TO 31R2-2URC-123

TECHNICAL MANUAL

MAINTENANCE INSTRUCTIONS WITH ILLUSTRATED PARTS BREAKDOWN DEPOT

RADIO FREQUENCY AMPLIFIER,

AM-7224/URC, P/N 10087-0000

HARRIS CORPORATION, RF COMMUNICATIONS GROUP
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USAF

SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components with the power supplies turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge circuits to ground before touching any circuit components. Remove watches and rings before performing any maintenance procedures.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Cardiopulmonary resuscitation procedures are outlined in T.O. 31-1-141-1, and annual refresher training requirements are outlined in AFOSH STD 127-50.

The following warnings appear in the text in this volume, and are repeated here for emphasis.

WARNING

Voltages dangerous to life exist in this radio equipment. Before removing the top cover, disconnect the primary power and wait 30 seconds. This allows time for all voltages to bleed off.

HANDLING OF ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (EDSD)

Electrostatic Discharge Sensitive Devices (EDSD) must be handled with certain precautions that must be followed to minimize the effect of static build-up. Consult T.O. 00-25-234, DOD Std-1686, and DOD HDBK 263. EDSD devices are identified in this technical order by the following symbol:

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For chapters 1-5, see the On-Equipment Manual, T.O. 31R2-2URC-121.

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GLOSSARY

A	Ampere(s)
A/D	Analog-to-Digital (Converter)
AFSK	Audio frequency shift keying; a baseband modulation scheme in which two audio frequencies are used to represent binary coded data; the frequency is shifted to one frequency to represent a 1 (mark) and to the other to represent a 0 (space).
AGC	Automatic gain control
ALE	Address latch enable
AM	Amplitude modulation; a modulation scheme in which the carrier is made to vary in amplitude in accordance with the modulating signal.
AME	Amplitude modulation equivalent
ANTIVOX	Prevents false VOX operation; see VOX
BFO	Beat Frequency Oscillator, used in SSB detection circuits
BIT	Built-in Test
BIU	Bus interface unit
BW	Bandwidth
CPU	Central processing unit
CREV	Converter reverse
CW	Continuous wave; a wave that does not vary in amplitude or frequency and is turned on and off to carry intelligence, e.g., Morse Code
D/A	Digital-to-Analog (Converter)
dB	Decibel(s)
dBm	Decibel(s) relative to one milliwatt
EMI	Electromagnetic interference
EPROM	Erasable programmable read-only memory
EU	Execution unit
HF	High frequency; a radio frequency band extending from about 3 MHz to 30 MHz; in this manual, HF includes 1.6 to 30 MHz.
HV	High voltage
IF	Intermediate frequency
IM	Intermodulation (distortion)
I/O	Input/Output
KREV	Keyer reverse
LCD	Liquid crystal display
LED	Light emitting diode
LPA	Linear power amplifier
LSB	Lower sideband; a modulation scheme in which the intelligence is carried on the first sideband below the carrier frequency; see SSB
MIC	Microphone
mA	Milliampere(s)
mV	Millivolt(s)
NBSV	Narrow band secure voice
PEP	Peak envelope power
PPC	Peak power control
PWB	Printed wiring board
RAM	Random access memory
rms	Root mean square
RTC	Real time clock
RX	Receive

GLOSSARY (Continued)

S TONE	Sidetone
SSB	Single sideband; a modulation scheme in which the intelligence is carried by one of the carrier sidebands, the other sideband and the carrier center frequency being suppressed
TGC	Transmitter gain control
TX	Transmit
uA	Microampere(s)
uP	Microprocessor
USB	Upper sideband; a modulation scheme in which the intelligence is carried on the first sideband above the carrier frequency; see SSB
uV	Microvolt(s)
Vac	Volts, alternating current
VCO	Voltage controlled oscillator
Vdc	Volts, direct current
VOX	Voice operated transmission
VSWR	Voltage standing wave ratio; the ratio of the maximum to the minimum voltage of a standing wave on a radio frequency transmission line
W	Watt(s)

INTRODUCTION

The purpose of this manual is to provide information necessary for the depot-level maintenance of Amplifier, Radio Frequency, AM-7224/URC, manufactured by the RF Communications Group of Harris Corporation, Rochester, New York. The manual is divided into three chapters. The contents of each chapter are briefly described in the following paragraphs.

NOTE

This manual only contains three chapters, because chapters 1-5 are contained in the On-Equipment Manual, T.O. 31R2-2URC-121. For a description of the contents of these chapters, see the INTRODUCTION in T.O. 31R2-2URC-121.

Chapter 6 describes the depot-level maintenance procedures. The maintenance procedures in this chapter are based on performance testing and trouble analysis of the subassembly or PWB to locate and replace faulty parts at the lowest replaceable unit level (LRU).

Chapter 7 contains the Illustrated Parts Breakdown (IPB) information at the depot level. This includes assemblies and parts that may be replaced at the depot location.

Chapter 8 contains foldout (FO) drawings, which consist of the schematic diagrams of all the PWB assemblies. A cross reference list is also provided. The diagrams are numbered FO-1, FO-2, etc. They are printed on sheets with page-size blank aprons to permit viewing the diagram with the rest of the book closed or opened to another page.

The following specifications, standards, and publications were used in the preparation of this manual.

APPLICABLE SPECIFICATIONS

SPECIFICATION	NAME
MIL-M-38798B, para. 3.4	Combined Operation and Maintenance Instructions Manual (Equipment).
MIL-M-38807, Amend. 4	Preparation of Illustrated Parts Breakdown.
MIL-M-38790 and MIL-M-38784A	General Requirements for Preparation of Technical Manuals.

APPLICABLE STANDARDS

STANDARD	NAME
MIL-STD-12	Abbreviations for use on Drawings and in Technical Type Publications.
MIL-STD-15-1A	Graphic Symbols for Electrical Components.
MIL-STD-17-1	Mechanical Symbols.
MIL-STD-806	Graphic Symbols for Logic Diagrams.

APPLICABLE PUBLICATIONS

PUBLICATION	NAME
DOD 5200.20	Distribution Statements on Technical Documents.
USAS Y14.15-1966	Electrical and Electronic Diagrams.
USAS Y32.16-1968	Electrical and Electronic Reference Designations.
T.O. 31-1-141 (Series)	Technical Manual-Basic Electronic Technology and Testing Practices.

CHAPTER 6

MAINTENANCE

WARNING

Voltages dangerous to life exist in this radio equipment. Before removing the top cover, disconnect the primary power and wait 30 seconds. This allows time for all voltages to bleed off.

Section I. INTRODUCTION

6-1. CHAPTER ORGANIZATION. This chapter is divided into four sections. Section I tells how the chapter is organized. Section II contains alignment procedures for the replaceable modules. This information is also contained in the On-Equipment Manual, T.O. 31R2-2URC-121, and is repeated here for convenience. Section III consists of diagnostic procedures which will enable you to troubleshoot faulty modules to the component level. These procedures are based on use of the BIT feature. For more information on BIT, as well as removal/replacement procedures and periodic maintenance procedures, see the On-Equipment Manual, T.O. 31R2-2URC-121. Section IV contains removal/replacement procedures for the internal components of the Tank Assembly.

Section II. ALIGNMENT PROCEDURES

6-2. INTRODUCTION. This section contains instructions for checking and adjusting the replaceable subassemblies in the 1KW LPA. This section also contains circuit board layouts to help you identify the components that can be adjusted. To do the procedures described in this section, you need the test equipment listed in Table 6-1.

Table 6-1. Test Equipment

Generic Name	Military Designation	Manufacturer, Model No.	National Stock No.	Required Range
Electronic Voltmeter w/ AC Probe & T-connector		Hewlett Packard, Model 410C Model 11036A Model 11042A	6625-00-469-2258 6625-00-910-5973 5985-00-713-4356	20 to 224 V rms; 1.6 to 30 MHz (peak reading)
Digital Multimeter		Fluke, Model 8012A	6625-01-140-0221	200 mV to 250 Vac; 200 mV to 40 Vdc; 0 to 20 megohms
PROM Programmer		Data I/O, Model System 19	7045-01-115-8993	
Dummy Load		Bird, Model 8833	6625-00-225-9074	1000 W, 50 ohms
1 KW LPA	AM-7224/URC	RF Communications RF-353	5820-01-164-4871	
100 Watt Transceiver	RT 1446/URC	RF Communications RF-350K	5820-01-162-3402	
Power Supply	PP-7913/URC	RF Communications RF-354	6130-01-164-6580ZX	

NOTE: Equivalent Items Authorized

6-3. ALIGNMENT PROCEDURES

NOTE

After each of the following alignment procedures, disconnect test equipment and reconfigure equipment (module or circuit card) to normal operating condition.

a. TUBE ASSY, A1 (figure 6-1)

R3, RF Plate Sample Adjustment

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for a least 10 seconds.
- The LPA's AUTO/MANUAL BAND Switch is in the AUTO position.

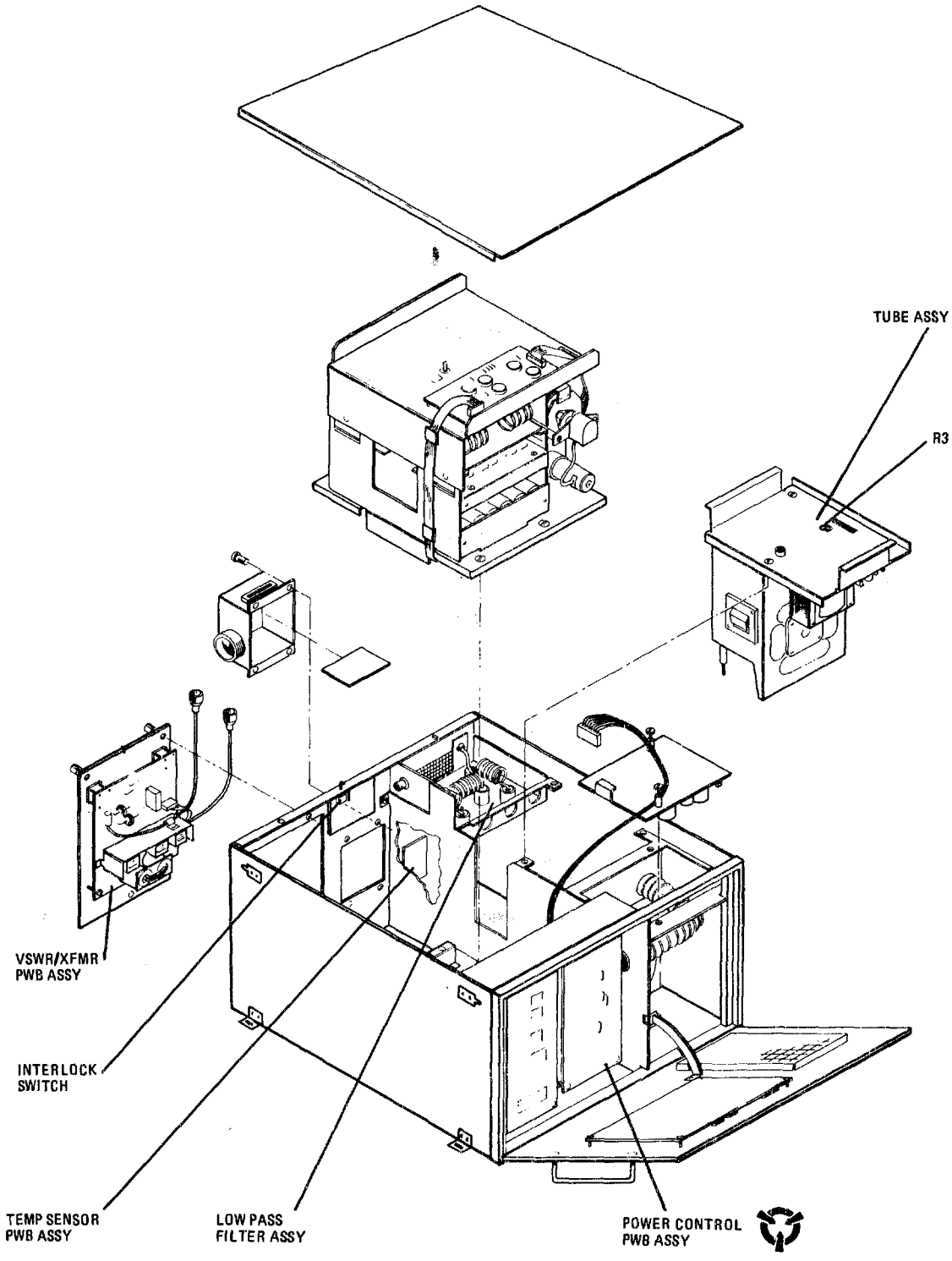

Figure 6-1. 1 KW LPA

(1) Using a Model 11042A T-connector, connect an HP-410C Voltmeter (or equilvalent) between the LPA's RF output connector J5 and a dummy load.

