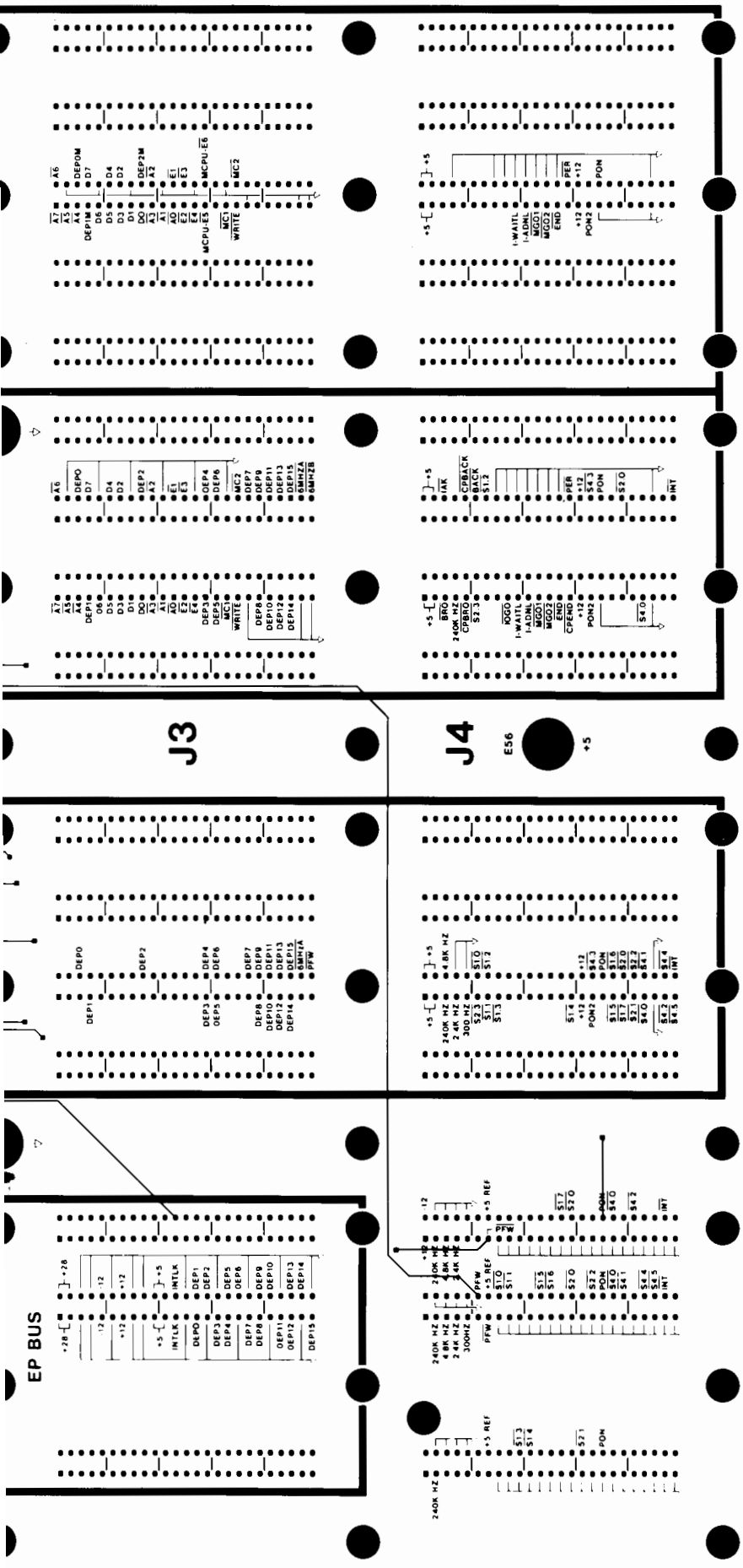
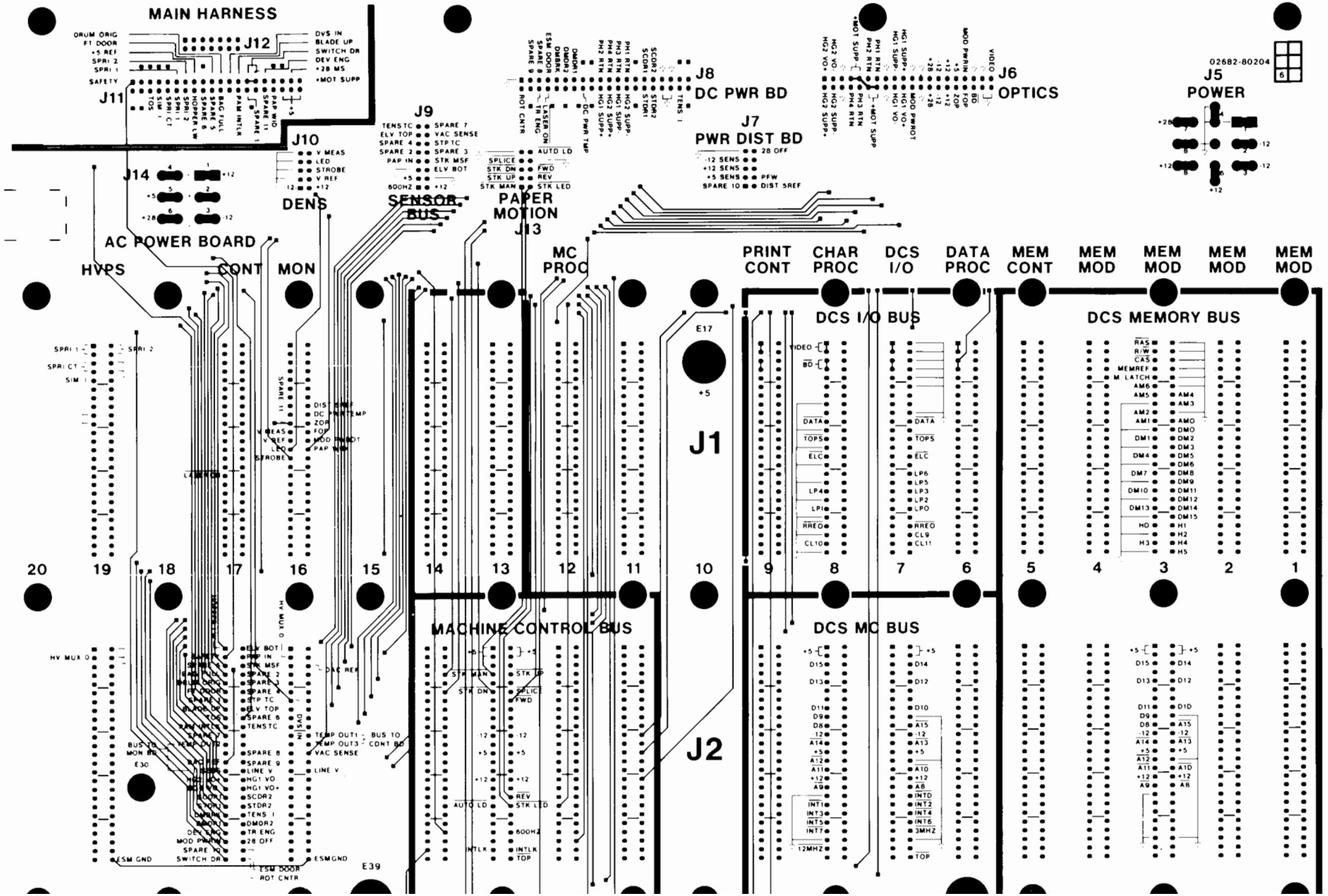


Figure 5-13. Backplane


MAIN HARNESS
J12
J11
J10
J9
J8
DC PWR BD
J7
PWR DIST BD
J6
OPTICS
J5
POWER
02682-80204
J14
DENS
SENSOR BUS
PAPER MOTION
J13
AC POWER BOARD
HVPS
CONT
MON
MC PROC
PRINT CONT
CHAR PROC
DCS I/O
DATA PROC
MEM CONT
MEM MOD
MEM MOD
MEM MOD
MEM MOD
DCS I/O BUS
DCS MEMORY BUS
DCS MC BUS
MACHINE CONTROL BUS
J1
J2
E17
E30
E39
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
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4
3
2
1

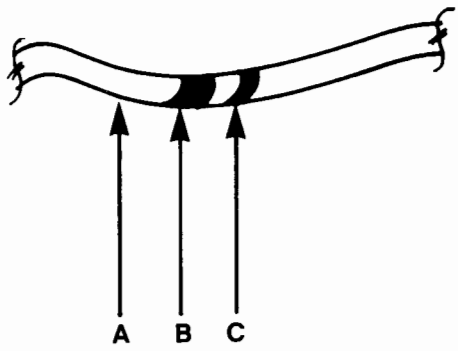
SECTION VI.
LOGIC DIAGRAMS

6-1. INTRODUCTION

This section of the manual provides a block diagrams of the major circuitry systems in the printer. The following diagrams are contained in this section of the manual:

The following color code is used for identification of wiring in the 2680A printer:

COLOR	A	B	C
Black	0	0	0
Brown	1	1	1
Red	2	2	2
Orange	3	3	3
Yellow	4	4	4
Green	5	5	5
Blue	6	6	6
Violet	7	7	7
Grey	8	8	8
White	9	9	9



Example: A wire marked "92" would indicate a white wire with a "red" band.

The following assumptions are used when measuring signals in the logic diagrams:

Testpoints (TP)	-	All testpoints are measured with an oscilloscope using a floating (non-grounded) test probe.
AC voltages	-	Are are labeled "VAC" or "VACpp"
DC voltages	-	No label or V
High	-	TTL +5 Vdc
Low	-	TTL 0 Vdc

7	8	9	10	11	12	13	14	15
ERASE LAMP	FUSER/PAMM FANS/CHNBX	OVERALL ILLUMINATION	ELEVATOR ENABLE	ELEVATOR UP/DOWN	FLAPPER MOTOR	PURGE FAN/PUMP	INPUT AIR SPLICE	LASER ON
DRUM ON	TRANSFER ENGAGE	ESM DOOR	ROTATION COUNTER	N/U	N/U	SINGLE STEP	REVERSE INPUT	PAPER STEP
		BEAM OFF	BEAM ON	DOUBLE JOB SEPARATION	SINGLE JOB SEPARATION	DEN. MARK	ELECTROSTATIC MONITOR MARK	N/U
	NOT USED							
	SIMULTANEOUS CORONA WORD							
	NOT USED							
4	CURRENT SENSE RESET	CURRENT SENSE MULTIPLEXER 0	1	2	POWER CONTROL FACTOR 0	1	2	3
NOT USED				ANALOG MULTIPLEXER SELECT 0	1	2	3	4
POWER FAIL WARN RESET	NOT USED							
	NOT USED				DOOR BIAS	HIGH VOLTAGE MULTIPLEXER 0	1	2
NOT USED								
TE TO DATA CONTROL SYSTEM 7	8	9	10	11	12	13	14	15
NOT USED								
NOT USED								
DISPLAY RESET	0	1	8048 DISPLAY DATA INPUT WORD 2	3	4	5	6	7
NOT USED							TOP OF PAGE SYNC	N/U
POWER FAIL WARNING	NOT USED							
ELEVATOR BOTTOM	HOPPER LOW	BAG FULL	SEPARATOR FULL	VACUUM SENSOR	N/U		POWER FAIL	N/U
	ANALOG/DIGITAL INPUT WORD 0	1	2	3	4	5	6	7
READ FROM DATA CONTROL SYSTEM 7	8	9	10	11	12	13	14	15
4	JAM FAST	JAM SLOW	PAPER AT INPUT	HALL EFFECT 1	HALL EFFECT 2	N/U	STEPPER TACHOMETER	TOP OF DRUM
					BLADE UP	N/U	PAMM INTERLOCK	FRONT DOOR
ADJUST PRINT LEFT	ADJUST PRINT DOWN	DISPLAY	5	8	NOT USED			2
CLEAR	STACK MANUAL	STACK UP	STACK DOWN	SPLICE	6	PAPER FORWARD	PAPER REVERSE	THREAD PAPER

R I/Os (DATA BUS AND SELECT LINES)

SELECT GROUP \ DATA BUS	0	1	2	3	4	5	6
0 (S1.0)	N/U	AC POWER CONTACTOR	VACUUM ON	FUSER ON	PREHEATER ON	N/U	TONER HOPPER ON
1 (S1.1)	NOT USED		ALL SWITCHES	28 VOLTS	N/U	DEVELOPER ENGAGED	SCANNER ON
2 (S1.2)	MARGIN OFFSET						
3 (S1.3)	TRANSFER CORONA WORD						
4 (S1.4)	PRIMARY CORONA WORD						
5 (S1.5)	LASER INTENSITY WORD						
6 (S1.6)					PREHEATER SECTIONS 1	2	3
7 (S1.7)	START OF CONVERSION			NULL LOOP	GATE	GAIN SELECT	DEN. LED ON
8 (S2.0)	TIMER RESET	DCS READ RESET	DCS ACK RESET	END OF CONVERSION RESET	NOT USED		SCANNER RESET
9 (S2.1)	DEVELOPER BIAS WORD						
10 (S2.2)							
11 (S2.3)	0	1	2	3	4	5	6 WI
12 (S2.4)							
13 (S2.5)							
14 (S2.6)	CHIP/SELECT DISPLAY	NOT USED		STACK MANUAL LED	BEEP	RUN LED	N/U
15 (S2.7)							
16 (S4.0)	TIMER	DCS READ	DCS ACKNOWLED	END OF CONVERSION	NOT USED		SCANNER
17 (S4.1)	TOP OF STACK	NOT USED				STACKER MISFOLD	ELEVATOR TOP
18 (S4.2)		NOT USED					
19 (S4.3)	0	1	2	3	4	5	6
20 (S4.4)	NOT USED			0	1	STEPNUM COUNT 2	3
21 (S4.5)	NOT USED						
22 (S4.6)	ADJUST PRINT UP	7	4	1	0	PRINT SINGLE	RUN
23 (S4.7)	ENTER	ADJUST PRINT RIGHT	EJECT SINGLE	EJECT ALL	HALT	9	3

MACHINE CONTROL PROCESSO

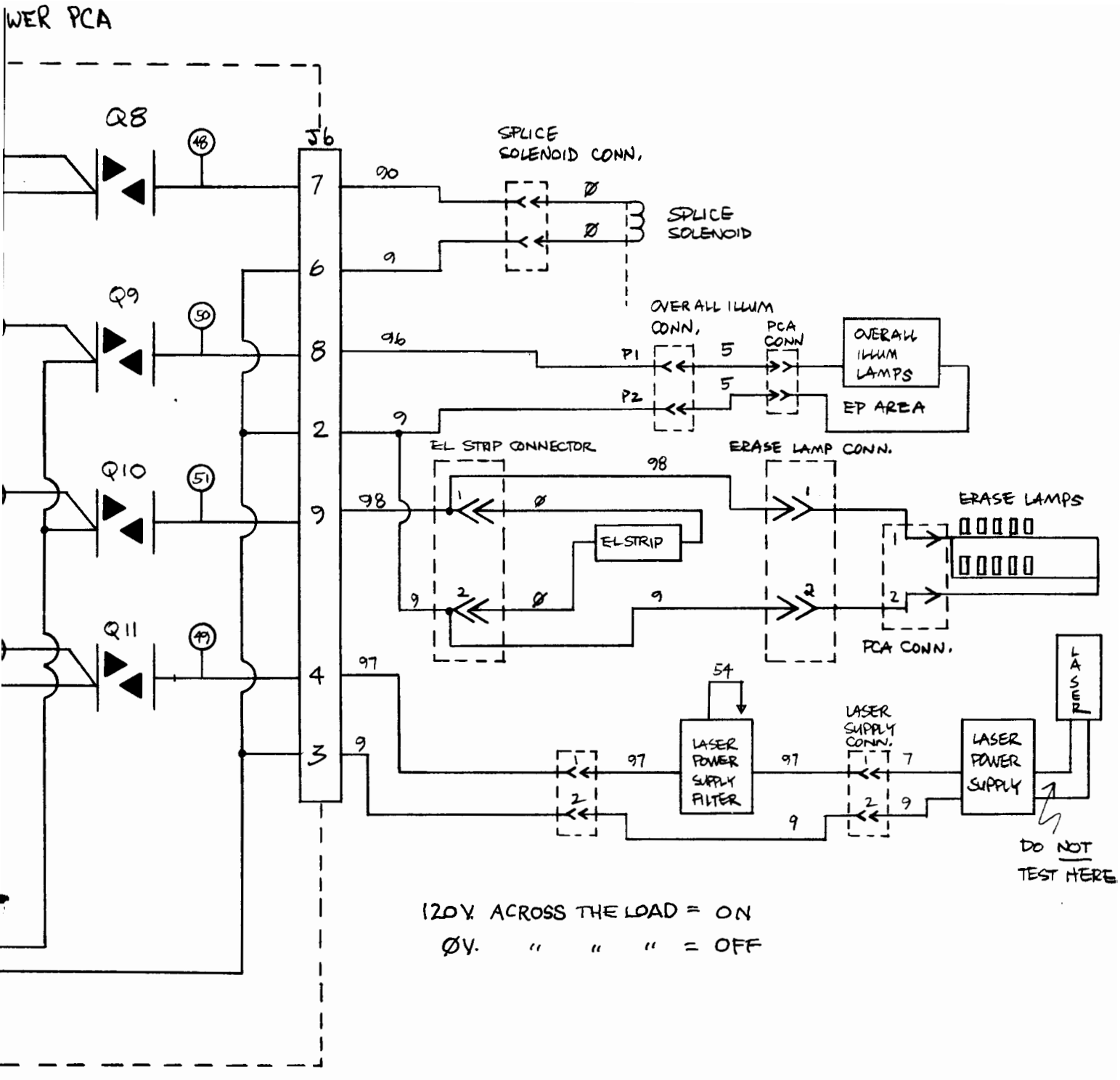
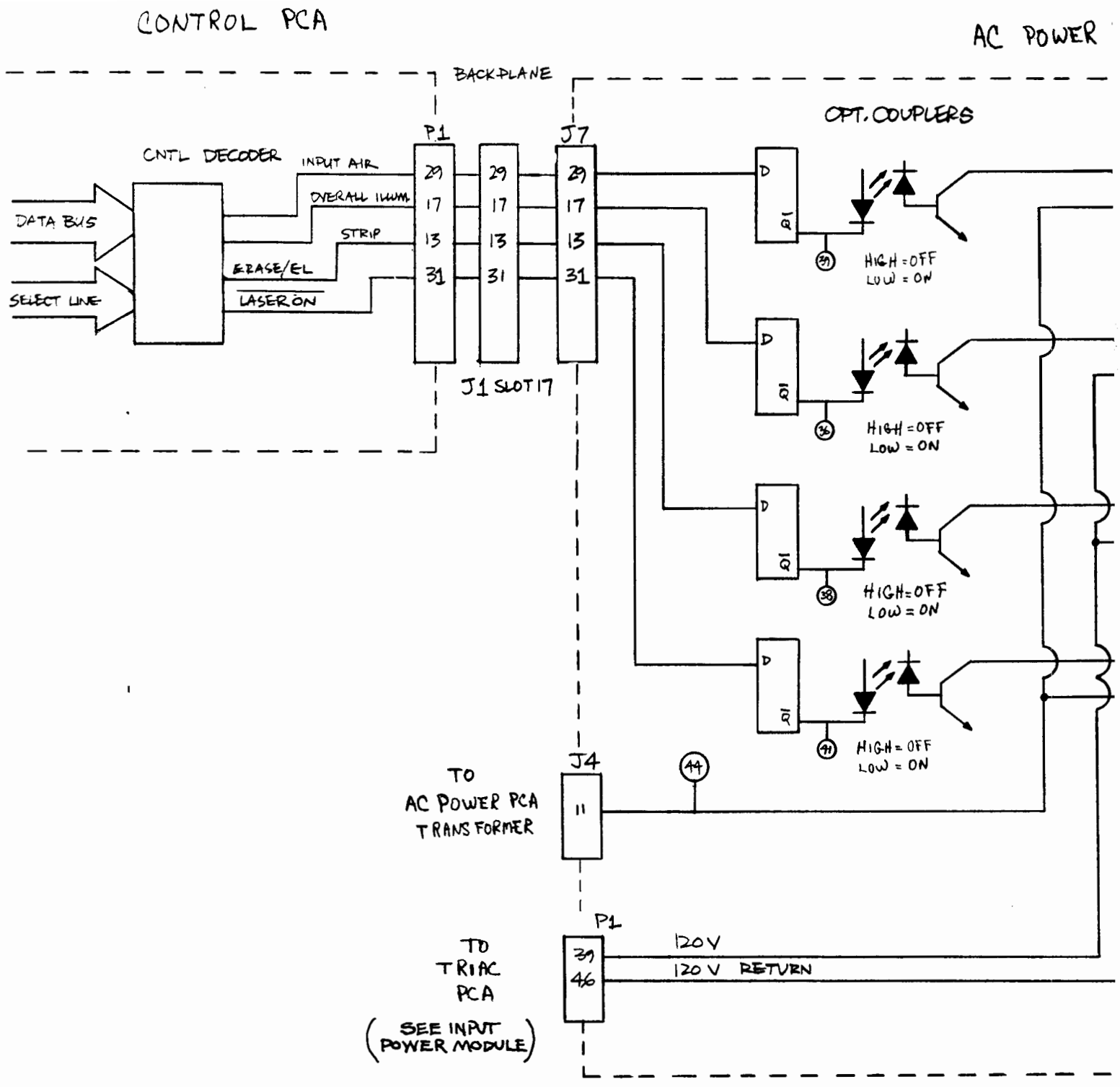


Figure 6-1. Isolated Triacs (AC Power PCA)


CONTROL PCA
AC POWER
BACKPLANE
OPT. COUPLERS
P1
J7
CNTL DECODER
INPUT AIR
OVERALL ILLUM.
STRIP
ERASE/EL
LASER ON
DATA BUS
SELECT LINE
29
17
13
31
J1 SLOT 17
Q1
HIGH = OFF
LOW = ON
J4
TO
AC POWER PCA
TRANSFORMER
11
44
TO
TRIAC
PCA
(SEE INPUT POWER MODULE)
39
46
120 V
120 V RETURN

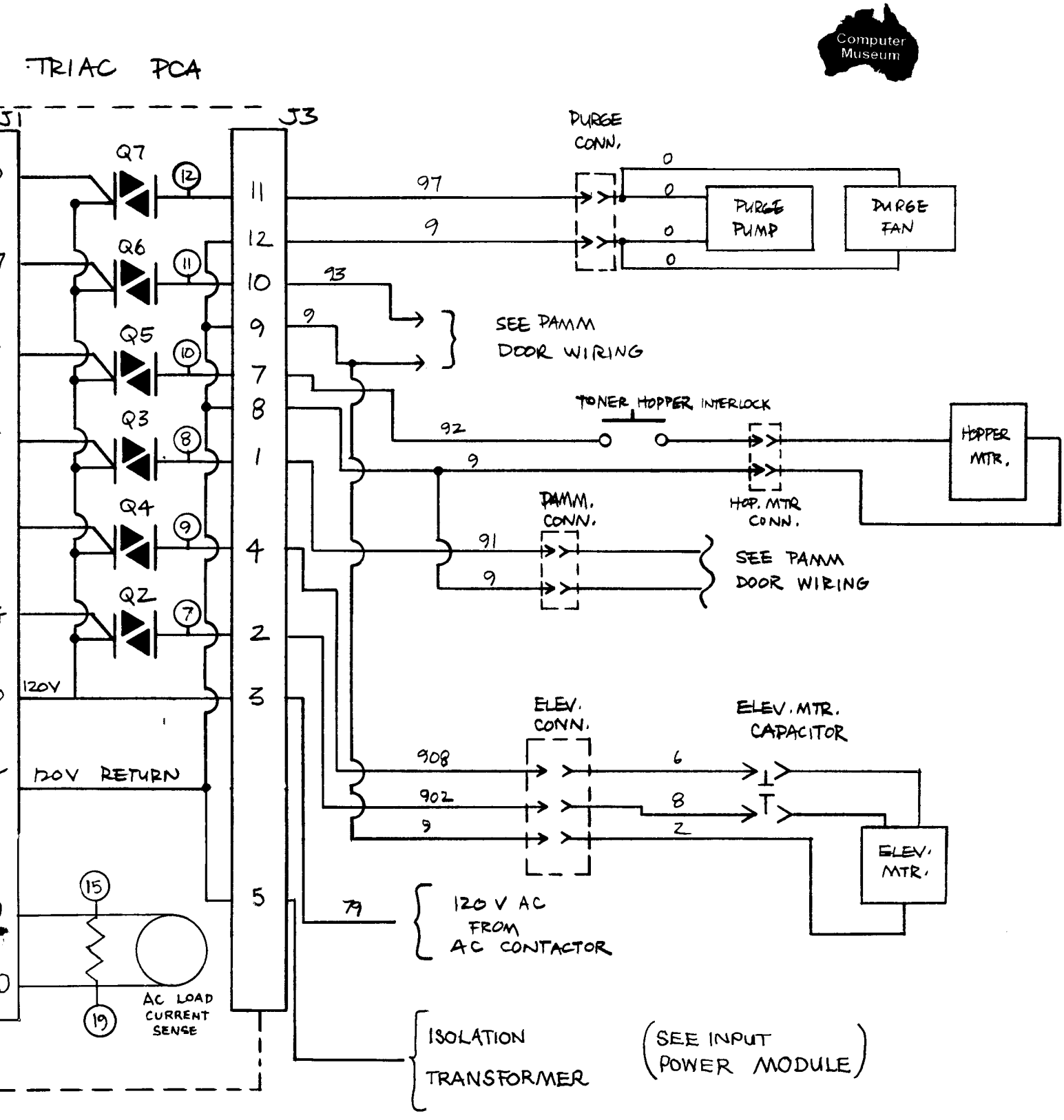
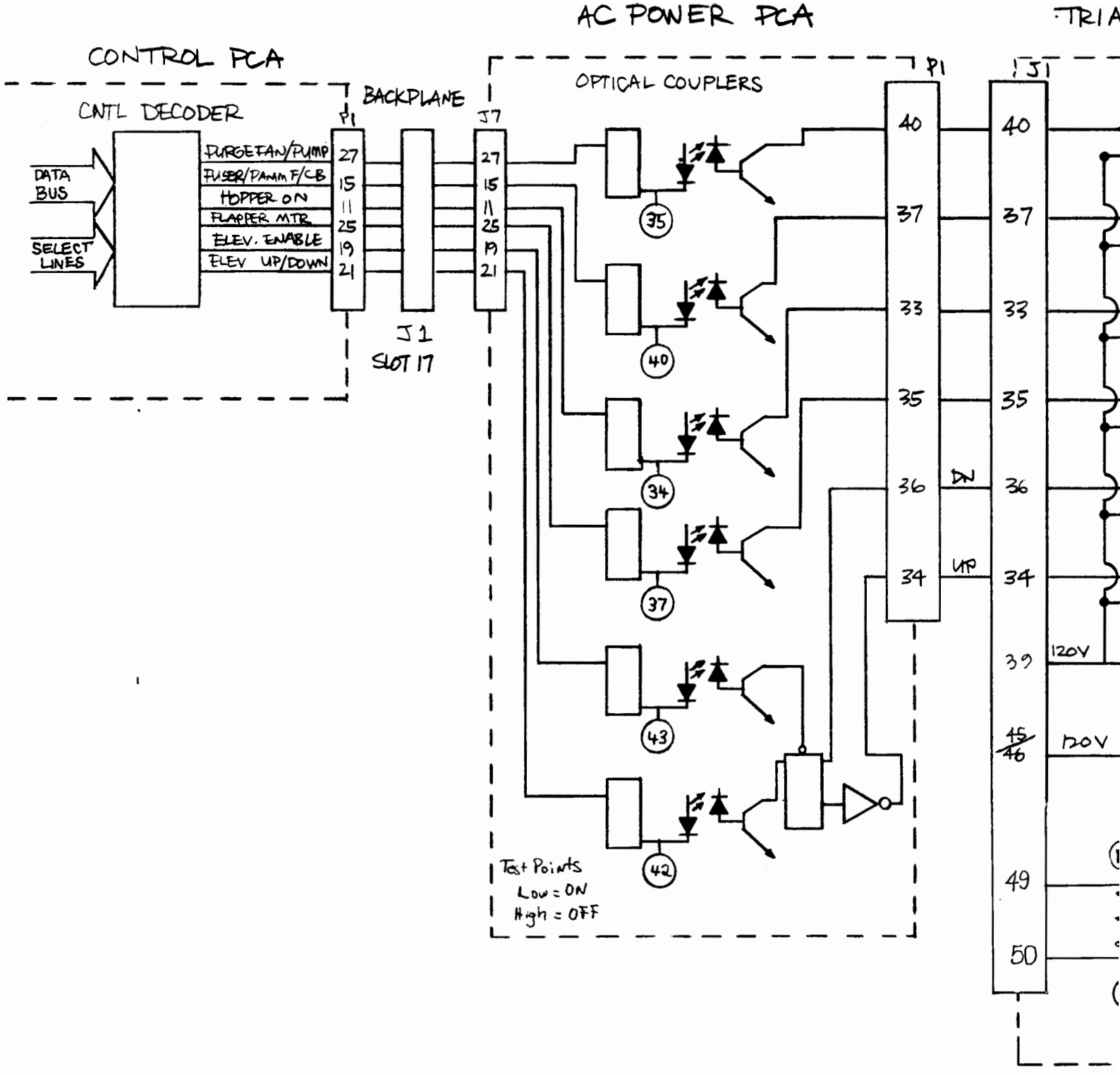


Figure 6-2. Isolated Triacs (Triac PCA)


AC POWER PCA
TRIA
CONTROL PCA
CNTL DECODER
DATA BUS
SELECT LINES
PURGE FAN/PUMP
FUSER/PAMM F/CB
HOPPER ON
FLAPPER MTR
ELEV. ENABLE
ELEV UP/DOWN
P1
27
15
11
25
19
21
BACKPLANE
J7
J1
SLOT 17
OPTICAL COUPLERS
35
40
34
37
43
42
Test Points
Low = ON
High = OFF
P1
40
37
33
35
36
34
DN
UP
J1
40
37
33
35
36
34
39
120V
45/46
120V
49
50