(2) Remove the top cover from the LPA, and pull the interlock switch all the way up to the "cheat" position.

(3) Turn the LPA on and set the operating frequency at the transceiver to 7.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), place LPA IN OPERATE and tune the system.

(4) Place the LPA in Manual mode with the AUTO/MANUAL BAND Switch in the 6-8 position. Set the ANTENNA Switch to the 50 ohm position and the LOCAL KEY Switch to CN. Key the transceiver, and monitor the voltage on the RF voltmeter.

(5) With a reading of 223 ±2 Vac on the meter, adjust R3 (accessible through a hole in the Tube Assy near the connector--see figure 6-1) so that the RF PLATE (VOLTS) position on the LPA front panel meter reads 2100 ±20.

(6) Return LOCAL KEY to OFF.

b. TANK ASSY, A2

No adjustments.

c. VSWR/XFMR PWB ASSY, A3 (figure 6-2)

(1) R5, Null Adjustment

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for at least 10 seconds.
- The LPA'S AUTO/MANUAL BAND Switch is in the AUTO position.

(a) Connect the 1KW LPA antenna connector J5 to a dummy load.

(b) Remove the top cover from the LPA, and pull the interlock switch all the way up to the "cheat" position.

(c) Lower the LPA front panel to its horizontal position to gain access to the Power Control PWB Assy.

(d) Connect a digital multimeter between test point TP2 and ground on the Power Control PWB Assy (see figure 6-3).

(e) Turn the LPA on and set the operating frequency at the transceiver to 16.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), place the LPA in OPERATE and tune the system.

(f) Key the system and adjust R5 (on the VSWR/XFMR PWB Assy -- see figure 6-2) for a null (minimum voltage) on the multimeter.

(2) R8, Forward Power Sample

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for at least 10 seconds.
- The LPA's AUTO/MANUAL BAND Switch is in the AUTO position.

(a) Using a Model 11042A T-connector and a Model 11036A AC Probe, connect an HP-410C Voltmeter (or equivalent) between the LPA's RF output connector J5 and a dummy load.

(b) Remove the top cover from the LPA, and pull the interlock switch all the way up to the "defeat" position.

(c) Lower the LPA front panel to its horizontal position to gain access to the Power Control PWB Assy.

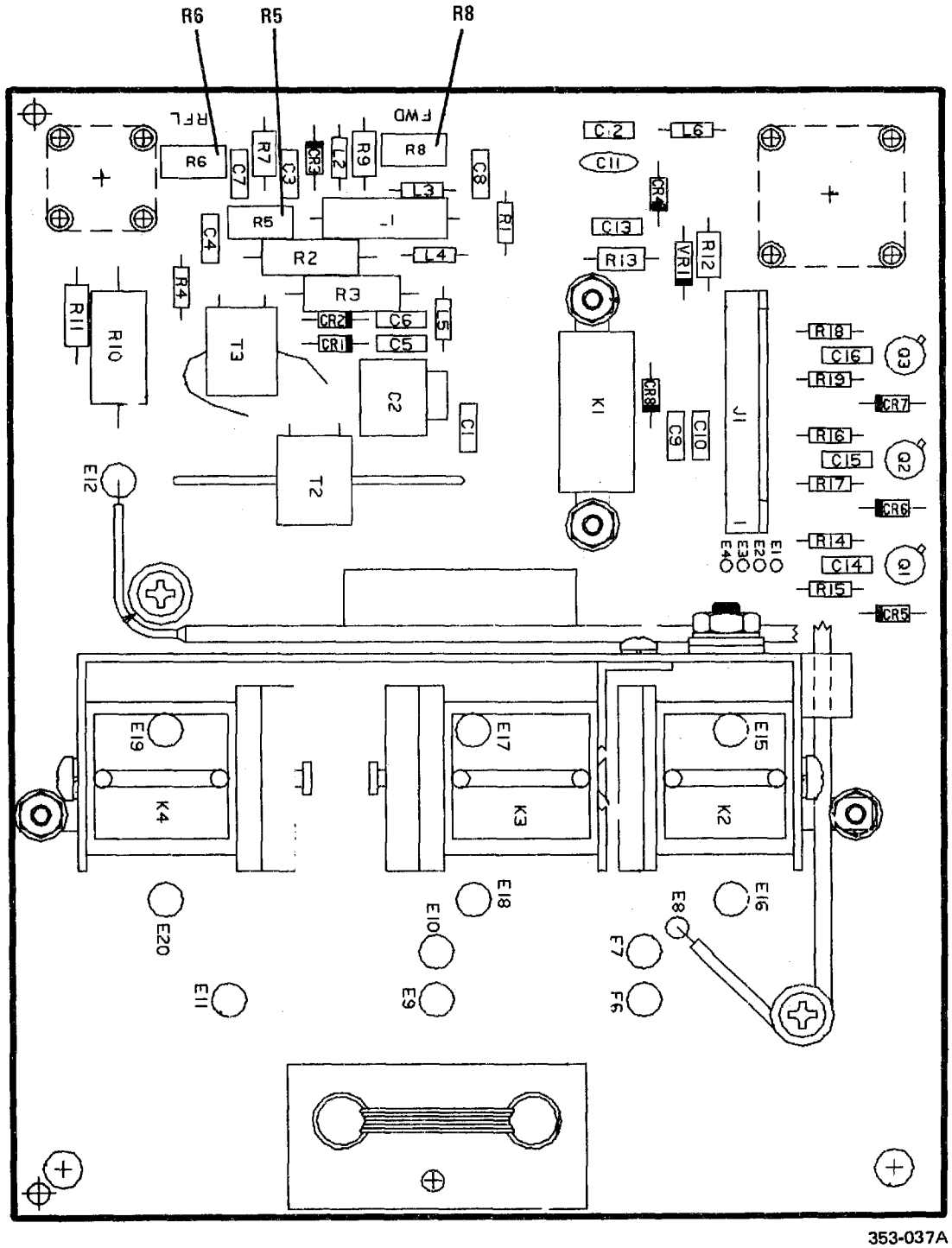

Figure 6-2. VSWR/XFMR PWB Assy

(d) Connect a digital multimeter between test point TP1 and ground on the A5 Power Control PWB Assy (see figure 6-3). Ensure that R34 is fully CCW and R74 is fully CW.

(e) Turn the LPA on and set the operating frequency at the transceiver to 16.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), place the LPA in OPERATE and tune the system.

(f) Key the system and observe the output voltage on the HP-410C and the forward power sample voltage on the digital multimeter. The HP-410C should read 223 ±2 Vac and the multimeter should read 7.00 ± 0.05 Vdc.

(g) If both readings are within tolerance, no adjustment is required. If either reading is out of tolerance, adjust Loop Gain Potentiometer R29 on the Power Control PWB Assy so that the HP-410C reads 223 Vac. If the multimeter reading is 7.00 ± 0.05 Vdc, no further adjustment is required.

(h) If the multimeter reads less than 6.95 Vdc, adjust R29 on the Power Control PWB Assy for a reading of slightly less than 223 Vac on the HP-410C. Then adjust R8 on the VSWR/XFMR PWB Assy for a reading of 7 volts on the multimeter. Readjust R29 to increase the HP-410C reading toward 223 Vac. Continue to alternately adjust R29 toward 223 Vac and R8 toward 7 Vdc until the HP-410C reads 223 ±2 Vac and the multimeter reads 7.00 ± 0.05 Vdc.

(i) If the multimeter reads more than 7.05 Vdc, adjust R8 on VSWR/XFMR PWB Assy for a reading of slightly less than 6.95 Vdc. Then adjust R29 on the Power Control PWB Assy for 223 Vac on the HP-410C. Readjust R8 toward 7 Vdc and R29 toward 223 Vac. Continue to alternately adjust R8 and R29 until the multimeter reads 7.00 ±0.05 Vdc and the HP-410C reads 223 ±2 Vac.

(3) R6, Reflected Sample Adjustment

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for at least 10 seconds.
- The LPA's AUTO/MANUAL BAND Switch is in the AUTO position.
- R5 and R8 on the VSWR/XFMR PWB Assy are correctly adjusted.

(a) Connect the LPA's RF output connector J5 to a dummy load.

(b) Remove the top cover from the LPA, and pull the interlock switch all the way up to the "cheat" position.

(c) Lower the LPA front panel to its horizontal position to gain access to the Power Control PWB Assy.

(d) Connect a digital multimeter between test points TP1 and TP2 on the A5 Power Control PWB Assy (see figure 6-3).

(e) Turn the LPA on and set the operating frequency at the transceiver to 16.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), place the LPA in OPERATE and tune the system.

(f) Unkey the system if keyed and disconnect the dummy load from the J5 antenna connector.

(g) Key the system, and adjust R6 for 0.00 ±0.05 Vdc on the digital multimeter.

d. FAN INVERTER PWB ASSY, A4

No adjustments.