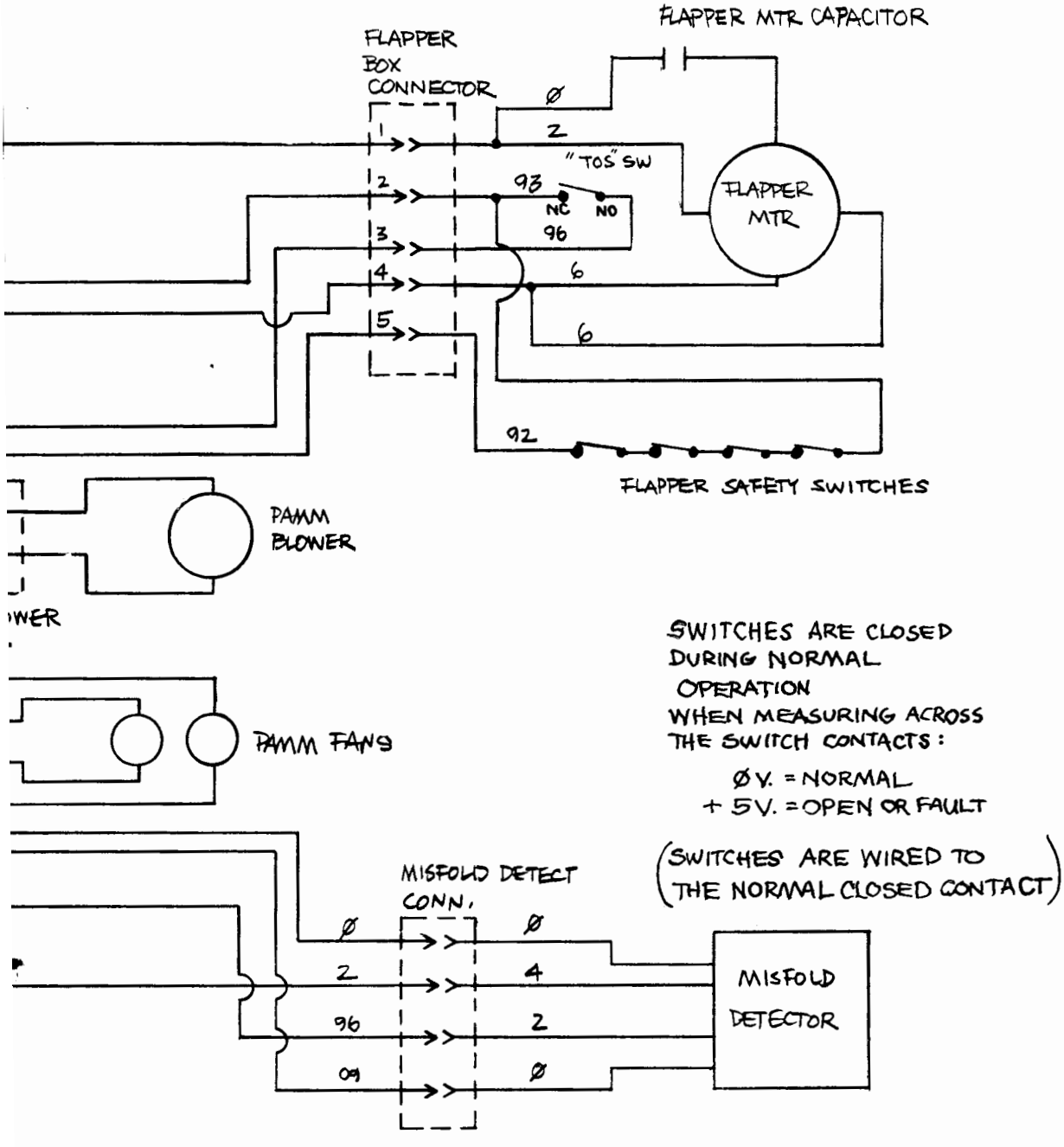
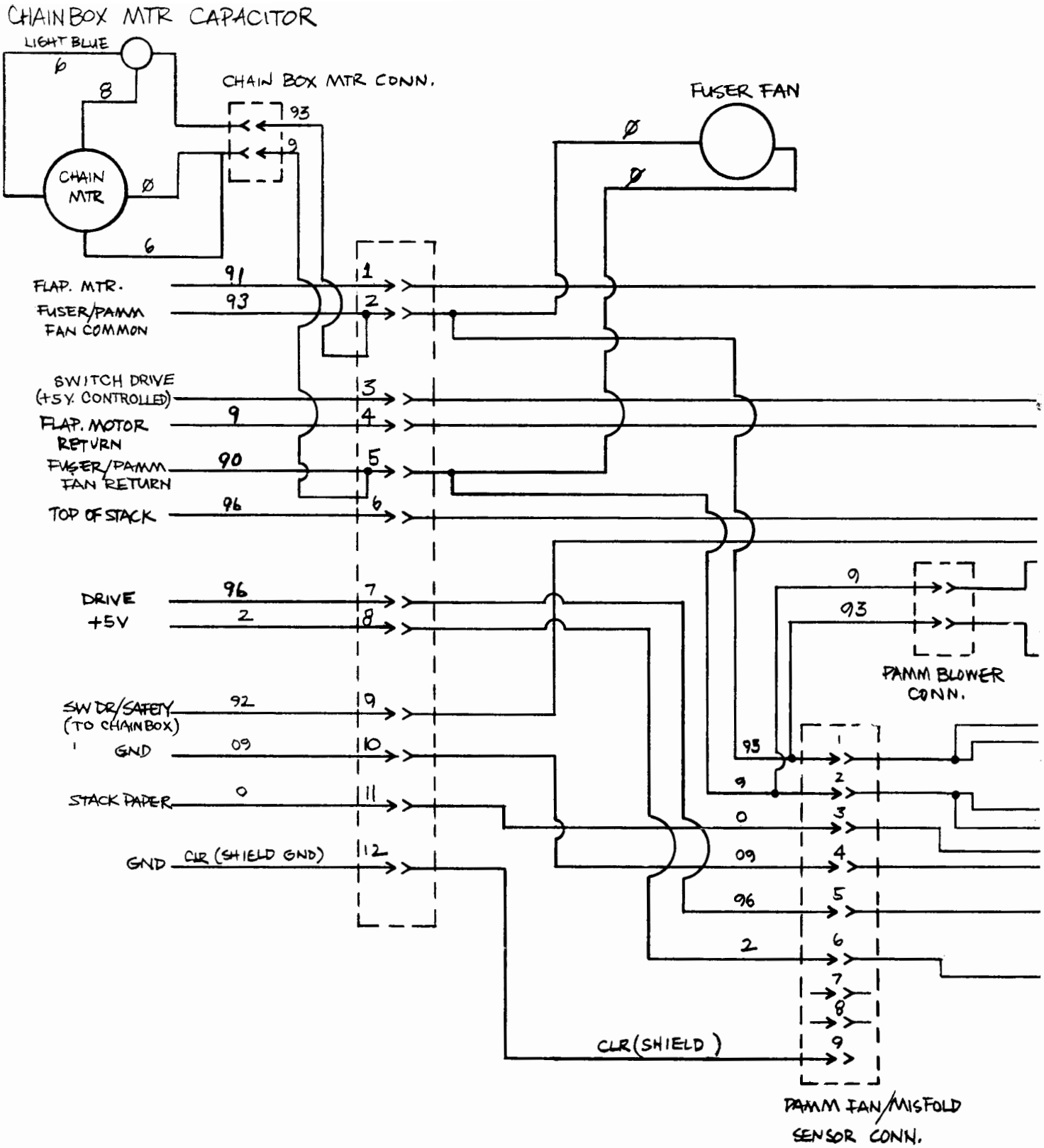


Figure 6-2A. PAMM Door Connector


CHAIN BOX MTR CAPACITOR
LIGHT BLUE
6
8
CHAIN MTR
Ø
6
CHAIN BOX MTR CONN.
93
9
FUSER FAN
Ø
Ø
FLAP. MTR.
91
FUSER/PAMM FAN COMMON
93
SWITCH DRIVE (+5V. CONTROLLED)
FLAP. MOTOR RETURN
9
FUSER/PAMM FAN RETURN
90
TOP OF STACK
96
DRIVE +5V
96
2
SW DR/SAFETY (TO CHAIN BOX)
92
GND
09
STACK PAPER
0
GND
CLR (SHIELD GND)
1
2
3
4
5
6
7
8
9
10
11
12
9
93
PAMM BLOWER CONN.
93
9
0
09
96
2
CLR (SHIELD)
2
3
4
5
6
7
8
9
PAMM FAN/MISFOLD SENSOR CONN.

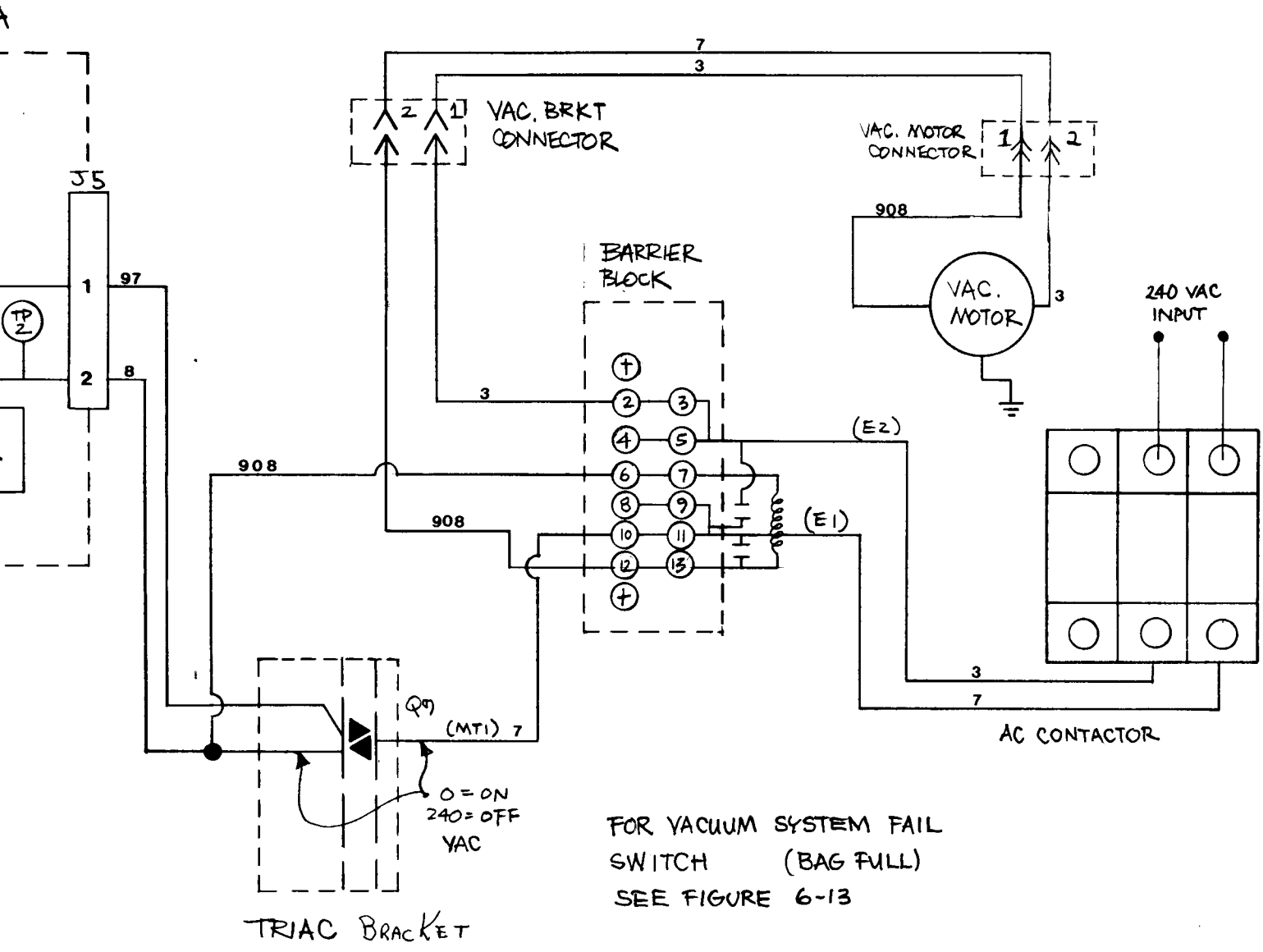
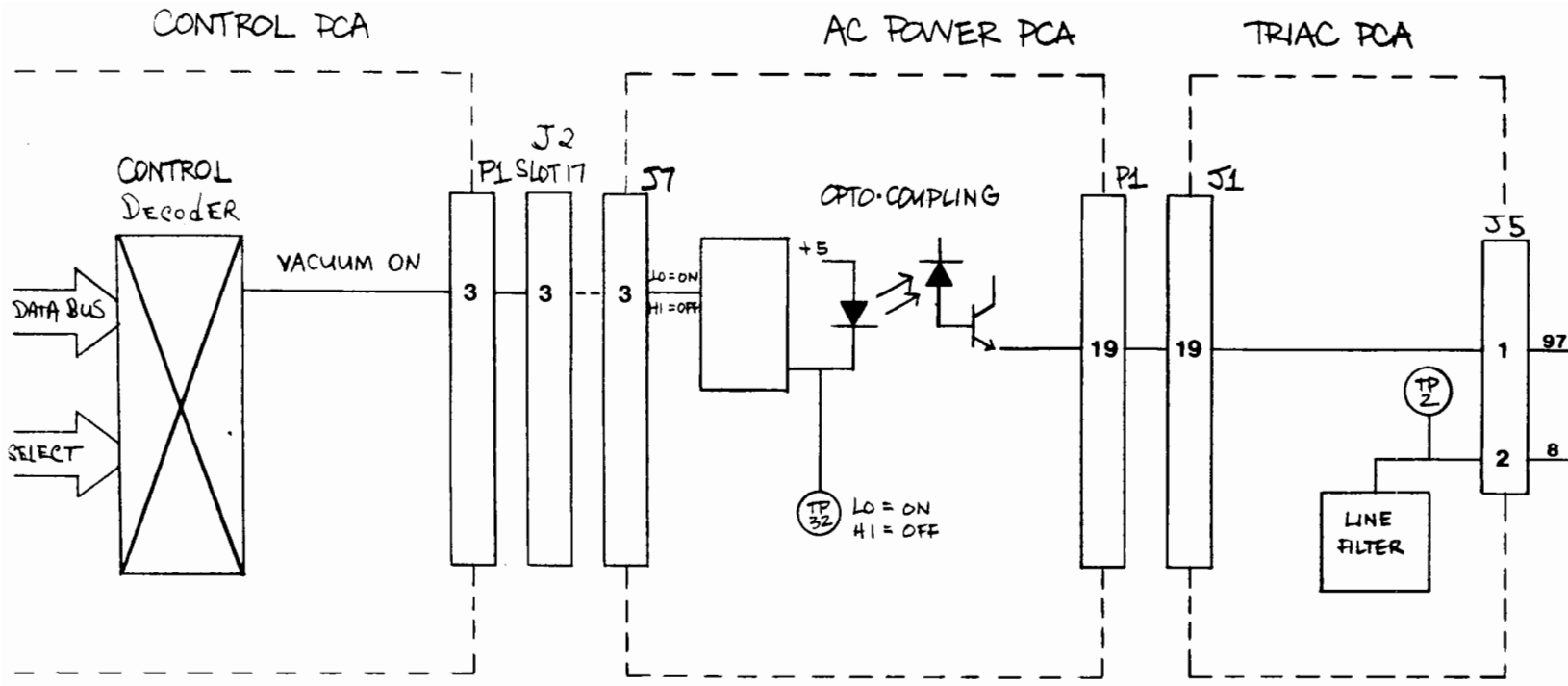
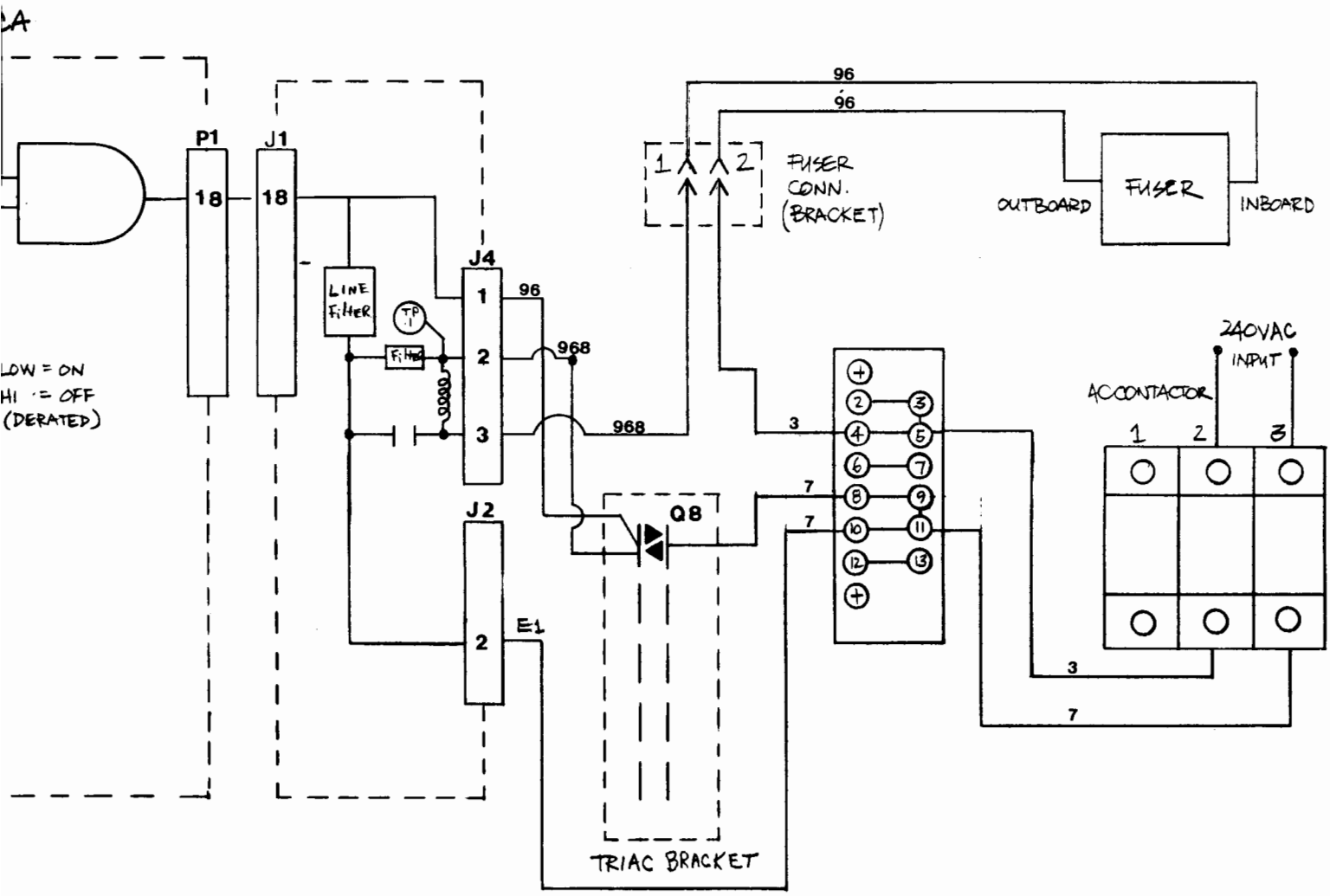


Figure 6-3. Vacuum Motor


CONTROL PCA
AC POWER PCA
TRIAC PCA
CONTROL
DECODER
DATA BUS
SELECT
VACUUM ON
3
J2
P1 SLOT 17
3
J7
3
LO = ON
HI = OFF
+5
OPTO-COUPLING
TP 32
LO = ON
HI = OFF
P1
19
J1
19
J5
1
97
TP 2
2
8
LINE FILTER

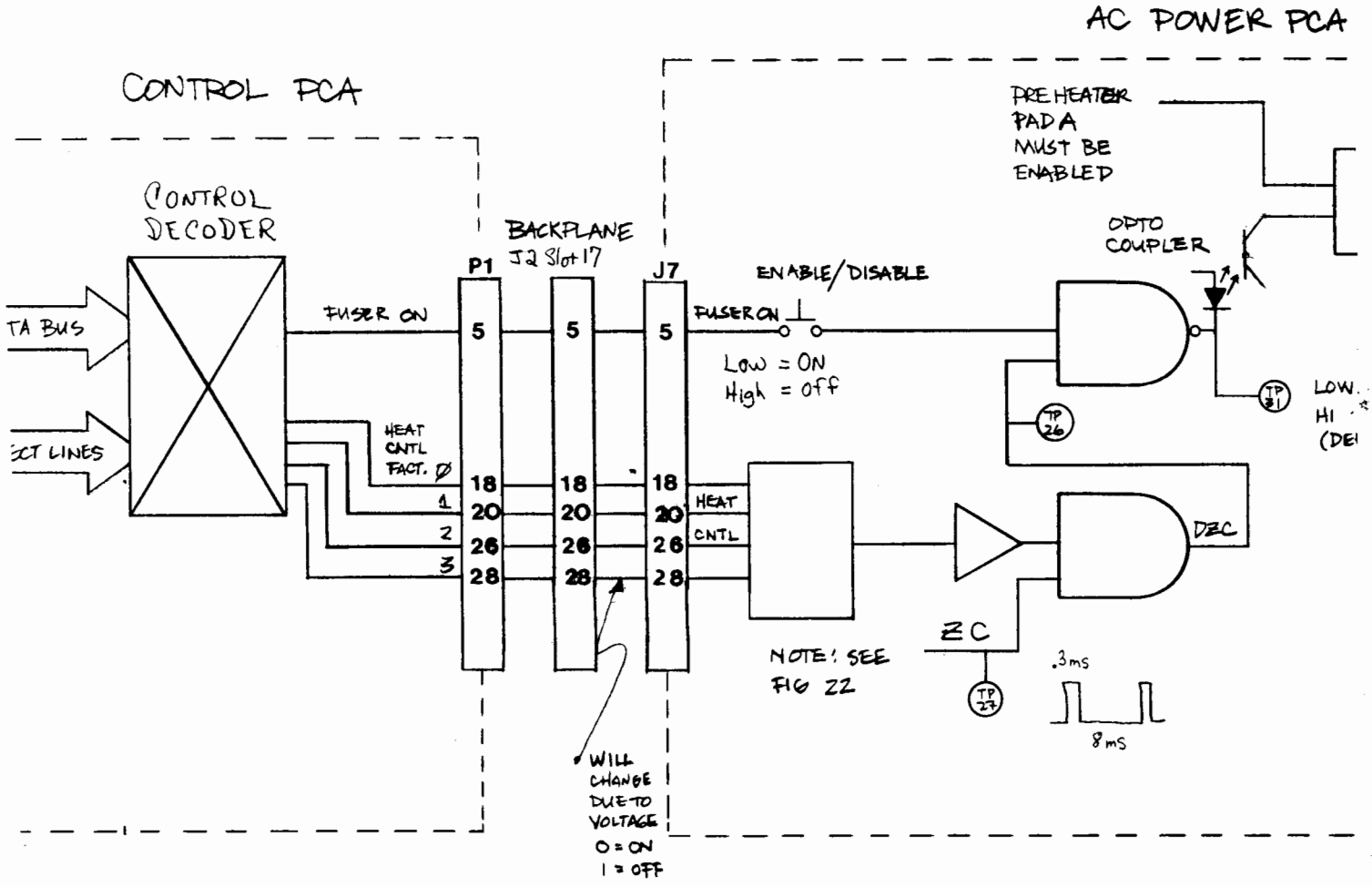


NOTE

TP1 ON = ~~~ 240 VAC

OFF = ~~~ 240 VAC

Figure 6-4. Fuser Lamp


AC POWER PCA
CONTROL PCA
PREHEATER PAD A MUST BE ENABLED
CONTROL DECODER
BACKPLANE J2 Slot 17
P1
J7
OPTO COUPLER
ENABLE/DISABLE
TA BUS
CT LINES
FUSER ON
FUSER ON
Low = ON
High = off
HEAT CNTL FACT. Ø
1
2
3
5
18
20
26
28
HEAT CNTL
TP 26
TP 31
LOW
HI
(DE
DZC
ZC
TP 27
.3ms
8ms
NOTE: SEE FIG 22
WILL CHANGE DUE TO VOLTAGE
0 = ON
1 = OFF

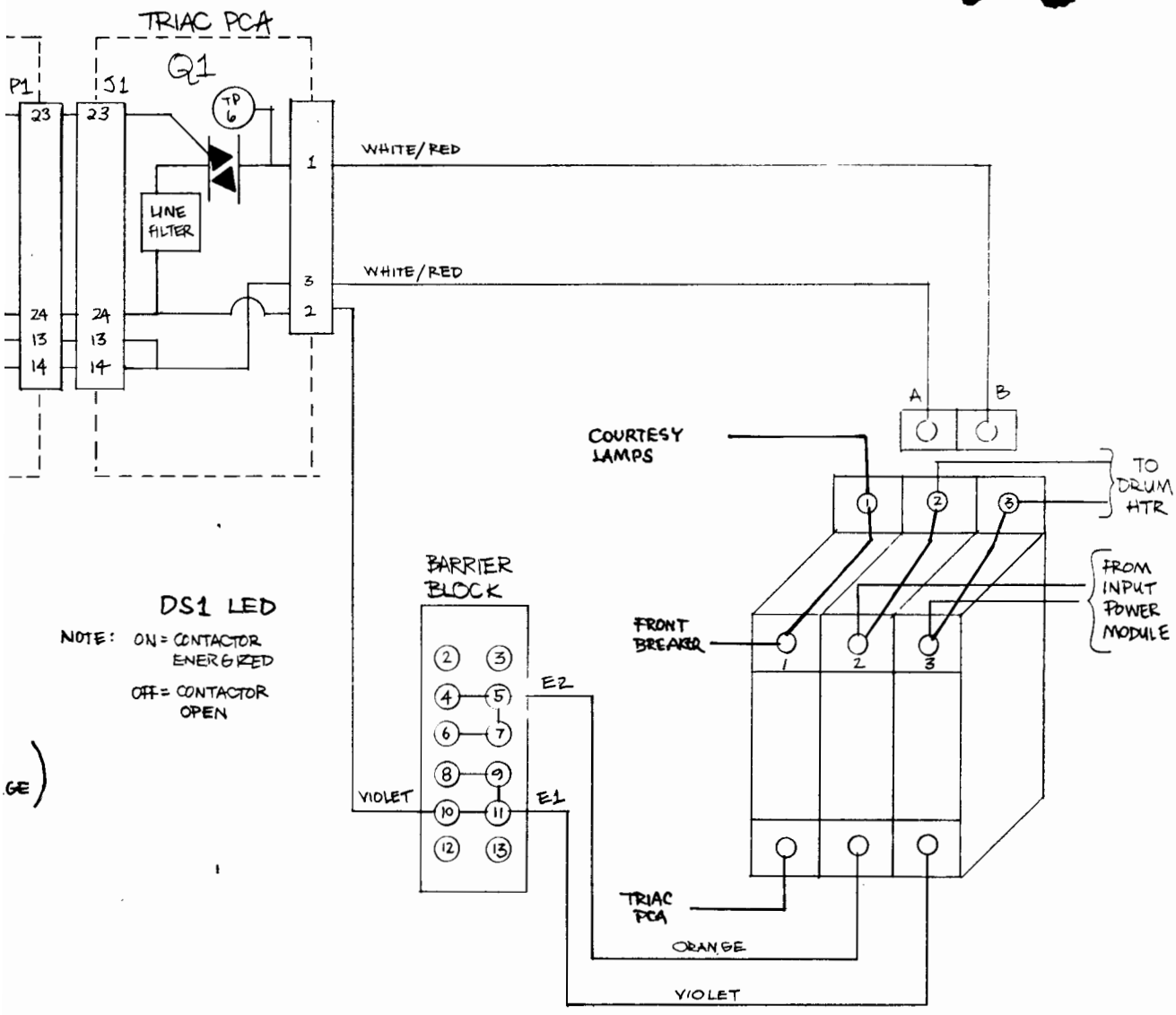
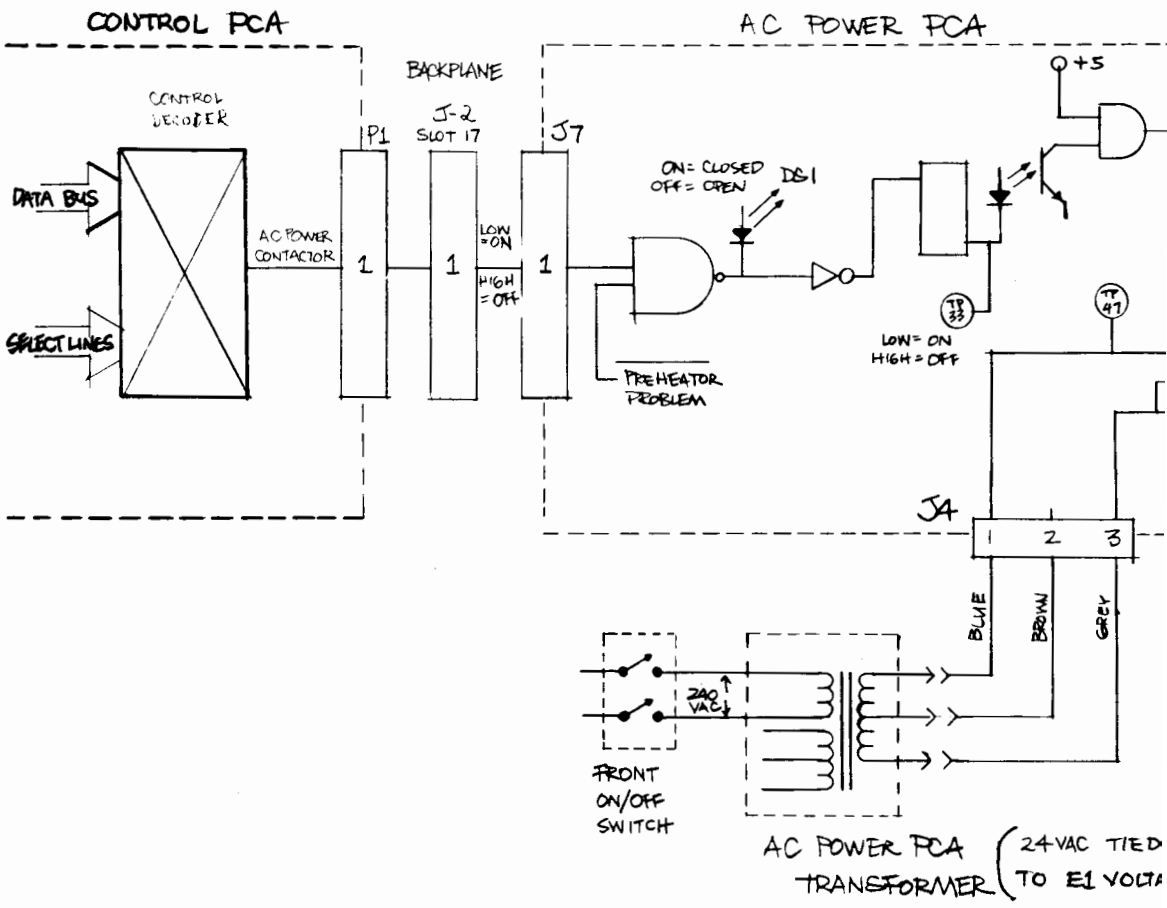
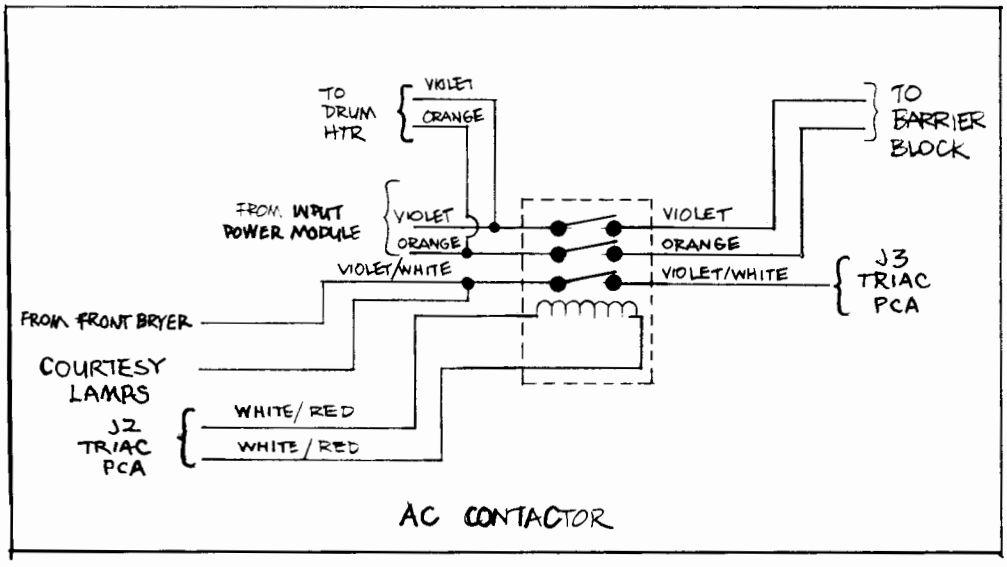