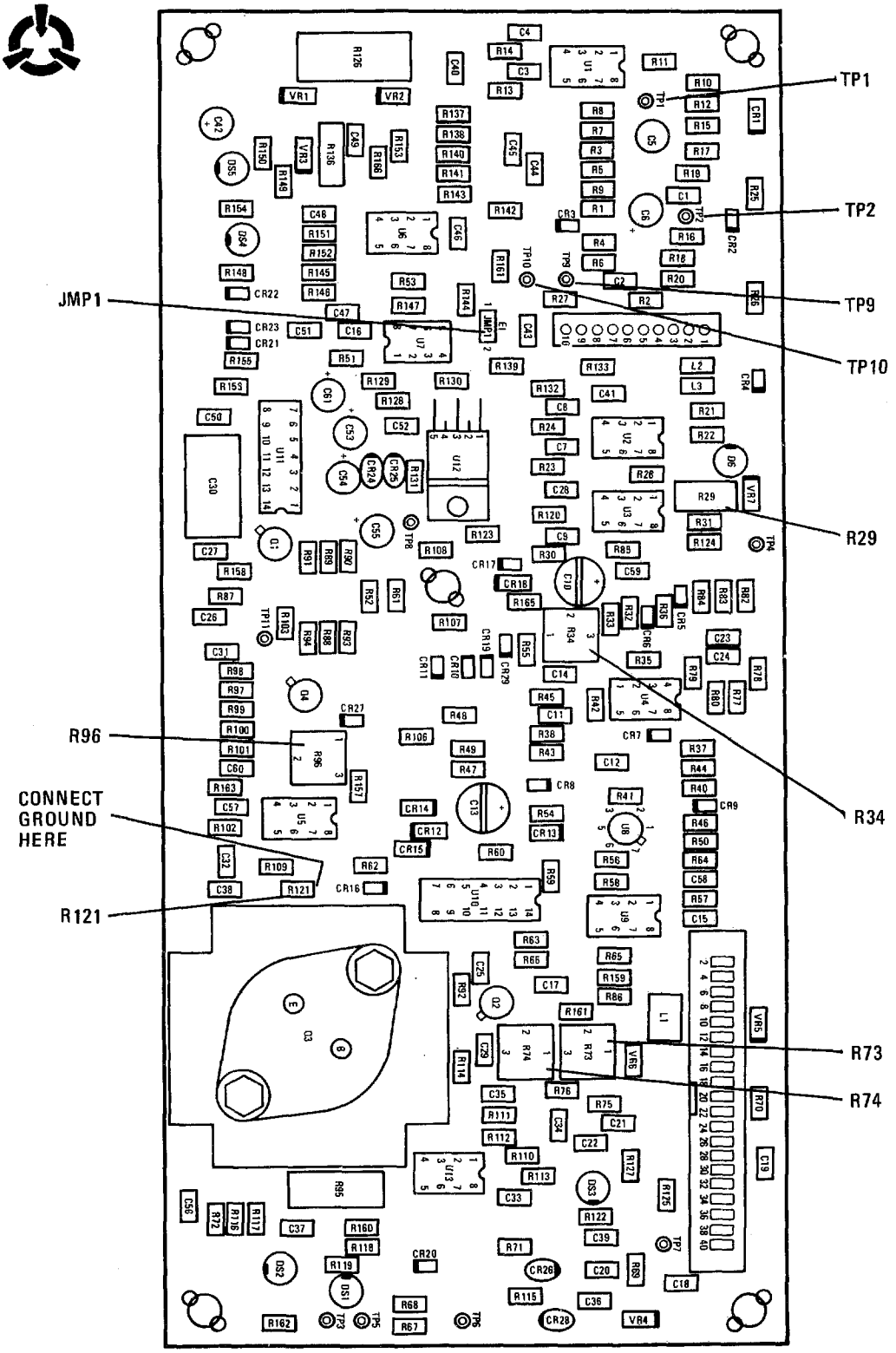

Figure 6-3. Power Control PWB Assy

e. POWER CONTROL PWB ASSY, A5 (figure 6-3)

(1) R29, Loop Gain Control

NOTE

To adjust R29, perform the Forward Power Sample adjustment, as described in c (2) above. The two adjustments are interactive.

(2) R34, CW/FSK Power Adjustment

This adjustment is normally set fully counterclockwise in the 1 KW LPA. If reduced power is required in the CW or FSK mode, then the required reduced power output may be obtained by adjusting R34 in a clockwise direction during normal operation.

(3) R73, Coupler Tune Power Adjustment

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for at least 10 seconds.
- The LPA's AUTO/MANUAL BAND Switch is in the AUTO position.
- R5, R6, and R8 on the VSWR/XFMR PWB Assy are correctly adjusted.

(a) Connect the LPA's RF output connector J5 to a dummy load.

(b) Lower the LPA front panel to its horizontal position in order to gain access to the Power Control PWB Assy.

(c) Turn the LPA on and set the operating frequency at the transceiver to 16.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), place the LPA in OPERATE and tune the system.

(d) Connect a ground to the J1-5 side of R121 on the Power Control PWB Assy (see figure 6-3). This will place the Power Control PWB Assy into the coupler tune mode.

(e) Set the LPA meter select switch on the front panel to the FWD PWR (WATTS) position and key the system. Adjust R73 on the Power Control PWB Assy for 200 watts on the front panel meter.

(f) Unkey the system and remove the ground from R121.

(4) R74, Power Control Adjustment.

This potentiometer is normally set fully clockwise. If reduced output power is required in all modes, then this is accomplished by adjusting R74 counterclockwise until the desired output power is attained.

(5) R96, Max Plate Current Adjustment

NOTE

This adjustment assumes the following initial conditions:

- The LPA has been turned off for at least 10 seconds.
- The LPA's AUTO/MANUAL BAND Switch is in the AUTO position.
- R5, R6, and R8 on the VSWR/XFMR PWB Assy are correctly adjusted.

(a) Connect the LPA's RF output connector J5 to a dummy load.

(b) Lower the LPA front panel to its horizontal position in order to gain access to the Power Control PWB Assy.

(c) Turn the LPA on and set the operating frequency at the transceiver to 16.0000 MHz in CW mode. After the LPA has warmed up (is in STANDBY), set the

LPA's AUTO/MANUAL BAND Switch to the 16-24 position.

(d) Set the TUNE PWR Switch to the ON position, and set the METER Switch to the I_K (mA) position.

(e) Adjust R96 on the PWB Assy for 400 ±8 on the front panel meter.

f. MICRO CONTROL PWB ASSY, A6

No adjustments.

g. FRONT PANEL PWB ASSY, A7A1

No adjustments.

h. TEMP SENSOR PWB ASSY, A8 (figure 6-4).

NOTE

This adjustment can be performed on a "cold" LPA (one that has been turned off for at least 15 minutes) or a "hot" LPA (one that has been turned on for more than 10 seconds). If you remove the JMP1 jumper (on the Power Control PWB Assy) from a cold LPA, you can begin the adjustment procedure immediately (as soon as you turn the LPA on). However, if you remove the jumper from an LPA that has been on for more than 10 seconds, then you should allow 15 minutes for the temperature sensors to stabilize at ambient before doing the adjustment.

(1) Lower the LPA front panel to its horizontal position to gain access to the Power Control PWB Assy.

(2) Remove JMP1 (PN65474-001) on the Power Control PWB Assy (see figure 6-3).

(3) With the LPA in warmup (for a cold LPA) or standby (for a hot LPA), connect a digital multimeter between test points TP9 and TP10 on the Power Control PWB Assy.

(4) If the voltage on the multimeter is 0± 2 mV, no adjustment is necessary. If not, adjust R2 (R2 is accessible through the rear grille of the LPA--see figure 6-4) until the voltage is within the limits.

(5) Re-install JMP1 on the Power Control PWB Assy.

i. INTERCONNECT PWB ASSY, A9

No adjustments.

j. LOW PASS FILTER ASSY, A10

No adjustments.

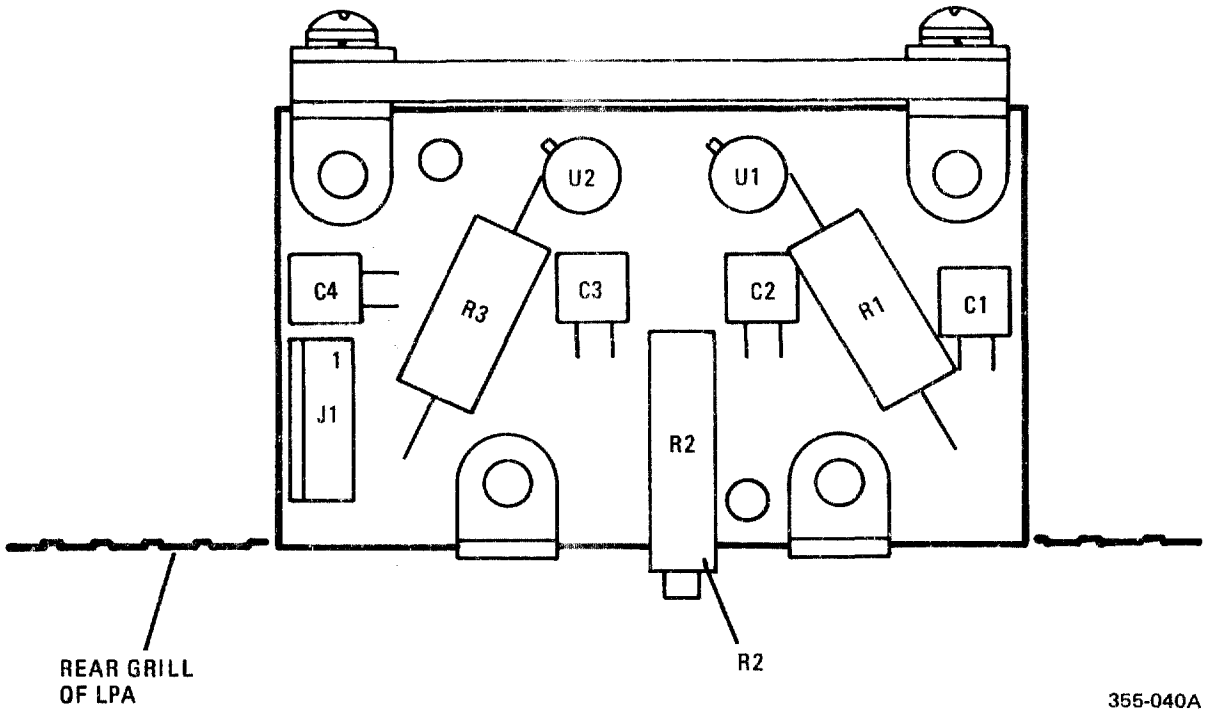

Figure 6-4. Temp Sensor PWB Assy

MAINTENANCE

Section III. DIAGNOSTIC PROCEDURES

6-4. DEPOT MAINTENANCE PHILOSOPHY. The maintenance procedures presented in this chapter assume that equipment problems have already been isolated to one of the replaceable subassemblies listed below. This has been accomplished in the field using the BIT (Built-In Test) troubleshooting approach. (For a detailed description of BIT, see Chapter 6 in the On-Equipment Manual for the 1 KW Linear Power Amplifier, T.O. 31R2-2URC-121). As a depot maintenance technician, your job is to take these defective subassemblies returned from the field, swap them with known good subassemblies in a properly functioning 1 KW Linear Power Amplifier (the "test bed"), and troubleshoot the defective subassemblies to the component level. Once you have identified and replaced the faulty component (resistor, capacitor, transistor, etc.), you will then perform whatever adjustment or alignment procedures are required to restore the subassembly to peak operating condition. To accomplish these tasks, you will need the procedures contained in this chapter, a complete set of schematics (in Chapter 8 of this manual), and the test equipment listed in Table 6-1. Also, refer to Appendix B for front panel meter functions and normal operating ranges. The following is a list of the subassemblies covered in Section III:

6-5. TUBE ASSY, A1.

a. Preliminary Procedure.

(1) Remove the good Tube Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Tube Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.)

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the Tube Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, refer to the "Additional Symptoms" section following the fault code discussions. If your problem is not covered there, start at the beginning of the following procedures and work your way through to the end.

CODE 8

This fault code indicates that with the LPA in STANDBY, the DC plate voltage is greater than +100 Vdc.

The most probable cause of this fault code is an open R2, which prevents the DC plate sample from discharging quickly enough after the LPA is switched back to STANDBY from OPERATE.

CODE 9

This fault code indicates that the DC plate voltage is not between 2000 and 5000 Vdc when the 1 KW LPA is put into OPERATE.

If the Tube Assy is known to be bad and this fault code occurs, it means that there is probably an open in the Tube Assy's B+ line. With power off and all voltages discharged, remove the faulty

Tube Assy from the test bed and take resistance measurements to determine the cause of the open.

CODE 11

This fault code indicates that when the 1 KW LPA is put into OPERATE and the bias is turned on, the DC plate current is not between 20 and 150 mA.

With power off and all voltages discharged, remove the faulty Tube Assy from the test bed. Using an ohmmeter, do the following:

(1) Check for continuity in the bias line between pins 4 and 5 of J1 and the cathode of the tube.

(2) Check for continuity between the tube grid and ground.

(3) Check for continuity in the filament line on both sides of the filament transformer T1.

(4) Check for an open in the plate circuit between the tube anode and the DC plate sample circuit (R1 etc.).

If the above circuitry checks good, replace the tube.

CODE 14

This fault code indicates that although the plate voltage, bias, and RF drive from the transceiver is within tolerance, the plate current is not between 325 and 480 mA.

With power off and all voltages discharged, remove the faulty Tube Assy from the test bed. Using an ohmmeter, look for a problem in the RF input circuit between J1-9 and C1. If the RF input circuitry checks good, replace the tube.

CODE 15

This fault code indicates that although the plate current is within tolerance for the RF drive at the cathode, the microprocessor was unable to find a tune peak.

With power off and all voltages discharged, remove the faulty Tube Assy from the test bed. Using an ohmmeter, check for a problem in the RF plate sample circuit (from C2 to J1-3). You might also check the adjustment of potentiometer R3. See the alignment procedures in Section II of this chapter.

CODE 18

This fault code indicates that the ratio of forward power to RF input power is not between 5 and 60.

With power off and all voltages discharged, remove the faulty Tube Assy from the test bed. Using an ohmmeter, do the following:

(1) Check for a problem with the output coupling capacitor C4.

(2) Check the continuity of the RF signal path from C4 to the output tab.

(3) Check for a problem with load inductor L1.

(4) If all the above components check good, replace the tube.

ADDITIONAL SYMPTOMS

High-voltage circuit breakers on the 1 KW Power Supply pop when the LPA is switched to OPERATE.

Since the Tube Assy is known to be bad, it means that there is probably a short on the Tube Assy's B+ line. With power off and all voltages discharged, remove the faulty Tube Assy from the test bed and take resistance measurements to determine the cause of the short.

6-6. TANK ASSY, A2.

a. Preliminary Procedure.

(1) Remove the good Tank Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Tank Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter).

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the Tank Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, start at the beginning of the following procedures and work your way through to the end.

CODE 4

This fault code indicates that the +13.5 Vdc, as measured at the input to the Micro Control PWB Assy, is not within the normal operating range (+10 to +16 Vdc).

Since the Tank Assy is known to be faulty, the problem is most likely a short on the Tank Assy's +13.5 V line or a short in one of the motors. Since this is a run-time fault (the FAULT light comes on whenever the +13.5 V supply is out of range for more than 3 seconds), you can easily determine whether the problem is in the supply line or in one of the motors:

(1) If the fault occurs as soon as you turn the equipment on, the problem is in the +13.5 Vdc line.

(2) If the fault occurs only during band selection, the problem is in the band switch drive motor.

(3) If the fault occurs only during coil positioning, the problem is in the coil drive motor.

CODE 6

This fault code indicates either that the band switch did not turn or that it did not reach the specified band within 10 seconds.

The problem could be in the following areas:

(1) The Band Switch Motor. Check it as follows:

(a) Check to see whether the motor turns when you change bands in manual mode. If not, check TP14 on the Servo/Band Switch Drive PWB Assy for approximately +13 Vdc. If the voltage is good, check to see whether the problem is in the motor cable or the motor itself. If the voltage at TP14 is bad, check for approximately +2.5 to +5.0 Vdc at TP15. If TP15 is good, the problem must be Q10, Q11, or one of their associated components. Or there might be an open in the +13.5 V line. If TP15 is bad, the problem could be in the band selection circuitry (see paragraph 2 below), the band switch, or the connector (P1/J3).

(b) If the motor does turn, check to see whether it turns fast enough (in other words, see if there is any mechanical binding which is slowing it down). If the motor appears to be turning freely, see if it stops within 10 seconds. If the motor does not stop within 10 seconds and does not appear to have any mechanical binding, look for a problem with the band switch or the band selection circuitry (see paragraph 2 below).

(2) The band selection circuitry (U1 and its associated components on the Servo/Band Switch Drive PWB Assy). Check this circuitry as follows:

(a) In manual mode, select a band other than the one you're in now.

(b) At TP17-TP20 on the Servo/Band Switch Drive PWB Assy, check to see that the bit pattern is correct for the band you have selected. For example, if you selected Band 1 (1.6 to 1.8 MHz), you should see a high on the BDSW 1 input to U1 and lows on BDSW 2, BDSW 4, and BDSW 8.

(c) If the input pattern to U1 is correct, check for a high on the corresponding output pin. In our example, pin 14 of U1 should be high; all other output pins (1-7, 9, 15) should be low.

(d) If the inputs and outputs of U1 are correct, check for continuity of the lines between U1 and connector J3/P1.

CODE 7

This fault code indicates either that the coil drive motor did not turn or that the coil position is incorrect.

Check the coil drive circuitry as follows:

(1) Check to see whether the motor turns when you move the manual TUNE switch to either MIN L or MAX L.

(a) If not, check TP6 (with the TUNE switch in the MAX L position) and TP10 (with the TUNE switch in the MIN L position) on the Servo/Band Switch Drive PWB Assy for approximately +12.5 Vdc with the motor running full speed. If the voltages are good, check to see whether the problem is in the motor cable or the motor itself. Also check to see whether there is any mechanical binding that might prevent the motor from turning.

(b) If the voltages at TP6 and TP10 are bad, check for an open in the +13.5 V line.

(c) If the motor turns in one direction but not the other, then check the appropriate driver transistors (Q1, Q2, and Q3 for MAX L; Q4, Q5, and Q6 for MIN L). Also check TP7 (MAX L) and TP8 (MIN L) for highs to turn the transistors on. When TP7 is high, check that Q8 (MIN L DISABLE) is turned off; when TP8 is high, check that Q7 (MAX L DISABLE) is turned off.

(d) Another reason why the motor might only turn in one direction is if the limit switch is stuck in one position or the other or if one of the limit switch transistors (Q13 or Q14) is shorted. Such a condition would cause the microprocessor to think that the motor had reached one of the end stops, thus preventing any further motion in that direction.

(2) If the coil drive motor moves freely in both directions, check to see whether the coil position is correct:

(a) Move the METER selector switch to COIL POS.

(b) Connect a voltmeter to TP1, which should read +5 Vdc.

(c) Using the manual TUNE switch, move the coil drive motor toward MIN L until the voltmeter reads 0 Vdc. At this point, the COIL POS meter on the LPA front panel should read 100 and the motor should stop. You should not be able to drive the motor any further in this direction.

(d) Connect the voltmeter to TP2, which should read +5 Vdc.

(e) Move the coil drive motor toward MAX L until the voltmeter reads 0 Vdc. At this point, the COIL POS meter should read 1770 and the motor should stop. You should not be able to drive the motor any further in this direction.

(f) If the COIL POS reading is incorrect at either end (for example, the voltage at TP1 went low when the COIL POS indicated 130; or the voltage at TP2 went low when the COIL POS indicated 1710), then you need to do an electro-mechanical realignment of the coil drive motor. See the alignment procedures in Section II of this chapter.

(g) If the COIL POS meter does not respond to changes in coil position or responds in a random manner, then check the twa and TWB outputs of the Encoder G1 at TP5 and TP4,respectively, with a dual-trace oscilloscope. While the motor is turning, these should both have TTL-level squarewaves (0 to +5 Vdc). If not, suspect the encoder or its inputs (+5 Vdc and ground).

(h) If the voltages at TP1 and TP2 do not respond correctly, look for a problem with the limit switch or transistors Q13 or Q14. For example, if the voltage at TP1 goes to 0 at a coil position of 100, but the voltage at TP2 does not go to 0 at a coil position of 1770, then look for a problem with Q13. Conversely, if TP2 switches from +5 Vdc to 0 at a coil position of 1770, but TP1 does not switch at a coil position of 100, then look for a problem with Q14. If neither test point switches at its corresponding limit, then look for a problem with the limit switch.

CODE 15

This fault code indicates that while the coil was moving from MAX L to MIN L, the microprocessor was unable to find a tune peak.

The first thing to determine is whether this fault occurs in all frequency bands or just certain ones. Therefore, you should run the BIT test in each of the frequency bands and make a note of which bands the fault occurs in.

(1) If the fault occurs in all bands, then the problem is most likely one of the following:

(a) An open in the RF line. Check for continuity between the input tab and the output connector J1.

(b) A short on the RF line. Check for a short between the RF signal line and ground.

(c) A bad variable coil L1. For example, the coil might be shorted internally.

(d) An open in the tune capacitor switch (S1-A), the load capacitor switch (S1-B), or the fixed-coil selector switch (S1-C).

(2) If the fault occurs in only certain bands, try to determine what these bands have in common. For example, if the fault occurs only in the three lowest bands, then you might look for a shorted tuning capacitor (C5 or C6) or a shorted load capacitor (C5 or C6). Or, if the fault only occurs in Band 1, then you might suspect fixed coil L2 (Band 1 is the only one in which this coil is not bypassed). Another possibility is a dirty or defective switch section.

CODE 16

This fault code indicates that when a tune peak is found, the forward tune power is not between 100 and 400 watts.

Use the same procedures as for code 15.

CODE 18

This fault code indicates that the ratio of forward power to RF input power is not between 5 and 60.

Use the same procedures as for code 15.

6-7. VSWR/XFMR PWB ASSY, A3.

a. Preliminary Procedure.

(1) Remove the good VSWR/XFMR PWB Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty VSWR/XFMR PWB Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.)

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the VSWR/XFMR PWB Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, first check the "Additional Symptoms" section following the fault code discussions. If your problem is not covered there, start at the beginning of the following procedures and work your way through to the end.

CODE 10

This fault code indicates that when the LPA is put into OPERATE (but without bias or RF drive), the cathode current is greater than 5 mA.

This problem is most likely caused by the T/R Relay being stuck closed, which allows RF to go to the Tube Assy, causing the tube to conduct. The relay itself could be defective, or there could be a short on the T/R keyline (C10 shorted to ground, for example), causing the T/R Relay to stay energized.

CODE 14

This fault code indicates that when the LPA is keyed in OPERATE with bias and RF drive applied, the plate current is not between 325 and 480 mA.

In this case, the problem is most likely the T/R Relay's failure to energize, preventing RF drive from being applied to the tube. This could be caused by a defect in the relay itself (open or shorted coil, for example), an open +13.5 Vdc line, or an open T/R keyline.

CODE 15

This fault code indicates that when the LPA is keyed in OPERATE with bias and RF drive applied, a tune peak cannot be found.