Figure 6-5. AC Contractor


CONTROL PCA
AC POWER PCA
BACKPLANE
CONTROL DECODER
DATA BUS
SELECT LINES
AC POWER CONTACTOR
P1
J-2 SLOT 17
J7
LOW = ON
HIGH = OFF
ON = CLOSED OFF = OPEN
DS1
PREHEATOR PROBLEM
+5
TP 33
TP 47
LOW = ON HIGH = OFF
J4
1 2 3
BLUE
BROWN
GREY
240 VAC
FRONT ON/OFF SWITCH
AC POWER PCA TRANSFORMER
24 VAC TIED
TO E1 VOLTA


TO DRUM HTR
VIOLET
ORANGE
TO BARRIER BLOCK
FROM INPUT POWER MODULE
VIOLET
ORANGE
VIOLET/WHITE
VIOLET
ORANGE
VIOLET/WHITE
J3 TRIAC PCA
FROM FRONT BRYER
COURTESY LAMPS
J2 TRIAC PCA
WHITE/RED
WHITE/RED
AC CONTACTOR

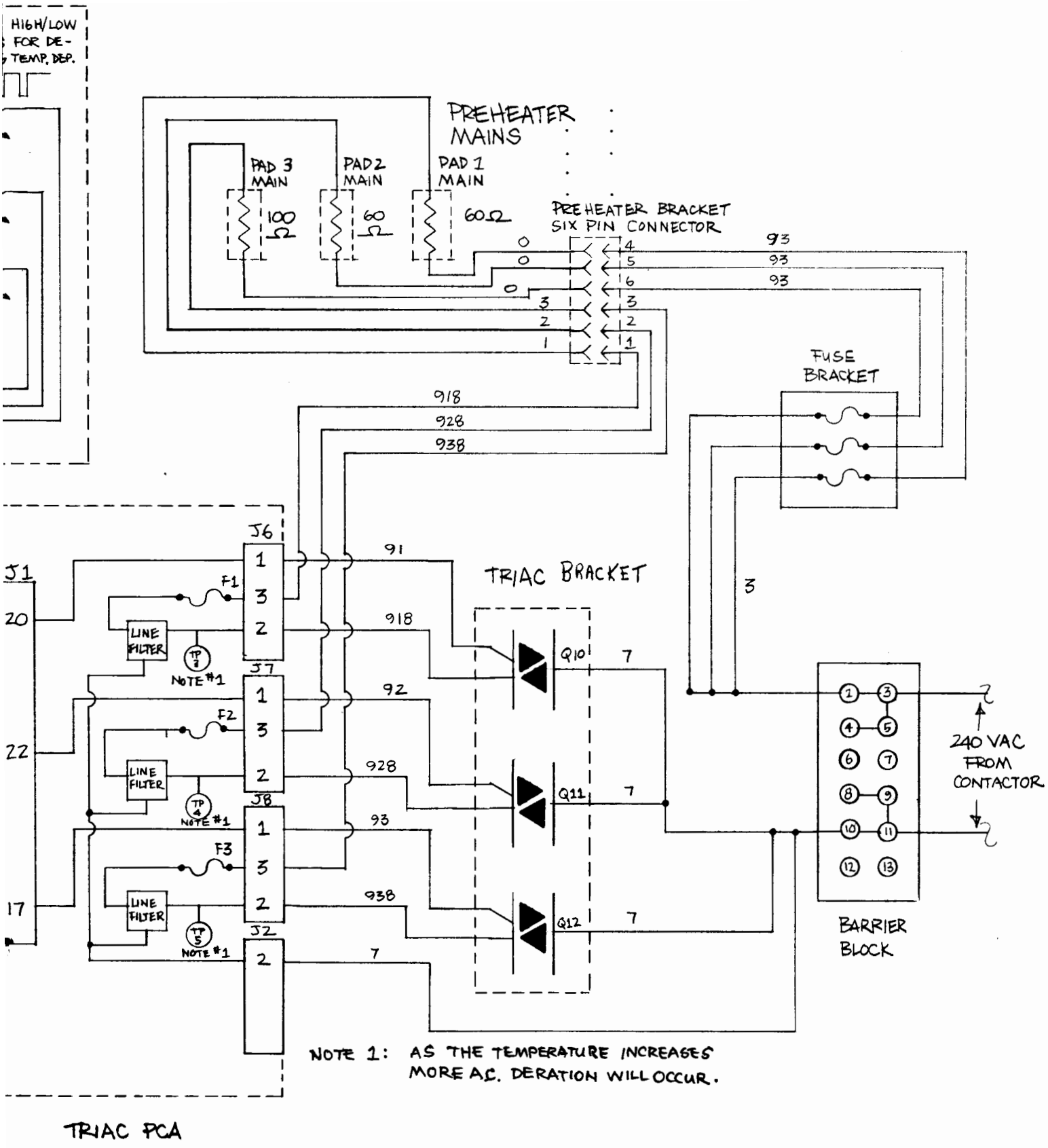
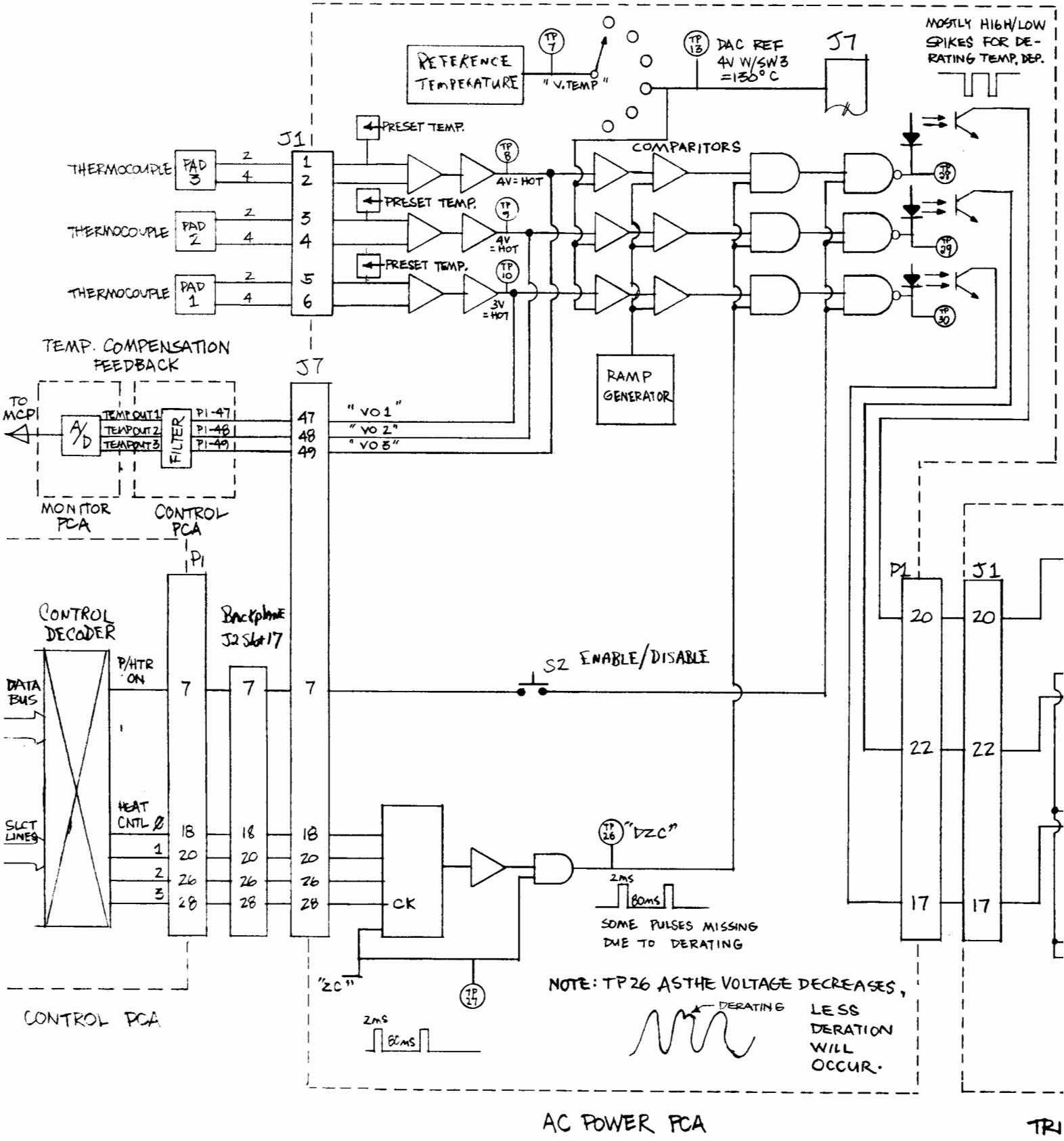


Figure 6-6. Preheater (Part 1)


REFERENCE TEMPERATURE
"V. TEMP"
TP 7
TP 13
DAC REF 4V W/SW3 =130° C
J7
MOSTLY HIGH/LOW SPIKES FOR DE-RATING TEMP. DEP.
J1
PRESET TEMP.
COMPARITORS
THERMOCOUPLE
PAD 3
PAD 2
PAD 1
TP 8
4V = HOT
TP 9
TP 10
3V = HOT
TP 29
TP 30
TEMP. COMPENSATION FEEDBACK
TO MCP
A/D
FILTER
TEMPOUT 1
TEMPOUT 2
TEMPOUT 3
P1-47
P1-48
P1-49
"VO 1"
"VO 2"
"VO 3"
RAMP GENERATOR
MONITOR PCA
CONTROL PCA
P1
J1
CONTROL DECODER
Backplane J2 Slot 17
DATA BUS
P/HTR ON
HEAT CNTL
SLCT LINES
S2 ENABLE/DISABLE
CK
"ZC"
TP 26
"DZC"
TP 27
2ms
60ms
SOME PULSES MISSING DUE TO DERATING
NOTE: TP 26 AS THE VOLTAGE DECREASES, DERATING LESS DERATION WILL OCCUR.
CONTROL PCA
AC POWER PCA

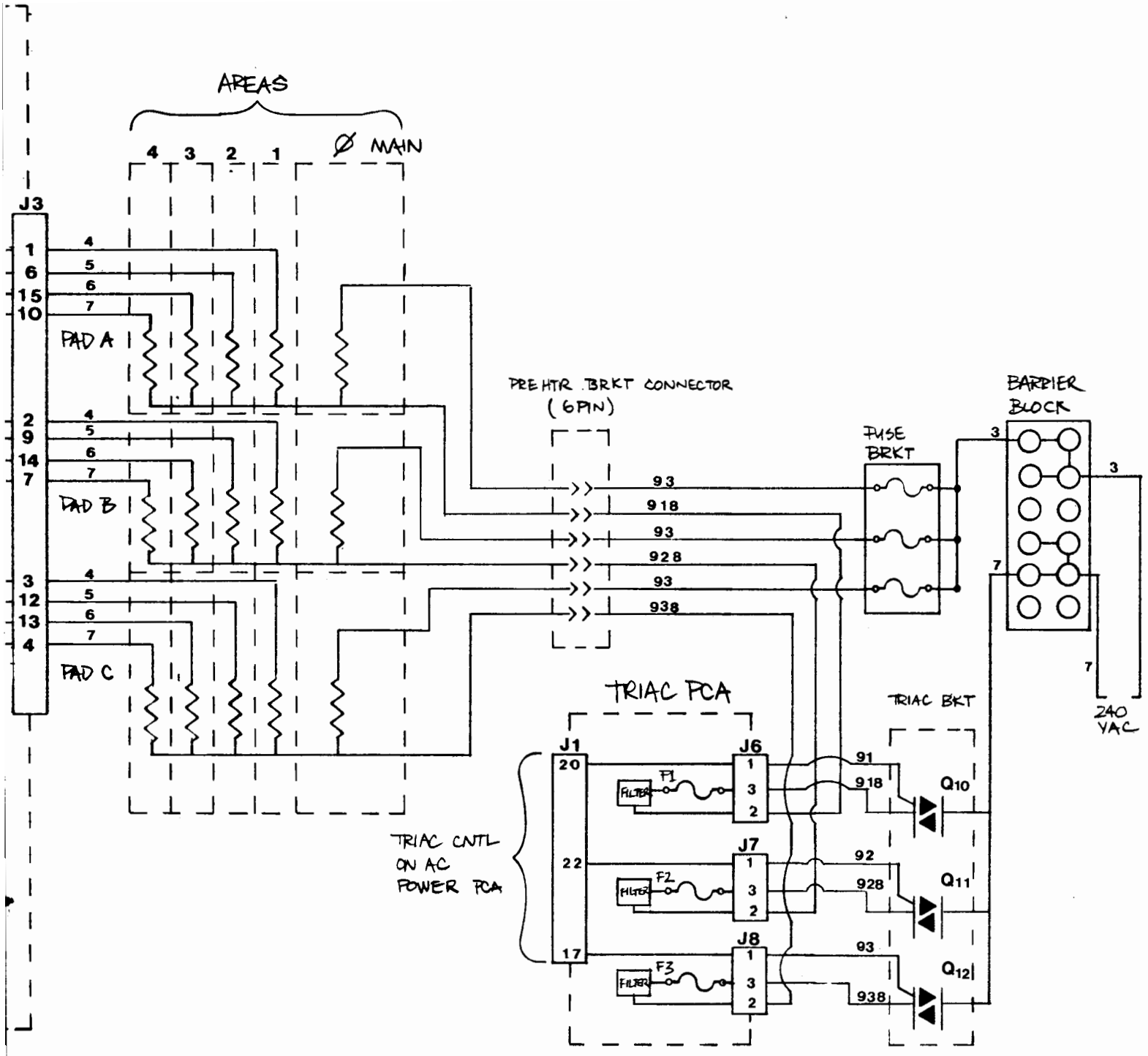
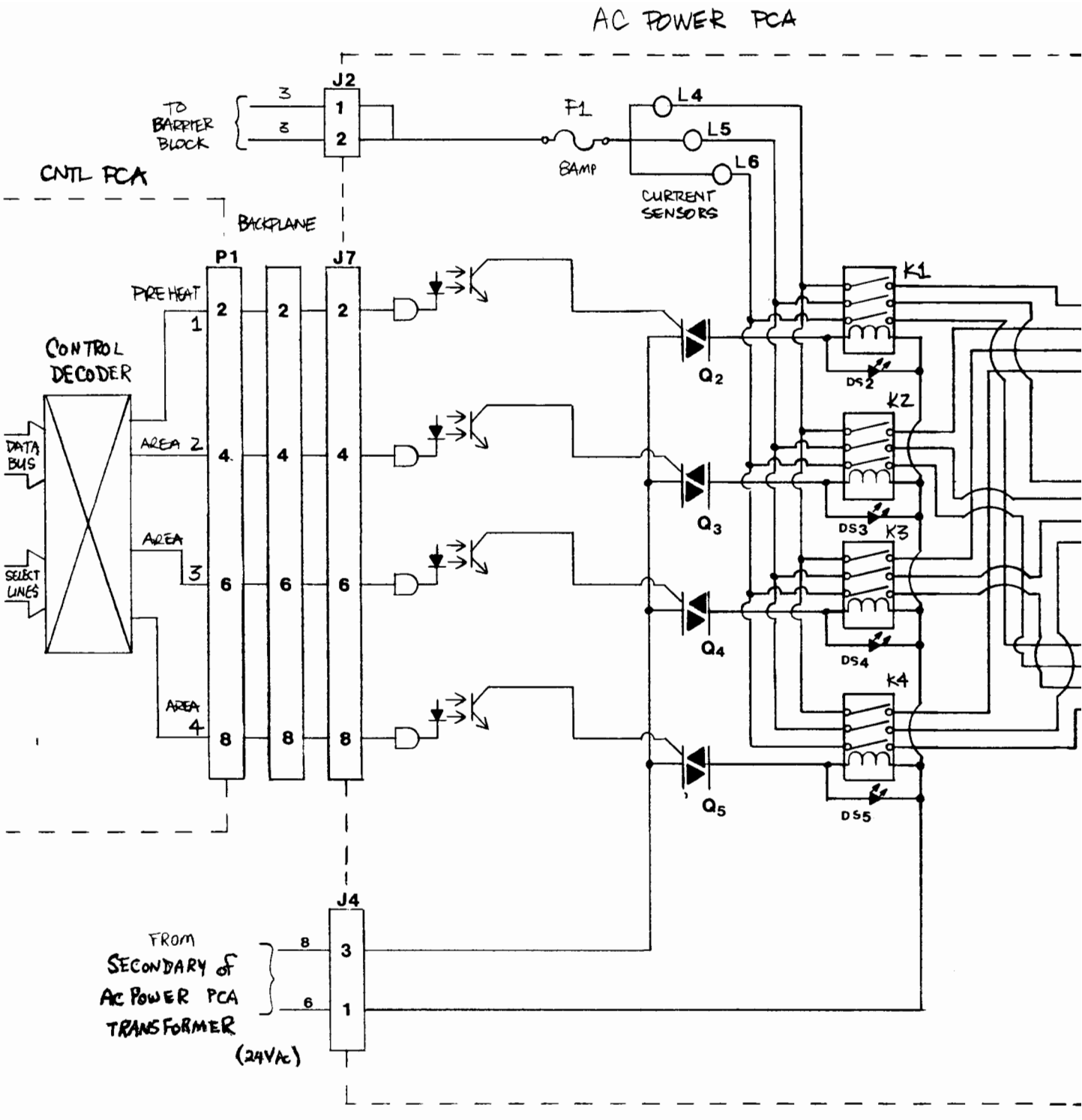


Figure 6-6. Preheater (Part 2)


AC POWER PCA
J2
TO BARRIER BLOCK
3
3
1
2
F1
8AMP
L4
L5
L6
CURRENT SENSORS
CNTL PCA
BACKPLANE
P1
J7
PRE HEAT
1
CONTROL DECODER
DATA BUS
SELECT LINES
AREA 2
AREA 3
AREA 4
2
4
6
8
Q2
Q3
Q4
Q5
K1
K2
K3
K4
DS2
DS3
DS4
DS5
J4
FROM SECONDARY of AC POWER PCA TRANSFORMER (24VAC)
8
6
3
1

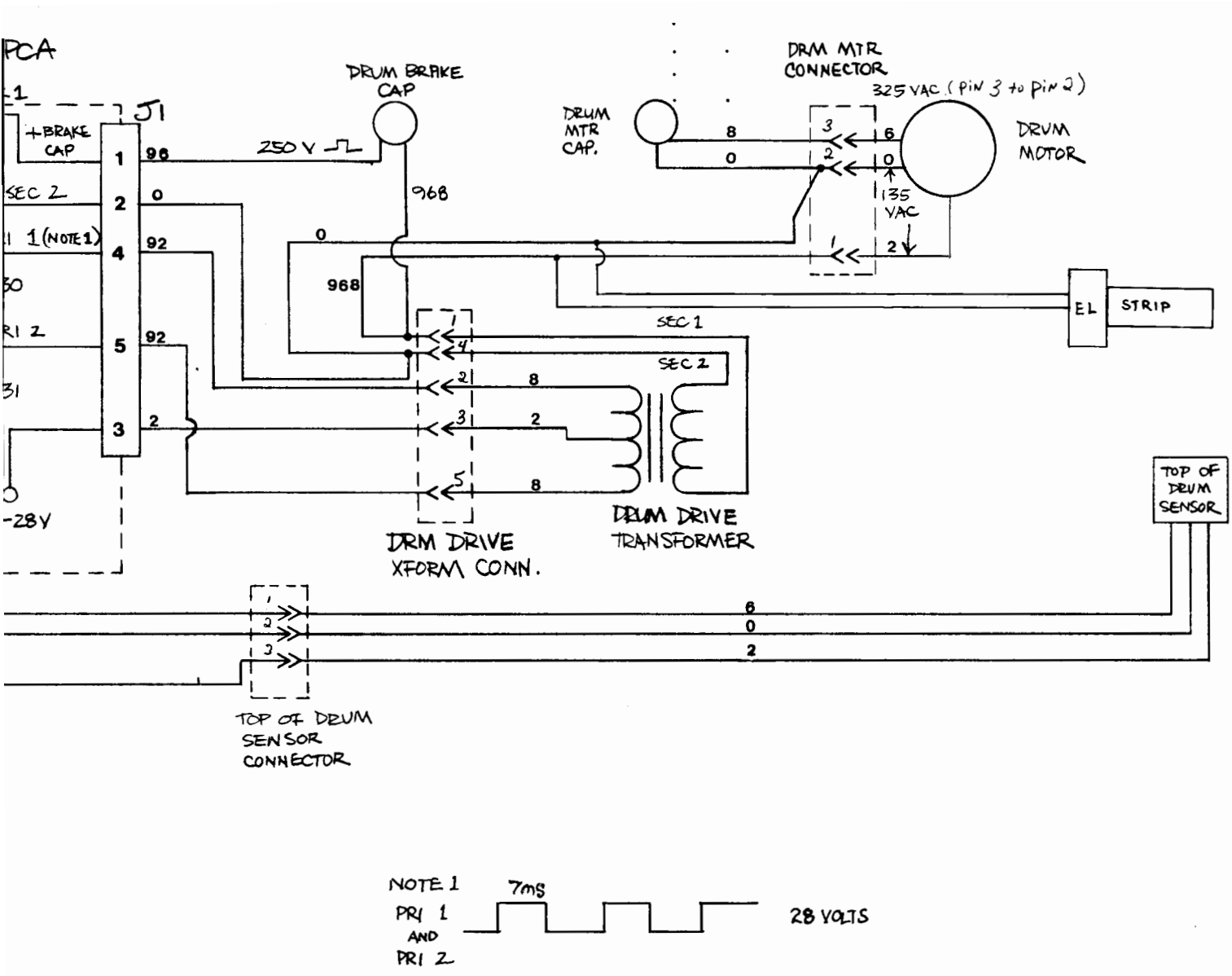
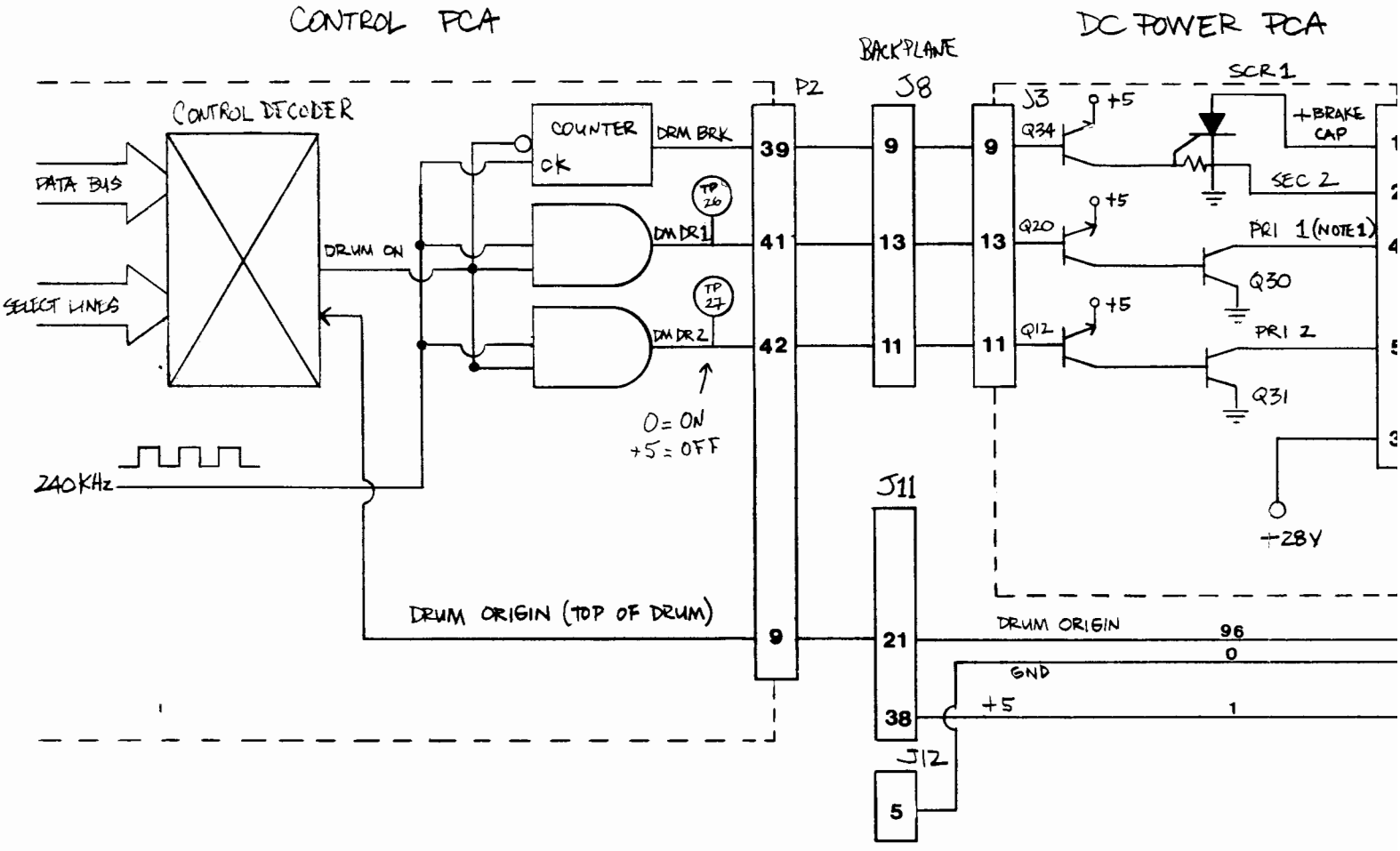


Figure 6-7. Drum Drive Motor


CONTROL PCA
DC POWER PCA
BACKPLANE
CONTROL DECODER
DATA BUS
SELECT LINES
240KHz
DRUM ON
COUNTER
CK
DRM BRK
DM DR1
DM DR2
TP 26
TP 27
0 = ON
+5 = OFF
P2
J8
J3
J11
J12
39
41
42
9
13
11
21
38
5
Q34
Q20
Q12
+5
SCR 1
+BRAKE CAP
SEC 2
PRI 1 (NOTE 1)
PRI 2
Q30
Q31
+28V
DRUM ORIGIN (TOP OF DRUM)
DRUM ORIGIN
96
0
GND
+5
1

NOTE: DEVELOPER SSR (PINS 1 AND 2)

120 V. = ON.
Ø V. = OFF

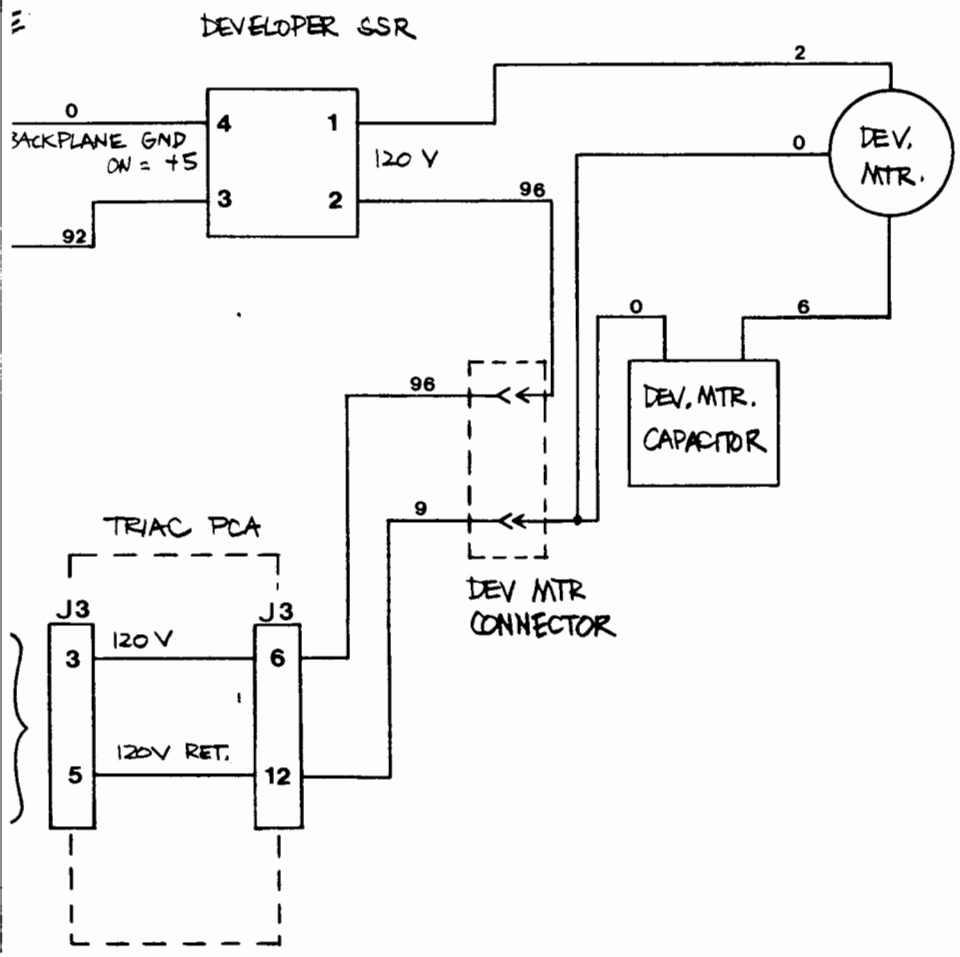
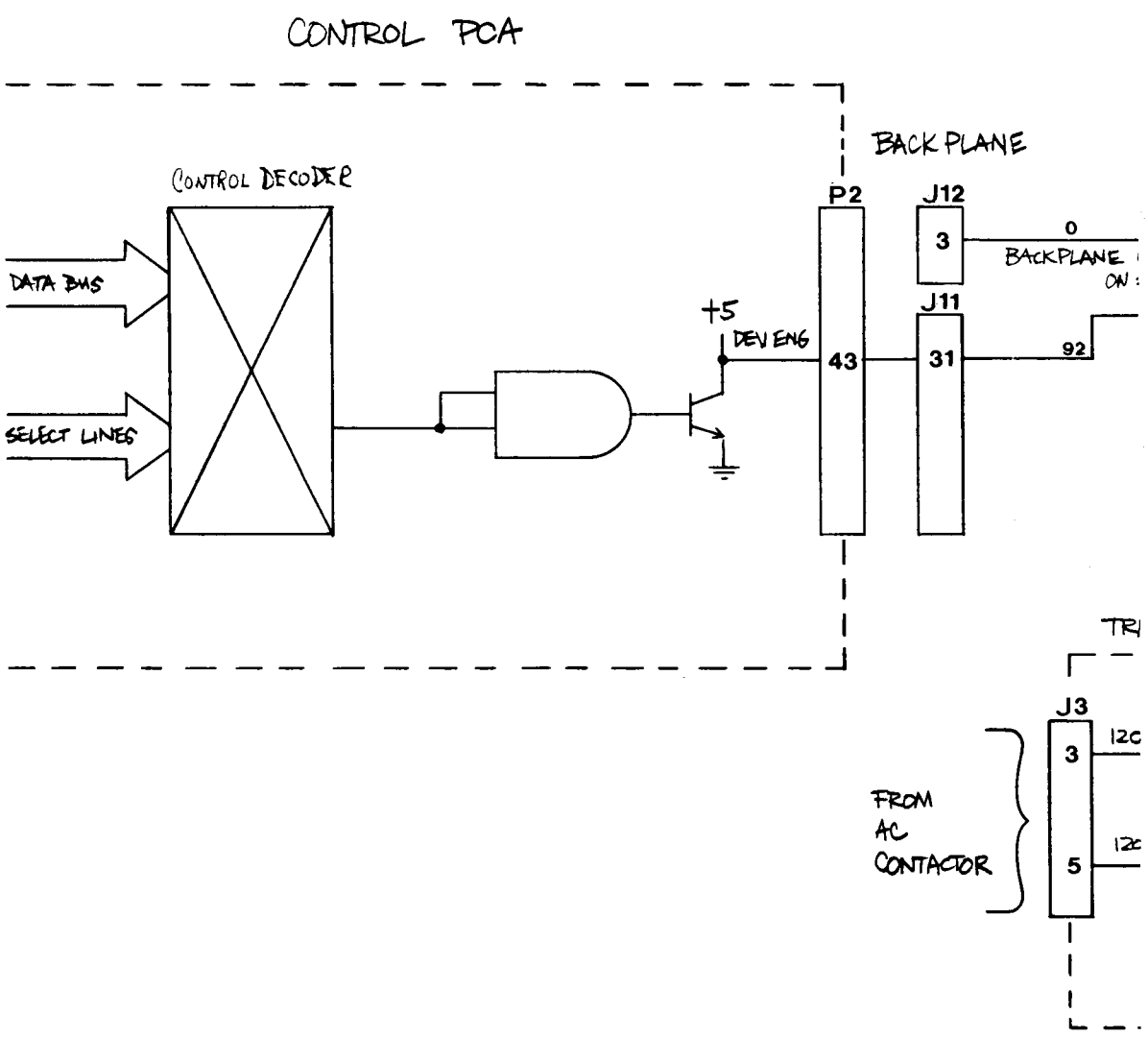