Look for a short or open on the RF line. A possible problem could be the failure of one of the impedance-matching relays (K2-K4) to energize, which in turn could be caused by a defective relay or a fault in one of the relay driver circuits (Q1-Q3 and their associated components). Also, there could be an open in the FWD SAMPLE circuitry. Check the voltage at TP1 on the Power Control PWB Assy. If the FWD SAMPLE circuitry is working properly, this voltage should be positive (+7 Vdc indicates full forward power). If not, this voltage should be slightly negative.

CODE 16

This fault code indicates that when the LPA is keyed in OPERATE with bias and RF drive applied, the FWD PWR is not between 100 and 400 watts.

Look for a problem in the FWD SAMPLE circuitry. Check the voltage at TP1 on the Power Control PWB Assy. If the FWD SAMPLE circuitry is working properly, this voltage should be positive (+7 Vdc indicates full forward power). If not, this voltage should be slightly negative. Also, check the adjustment of R8. See the alignment procedures in Section II of this chapter.

CODE 17

This fault code indicates that the VSWR is not less than 2.25:1.

NOTE

The following measurements should be taken with rf drive applied (the LPA is keyed in CW mode).

Look for a problem in the REFL SAMPLE/FWD SAMPLE circuitry by checking the voltages at TP1 and TP2 on the Power Control PWB Assy. Normally, TP1 should be close to +7 Vdc, and TP2 should be less than +1 Vdc. Also, check the adjustment of R5. See the alignment procedures in Section II of this chapter. Another possibility is an open in the RF line, which might be caused by a failure in one of the impedance-matching relays (K2-K4) or their associated driver circuits (Q1-Q3 and their surrounding components).

CODE 18

This fault code indicates that the ratio of forward power to RF input power is not between 5 and 60.

Look for a problem in the RF IN SAMPLE circuitry. (Power gain is computed by taking the ratio of the FWD SAMPLE to the RF IN SAMPLE. Since the FWD SAMPLE has been used in several other calculations prior to this one without generating a fault code, the problem is more likely in the RF IN SAMPLE circuitry.)

ADDITIONAL SYMPTOMS

High Forward Power

Look for a problem in FWD SAMPLE circuitry. Also, check the adjustment of R8 (see the alignment procedures in Section II of this chapter).

6-8. FAN INVERTER PWB ASSY, A4.

a. Preliminary Procedure.

(1) Remove the good Fan Inverter PWB Assy from the test-bed 1 KW LPA. Connect the two Fan Inverter PWB Assy cables to the faulty Fan Inverter PWB Assy. Rest the faulty Fan Inverter PWB Assy face up on top of the chassis, being careful to insulate it sufficiently.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) If there is a fault in the Fan Inverter PWB Assy, the fan should not be running. Use the following procedure to isolate the problem.

b. Troubleshooting Procedure.

(1) Check for +13.5 Vdc at pin 2 or pin 5 of T2.

(2) Check Q1 and Q2 for collector-emitter shorts.

(3) Check the bias circuitry (R1-R3, CR1, C3).

(4) Check C4 and C5 for shorts.

6-9. POWER CONTROL PWB ASSY, A5.

a. Preliminary Procedure.

(1) Remove the good Power Control PWB Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Power Control PWB Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.)

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the Power Control PWB Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, first check the "Additional Symptoms" section following the fault code discussions. If your problem is not covered there, start at the beginning of the following procedures and work your way through to the end.

CODE 5

This fault code indicates that the XMTR FAULT line (TP11 on the Power Control PWB Assy) has gone low, indicating a temperature-related fault condition.

This fault code can be generated by any one of the following:

(1) JMP 1 is not in place, or there is an open in the +13.5 Vdc line.

(2) There is a fault in the LO AIR circuit (the LO AIR LED should be on if the problem is here).

(3) There is a fault in the OVERTEMP circuit (the OVERTEMP LED should be on if the problem is here).

You should be able to isolate this problem quickly by checking the "sense" (whether the output corresponds to the inputs) of inverters U11D and U11E and of op amps U6A, U6B, and U7B.

CODE 10

This fault code indicates that when the LPA is put into OPERATE (but without bias or RF drive), the cathode current is greater than 5 mA.

(1) Check the operation of U13A by placing the LPA into OPERATE and measuring the voltage on pin 1, which should be close to 0 (+12.5 mV or less). If it is greater than +12.5 mV, check the input at pin 3, which should be 40% of the voltage on pin 1. If the voltage on pin 3 is correct, then U13A is probably okay.

(2) Check the voltage across R95, which should be the same as on U13-3. Normally, with the LPA in OPERATE and unkeyed, the voltage across R95 should be 0 (in other words, there should be no cathode current).

(3) If the voltage across R95 indicates that there is cathode current, check for a problem with Q2 or Q3 (collector-emitter short) or with the keyline circuitry (U11A and Q1). With the LPA unkeyed, the output of U11A (pin 2) should be low, which keeps Q1 turned off, which in turn keeps Q2 and Q3 turned off.

CODE 11

This fault code indicates that with the LPA in OPERATE and bias applied (no RF drive), the plate current is not between 20 and 150 mA.

(1) Key the LPA in OPERATE with no RF drive, and check the voltage at TP3. This voltage should be +5 Vdc. When you unkey the LPA, this voltage should increase to +24 Vdc. If the voltage at TP3 is incorrect, look for a problem in the bias circuit (Q2, Q3, and their associated components) or the keyline circuit (U11A, Q1, and their associated components). When the LPA is keyed, the output of U11A should be high, which turns on Q1, which then turns on Q2 and Q3.

(2) If the voltage at TP3 is good, check the voltages at the input and output of U13A. With the LPA keyed in OPERATE (no RF drive), look for +20 to +150 mV on pin 3 and +50 to +375 mV on pin 1. If these voltages are not correct, look for a problem in U13A or its associated components.

CODE 14

This fault code indicates that when the LPA is keyed in OPERATE with bias and RF drive applied, the plate current is not between 325 and 480 mA.

The bias, keyline, and cathode current sampling circuitry are probably okay; otherwise, code 11 would have been declared. In this case, since the fault occurs with RF drive applied, look for a problem in the TGC circuitry, which controls the amount of RF drive applied to the LPA. Check this circuitry as follows:

(1) To see whether the TGC circuitry is indeed the cause of the problem, disconnect the cable from J1 on the AGC/TGC PWB Assy in the 100 Watt Transceiver. Run the BIT test again and see if Code 14 reappears. If it doesn't, continue with step 2 below. If it does, check the bias, keyline, and cathode current sampling circuitry as in Code 11 above.

(2) Re-connect the cable to the AGC/TGC PWB Assy in the 100 Watt Transceiver. The first thing to do is determine whether the problem can be corrected by adjusting the potentiometers on the Power Control PWB Assy. Go the alignment procedures in Section II of this chapter and perform the entire alignment procedure. If this does not correct the problem, continue with step 3 below.

(3) Key the LPA from the 100 Watt Transceiver in CW mode with the CW key. Measure the voltage at TP5. Normally, this voltage should be +8 Vdc. If it is greater than +8 Vdc, the output power will be lower than normal; if it is less, the output power will be greater than normal. If the voltage at TP5 is good, skip to step 8. If it is not, continue with step 4. Return the transceiver to USB mode.

NOTE

For all the measurements that follow, you must key the LPA from the 100 Watt Transceiver and hum into the microphone.

(4) Observe the voltage at TP1 and TP2 with an oscilloscope. TP1 should read +7 Vdc at the peak of the waveform, and TP2 should read less than +1 Vdc (almost 0). Also, check pins 1 and 7 of U1. The voltages at these pins should be about the same as on the corresponding test points. If any of these voltages are incorrect, look for a problem in U1 and its associated components.

(5) Check the output of U3A with an oscilloscope. Pin 1 (TP4) should be +8 Vdc at the peak. If this voltage is incorrect, look for a problem with U3A or its associated components.

(6) Check the output (pin 1) of U9A for +8 Vdc (peak). Normally, U9A has unity gain. However, any one of several conditions can cause U8 to conduct. During CW power cutback, for example, after C10 charges, the output of U4A goes high, causing the output of U4B to go high, which in turn causes the output of U7A to go low, turning on U8 and increasing the gain of U9A. This same situation can occur if either CR29, CR10, or CR11 conducts (in response to an rf/DC protect voltage or an overtemperature or overcurrent condition), forcing the output of U4B to go high. If the voltages at U9A are not normal, do the following:

(a) Check the anodes of CR29, CR11, CR10, and CR7 to determine if any of these is sufficiently positive to cause pin 5 of U4B to go higher than +5 Vdc, causing the output of U4B to go low. If so, you can then identify the circuit that is causing this condition:

CR29 RF/DC protect (U3B and its associated components
CR11 Overtemperature (U6B and its associated components
CR10 Max plate current control (U5A and its associated components)
CR7 CW power cutback (U4A and its associated components)

(b) If none of the above circuits is responsible for changing the gain of U9A by causing the output of U4B to go low, check for a problem in U4B, U7A, U8, or their associated components.

(7) If the voltages at U9A are normal, check the voltages at U9B. Pin 5 should normally be at +4 Vdc (peak), and pin 7 (TP5) should be at +8 Vdc (peak). If this is not the case, check for a possible problem in quad switch U10 or in U9B and one of its associated components.

(8) Check for a possible problem in the PPC circuitry (U5B and its associated components). Measure the voltage at TP6 with an oscilloscope. Normally, this voltage should be 0 to +5 Vdc (peak). A voltage greater than this initiates the cutback condition in the transceiver (Exciter PWB Assy). Check to see whether the PPC LED illuminates (this LED should illuminate whenever the voltage at TP6 exceeds +5 Vdc, which is the threshold point for U13B). If the voltage at TP6 is consistently greater than +5 Vdc (PPC LED is on continuously), check for a problem in U5B and its associated circuitry.

CODE 16

This fault code indicates that when the LPA is keyed in OPERATE with bias and RF drive applied, the FWD PWR is not between 100 and 400 watts.

Use the same procedure as for Code 14.

ADDITIONAL SYMPTOMS

High Forward Power, Low Forward Power

Look for a problem in the TGC circuitry. Use the same procedure as for Code 14.

6-10. MICRO CONTROL PWB ASSY, A6.

a. Preliminary Procedure.

(1) Remove the good Micro Control PWB Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Micro Control PWB Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.) If you are unable to run the BIT test, either from the 100 Watt Transceiver or from the LPA, go to the "Additional Symptoms" section following the fault code discussions.

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the Micro Control PWB Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, check the "Additional Symptoms" section following the fault code discussions. If the procedure there does not indicate that there is a problem, chances are that the Micro Control PWB Assy is all right.

CODE 1

This fault code indicates that when the microprocessor reads the RF PLATE SAMPLE input to the A-to-D Converter, it indicates full scale, which means that the metering is inaccurate.

The problem is most likely in either the microprocessor chip (U1) or the A-to-D Converter chip (U6). Check the clock signal (TP4) to U6 (it should be 614.4 KHz). If the signal is bad at TP4, trace the line back through U31-5 and U31-1 (4.9152 MHz), all the way back to the clock oscillator (U8, Y1, etc.). If the signal at TP4 is good, try replacing the microprocessor first (since it's socketed), then the A-to-D Converter.

CODE 3

This fault code indicates that when the microprocessor read the PRI PWR input to the A-to-D Converter, it found it to be out of range (which is 80 to 120% of the nominal value).

Since Code 1 was not declared, the microprocessor and the A-to-D Converter are probably okay. Look for an open (R140) or a short (C140) on the PRI PWR SAMPLE input line (J1-16 to U6-4) to the A- to-D Converter (U6).

CODE 4

This fault code indicates that when the microprocessor read the +13.5 VDC SAMPLE input to the A-to-D Converter, it found it to be out of range (which is +10 to +16 Vdc).

Since Code 1 was not declared, the microprocessor and the A-to-D Converter are probably okay. Look for an open (R16) or a short (C22, VR2) on the +13.5 VDC SAMPLE input line (J1-47, -48 to U6-3) to the A-to-D Converter (U6). Check also the voltage divider formed by R16 and R17. Another possibility is that VR2 is breaking down at a lower potential than it is rated at (5.1 Vdc).

CODE 6

This fault code indicates that the band switch, when commanded to move to a different band, did not reach the selected band within 10 seconds.

(1) With the LPA in manual mode, select a different operating band from the one you're in now. Then check the BDSW output signal lines to the Tank Assy for the correct binary code. In other words, if you switch from the 1.6 to 1.8 MHz band (Band 1) to the 4 to 6 MHz band (Band 5), you should see highs on pins 5 and 9 of Output Latch U13 and lows on pins 2 and 6. Check for the signals on the output sides of their resistors (R120-R123) also. If the code is correct, try switching to Band 2 (U13-6 should be high; pins 2, 5, and 9 should be

low) and then to Band 8 (U13-2 should be high; pins 5, 6, and 9 should be low), checking the code at both bands. If the codes are correct in all cases, proceed to step 2.

(2) If the Output Latch U13 and the BDSW signal lines are functioning properly, check the BDSW ON line and the Input Latch U28. After making a band change in manual mode, check to see whether pin 13 of U17 goes high and then low again after a few seconds. Check for the opposite on pin 12 of U17 and pin 14 of U28. If U17 appears to be working properly, suspect U28.

CODE 7

This fault code indicates that when the coil drive motor was commanded to move first to MIN L and then to MAX L, it either did not move or its position counter was found to be inaccurate (the coil's position at MIN L or MAX L did not agree with stored values).

(1) Check the MIN L and MAX L signal lines on both sides of U11. When the BIT test is run, U11-3 should be low normally and then go high momentarily. The opposite should happen at U11- 14. After U11-3 returns low, U11-2 should go high momentarily and then return low again. The opposite should occur at U11- 15. If the signals are good at U11, check at the output sides of the respective resistors (R125, R126). If the signals are good there, proceed to step 2.

(2) Check the MIN L LIMIT and MAX L LIMIT signal lines coming into the board. When the BIT test is run, the MIN L LIMIT signal line (U28-13) should go low and then high again. After the MIN L LIMIT signal line returns high, the MAX L LIMIT signal line (U28-8) should go low and then remain there for a few seconds until the tuning portion of the BIT test, when it should go high again. If these signals are incorrect, look for a problem in the input resistors (R130, R131) or the pullup resistor pack (R20).

(3) Check the TWA and TWB signal lines (U17-9, U17-11). When the tuning coil is in motion, these signals should be TTL (0 to +5 Vdc) square waves of opposite polarity. Check these signals on both the inputs and outputs of U17. Also, check the edge detector circuit: pins 4 and 5 of U26 should be high pulses when the coil drive motor starts to move and continue to be high pulses until the motor stops. Pin 1 of U26 should be the opposite. If this is not the case, look for a problem in U17, U26, or one of their associated components (R5, C24, C29, CR1,

CODE 8

This fault code indicates that with the LPA in STANDBY, the DC plate voltage is greater than 100.

(1) Look for a problem in U25 or U20. Place the LPA in STANDBY and check the signal level at U25-12. It should be low. Then command the LPA to OPERATE, and see whether this pin goes high. If it does, check for the opposite reactions at U20-14 and the output side of R107.

(2) If the signal at U25-12 is not correct, check the inputs to U25: +5 Vdc at pins 15 and 16; GND at pin 8; the clock signal (TP2) at pin 3 and the SERIAL DATA signal (TP3) at pin 2 (also check the pullup lines through R8); and the strobe signal at pin 1. If the inputs to U25 appear to be good, replace U25.

CODE 9

This fault code indicates that with the LPA in OPERATE, the DC plate voltage is not between 2000 and 5000.

Check for an open (R141) or a short (C141) on the DC PLATE SAMPLE line (J1-38 to U6-5). With the LPA in OPERATE, this line should read approximately +1.8 to +4.5 Vdc, which corresponds to a plate voltage of +2000 to +5000 Vdc.

CODE 11

This fault code indicates that when the LPA is keyed in OPERATE without RF drive, the plate current is not between 20 and 150 mA.

Check for an open (R138) or a short (C138) on the I SAMPLE line (J1-42 to U6-1).

CODE 12

This fault code indicates that when the RF MUTE command was sent to the 100 Watt Transceiver, the RF input level to the LPA did not drop below 6 W in 200 ms.

(1) Look for a problem in U19 or U30. Run the BIT test and see whether U30-11, which should normally be high, goes low momentarily and then high again. If not, check for the reverse situation at U30-6.

(2) If the signal is good at U30-6, suspect U30 itself or look for a short (CR8 or C111) or open (R111) on the RF MUTE signal line.

(3) If the signal at U30-6 is not good, suspect U19. Before replacing it, check for +5 Vdc at pins 15 and 16 and for GND at pin 8. If these inputs are good, replace U19.

CODE 13

This fault code indicates that when the TPR (Tune Power Request) and TGC TPR signals were sent to the transceiver, the RF input signal level did not rise above 5 W in 20 seconds.

(1) Check for an open (R137) or a short (C137) in the RF IN SAMPLE signal line (J1-12 to U6-28).

(2) Another possibility is a fault in the DATA lines (J1-8, 9 to U1-10, 11). With the LPA in AUTO mode, change frequency bands on the transceiver and then key the system. You should see a series of pulses on the DATA+ line. Trace these pulses from U1-11 through U10, Q2, U4-1, and out to J1-9. You should also see these pulses at U4-4, U3, and back at U1-10.

CODE 15

This fault code indicates that when the LPA is keyed in OPERATE with RF drive, a tune peak cannot be found as the coil is moved from MAX L to MIN L.

(1) Look for an open (R136) or a short (C136) in the FWD SAMPLE line (J1-39 to U6-27).

(2) Check that the PA TUNE line (output side of R102) goes low while the microprocessor is attempting to find a tune peak during the BIT test. If not, check for an open R102 or a problem in U20 or U25 (these two chips should be okay; otherwise, a Code 8 would have been declared).

CODE 21

This fault code indicates that data sent from pin 11 of the microprocessor (U1) was not received (echoed back) at pin 10. Normally, this code indicates a problem in the communications link between the LPA and the transceiver; but in this case, since we know that the Micro Control PWB Assy is faulty, the problem has to be in the on-board DATA lines (J1-8, 9 to U1-10, 11). With the LPA in AUTO mode, change frequency bands on the transceiver and then key the system. You should see a series of pulses on the DATA+ line. Trace these pulses from U1-11 through U10, Q2, U4-1, and out to J1-9. You should also see these pulses at U4-4, U3, and back at U1-10.

ADDITIONAL SYMPTOMS

Microprocessor Fault

Microprocessor-related faults are generally characterized by an abnormal or random display and a loss of transceiver control functions (i.e., there is no LPA status displayed on the transceiver or the status is always MANUAL). In this case, running the BIT test is of no avail. Therefore, if you think you have a microprocessor-related fault and you cannot run the BIT test, use the following procedure:

NOTE

The Micro Control PWB Assy contains the Intel 8031 microprocessor, which controls all the functions of the LPA, including the BIT test. A failure in the microprocessor, EPROM, RAM, decoder, etc. will probably disable the BIT circuitry and most of the other LPA functions as well. Unless you are thoroughly familiar with the

circuitry of this board and with the operation of microprocessors, it will be very difficult for you to isolate a faulty chip or discrete component using standard test equipment and troubleshooting techniques. The following procedures, therefore, are intended to check only the most obvious and fundamental aspects of the board's operation. If these do not enable you to identify the problem, then you will need more advanced test equipment and test procedures, which are beyond the scope of this manual.

(1) Check the supply voltage (+5 Vdc) to the microprocessor at U1-40. Also check for 0 Vdc at pins 20 and 31.

(2) Check the reset pin (U1-9). Normally, this pin should be low all the time. If the microprocessor is not working properly, it will be pulsing high at a 9.375 Hz rate. If this is the case, then the clock oscillator (Y1, U8, and their associated components), counters U31 and U32, and buffers U17 and U3 are probably okay. If the reset line is continually high, look for a failure in U3 or U17.

(3) Check the clock inputs to the microprocessor: U1-19 (4.9152 MHz), U1-15 (153.6 KHz), and U1-12 (300 Hz). If any of these inputs is bad, trace the signal line(s) back to the counters (U31, U32) and/or the oscillator (U8, Y1, etc.).

(4) Check U1-30 (TP1) to see if it's pulsing high and low; it should not be stuck high or low. Do the same for U1-16, U1- 17, and all the address lines.

(5) If all the above checks are good, try replacing the microprocessor U1. This chip is socketed for easy replacement.

(6) If the problem persists, replace the EPROM U2. This chip is also socketed.

(7) If the problem still persists, check the supply voltages and ground connections to all the other chips, beginning with the RAM (U29) and the address decoder (U27).

6-11. FRONT PANEL PWB ASSY, A7A1.

a. Preliminary Procedure.

(1) Disconnect the cable from the good Front Panel PWB Assy in the test-bed 1 KW Linear Power Amplifier, and connect it to the faulty Front Panel PWB Assy. It is not necessary to mount the faulty Front Panel PWB Assy in the test bed.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) Look at the display on the front panels of both the 1 KW LPA and the 100 Watt Transceiver. If you notice anything abnormal, either when you first power up the LPA or after the LPA is warmed up and you try to operate it, refer to the appropriate section below.

b. Troubleshooting Procedures.

Problems with the 1 KW LPA can be grouped under the following general symptoms:

LPA does not power up.

The first thing you should do in this situation is determine whether the Front Panel PWB Assy has +5 V applied when you command the LPA to turn on from the 100 Watt Transceiver. Normally, this is indicated by the POWER ENABLE LED being on steady and the STANDBY LED blinking. If neither LED is on, look for a failure in the POWER ENABLE switch S8. If the STANDBY LED is blinking but the POWER ENABLE LED is off, look for a failure in the POWER ENABLE LED.

LPA status at 100 Watt Transceiver is missing or incorrect.

(1) If there is no LPA status at the transceiver (the AMP:STBY indicator is not visible on the transceiver's display), the problem could be anywhere on the output side of the data line (U17-U20, U11F, or the FP IN EN, SER CK, or SER DATA signal lines).

(a) Every 50 ms, you should see a series of 200 KHz clock pulses on the SER CK line (pin 10 of U17-U20). During this time, the FP IN EN line (pin 9 of U17-U20 and pin 15 of U11) should go low, which allows the serial data to be clocked out from U17-U20 through U11F. Check pin 13 of U11 for a series of data pulses every 50 ms.

(b) If the data pulses are not present, but the SER CK and FP IN EN signals are good, trace the data pulses back through U11-14 and the inputs (pin 11) and the outputs (pin 3) of U17-U20. Check for the presence of the operating voltages (+5 Vdc, GND) at each of these chips.