Figure 6-8. Developer Motor


CONTROL PCA
BACK PLANE
CONTROL DECODER
DATA BUS
SELECT LINES
+5
DEV ENG
P2
43
J12
3
0
BACKPLANE
ON
J11
31
92
TRI
J3
3
12C
5
12C
FROM
AC
CONTACTOR

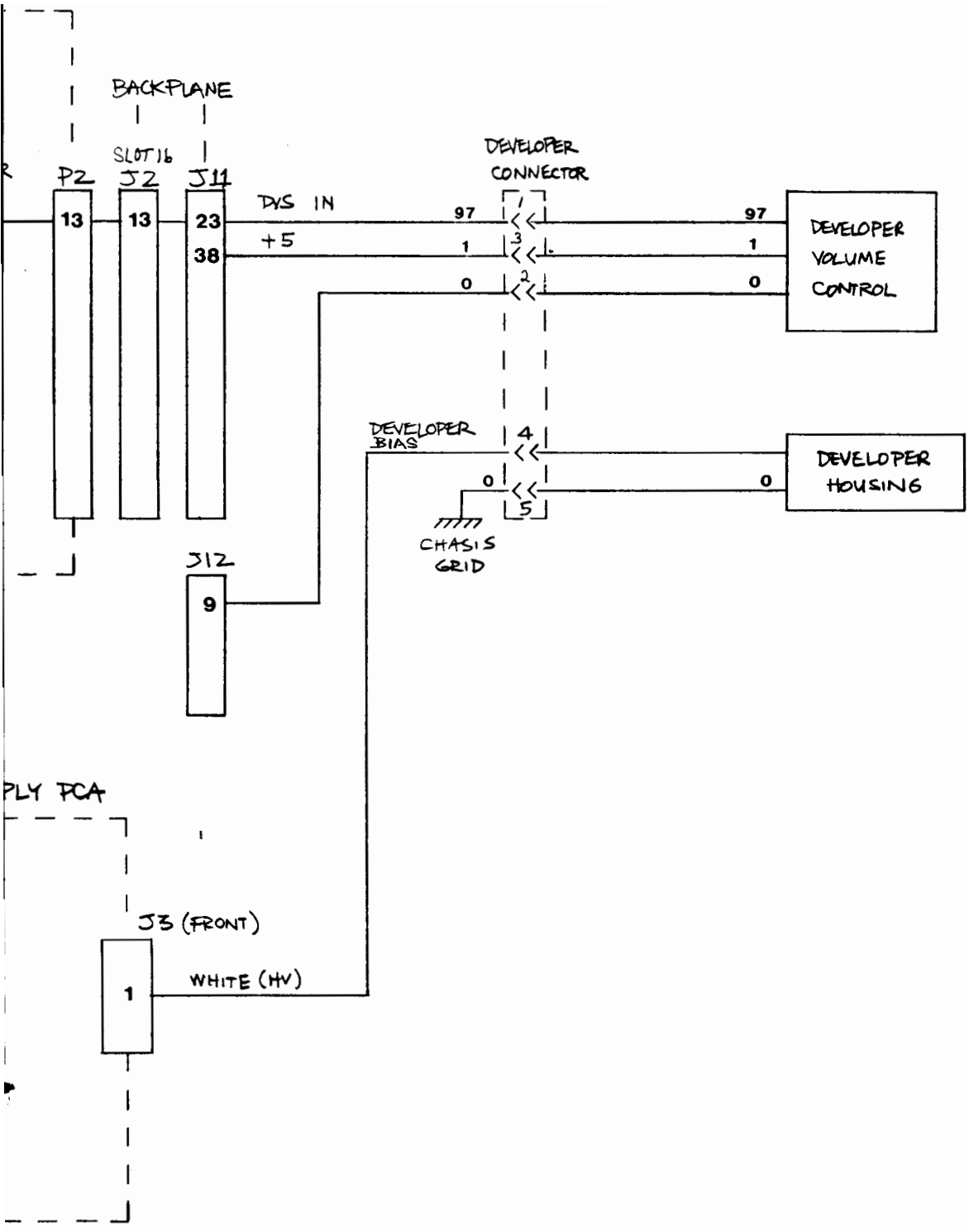
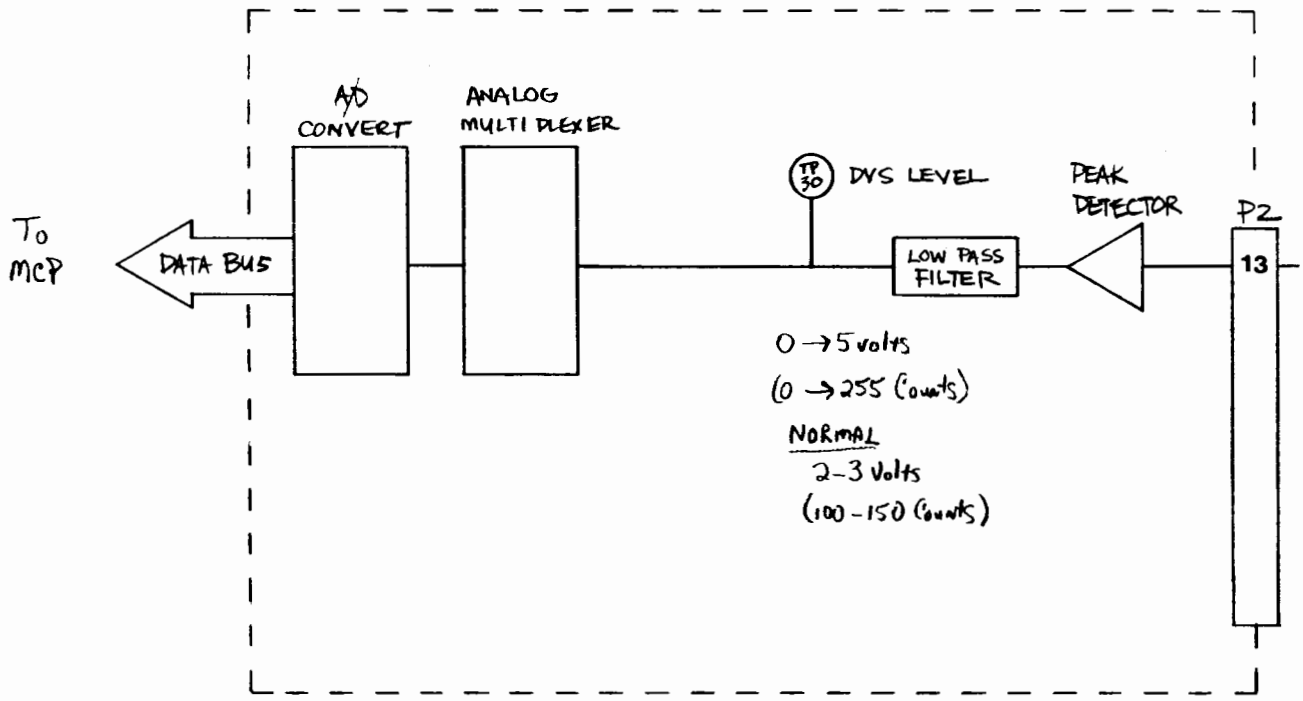


Figure 6-8A Developer Volume Sensor

MONITOR PCA



HIGH VOLTAGE SUPPLY PCA

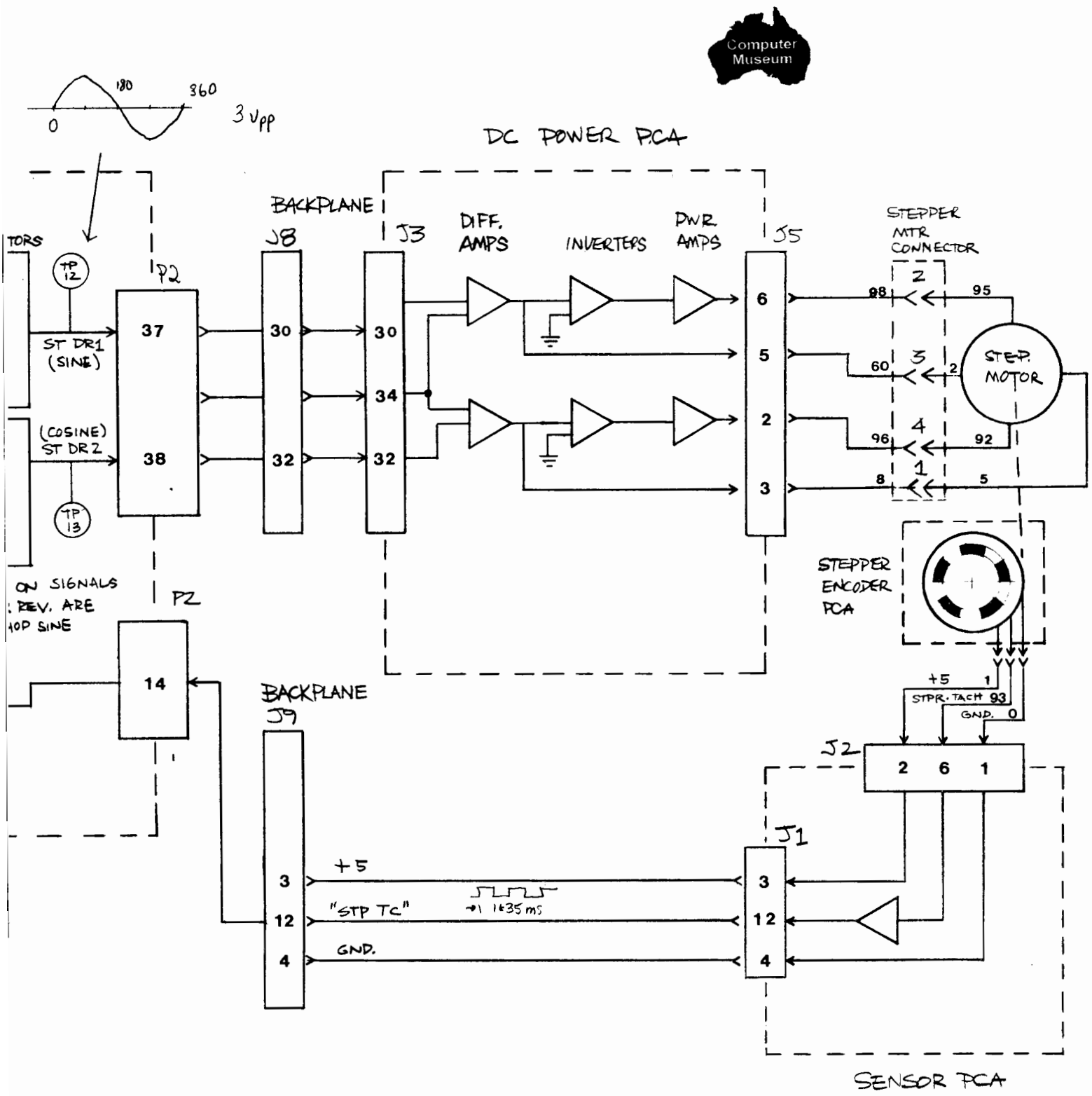
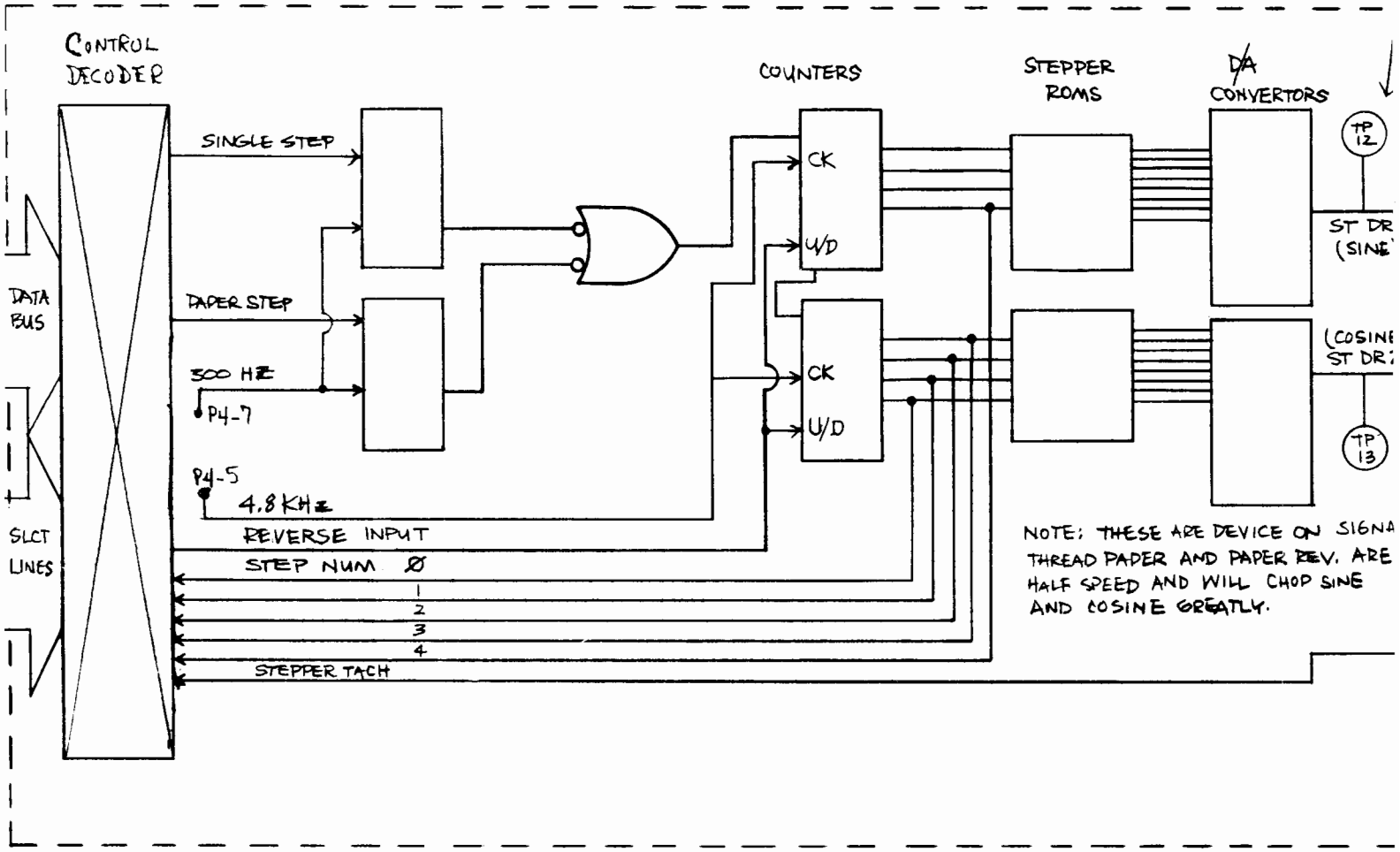


Figure 6-9. Input Stepper Motor

CONTROL PCA


CONTROL DECODER
DATA BUS
SLCT LINES
SINGLE STEP
PAPER STEP
500 HZ
P4-7
P4-5
4.8 KHz
REVERSE INPUT
STEP NUM Ø
1
2
3
4
STEPPER TACH
CK
U/D
CK
U/D
COUNTERS
STEPPER ROMS
D/A CONVERTORS
TP 12
TP 13
NOTE: THESE ARE DEVICE ON SIGNA
THREAD PAPER AND PAPER REV. ARE
HALF SPEED AND WILL CHOP SINE
AND COSINE GREATLY.

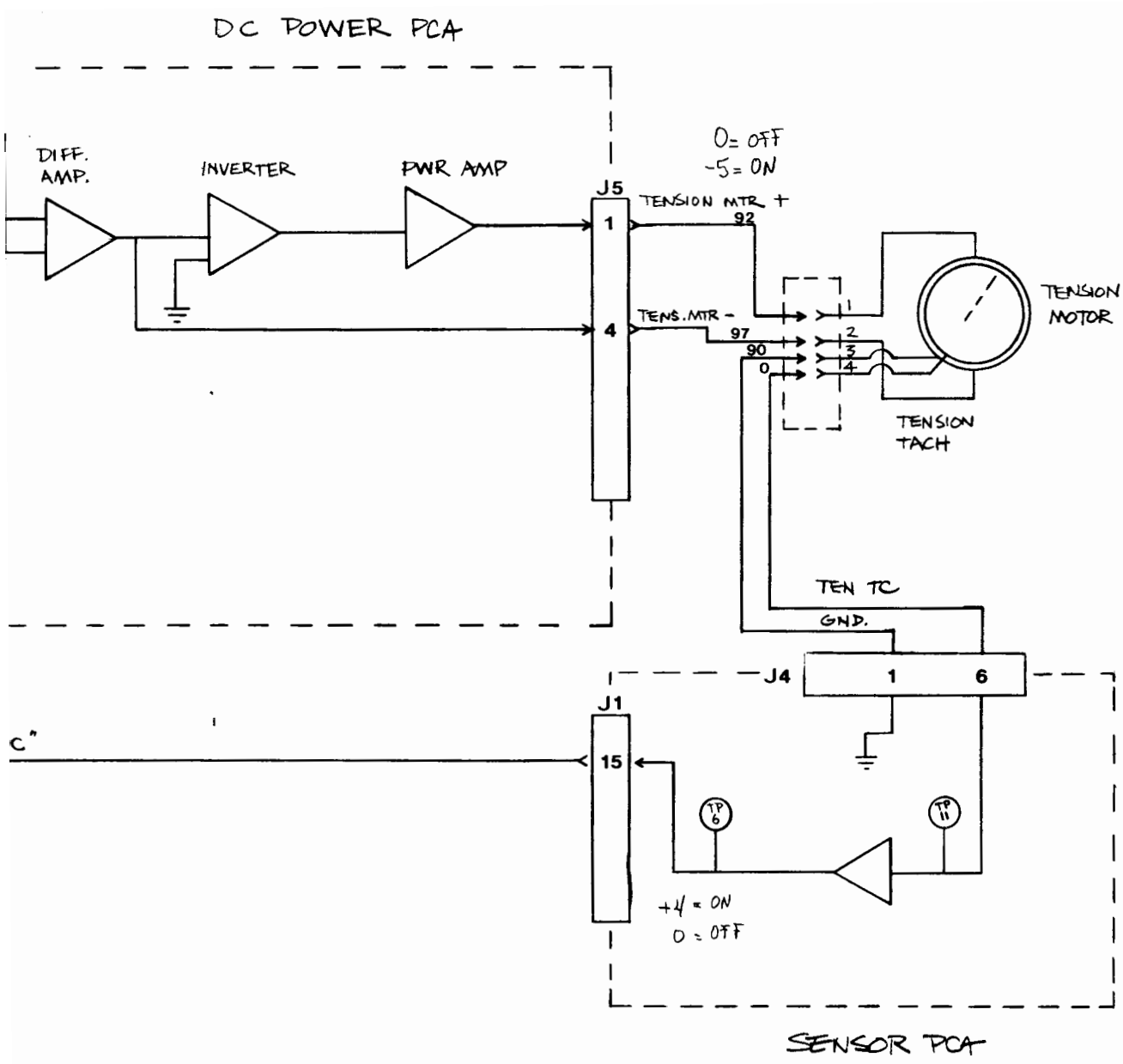
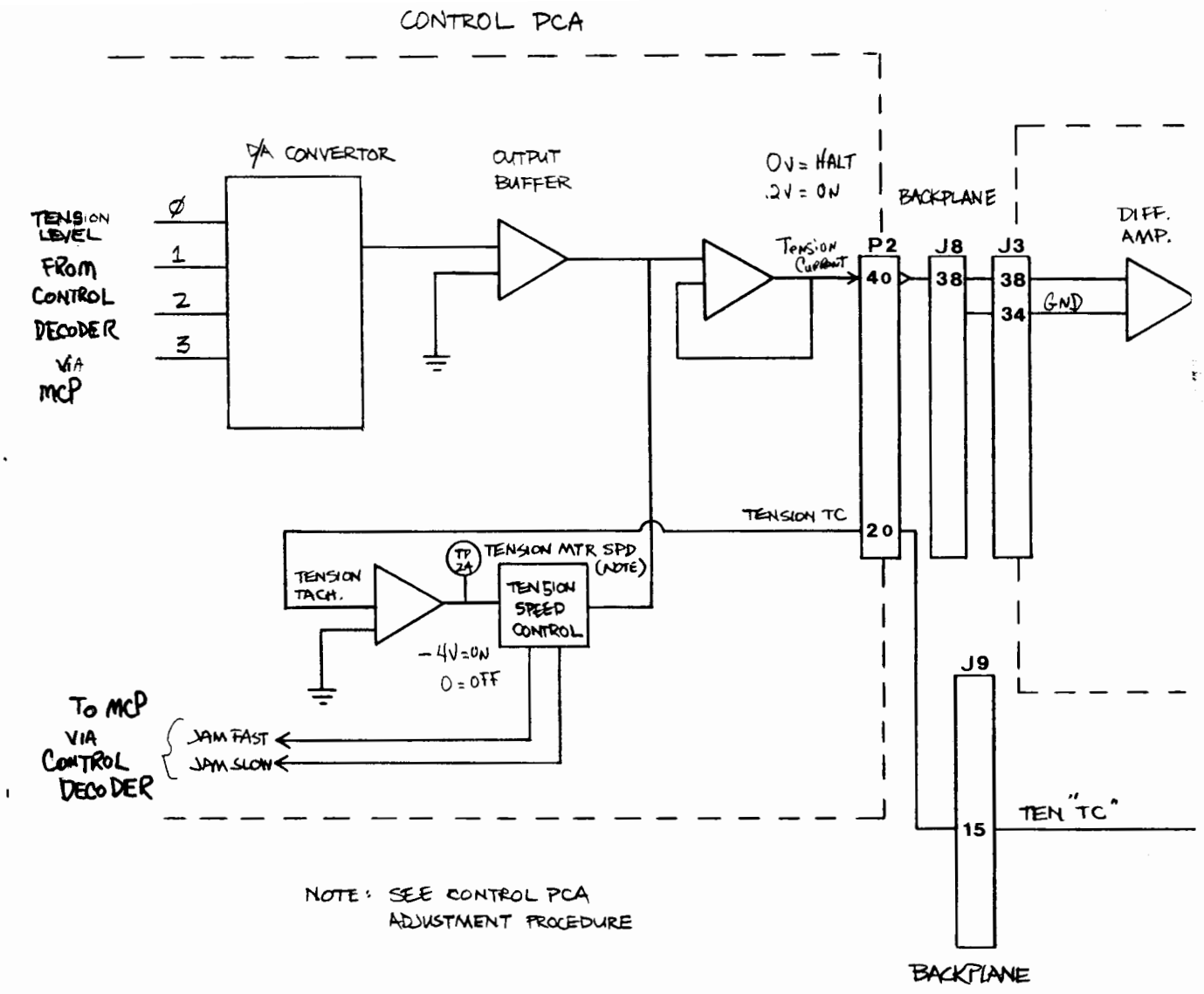


Figure 6-10. Tension Motor



NOTE: SEE CONTROL PCA ADJUSTMENT PROCEDURE

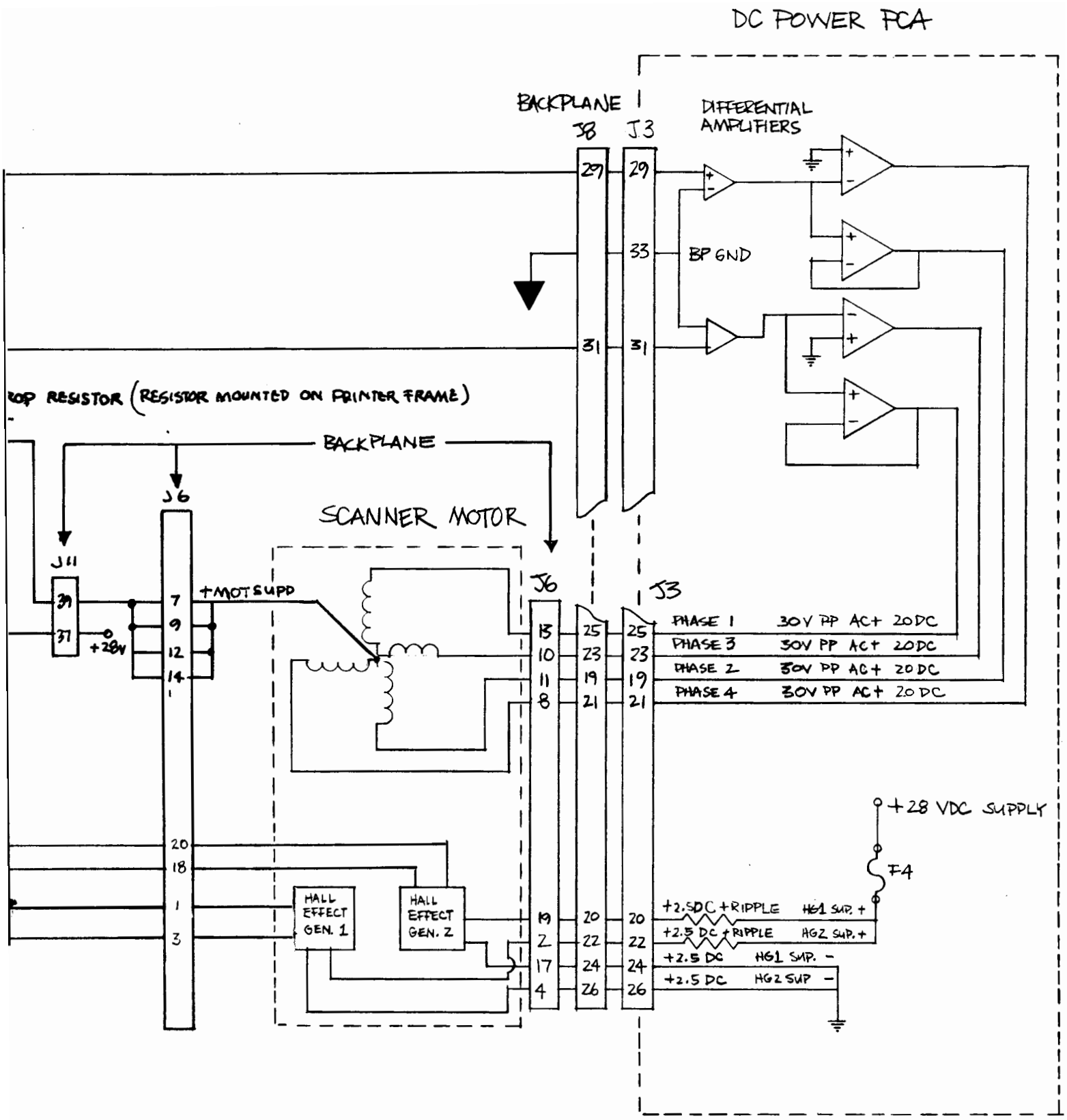
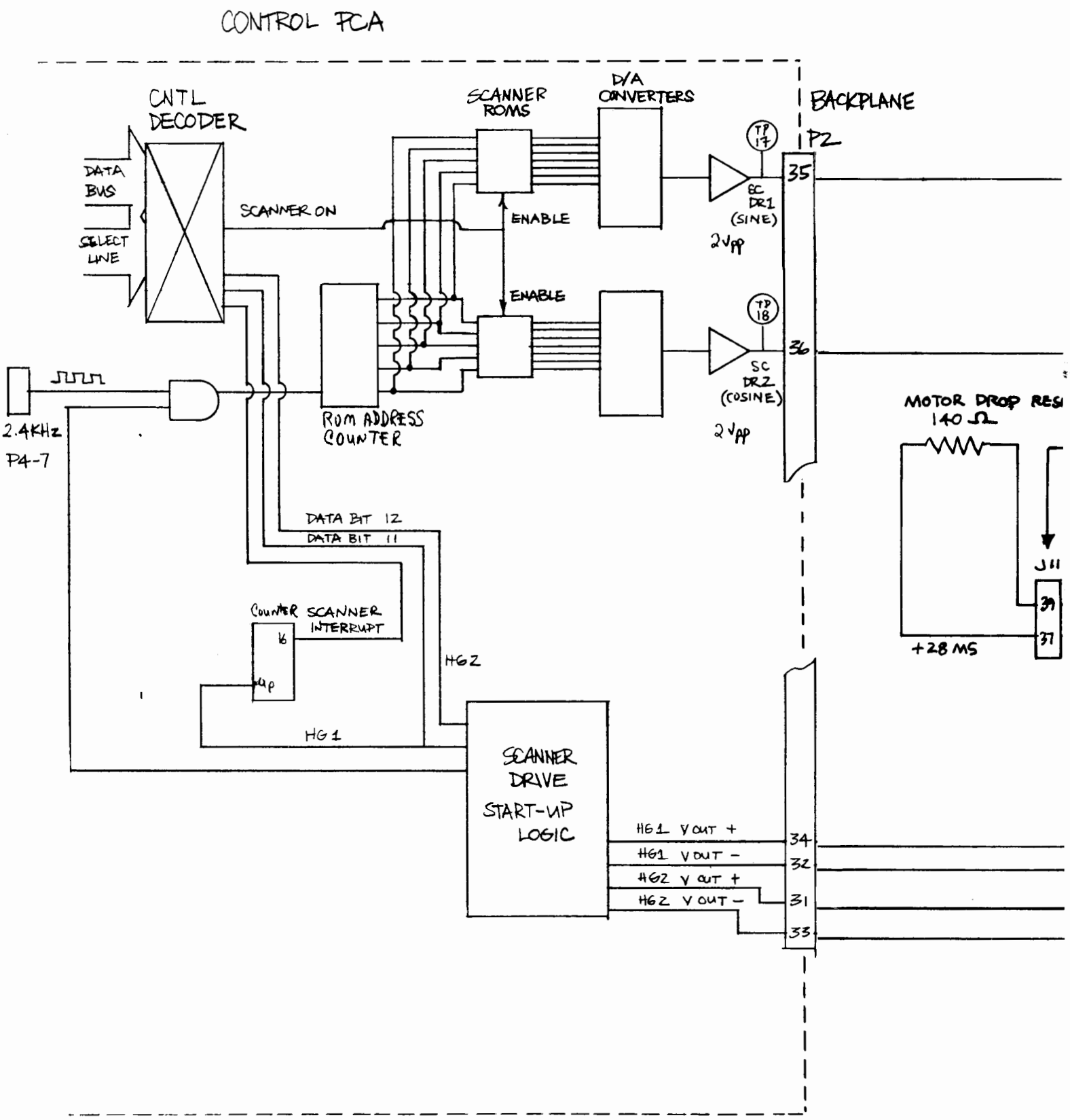


Figure 6-11. Scanner Motor


CONTROL PCA
CNTL DECODER
DATA BUS
SELECT LINE
SCANNER ON
SCANNER ROMS
D/A CONVERTERS
BACKPLANE
P2
ENABLE
ENABLE
TP 17
TP 18
35
36
SC DR1 (SINE)
2 Vpp
SC DR2 (COSINE)
2 Vpp
ROM ADDRESS COUNTER
2.4KHz
P4-7
MOTOR DROP RES
140 Ω
J11
39
37
+28 MS
DATA BIT 12
DATA BIT 11
COUNTER SCANNER INTERRUPT
16
Up
HG2
HG1
SCANNER DRIVE START-UP LOGIC
HG1 V OUT +
HG1 V OUT −
HG2 V OUT +
HG2 V OUT −
34
32
31
33

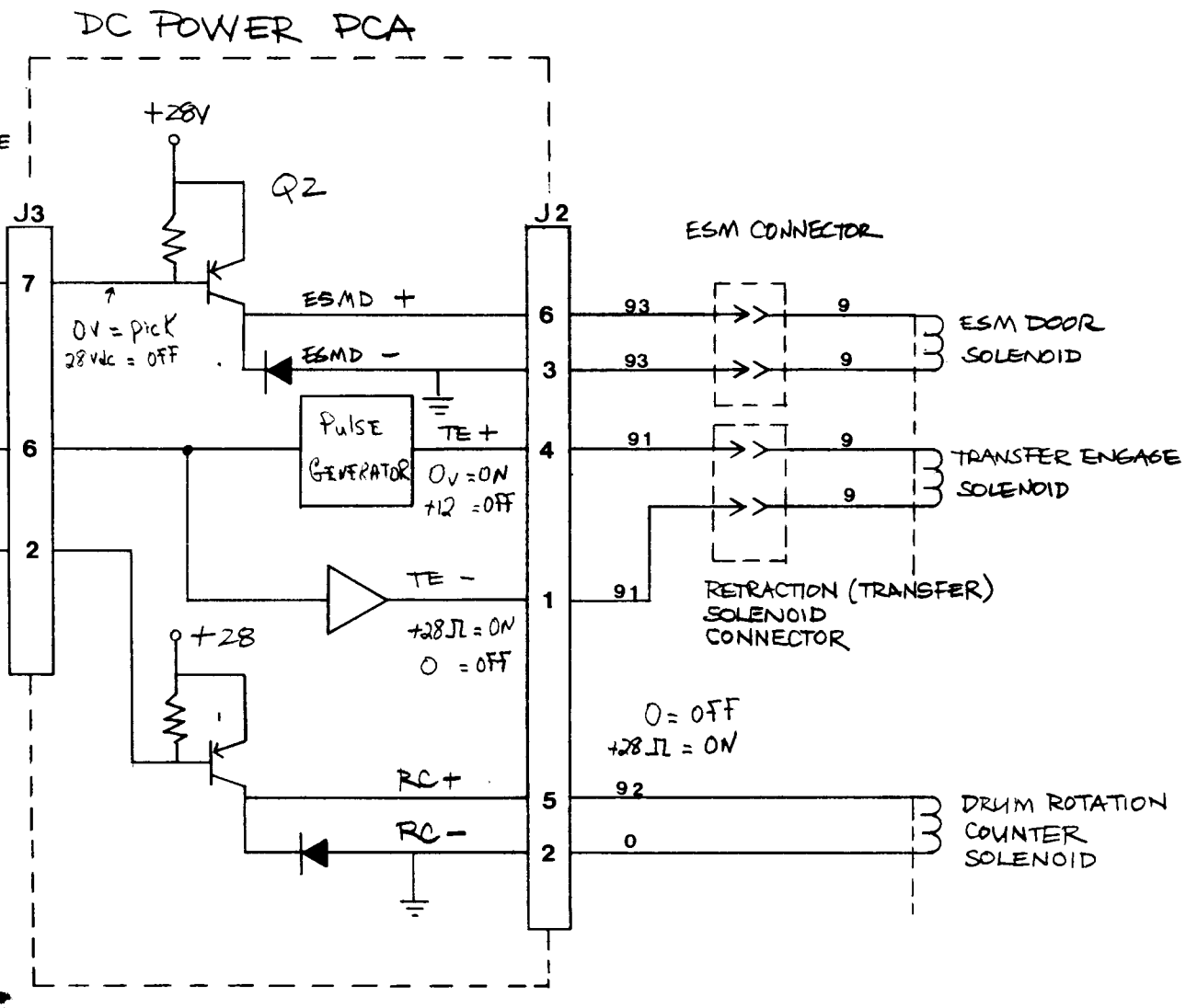
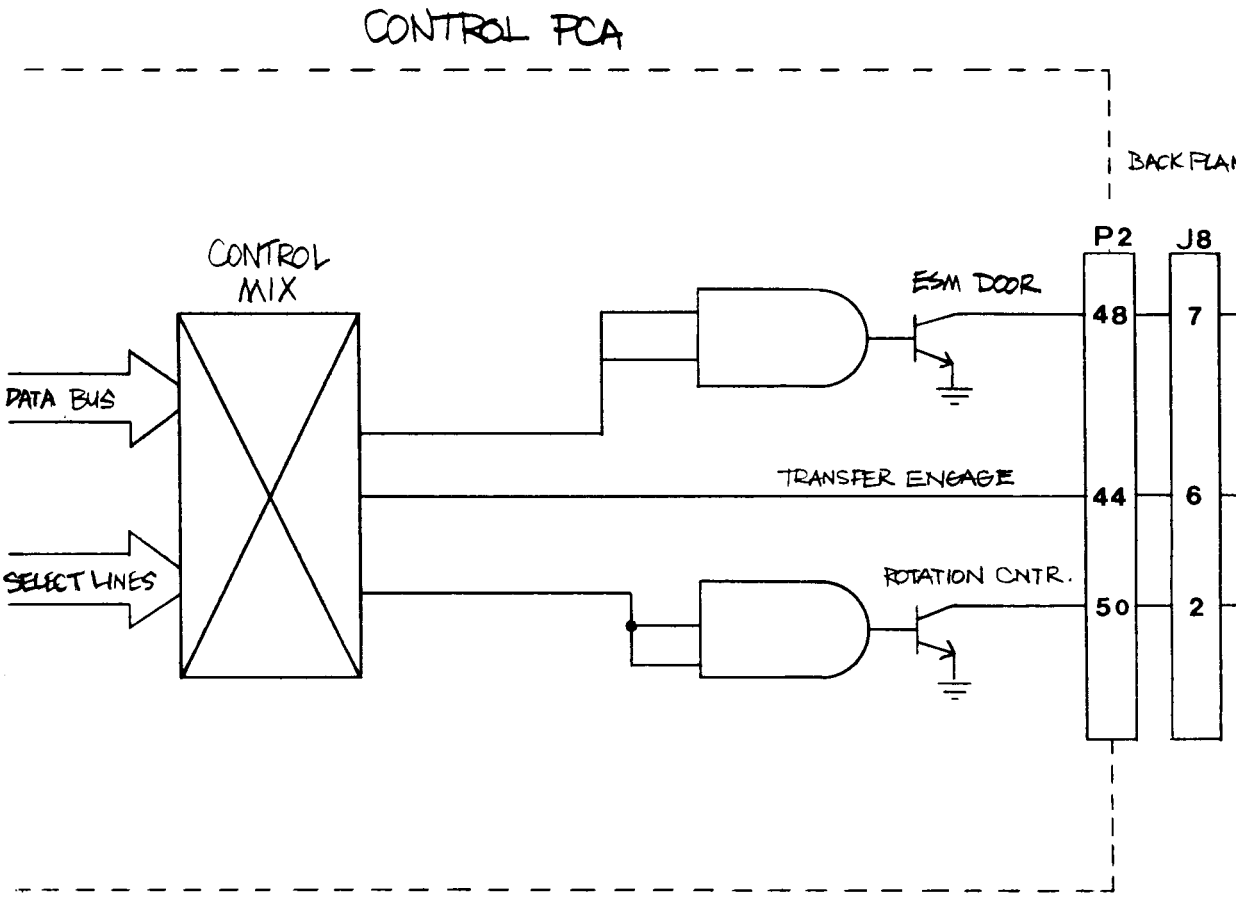


Figure 6-12. Solenoids


CONTROL PCA
BACK PLAN
CONTROL MIX
DATA BUS
SELECT LINES
ESM DOOR
TRANSFER ENGAGE
ROTATION CNTR.
P2
J8
48
44
50
7
6
2

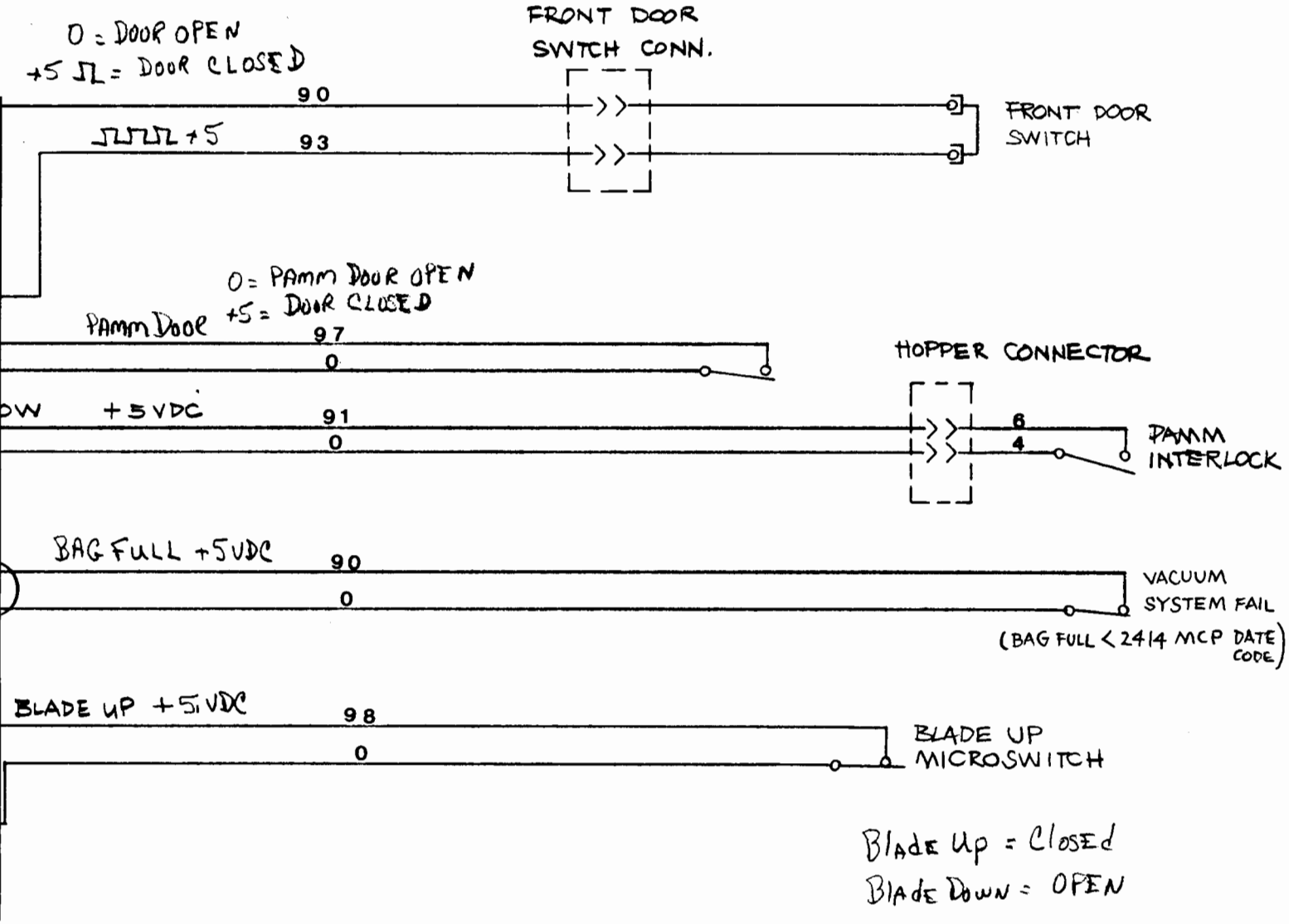
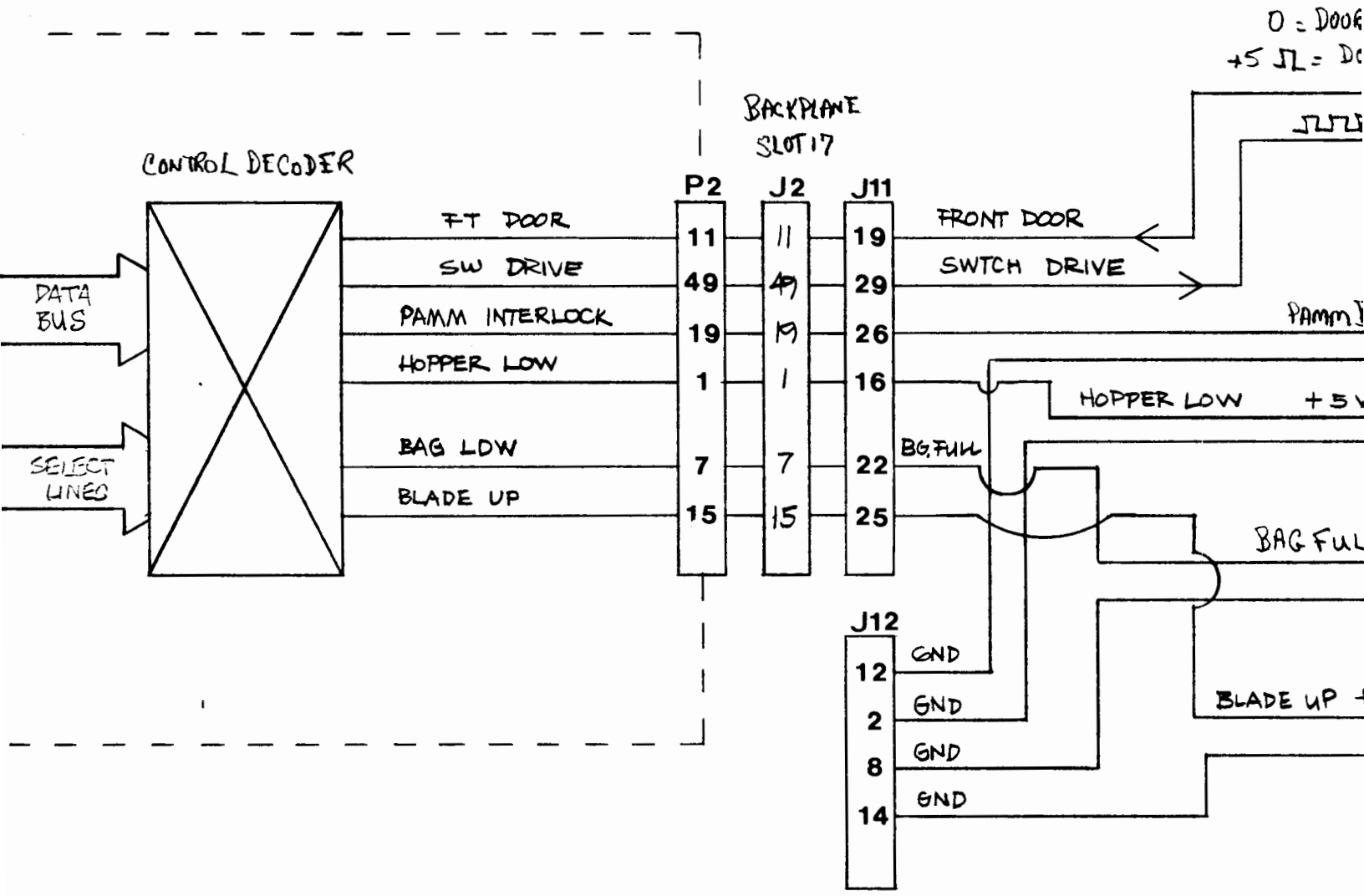


Figure 6-13. Detection Circuitry


CONTROL DECODER
DATA BUS
SELECT LINES
FT DOOR
SW DRIVE
PAMM INTERLOCK
HOPPER LOW
BAG LOW
BLADE UP
BACKPLANE SLOT 17
P2
J2
J11
11
49
19
1
7
15
19
29
26
16
22
25
FRONT DOOR
SWTCH DRIVE
BG FULL
HOPPER LOW
BAG FUL
BLADE UP
J12
12
2
8
14
GND
GND
GND
GND

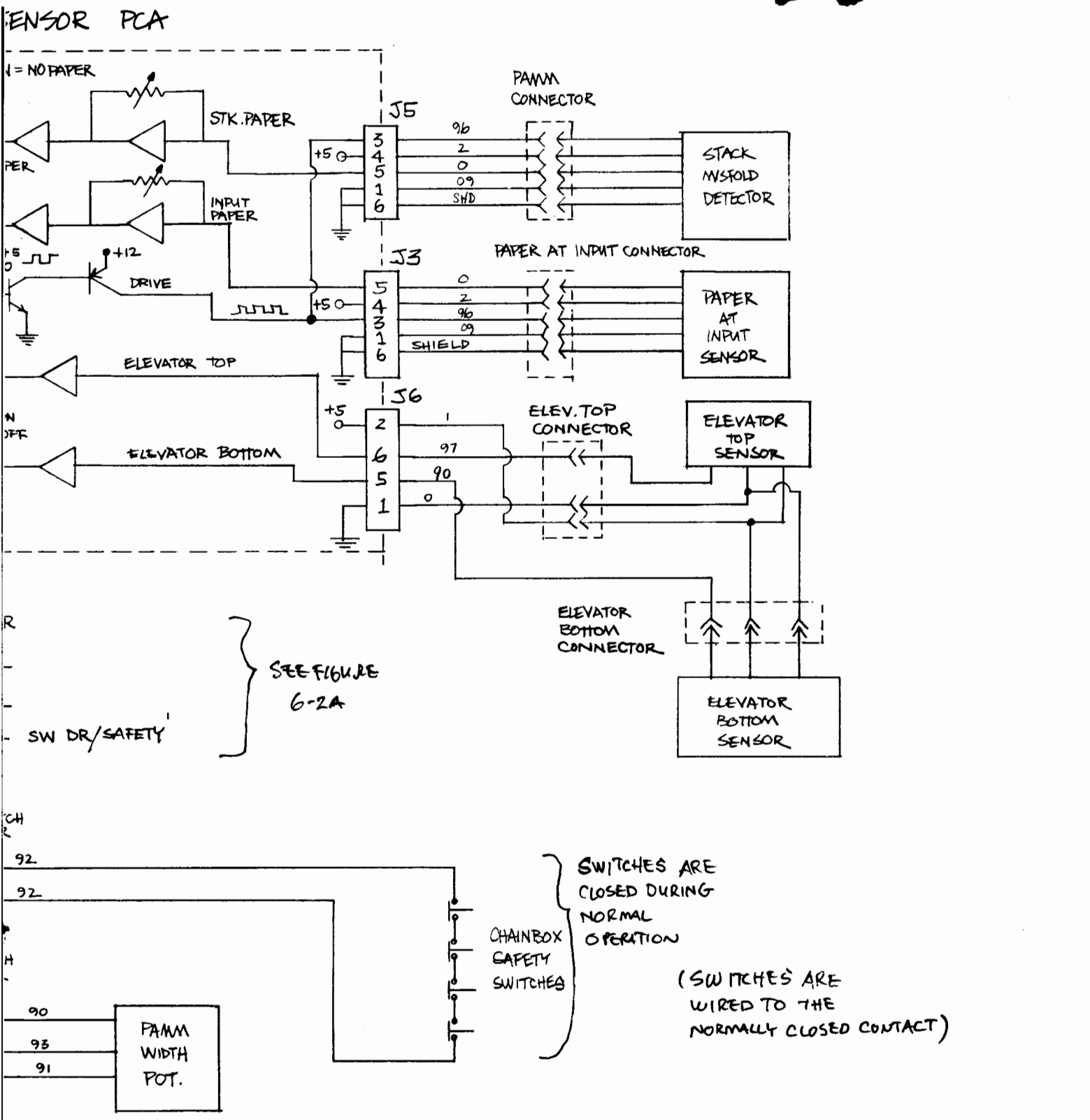
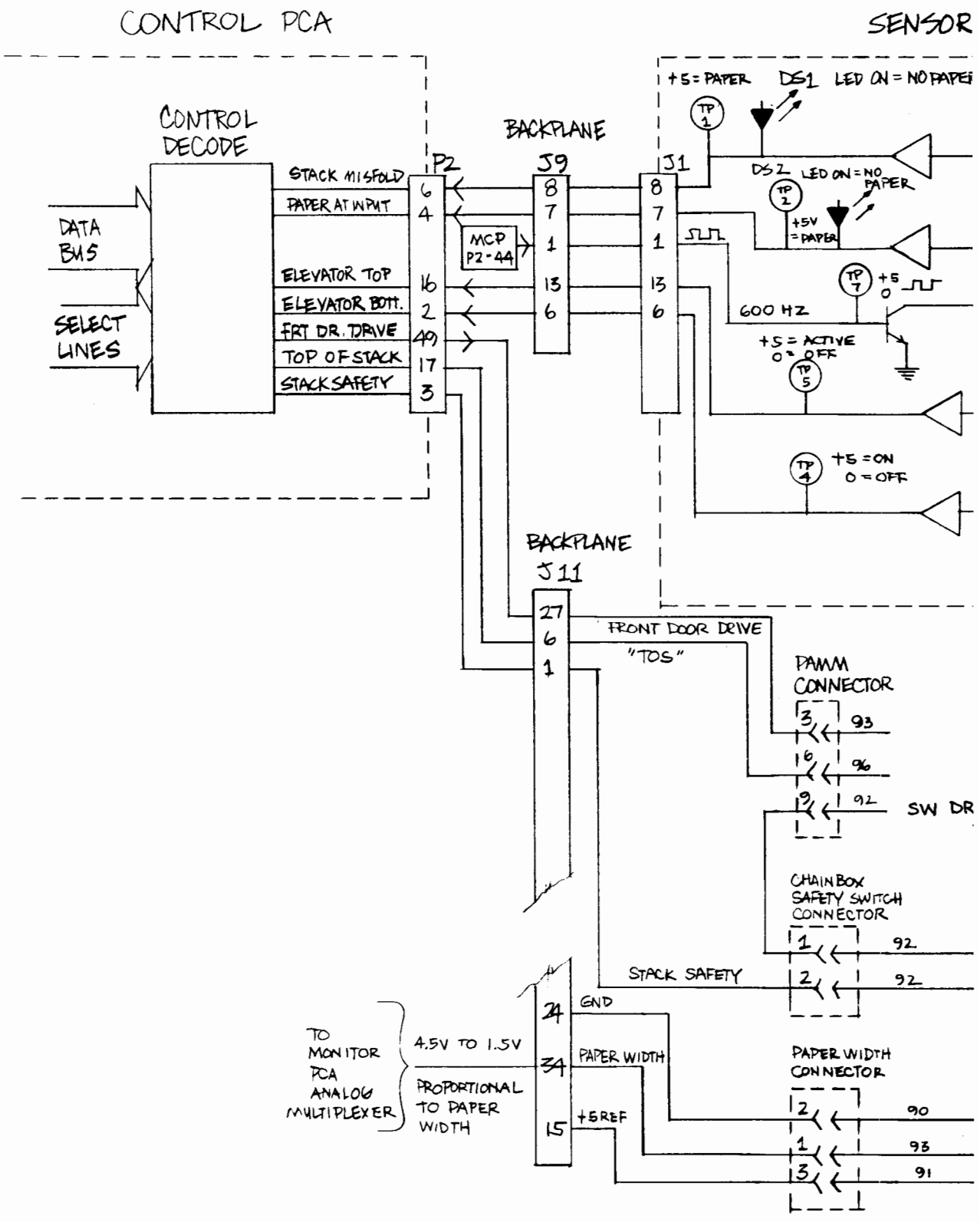


Figure 6-14. Paper Detection Circuitry


CONTROL PCA
SENSOR
CONTROL DECODE
DATA BUS
SELECT LINES
STACK MISFOLD
PAPER AT INPUT
ELEVATOR TOP
ELEVATOR BOTT.
FRT DR. DRIVE
TOP OF STACK
STACK SAFETY
P2
6
4
16
2
49
17
3
MCD P2-44
BACKPLANE J9
8
7
1
13
6
J1
+5 = PAPER
DS1 LED ON = NO PAPER
TP 1
DS2 LED ON = NO PAPER
TP 2
+5V = PAPER
TP 7
+5
0
600 HZ
+5 = ACTIVE
0 = OFF
TP 5
TP 4
+5 = ON
0 = OFF
BACKPLANE J11
27
6
1
FRONT DOOR DRIVE
"TOS"
PAMM CONNECTOR
3
93
6
96
9
92
SW DR
CHAINBOX SAFETY SWITCH CONNECTOR
1
92
2
92
STACK SAFETY
24
GND
34
PAPER WIDTH
15
+5REF
TO MONITOR PCA ANALOG MULTIPLEXER
4.5V TO 1.5V
PROPORTIONAL TO PAPER WIDTH
PAPER WIDTH CONNECTOR
2
90
1
93
3
91

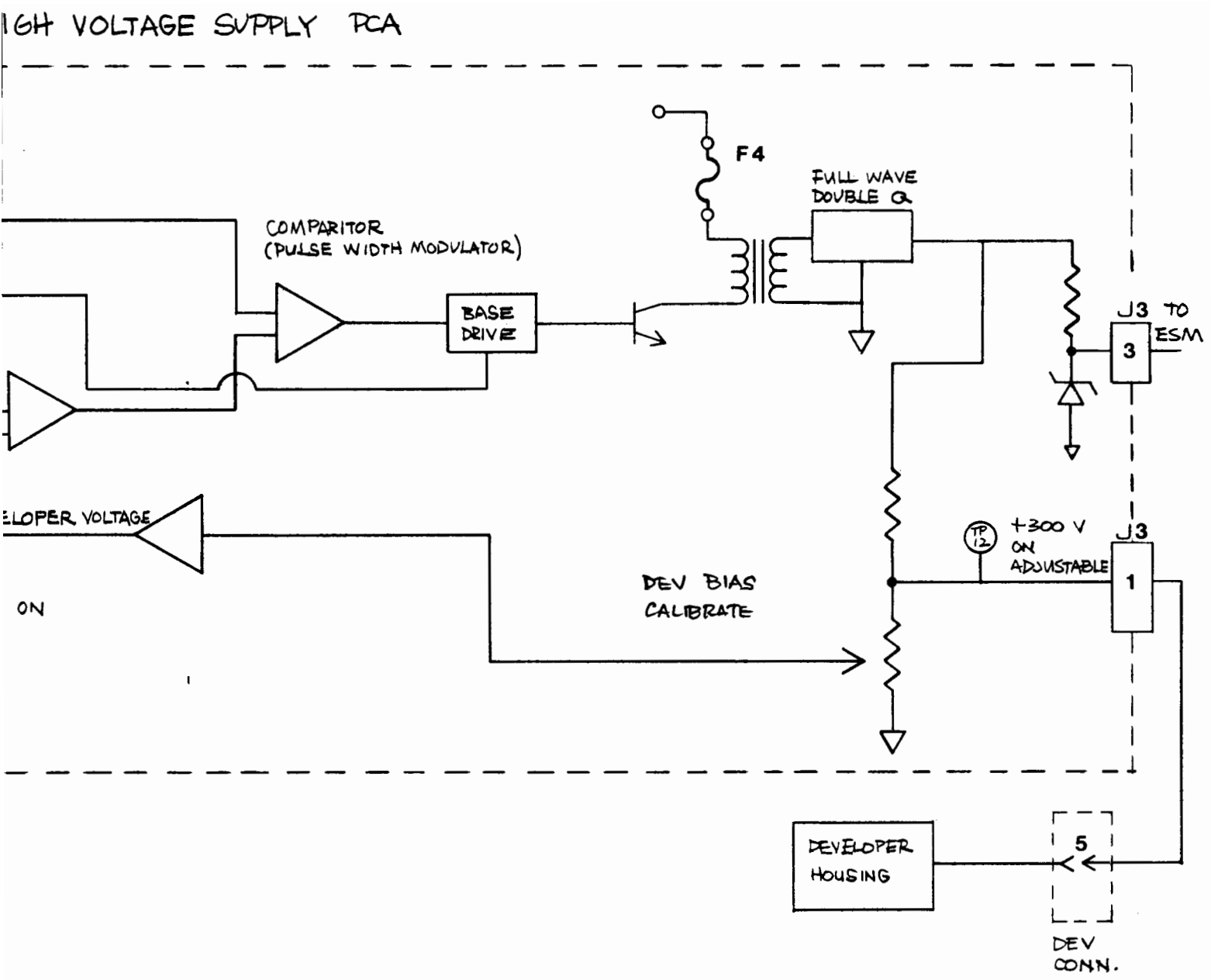
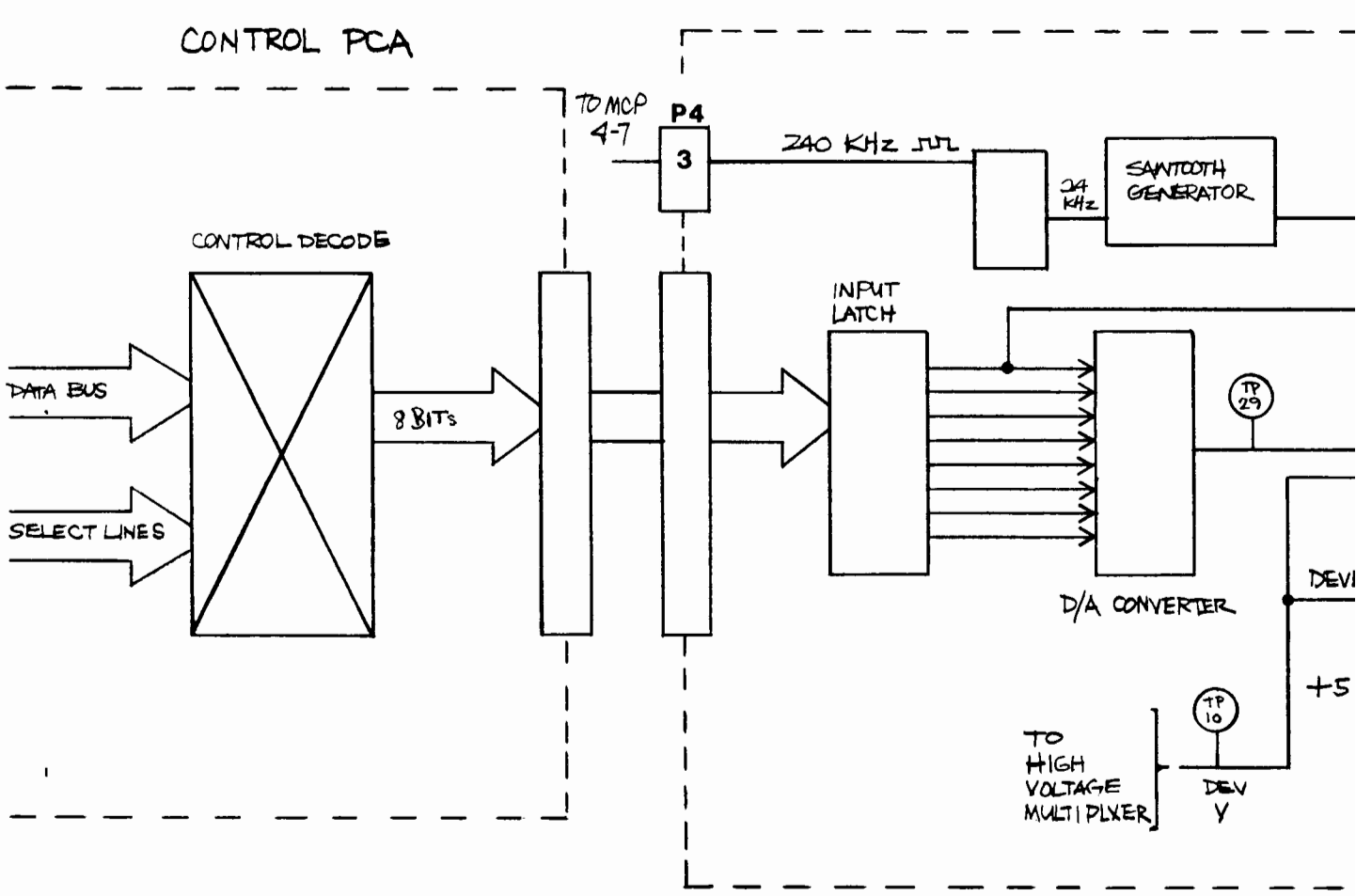