(2) If you do have LPA status at the transceiver (AMP:STBY indicator is on) but the status is incorrect (e.g., the LPA MAN indicator on the transceiver is on when the LPA's AUTO/MANUAL BAND switch is in the AUTO position), look for a problem with switch S1 or shift registers U17 or U18 and their associated components.

(a) Rotate AUTO/MANUAL BAND switch S1 through each of its positions. At each position, check the bit pattern on pins 1, 4-7, and 13-15 of U17 and on pins 5-7 of U18. Only one of these pins should be low for a given setting of S1, and it should be different for each setting.

(b) If the bit pattern at the parallel inputs to U17 and U18 is correct for each position of S1, then check the serial outputs (pin 3) of both U17 and U18. Using a dual-trace oscilloscope, sync on the negative transition of the FP IN EN signal and look for a series of data pulses at U17-3 and- U18-3. Try changing the setting of S1 and look for a corresponding change in the data pattern.

(c) If the data signal at U17-3 and/or U18-3 is incorrect, check the operating voltages (+5 Vdc and GND) for U17 and/or U18. If the operating voltages are good, replace the appropriate chip (U17 if the data signal at U17-3 was bad; U18 if the data signal at U17-3 was good).

Meter failures.

Look for a problem with METER switch S2 or with one of the resistor packs (R17, R18). Rotate S2 through each of its positions. At each position, check the bit pattern on the control lines to U17 (pins 1, 4, 13-15) and U18 (pins 4-7, 13, 14). For each switch setting, only one of these control lines should be low; all others should be high. Presumably, the shift registers (U17-U18), the output buffer (U11F), the SER CK line, and the FP IN EN line are good; otherwise, you would probably have missing or incorrect LPA status at the transceiver.

Manual control failures.

If one of the manual control switches (TUNE PWR, LOCAL KEY, TUNE, ANTENNA, and SELF TEST) does not appear to be functioning properly, check its operation by monitoring the logic level at its control line. For example, when you activate the TUNE PWR switch, pin 15 of U19 should go low. It should remain low until you flip the TUNE PWR switch off. For multiple switch failures, including failures at selected positions of the AUTO/MANUAL BAND and METER switches, look for a problem in one of the resistor packs (R16-R19).

LCD failures.

Typical failure modes for the LCD (DS1) are (1) the loss of an individual segment, (2) a completely blank display, or (3) a display in which the outline of the previous character persists after a new character appears.

(1) A good way to check whether a particular segment is defective is to run the BIT test. During the BIT test, all LCD segments are supposed to be lit. If a segment is not lit, check for a high at its corresponding control line on U28 (a high at the output of U28 turns the segment on). For example, if the center segment of the third character is not illuminated during BIT, check to see whether U28-15 is high during BIT. If it is, replace DS1. If it isn't, replace U28.

(2) If the display is completely blank, do the following:

(a) Check for the presence of the operating voltages (+5 Vdc, GND) at U28 and DS1. If these voltages are good, run the BIT test and check for highs on all the outputs of U28 (pins 3-29, 32, 33, 37-39). If the outputs of U28 are high, replace DS1.

(b) If the outputs of U28 are not high, check for a series of 200 KHz clock pulses at U28-40 every 50 ms, along with a series of data pulses at U28-34. If the inputs to U28 are good, replace U34.

(c) If the clock signal is bad at U28-40, check it at U11-2. Also, check for a low on the LCD OUT EN line (U11-1) while the SER CK line and the SER DATA lines are pulsing. (The LCD OUT EN line allows the SER CK pulses to be buffered through U11A to U28-40.) If the inputs to U11 (including the +5 Vdc and GND operating voltages) are good, replace U11.

(3) If the outline of a previous character persists after a new character appears, the 75 Hz LCD CLK signal is probably bad. Check it at pins 1 and 28 of DS1 and at pin 31 of U28.

LED Failures.

If you suspect that one of the front panel LEDs is defective, run the BIT test. All of the LEDs should be on during the test.

(1) If one LED fails to light, check its driver circuit. The four LEDs are controlled by U26, pins 4-7. A high on one of these pins is applied to the base of its driver transistor, thus turning it and its associated LED on. For example, if the FAULT LED fails to come on during the BIT test, check for a high on U26-4. If U26-4 is low, replace U26. If U26-4 is high, the problem is either in Q1, R6, or DS2.

(2) If two or more LEDs fail to function properly, do the following:

(a) If none of the LEDs comes on, check the supply voltages (+5 Vdc and GND) to U26: pins 15 and 16 should be at +5 Vdc, and pin 8 should be at 0 Vdc. Also, check for a series of 200 KHz clock pulses every 50 ms at pin 3 and a corresponding series of data pulses at pin 2. At the same time, pin 1 should pulse high whenever there is a change in the LED status, such as when the LPA is switched from STANDBY to OPERATE. When the clock and data lines are inactive, pin 1 should be low. If all the inputs to U26 are good, replace U26. If not, trace out the defective signal line.

(b) If at least one of the LEDs comes on, replace U26.

6-12. TEMP SENSOR PWB ASSY, A8.

a. Preliminary Procedure.

(1) Remove the good Temp Sensor PWB Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Temp Sensor PWB Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.)

b. Interpreting the BIT Codes. Use the fault code listed below as a guide in troubleshooting the Temp Sensor PWB Assy. In the event that the test runs without generating a fault code, check the "Additional Symptoms" section following the discussion of the fault code.

CODE 5

This fault code indicates that the XMTR FAULT line (TP11 on the Power Control PWB Assy) went low, which could have been caused by any of the following:

Low air flow

High ambient temperature

JMP1 on the Power Control PWB Assy not being installed

Since we know that the problem is in the Temp Sensor PWB Assy, we can eliminate the last cause. To determine whether the fault code is generated by low air flow or by high ambient temperature, check whether the LO AIR LED (DS4) or the OVERTEMP LED (DS5) on the Power Control PWB Assy comes on when the fault is declared.

(1) The LOW AIR LED indicates that the temperature sensed by U2 on the Temp Sensor PWB Assy (as measured by the voltage at TP9 on the Power Control PWB Assy) is at least 15° C to 21° C greater than the temperature sensed at U2 (as measured by the voltage at TP10). This could be caused by either a failure in the fan (which in this case we know is okay) or in one of the temperature sensing circuits (U1, U2, or their associated components). Do the following:

NOTE

This procedure can be performed on a "cold" LPA (one that has been turned off for at least 15 minutes) or a "hot" LPA (one that has been turned on for more than 10 seconds). If you remove the JMP1 jumper (on the Power Control PWB Assy) from a cold LPA, you can begin the procedure immediately (as soon as you turn the LPA on). However, if you remove the jumper from an LPA that has been on for more than 10 seconds, then you should allow 15 minutes for the temperature sensors to stabilize at ambient before doing the procedure.

(a) Remove JMP1 on the Power Control PWB Assy. With the LPA in STANDBY, measure the voltages at TP9 and TP10 on the Power Control PWB Assy. At a room temperature of 21° C (70° F), both test points should read approximately +2.94 Vdc. (For each °C up or down, the voltage at the test points should increase or decrease by 10 mV.) If TP9 is off by more than a few tenths of a volt, replace U1. If TP10 is off, try adjusting potentiometer R2 on the Temp Sensor PWB Assy to make the voltage at TP10 match that at TP9. If adjusting R2 is ineffectual, replace U2.

(b) If the above procedure does not isolate the problem, install JMP1 and measure the voltages at TP9 and TP10 again. TP10 should read the same as before, but TP9 should indicate an increase of approximately 70 mV (in other words, with the fan running, the heat generated by the conduction of R1 should increase the temperature of U1 by approximately 7° C).

(c) If the results of the above tests are still inconclusive, try transmitting for awhile into the dummy load until the LPA reaches its normal operating temperature (110° C). Measure the voltages at TP9 and TP10 again. TP10 should read approximately +3.68 Vdc, with TP9 approximately 70 mV higher (+3.75 Vdc).

(2) The OVERTEMP LED indicates that the ambient temperature of the LPA, as measured by U2 on the Temp Sensor PWB Assy, is greater than 150° C (302° F). The problem has to be in the U2 temperature sensing circuit. Try adjusting R2 first (see the alignment procedures in Section II of this chapter). If adjusting R2 fails to correct the problem, replace U2.

ADDITIONAL SYMPTOMS

Low forward power.

This could indicate a faulty U2 or a misadjusted R2. In other words, the output voltage of U2 is high enough to initiate power cutback, but not

high enough to generate an OVERTEMP fault. First try adjusting R2 (see the alignment procedures in Section II of this chapter). If this fails to correct the problem, replace U2.

6-13. INTERCONNECT PWB ASSY, A9.

a. Preliminary Procedure.

(1) Remove the good Interconnect PWB Assy from the test-bed 1 KW Linear Power Amplifier, and replace it with the faulty Interconnect PWB Assy.

(2) Connect a dummy load to the output (J5) of the 1 KW Linear Power Amplifier (hereafter referred to as the 1 KW LPA).

(3) Power up the 1 KW LPA from the front panel of the 100 Watt Transceiver.

(4) After the 1 KW LPA is warmed up, run the BIT test. (For a complete description of the events that take place during the BIT test, including the causes of the various fault codes, see the Appendix at the end of this chapter.) If you are unable to run the BIT test, either from the 100 Watt Transceiver or from the LPA, go to the "Additional Symptoms" section following the fault code discussions.

b. Interpreting the BIT Codes. Use the fault codes listed below as a guide in troubleshooting the Interconnect PWB Assy. Refer to the section corresponding to the fault code you get. In the event that the test runs without generating a fault code, refer to the "Additional Symptoms" section following the fault code discussions. If your problem is not covered there, start at the beginning of the following procedures and work your way through to the end.

CODE 3

This fault code indicates that when the microprocessor read the PRI PWR SAMPLE input to the A-to-D Converter, it found it to be out of range (which is 80 to 120% of the nominal value).

The PRI PWR SAMPLE input to the A-to-D Converter is obtained from a precision voltage divider (R1, R2) in series with the +13.5 Vdc from the 1 KW Power Supply. With a nominal input voltage (+13.5 Vdc), there should be approximately +3 Vdc at the junction of R1 and R2. Measure the voltage across R1 and R2. The voltage across R1 should be 3.46 times greater than the voltage across R2. If the input voltage (+13.5 Vdc) is marginally high or low, a slight change in the ratio of these two resistors can generate a Code 3 fault.

CODE 8

This fault code indicates that with the LPA in STANDBY, the DC plate voltage is greater than 100.

Look for a fault in the HV ON circuit, specifically a shorted Q1 or Q2, which is keeping the high voltage relay (K1 in the 1 KW Power Supply) energized in STANDBY.

CODE 9

This fault code indicates that with the LPA in OPERATE, the DC plate voltage is not between 2000 and 5000.

The most obvious cause of this fault is an open Q1 or 02 (or a fault in one of their associated components), which is preventing the high voltage relay (K1 in the 1 KW Power Supply) from energizing in OPERATE.

ADDITIONAL SYMPTOMS

LPA does not power up.

Look for a problem in the POWER ON SW line: either an open or a short (C1 or CR1, for example).

No LPA status at the transceiver.