Figure 6-15. Developer Bias Power Supply


CONTROL PCA
TO MCP 4-7
P4
3
240 KHz
24 KHz
SAWTOOTH GENERATOR
CONTROL DECODE
INPUT LATCH
DATA BUS
SELECT LINES
8 BITS
TP 29
D/A CONVERTER
+5
TP 10
TO HIGH VOLTAGE MULTIPLEXER
DEV Y

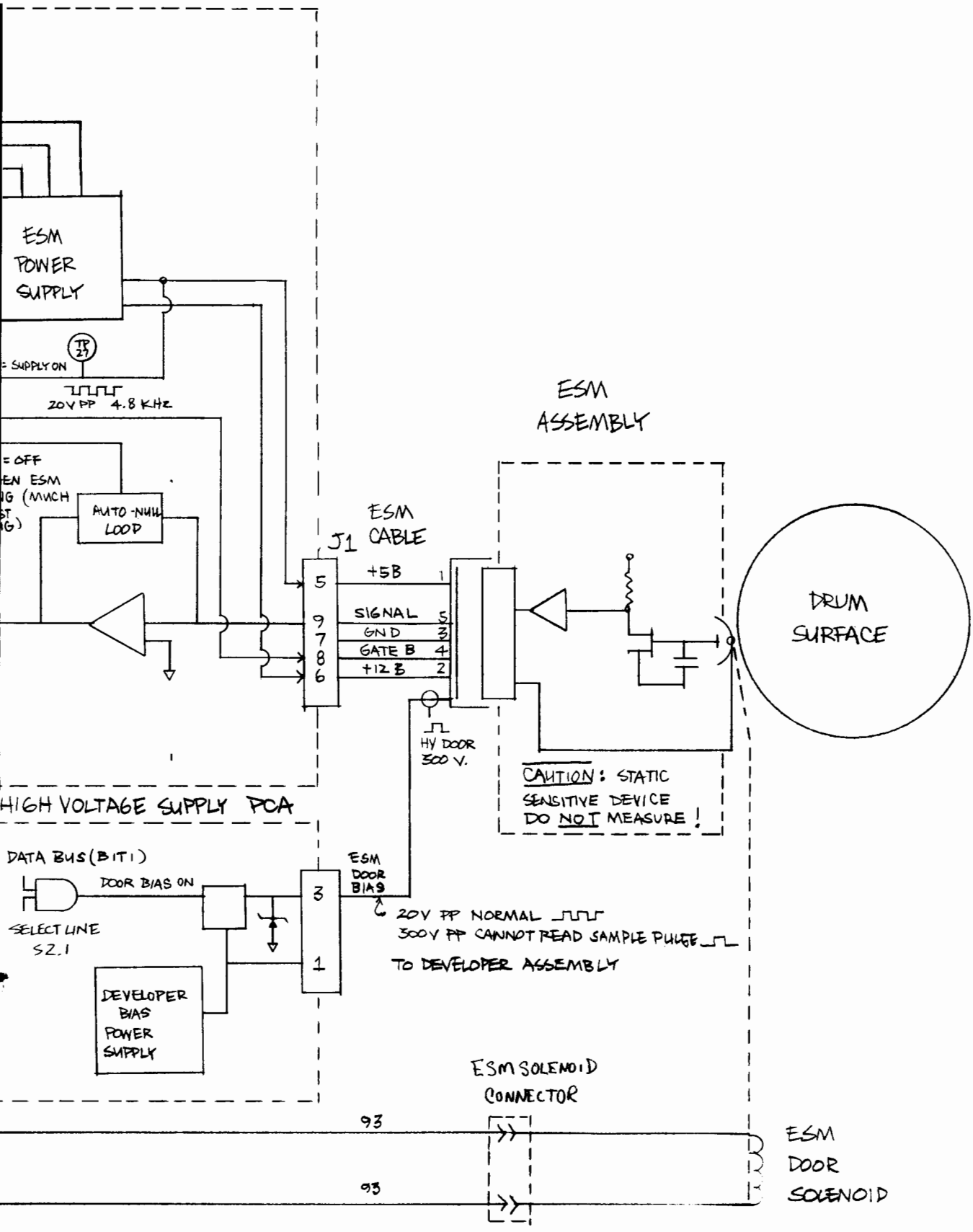
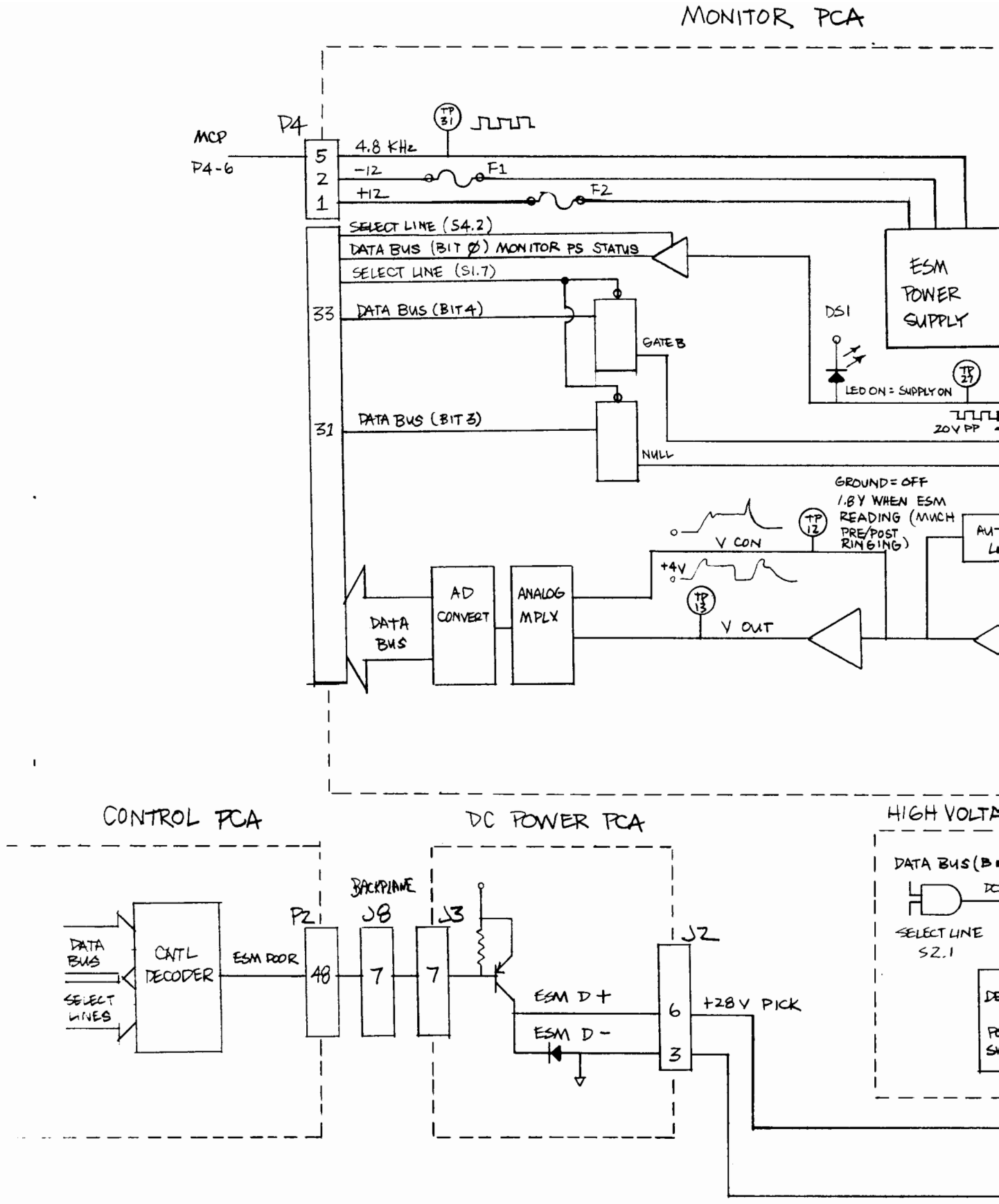


Figure 6-16. Electrostatic Monitor


MONITOR PCA
MCP
P4-6
P4
5
2
1
4.8 KHz
-12
+12
F1
F2
TP 31
SELECT LINE (S4.2)
DATA BUS (BIT Ø) MONITOR PS STATUS
SELECT LINE (S1.7)
33
DATA BUS (BIT 4)
GATE B
31
DATA BUS (BIT 3)
NULL
ESM POWER SUPPLY
DS1
LED ON = SUPPLY ON
TP 27
20V PP
GROUND = OFF
1.8V WHEN ESM READING (MUCH PRE/POST RINGING)
TP 12
V CON
+4V
TP 13
V OUT
AD CONVERT
ANALOG MPLX
DATA BUS
CONTROL PCA
DC POWER PCA
HIGH VOLTA
DATA BUS (B
SELECT LINE S2.1
BACKPLANE
P2
J8
J3
J2
DATA BUS
SELECT LINES
CNTL DECODER
ESM DOOR
48
7
7
ESM D+
ESM D-
6
3
+28V PICK

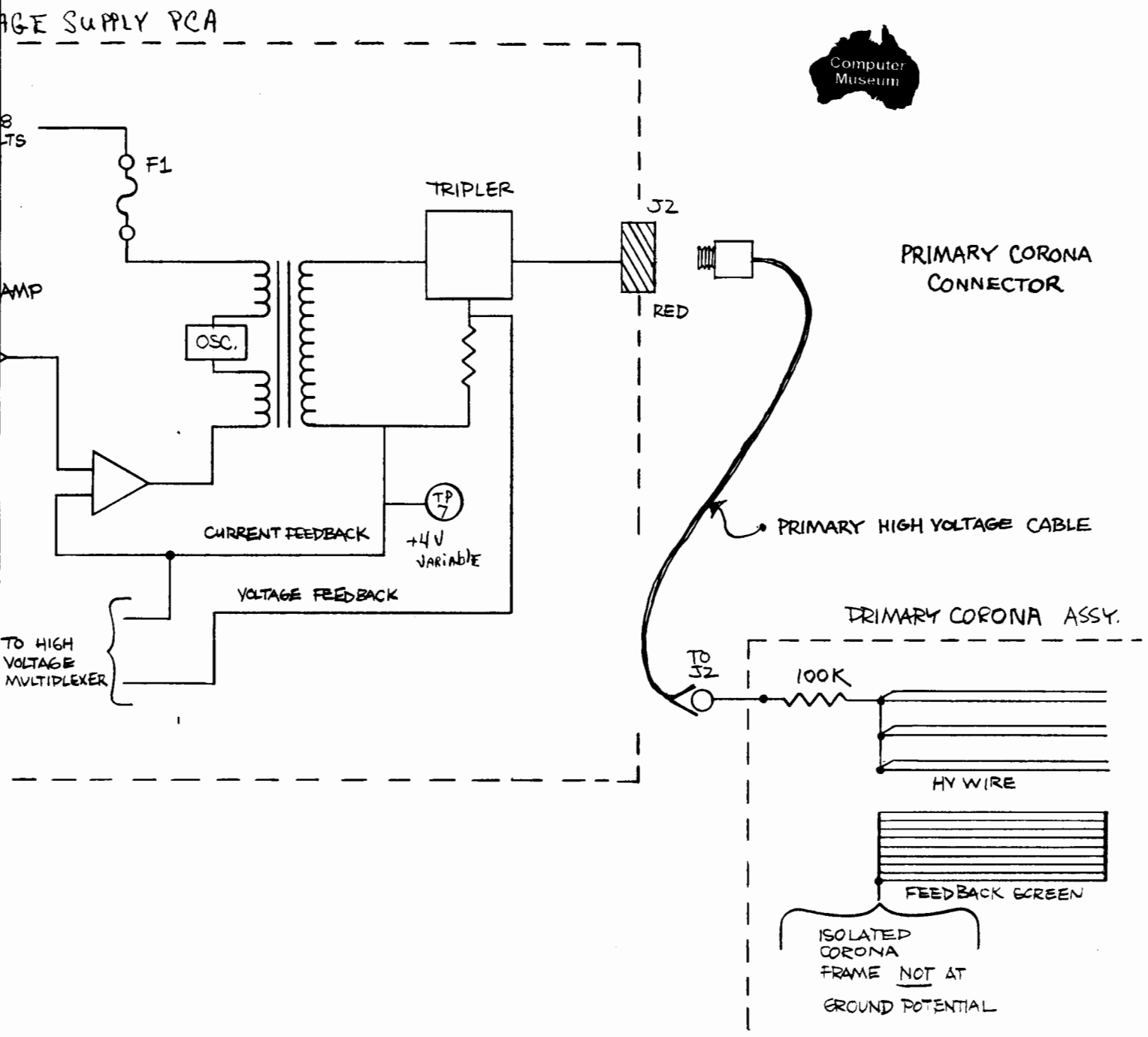
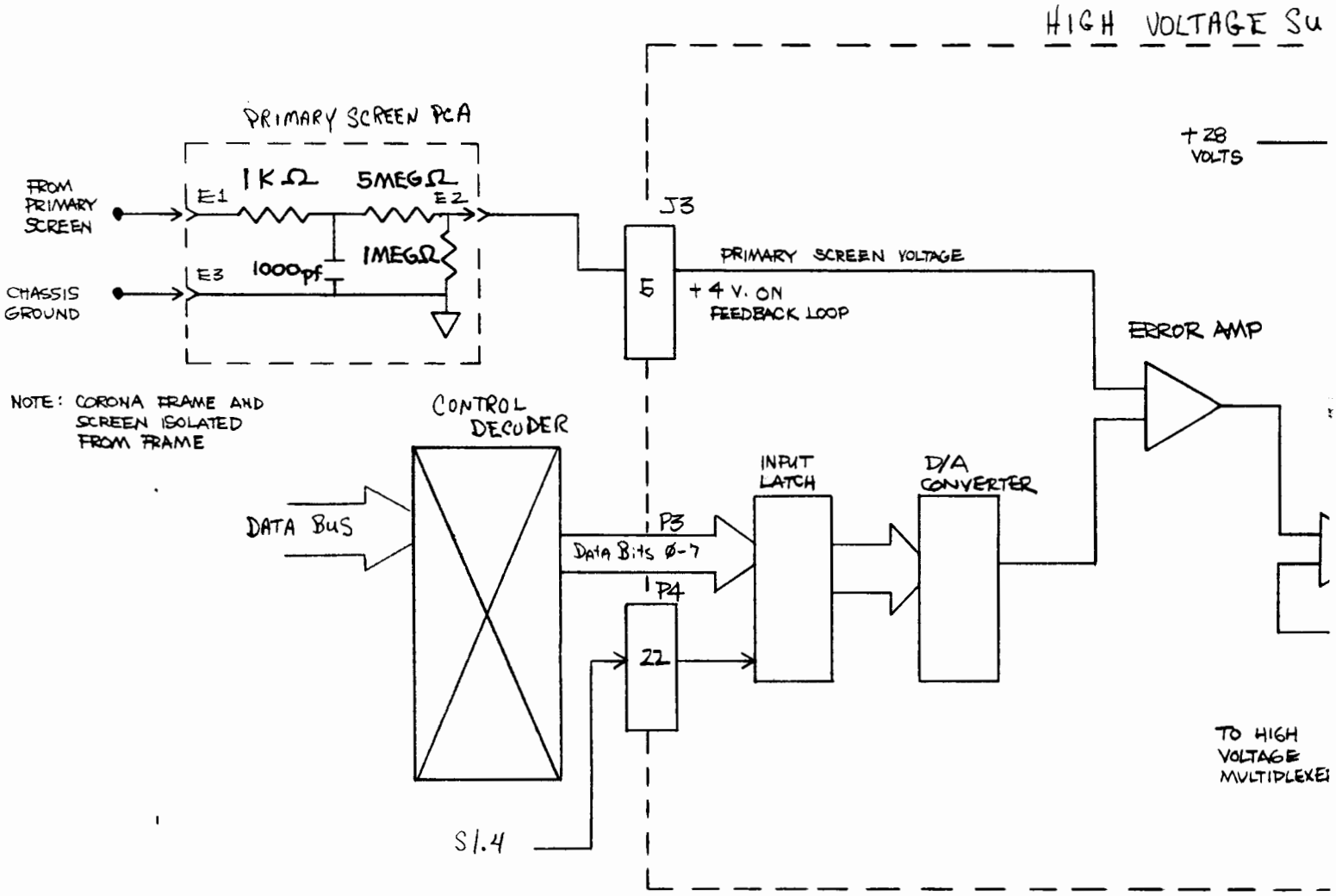


Figure 6-17. Primary Corona Power Supply


HIGH VOLTAGE Su
PRIMARY SCREEN PCA
+28 VOLTS
FROM PRIMARY SCREEN
E1
1KΩ
5MEGΩ
E2
J3
E3
1000pf
1MEGΩ
CHASSIS GROUND
5
PRIMARY SCREEN VOLTAGE
+4 V. ON FEEDBACK LOOP
ERROR AMP
NOTE: CORONA FRAME AND SCREEN ISOLATED FROM FRAME
CONTROL DECODER
INPUT LATCH
D/A CONVERTER
DATA BUS
P3
Data Bits Ø-7
P4
22
TO HIGH VOLTAGE MULTIPLEXE
S1.4

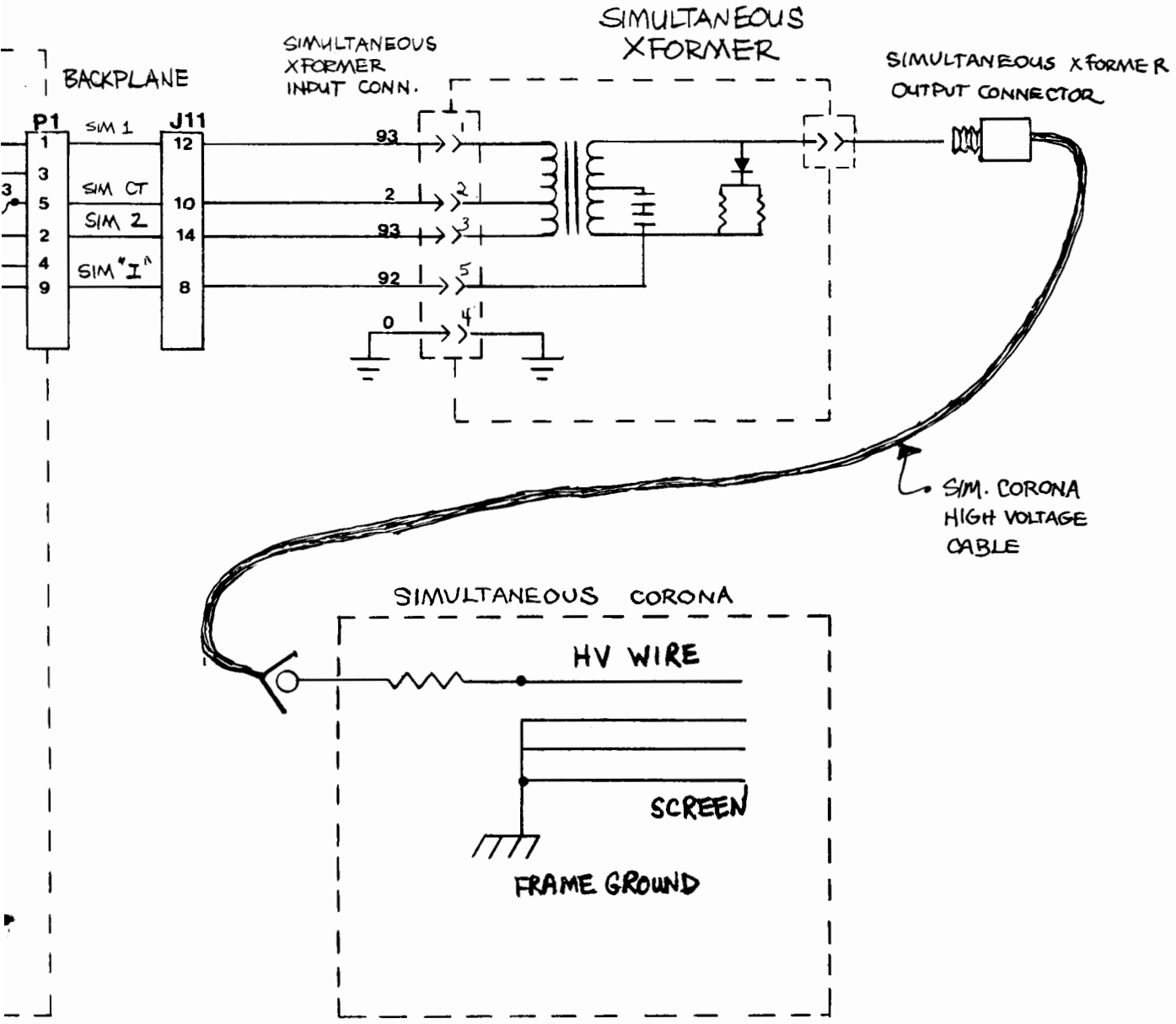
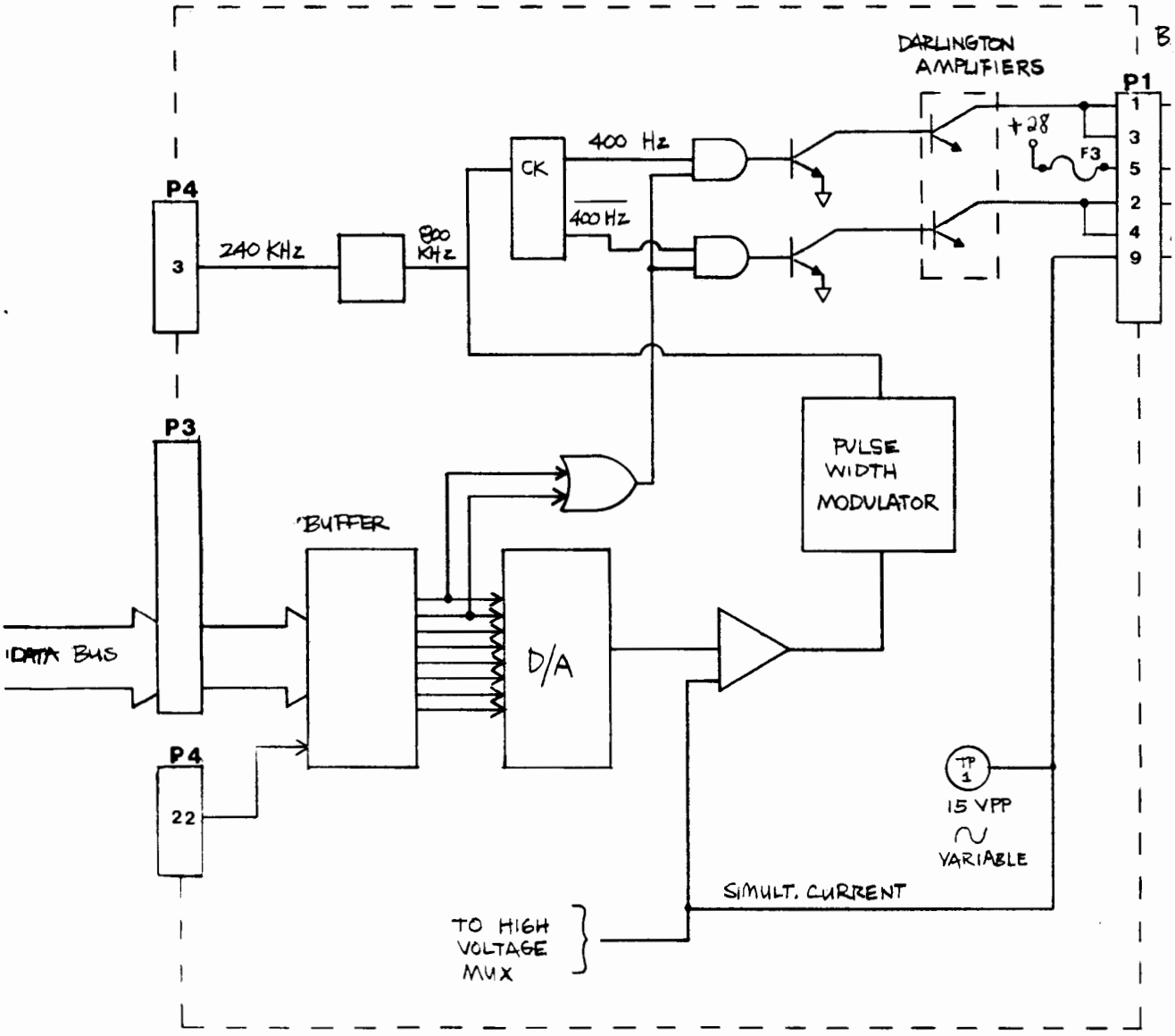


Figure 6-18. Simultaneous Corona Power Supply

HV SUPPLY PCA



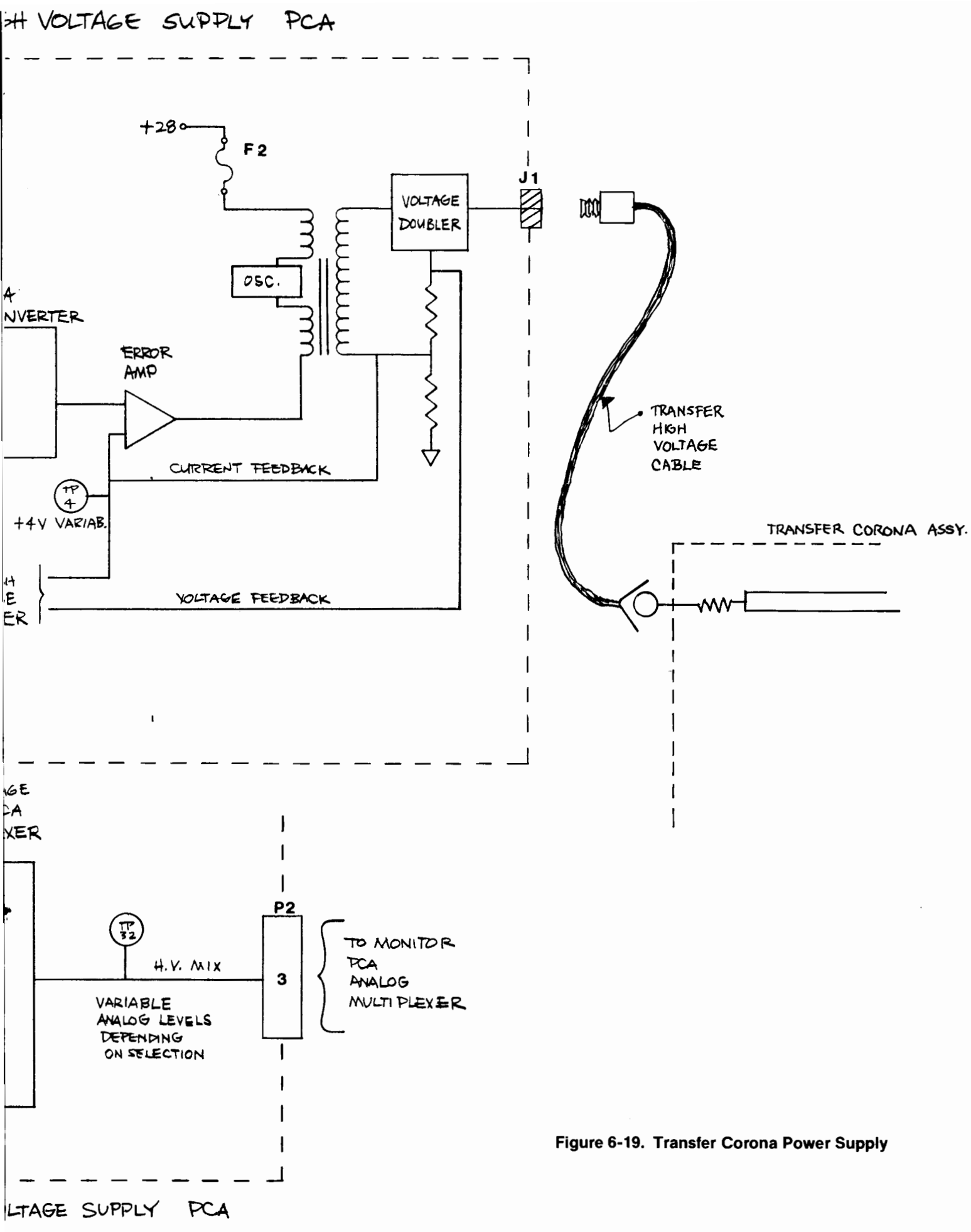
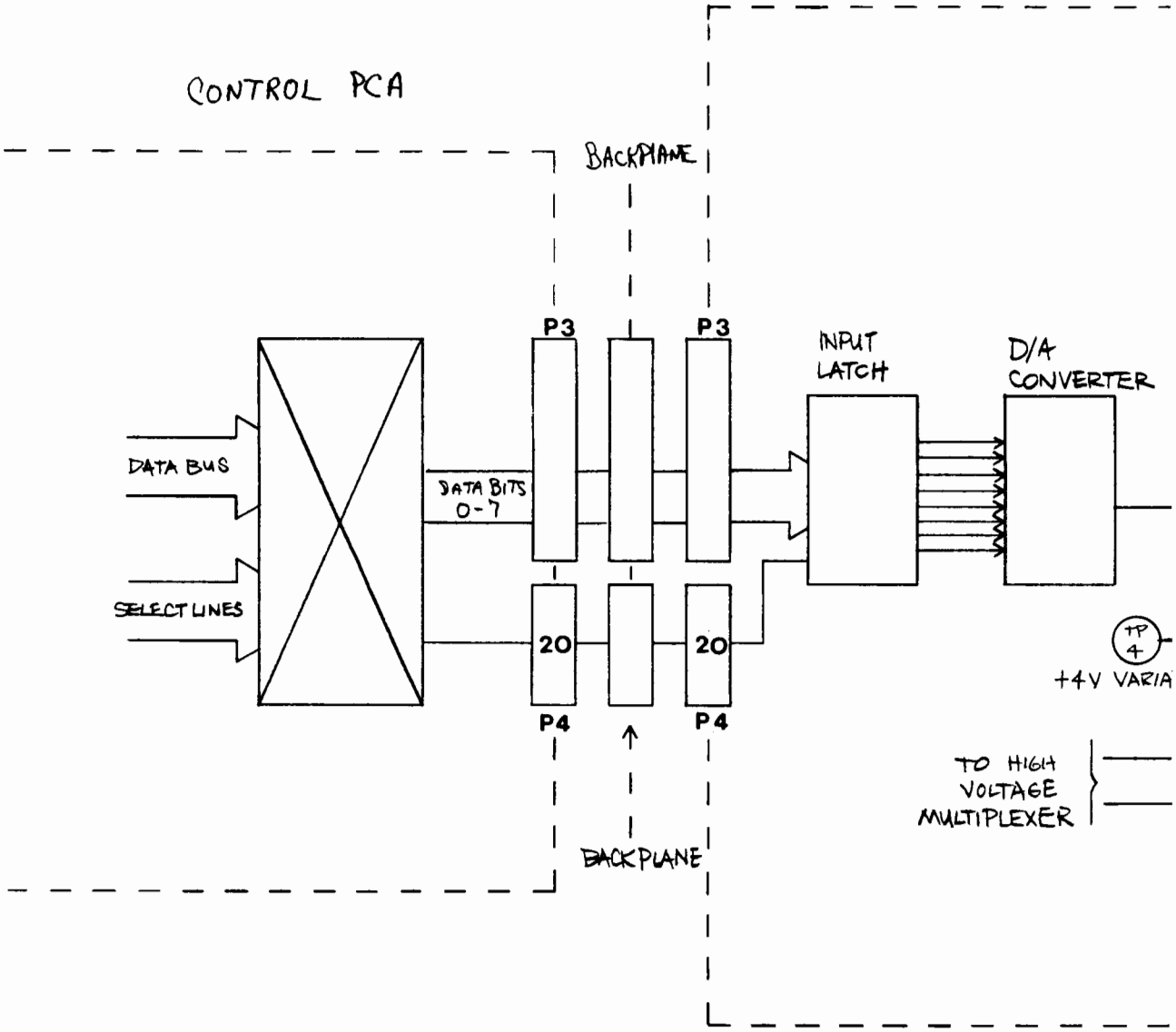
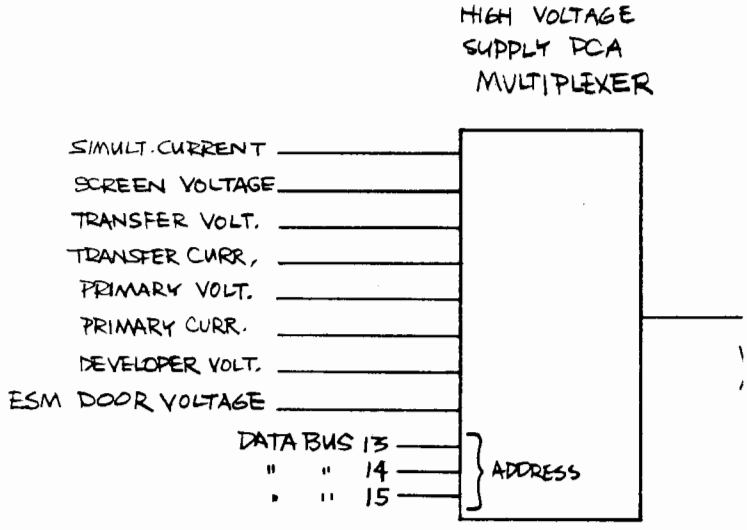


Figure 6-19. Transfer Corona Power Supply


CONTROL PCA
BACKPLANE
P3
P3
INPUT LATCH
D/A CONVERTER
DATA BUS
SELECT LINES
DATA BITS 0-7
20
20
P4
P4
TP 4
+4V VARIA
TO HIGH VOLTAGE MULTIPLEXER
BACKPLANE


HIGH VOLTAGE SUPPLY PCA MULTIPLEXER
SIMULT. CURRENT
SCREEN VOLTAGE
TRANSFER VOLT.
TRANSFER CURR.
PRIMARY VOLT.
PRIMARY CURR.
DEVELOPER VOLT.
ESM DOOR VOLTAGE
DATA BUS 13
" " 14
" " 15
ADDRESS

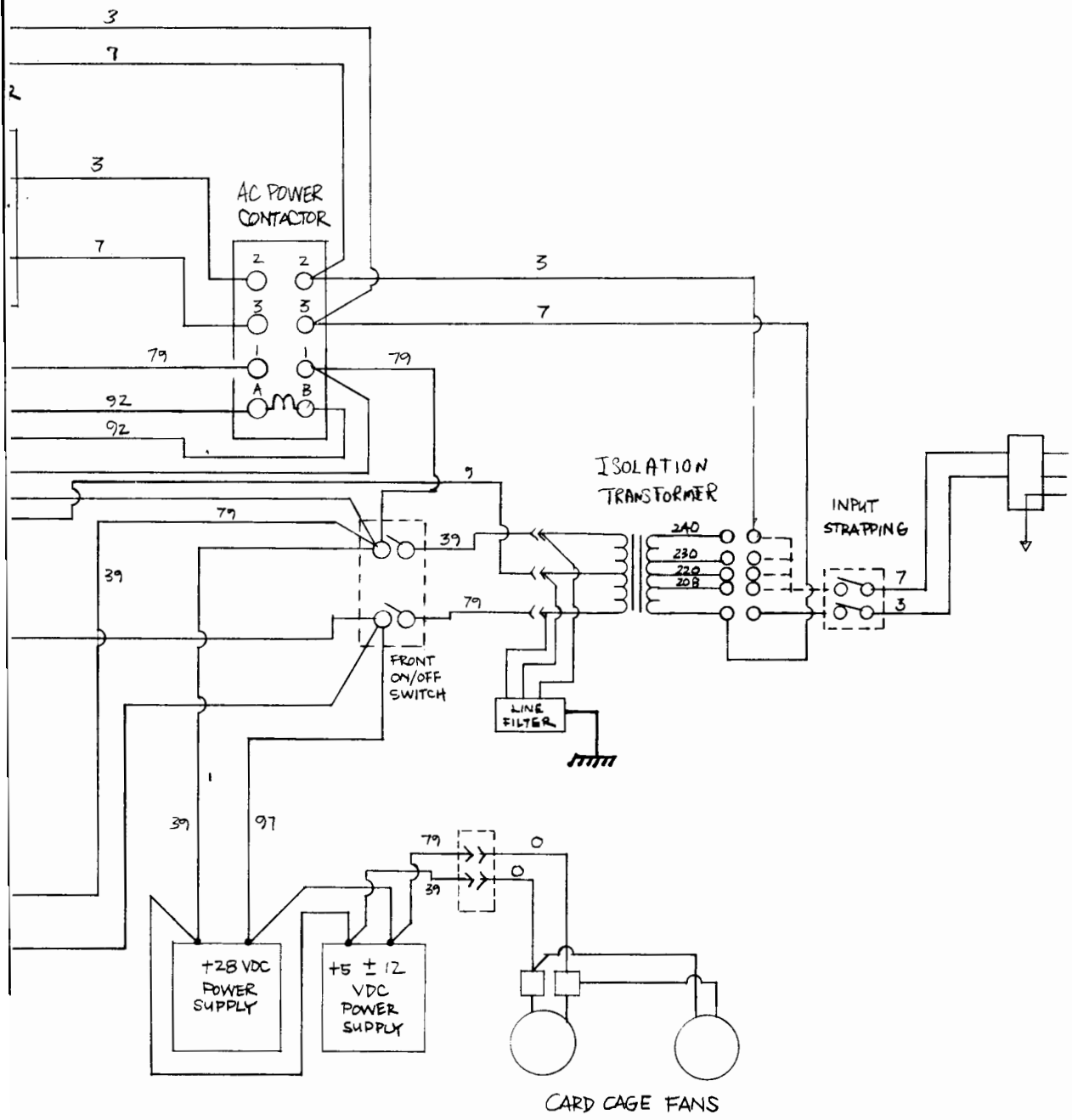
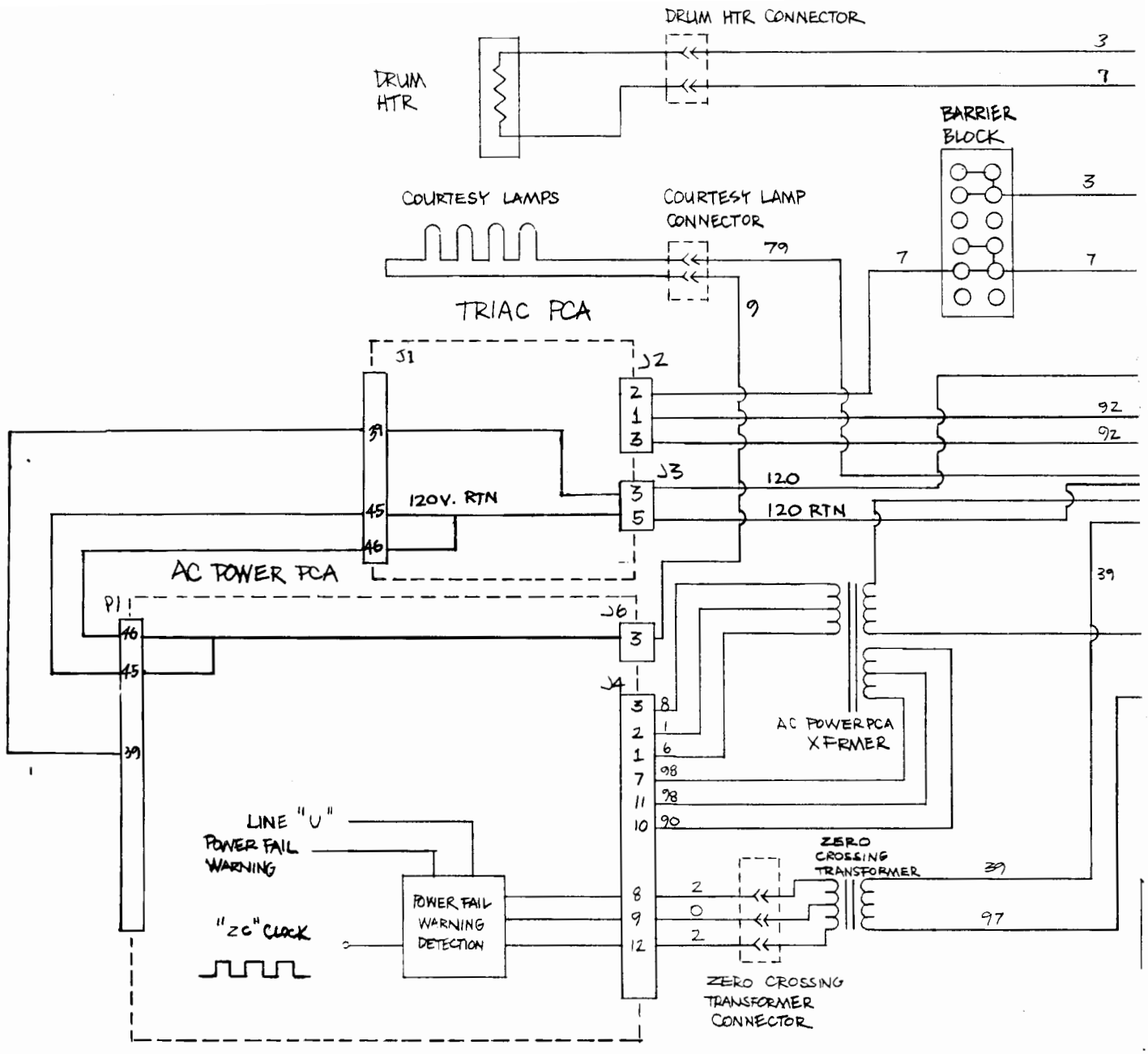


Figure 6-20. Input Power Module


DRUM HTR CONNECTOR
DRUM HTR
3
7
BARRIER BLOCK
3
7
COURTESY LAMPS
COURTESY LAMP CONNECTOR
79
7
9
TRIAC PCA
J1
J2
2
1
3
92
92
J3
120
3
5
120V. RTN
120 RTN
45
46
AC POWER PCA
39
P1
J6
46
3
45
J4
3
2
1
7
11
10
8
6
98
98
90
AC POWER PCA XFRMER
39
LINE "U"
POWER FAIL WARNING
"ZC" CLOCK
POWER FAIL WARNING DETECTION
8
9
12
2
0
2
ZERO CROSSING TRANSFORMER
97
ZERO CROSSING TRANSFORMER CONNECTOR

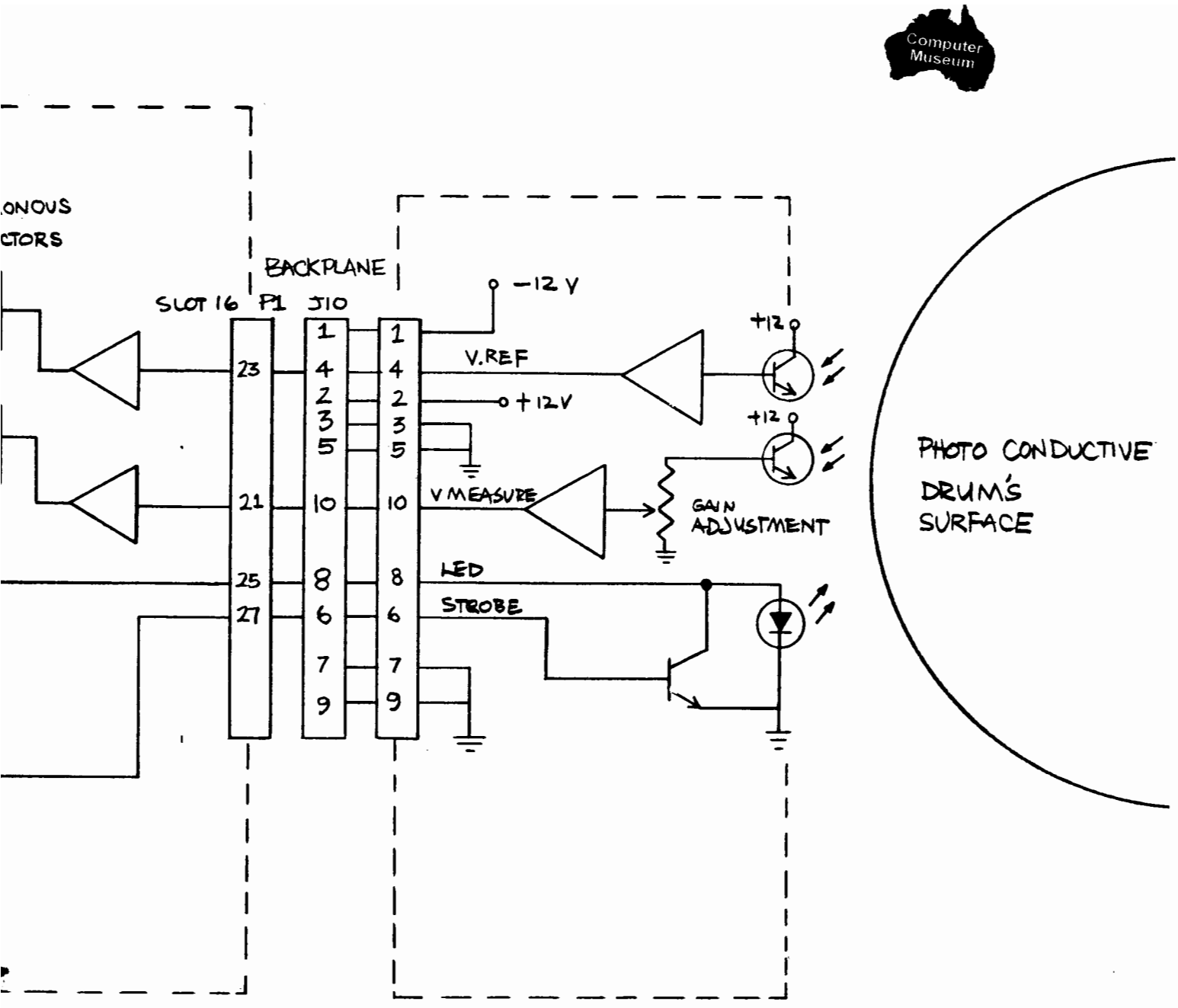
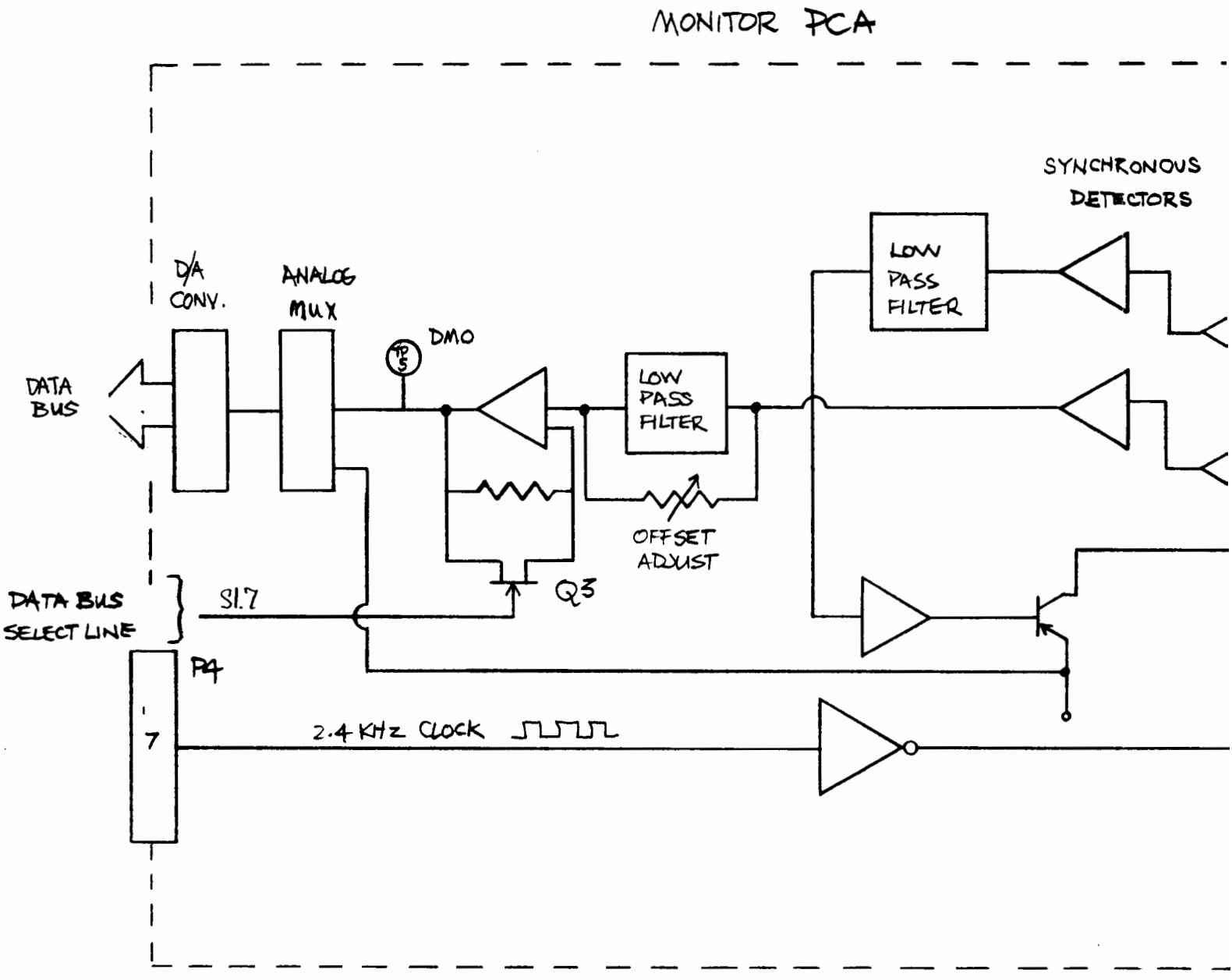
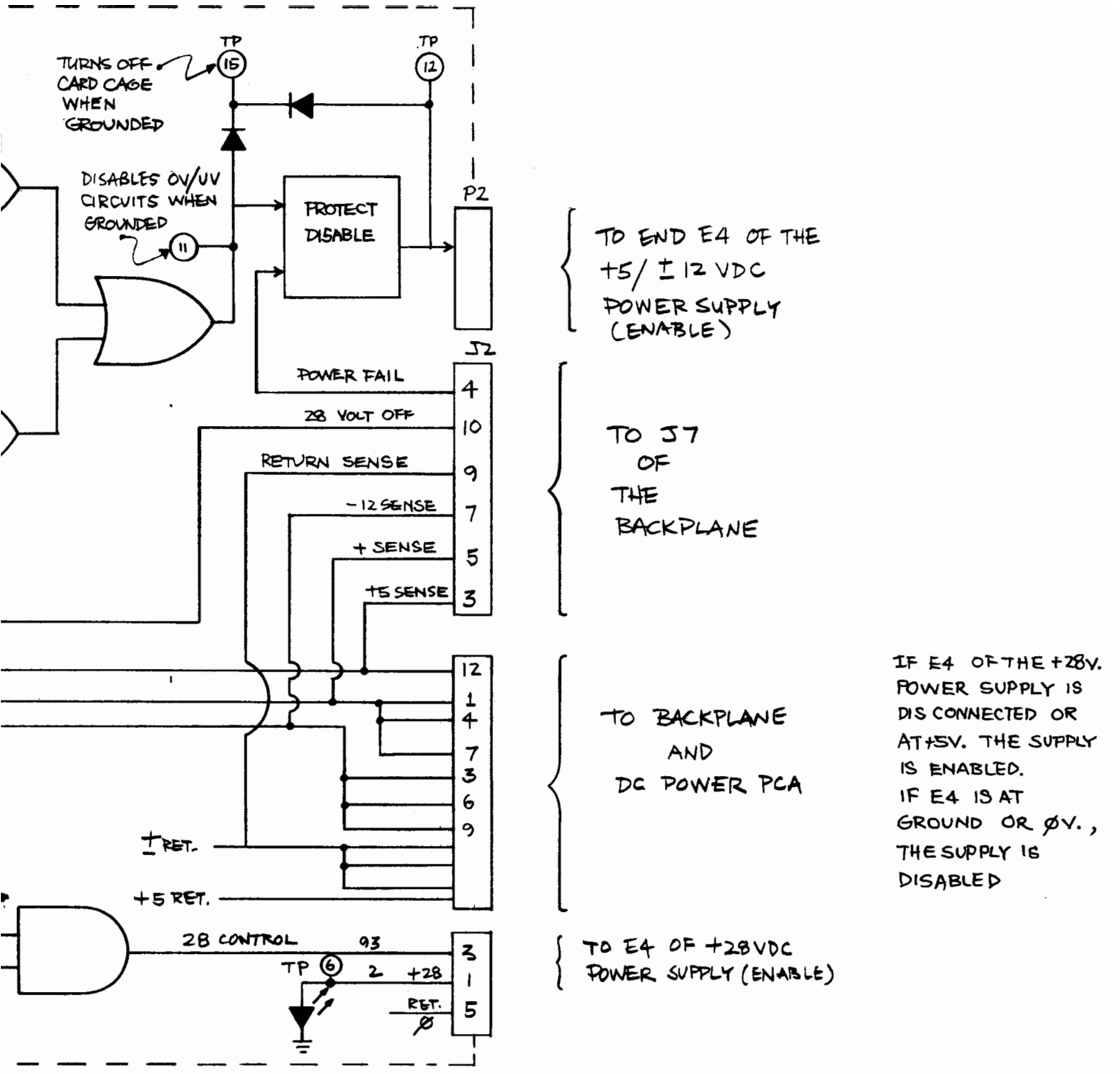


Figure 6-21. Densitometer

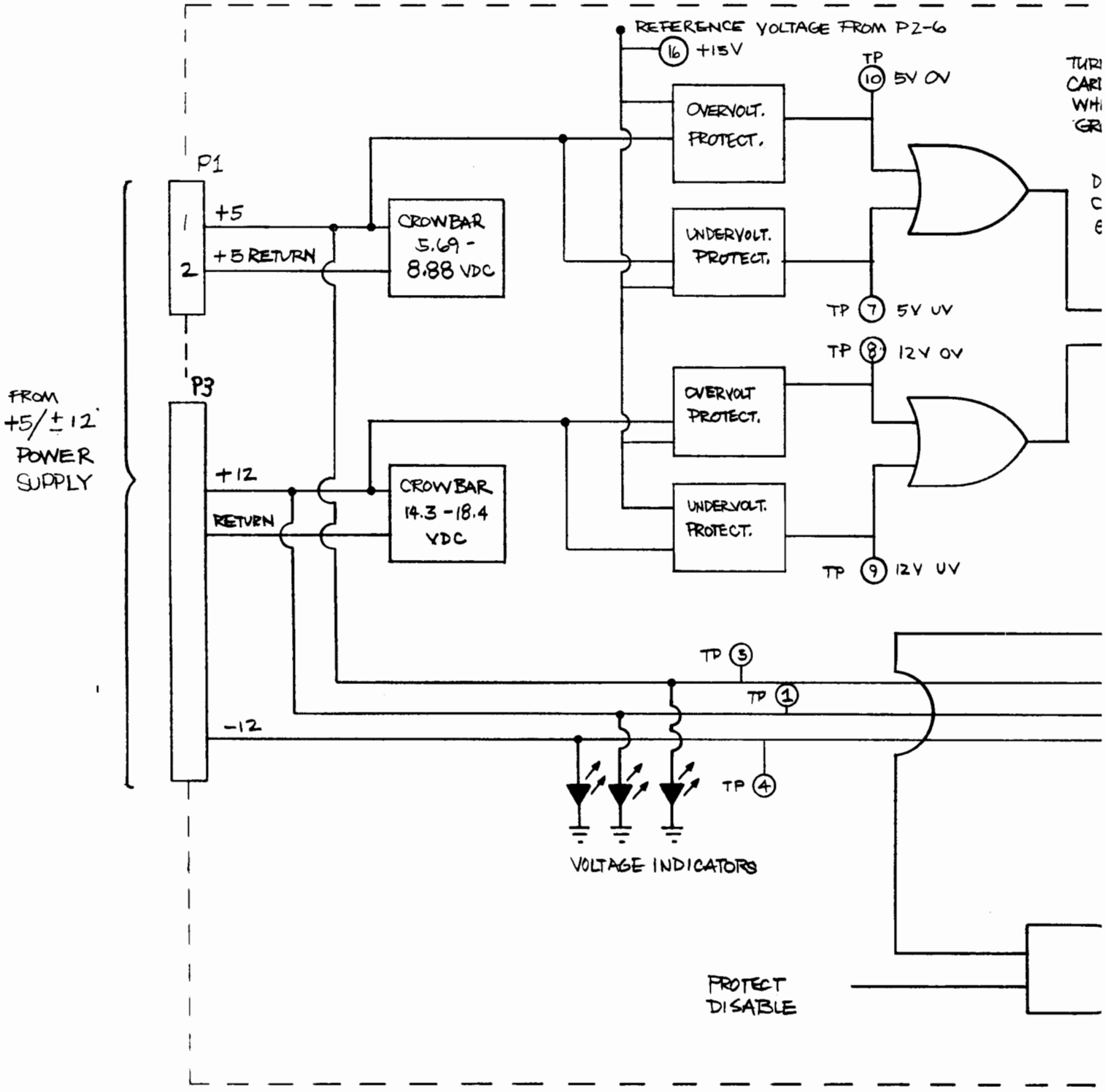

MONITOR PCA
SYNCHRONOUS DETECTORS
D/A CONV.
ANALOG MUX
DMO
TP 5
DATA BUS
LOW PASS FILTER
LOW PASS FILTER
OFFSET ADJUST
Q3
DATA BUS SELECT LINE
S1.7
P4
7
2.4 KHz CLOCK



AGE +5V. = ERROR
ØV. = NORMAL
HED AS LONG AS BOTH THE FRONT AND REAR
TING THE REAR BREAKER RESETS THE LOGIC.

Figure 6-22. Power Distribution PCA

POWER DISTRIBUTION



TP7-10 OVERVOLTAGE/UNDERVOLTAGE +5V
ERROR CONDITIONS: Ø
THE TESTPOINTS ARE LATCHED AS LO
BREAKERS ARE ON. RESETTING THE

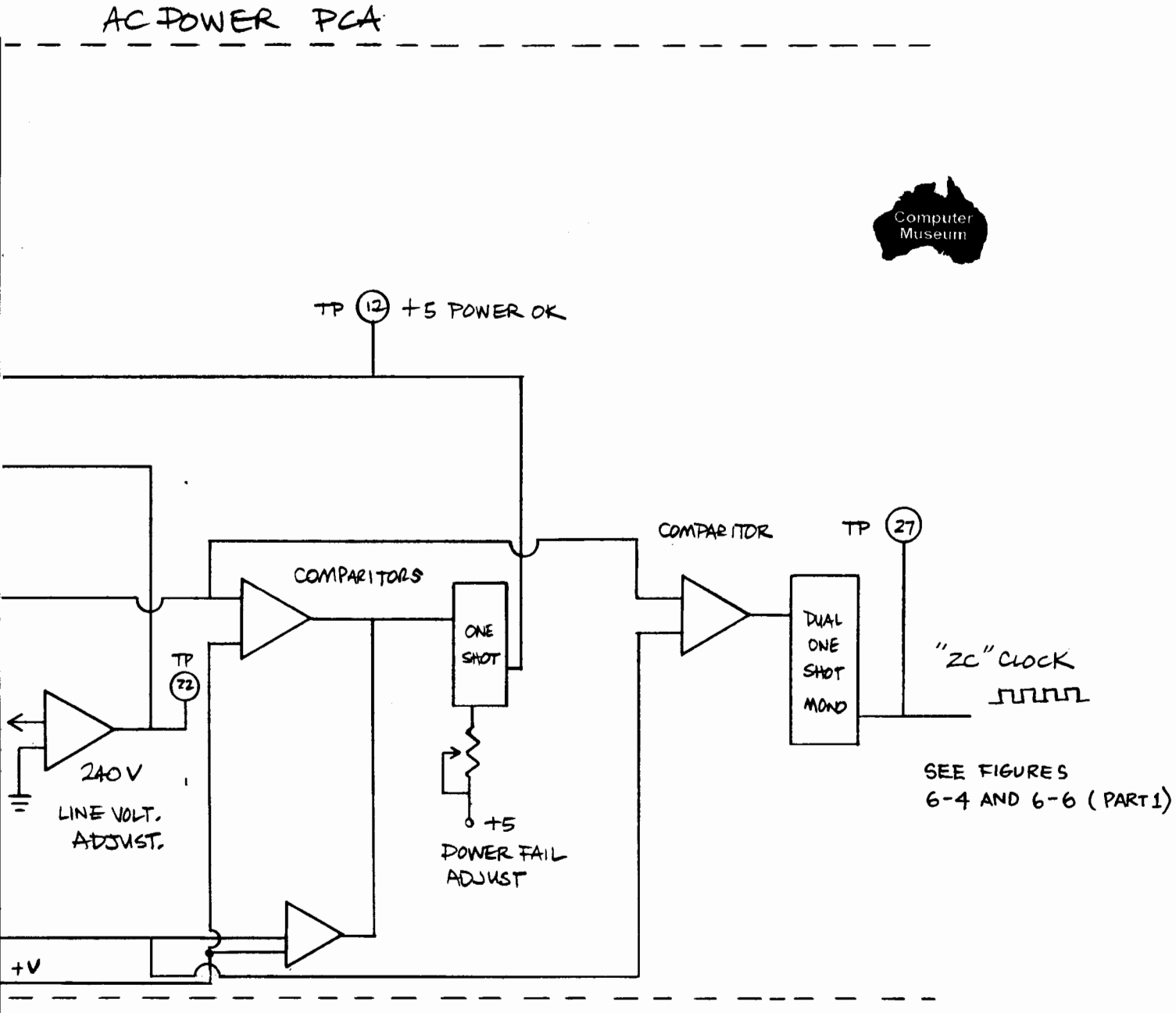
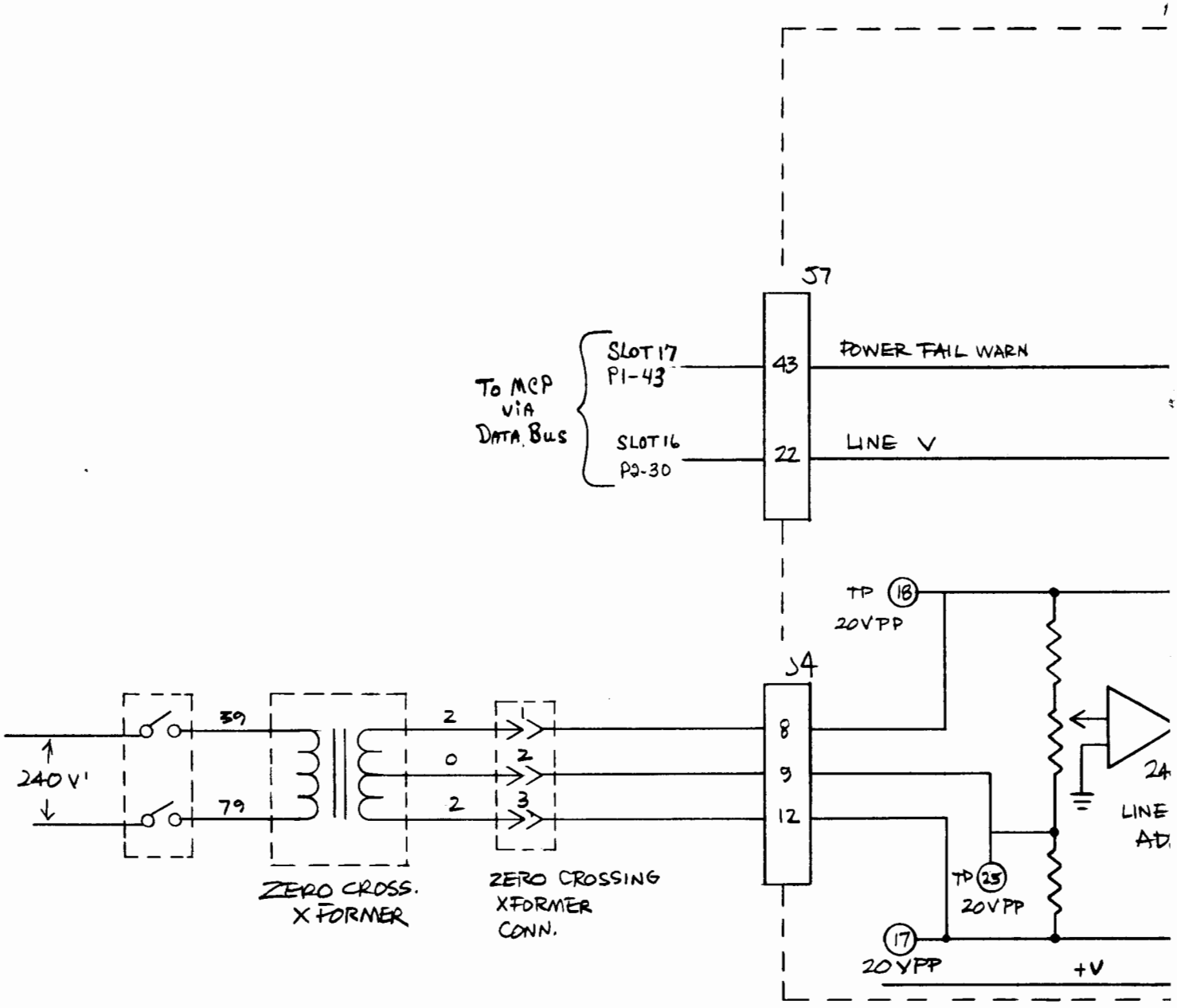
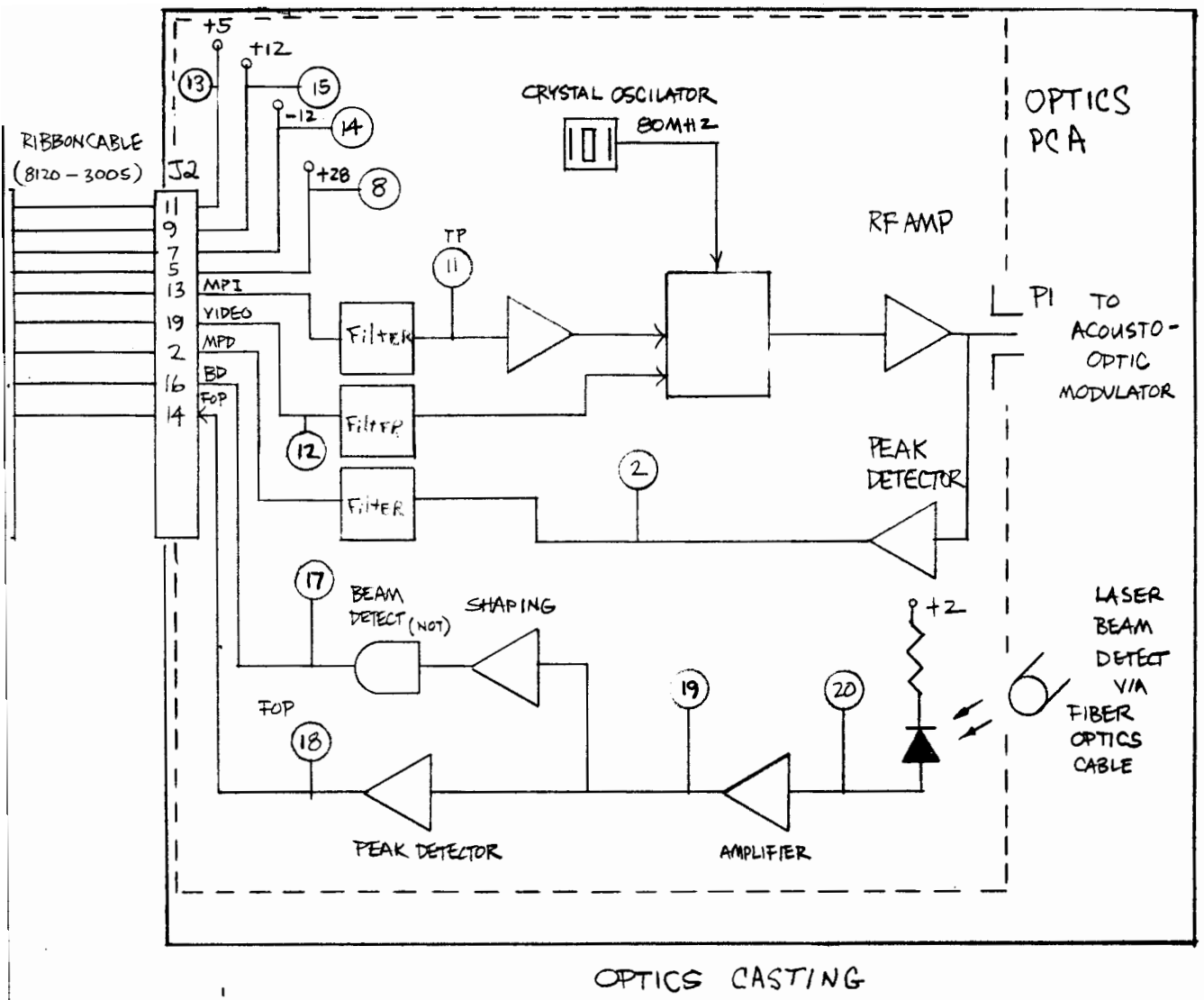
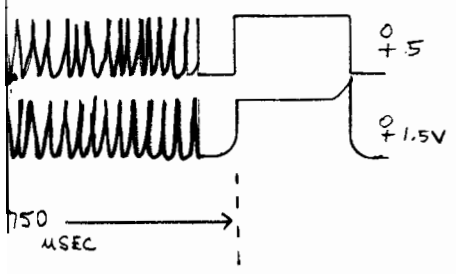


Figure 6-23. Zero Crossing Transformer


J7
To MCP via Data Bus
SLOT 17 P1-43
SLOT 16 P2-30
43
22
POWER FAIL WARN
LINE V
TP 18
20VPP
J4
8
9
12
240 V'
39
79
2
0
2
2
3
ZERO CROSS. XFORMER
ZERO CROSSING XFORMER CONN.
TP 25
20VPP
17
20VPP
+V
LINE



n MCP PCA
\ DATA PROCESSOR PCA



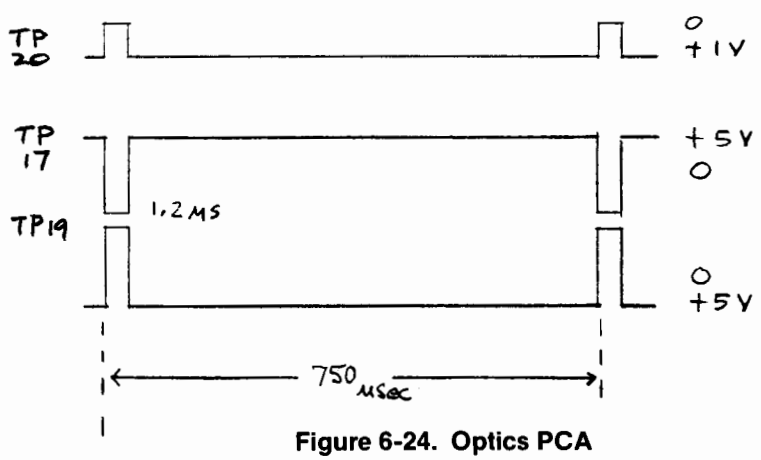
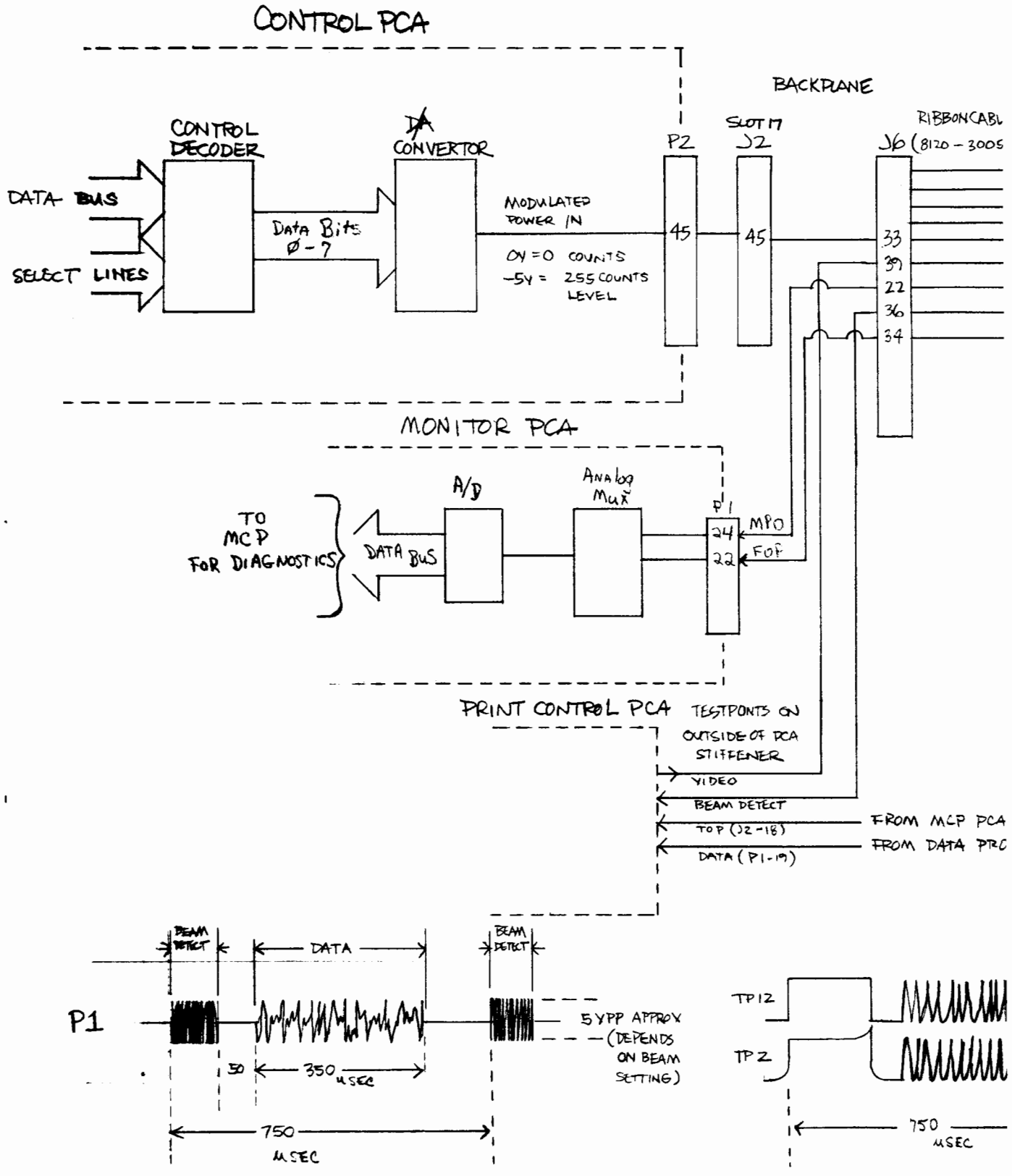


Figure 6-24. Optics PCA



AS DEFINED ON THE SELFTEST PRINTOUT:

MPO = RFPOWER

MPI = BEAM SETTING

FOP = 1ST. ORD BEAM

SECTION VII.
2680A RIBBON CABLES

7-1. INTRODUCTION

The following is a list of the ribbon cables used in the 2680A printer. Listed with along with each cable are the cable's connector ends and the associated pin positions and signal names of each wire in the cables.

SENSOR CABLE
(P/N 8120-3001)

BACKPLANE J9		SENSOR PCA J1
1	600 Hz	1
2	+12	2
3	+5	3
4	GND	4
5	GND	5
6	Elv Bot	6
7	PapIN	7
8	STKMSF	8
9	Spare 2	9
10	Spare 3	10
11	Spare 4	11
12	STP TC	12
13	Elv Top	13
14	Vac Sense	14
15	Ten TC	15
16	Spare 7	16

POWER DISTRIBUTION CABLE
(P/N 8120-3004)

BACKPLANE J7		POWER DISTRIBUTION PCA J2
1	Spare 10 (PWR Off)	1
2	Dist 5Ref	2
3	+ 5 Sens	3
4	PFW Fail	4
5	+ 12 Sens	5
6		N/C
7	- 12 Sens	7
8		N/C
9	Return Sens	9
10	28 Off	10

DENSITOMETER CABLE
(P/N 8120-3002)

BACKPLANE J10		DENSITOMETER J1
1	-12	1
2	+12	2
3	GND	3
4	V Ref	4
5	GND	5
6	Strobe	6
7	GND	7
8	LED	8
9	GND	9
10	V Meas	10

OPTICS RIBBON CABLE
(P/N 8120-3005)

BACKPLANE J6		SCANNER PCA J1
1	HG2 VO+	1
2	HG2 Supp+	2
3	HG2 VO-	3
4	HG3 Supp-	4
5		5
6		6
7	+ Mot Supp	7
8	PH4 Rtn	8
9	+ Mot Supp	9
10	PH3 Rtn	10
11	PH2 Rtn	11
12		12
13	PH1 Rtn	13
14	+ Mot Supp	14
15	GND	15
16	GND	16
17	HG1 Supp-	17
18	HG1 VO-	18
19	HG1 Supp+	19
20	HG1 VO+	20
.		
.		OPTICS PCA J2
.		
21	GND	1
22	MPO	2
23	GND	3
24	GND	4
25	+28	5
26	+28	6
27	-12	7
28	-12B	8
29	+12	9
30	+12B	10
31	+5	11
32	GND	12 *
33	MPI	13
34	FOP	14
35	GND	15
36	BD NOT	16
37	GND	17
38	GND	18
39	Video	19
40	GND	20

* pin labeled "ZOP" on backplane, not used

AC POWER PCA CABLE
(P/N 8120-2997)

BACKPLANE J1 Slot 17		AC POW
1	AC Power Cont	1
2	Preheater Area	2
3	Vacuum C	3
4	Preheater Area 2	4
5	Fuser On	5
6	Preheater Area	6
7	Preheater On	7
8	Preheater Area 4	8
9	Spare	9
10	GNDB	10
11	Hopper On	11
12	Current Sense Mux 1	12
13	Erase On	13
14	Current Sense Mux 2	14
15	Fuser/PAMM Fans	15
16	Current Sense Mux 3	16
17	Overall/Illum Lamps	17
18	Heat Cntrl Factor 0	18
19	Elevator Enable	19
20	Heat Cntrl Factor 1	20
21	Elevator Up/Not Down	21
22	Line V	22
23	NOT SRSTB	23
24	Current Sense	24
25	Stacker Motors	25
26	Heat Cntrl Factor 2	26
27	Purge Fan/Pump	27
28	Heat Cntrl Factor 3	28
29	Input Air	29
30	DAC Ref	30
31	Laser ON (NOT)	31
32		32
33	Spare	33
34		34
35		35
36	GNDB	36
37		37
38		38
39		39
40	Spare	40
41	Preheater Problem	41
42	Spare	42
43	Power Fail (NOT)	43
44	Spare	44
45		45
46		46
47	V01	47
48	V02	48
49	V03	49
50	GNDB	50

DC POWER PCA CABLE
(P/N 8120-2999)

BACKPLANE J8		DC POWER PCA 3	
1	BPGNDA	1	
2	Rotation Counter	2	
3	Spare 9	3	
4		4	
5	Spare 8	5	
6	Transfer Engage	6	
7	ESM Door	7	
8	Laser ON	8	*
9	DMBRK	9	
10		10	
11	DMDR2	11	
12		12	
13	DMDR1	13	
14		14	
15		15	
16	DC PWR BD TEMP	16	
17		17	
18		18	
19	Phase 2 Return	19	
20	HG1 Supp+	20	
21	Phase 4 Return	21	
22	HG2 Supp-	22	
23	Phase 3 Return	23	
24	HG1 Supp-	24	
25	Phase 1 Return	25	
26	HG2 Supp-	26	
27		27	
28		28	
29	SCDR1	29	
30	STDR1	30	
31	SCDR2	31	
32	STDR2	32	
33	BPGND	33	
34	BPGND	34	
35		35	
36	BPGND	36	
37		37	
38	Tension Current	38	
39		39	
40		40	

* Pin not used in circuitry

DISPLAY PCA RIBBON CABLE
(P/N 8120-2996)

BACKPLANE J1 SLOT 12		DISPLAY DRIVER P3
1	Data I/O 0	1
2	Data I/O 1	2
3	Data I/O 2	3
4	Data I/O 3	4
5	Data I/O 4	5
6	Data I/O 5	6
7	Data I/O 6	7
8	Data I/O 7	8
9	Reset (NOT)	9
10	DIS CS (NOT)	10
11	RUN LED (NOT)	11
12	BEEP	12
13	+12	13
14	+12	14
15	GND	15
16	GND	16
17	GND	17
18	GND	18
19	GND	19
20	GND	20
21	+5	21
22	+5	22
23	+5	23
24	+5	24
25	+5	25
26	+5	26
27	CE 1 (NOT)	27
28	CE 2 (NOT)	28
29	CE 3 (NOT)	29
30	CE 4 (NOT)	30
31	CE 5 (NOT)	31
32	CE 6 (NOT)	32
33	CE 7 (NOT)	33
34	CE 8 (NOT)	34
35	CE 9 (NOT)	35
36	CE 0 (NOT)	36
37	ENTER (NOT)	37

38	CLEAR (NOT)	38
39	PRINT (NOT)	39
40	STOP (NOT)	40
41	PNEXT (NOT)	41
42	REG (NOT)	42
43	REG UP (NOT)	43
44	REG DN (NOT)	44
45	REG LFT (NOT)	45
46	REG RHT (NOT)	46
47	REG DIS	47
48	EJECT ALL(NOT)	48
49	GND	49
50	GND	50

DCS I/O RIBBON CABLE
(8120-3338)

DCS I/O PCA J3		HPIB CONNECTOR
1	SWCIC	1
2	SWCIC	2
3		3
4		4
5	GND	5
6	ATN (NOT)	6
7	GND	7
8	SRQ (NOT)	8
9	GND	9
10	IFC (NOT)	10
11	GND	11
12	NDAC (NOT)	12
13	GND	13
14	NRFD (NOT)	14
15	GND	15
16	DAV (NOT)	16
17	REN (NOT)	17
18	EOI (NOT)	18
19	DI/O 8(NOT)	19
20	DI/O 4(NOT)	20
21	DI/O 7(NOT)	21
22	DI/O 3(NOT)	22
23	DI/O 6(NOT)	23
24	DI/O 2(NOT)	24
25	DI/O 5(NOT)	25
26	DI/O 1(NOT)	26
27	GND	27
28	SW4	28
29	SW2	29
30	SW1	30
31	+5	31
32	+5	32
33		33
34		34

OPERATOR KEYBOARD
(P/N 8120-3003)

DISPLAY DRIVER P4		KEYBOARD
1	CE 1 (NOT)	1
2	CE 2 (NOT)	2
3	CE 3 (NOT)	3
4	CE 4 (NOT)	4
5	CE 5 (NOT)	5
6	CE 6 (NOT)	6
7	CE 7 (NOT)	7
8	CE 8 (NOT)	
9	CE 9 (NOT)	9
10	CE 0 (NOT)	10
11	ENTER (NOT)	11
12	CLEAR (NOT)	12
13	PRINT (NOT)	13
14	HALT (NOT)	14
15	PNEXT (NOT)	15
16	EJECT SINGLE (NOT)	16
17	REG UP (NOT)	17
18	REG DN (NOT)	18
19	REG LFT (NOT)	19
20	REG RHT (NOT)	20
21	REG DIS (NOT)	21
22	EJECT ALL (NOT)	22
23	GND	23
24	GND	24
25	N/C	25
26	N/C	26

PAPER MOTION CABLE
(P/N 8120-3000)

BACKPLANE J13		PAPER CONTROL KEYBOARD
1	STK MAN (NOT)	1
2	STK LED (NOT)	2
3	STK UP (NOT)	3
4	REV (NOT)	4
5	STK DOWN (NOT)	5
6	FWD (NOT)	6
7	SPLICE (NOT)	7
8		8
9		9
10	AUTO THD (NOT)	10

DCS I/O FRONT PLANE CONNECTOR
(P/N 8120-3147)

MEMORY PCA FRONT PLANE CONNECTOR
(P/N 8120-3339)

DISPLAY READOUT
(P/N 8120-2998)

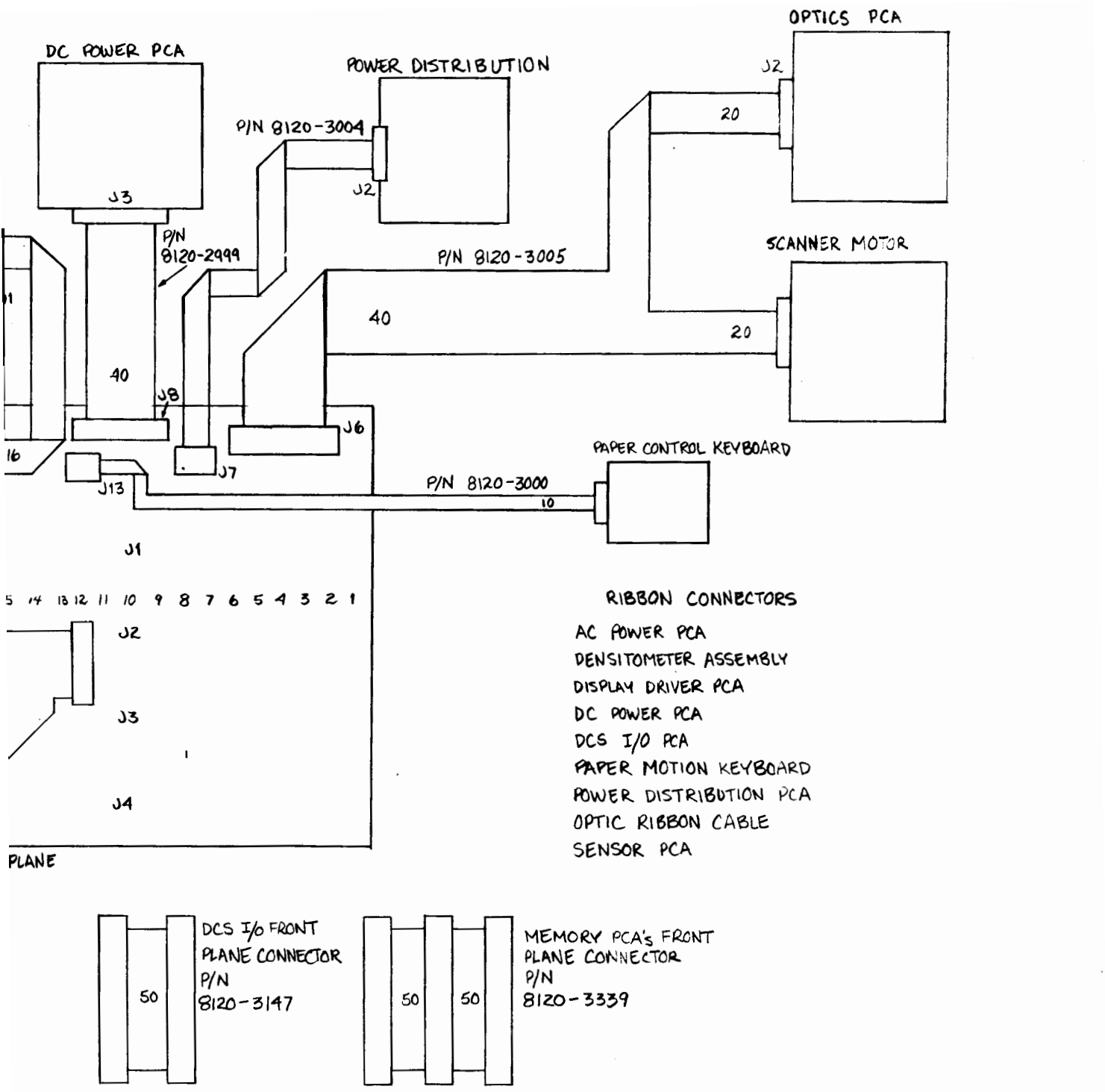
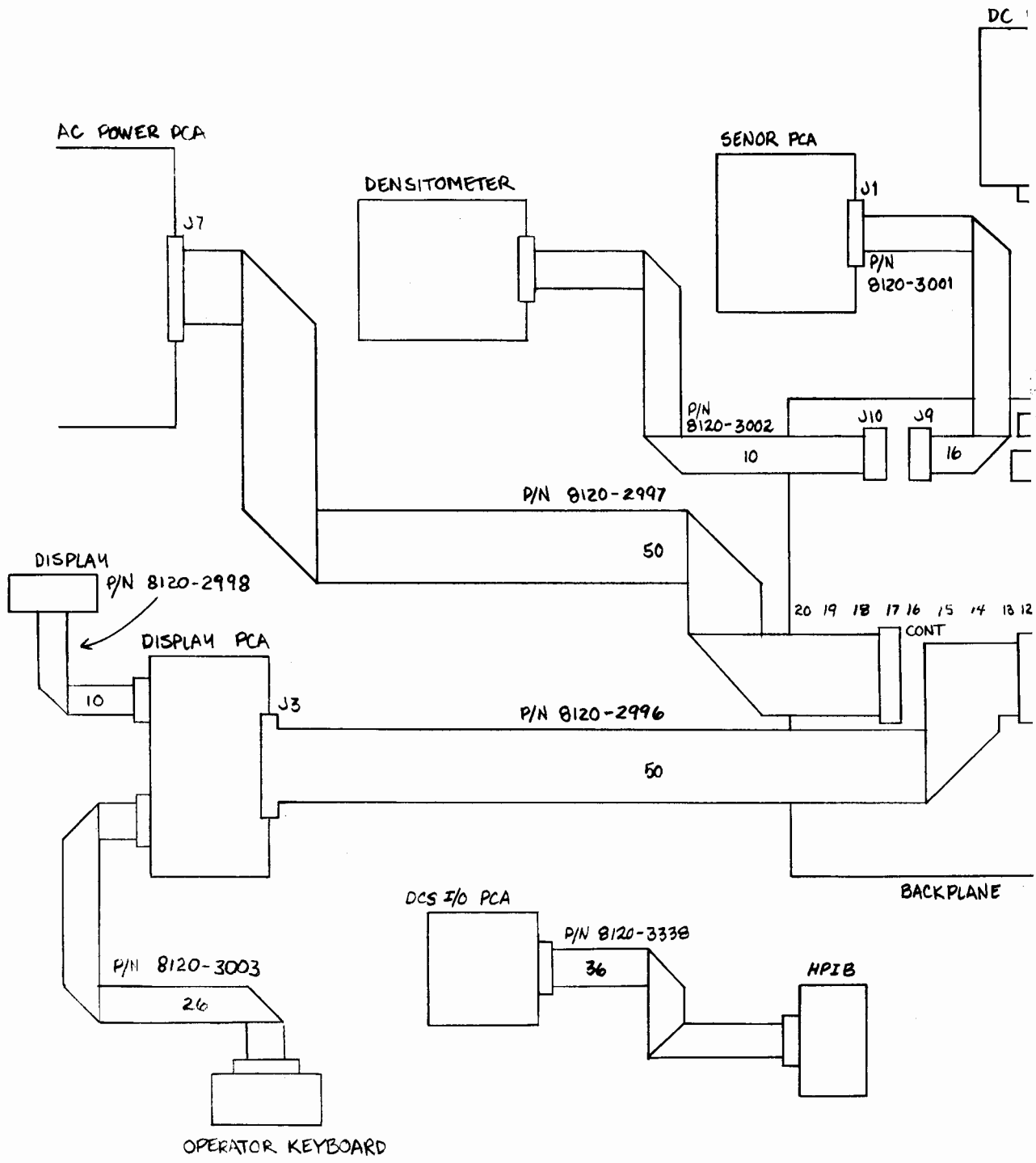


Figure 7-1. Ribbon Cables


DC
AC POWER PCA
J7
DENSITOMETER
SENOR PCA
J1
P/N
8120-3001
P/N
8120-3002
J10
J9
10
16
P/N 8120-2997
50
DISPLAY
P/N 8120-2998
DISPLAY PCA
20 19 18 17 16 15 14 13 12
CONT
10
J3
P/N 8120-2996
50
BACKPLANE
DCS I/O PCA
P/N 8120-3338
36
HPIB
P/N 8120-3003
26
OPERATOR KEYBOARD