Since the Interconnect PWB Assy is the distribution center for the +13.5 Vdc to many of the other circuit boards, including the Micro Control PWB Assy which in turn supplies the Front Panel PWB Assy, an open in one of the +13.5 Vdc distribution lines could disrupt LPA transceiver communications. Check especially for continuity in the connectors, J1 and J2.

6-14. LOW PASS FILTER ASSY, A110. If this assembly is defective, the problem is most likely a shorted capacitor or an open inductor. You should be able to isolate the faulty component very quickly by taking resistance measurements from the RF Me to ground and from one end of the RF line (J4) to the other (J5).

Section IV. REMOVAL/REPLACEMENT PROCEDURES

6-15. REMOVAL/REPLACEMENT PROCEDURES. The following removal/replacement procedures are for the internal components of the A2 Tank Assy only. Removal/replacement procedures for the Tank Assy itself and for the other major subassemblies of the 1 KW LPA are contained in the On-Equipment Manual, T.O. 31R2-2URC-121.

NOTES

When replacing switches, apply a thin film of Dow Corning No. 200 silicone lubricant to the wiping surface of the switch contacts.

Some of the screws in the following procedures are secured with Loctite No. 222 (purple). Apply a new coating of Loctite 222 when reinstalling these screws.

(1) Wafer Switches

(a) Band Select Switch

CAUTION

Due to the shape of the shaft that runs through the center of the Band Select Switch, it is possible to install the switch correctly or 180° out of phase. Therefore, before removing the switch, make sure that the switch is set for band 1 (1.6-1.8 MHz), in which case the open position of the switch should be oriented toward the driven pulley. When installing a new switch, make sure that its orientation is the same as that of the one you took out.

i. Loosen the two setscrews holding the black plastic Geneva drive gear to the switch shaft.

NOTE

Before removing the Geneva drive gear from the shaft, place an identifying mark on the gear and the flat of the shaft. This is so you will be able to re-install the gear in the same position it was when you took it off.

ii. Remove the Geneva drive gear from the shaft.

iii. Remove the two Phillips screws holding the Band Select Switch to the chassis.

iv. Unsolder the flexible cable wires from the old switch and solder them to the new switch, being careful to orient the flexible cable correctly.

v. Mount the new switch to the chassis, making sure that its orientation is the same as for the old switch.

vi. Mount the Geneva drive gear to the shaft.

(b) Selector Switch Assy for the Tune Capacitors, Load Capacitors, and Inductors

NOTES

This switch assembly (S1-A, -B, and -C) must be replaced as a unit. If one of the sections is defective, do not attempt to repair it. Instead, replace the entire switch assembly.

Before starting the following procedure, select band 1 (1.6-1.8 MHz). Note the orientation of the three movable switch contacts on each section of the switch assembly. The contacts on the new switch assembly must be oriented the same way. Due to the shape of the switch shaft, it is possible to mount the switch in only one of two ways: correctly or 180° out of phase.

i. Loosen the setscrew holding the black plastic Geneva drive gear to the switch shaft.

ii. Remove the Geneva drive gear from the shaft.

iii. Loosen six Phillips screws and remove the top cover (to which the circuit board is mounted).

iv. Unsolder the Coil Assy leads at the switch. Also, unsolder the connecting strap to the variable coil. Disconnect the ground wire to the chassis by removing the Phillips mounting screw.

v. Remove the four Phillips screws and remove the Coil Assy.

vi. After placing identifying marks on the two Load Capacitor Assemblies, remove them from the chassis by removing their two Phillips mounting screws.

vii. Do the same for the two Tune Capacitor Assemblies.

viii. Unsolder the remaining strap to the variable coil.

ix. On the bottom of the Tank Assy, remove the three mounting nuts for the switch assembly.

x. Remove the switch assembly.

xi. Unsolder any remaining leads or jumpers from the old switch assembly and transfer them to the new switch assembly.

xii. Unsolder coil L6 from the old switch assembly. Remove the two plastic mounting screws, and remove the coil. Transfer this coil to the new switch assembly.

xiii. Mount the new switch assembly to the Tank Assy chassis. Use the chassis ground strap as a guide in orienting the new switch assembly correctly. Make sure that the orientation of the movable switch contacts is the same as it was on the old switch assembly. Install and tighten the three mounting nuts on the bottom of the Tank Assy.

xiv. Solder the leads from the variable coil to the new switch assembly.

xv. Install the Tune Capacitor Assemblies and the Load Capacitor Assemblies, making sure that the assemblies are correctly installed per your identifying marks. Check that all the contacts on these assemblies engage the switch tabs.

xvi. Install the Coil Assy, and make all solder connections between it and the switch assembly.

xvii. Install the top cover and tighten the six Phillips screws.

xviii. Install the Geneva drive gear.

xix. Check the shaft alignment as follows:

With the drive pin completely disengaged from the Geneva drive gear, check that the three movable switch contacts in each section are centered on their corresponding fixed contacts. Manually rotate the band switch drive through all the frequency bands, checking the alignment of the movable switch contacts in each band.

xx. To align the shaft:

Remove the two Phillips screws and the Geneva drive gear. Twist the shaft manually until the contacts are centered. Position the Geneva drive gear onto the adjustable disk so that the mounting holes in the drive gear align with the holes in the disk. Install and tighten the Phillips screws. Rotate the drive 360° and check whether the contact alignment is still correct. You may

have to go back and forth a couple of times to optimize the alignment for the entire range of bands.

(2) S3, Overtravel Limit Switch

NOTE

This switch is located on the bottom of the Tank Assy.

(a) Manually rotate the band switch drive pulley until the switch actuator is in the middle of the cam. The switch should be actuated at this point.

(b) Note the orientation of the flexible cable, and unsolder the flexible cable wires from the switch.

(c) Remove the two Phillips mounting screws from the standoffs, and remove the switch.

(d) Mount the new switch to the standoffs with the two Phillips screws.

(e) Resolder the flexible cable wires, making sure that the cable orientation is correct.

(f) Before tightening the screws, make sure that the switch is actuated but not bottomed out. In other words, the switch actuator should not be at the limit of its travel.

(3) Band Switch Drive Motor

(a) Unsolder the motor leads at the bottom of the chassis where they are connected to the flexible cable. Mark the flexible cable wires appropriately.

(b) Slip the drive belt off the drive pulley.

(c) Loosen the setscrew and remove the drive pulley from the motor shaft.

(d) Remove the three Phillips screws holding the motor to the chassis.

(e) Remove the motor.

(f) Install the new motor, reversing the order of the above steps.

(4) Coil Drive Motor

(a) Unsolder the flexible cable leads from the coil drive motor and mark them.

(b) Remove the four Phillips screws holding the Coil Drive Assy to the chassis.

(c) Pull the Coil Drive Assy straight out, disengaging the Coil Drive Assy coupling from the coil shaft coupling (the couplings are mated together with a phenolic key which will fall out when the Coil Drive Assy is removed).

(d) Slip the drive belt off the coil drive pulley.

(e) Loosen the setscrew and remove the pulley from the motor shaft.

(f) Remove the three screws holding the motor to the Coil Drive Assy mounting plate.

(g) Remove the motor.

(h) Install the new motor, reversing the order of the above steps and being careful not to disturb the position of the gears.

(5) Motion Sensor Assy

(a) Loosen the two slotted setscrews on the Motion Sensor side of the white plastic coupling.

(b) Unsolder the four Motion Sensor flexible cable wires, being careful to mark their positions.

(c) Remove the two Phillips mounting screws and remove the Motion Sensor Assy.

(d) Remove the nut and remove the Motion Sensor from its mounting plate.

(e) To install the new Motion Sensor, reverse the order of the above steps.

(6) Limit Switch

(a) Manually position the tuning coil so that it is at least a third of the way from either end stop.

(b) Remove the two Phillips screws holding the Limit Switch Assy.

(c) Remove the nut and remove the Limit Switch from its mounting plate.

(d) Unsolder the Limit Switch from its flexible cable, and note the cable's orientation.

(e) To install a new Limit Switch, reverse the order of the above steps.

(7) Tuning Coil

(a) Manually position the tuning coil to its rear end stop.

(b) Remove the Coil Drive Assy, but do not unsolder any wires (see paragraph 4 above).

(c) Remove the two nuts, and disconnect the three straps at the front of the coil.

(d) Grasping the coil with one hand, remove the two Phillips screws holding the tuning coil assembly to the side of the chassis.

(e) Remove the tuning coil assembly, and remove its coupling half.

(f) Assemble the coupling half to the shaft of the new coil assembly using the two setscrews. Manually position the new tuning coil assembly so that it is in the same position as the old one (with the coil at its rear end stop).

(g) Fasten the new tuning coil assembly to the side of the chassis with the two Phillips screws. Do not tighten the screws.

(h) Connect the straps at the front of the coil.

(i) Install the Coil Drive Assy, mating the coil drive coupling to the coil shaft coupling with the phenolic key. If the two couplings do not line up, rotate the coil shaft until they do. DO NOT ROTATE THE COIL DRIVE COUPLING.

(j) Tighten the Coil Drive Assy mounting screws.

APPENDIX A

CHECKS PERFORMED DURING THE AUTOMATIC BIT ROUTINE FOR THE 1 KW LPA

NOTE

If BIT is initiated during WARMUP, only the tests up to and including the Band Switch/Servo Coil Test are performed.

1. Front Panel Test. At the start of the test, the front panel is disabled and remains so for the remainder of the test. Also at the start of the test, all front panel LCD segments and LED indicators are turned on. They stay on for the remainder of the test with the exception of the condition when tune power is requested from the 100 Watt Transceiver (see "Keying Test").

2. Micro Control Test. The microprocessor is checked. If its operation is determined to be incorrect, FAULT 2-01 is declared.

3. Primary Power Test. The primary power level is sampled. If it is not between 80 and 120% of the nominal value, FAULT 2-03 is declared.

4. Low Voltage Supply Test. The 13.5 V supply is sampled. If it is not between 10 and 16 Vdc, FAULT 2-04 is declared.

5. Transmitter Fault Test. If the XMTR-FAULT signal line (temperature sensor) is active, FAULT 2-05 is declared.

6. Band Switch/Servo Coil Test. For this test, a band other than the current operating band is selected for the band switch. Once this position is reached, the switch returns to the current operating band position. If the switch does not turn, or if it takes over 10 seconds to reach the selected band, FAULT 2-06 is declared. The coil is moved to MIN L and then to MAX L, and the coil position counter is checked at both limits. If the coil does not move, or if the position counter is inaccurate, FAULT 2-07 is declared. If the 1 KW LPA is in WARMUP, no further testing is done.

7. High Voltage Test. With the 1 KW LPA in STANDBY, FAULT 2-08 is declared if the DC plate voltage is greater than 100 volts. The 1 KW LPA is put into OPERATE. If the DC plate voltage is not between 2000 and 5000 volts, FAULT 2-09 is declared. If the plate current is greater than 5 mA, FAULT 2-10 is declared.

8. Bias Test. The power amplifier bias is turned on (the LPA is keyed without RF drive). If the plate current is not between 20 and 150 mA, FAULT 2-11 is declared.

9. Keying Test. An RF MUTE message is sent to the 100 Watt Transceiver. If the RF input signal level is not below 6 watts in 200 milliseconds, FAULT 2-12 is declared. If the RF input falls below 6 watts, the T/R relay is keyed and the RF MUTE signal is removed. Tune Power Request (TPR) and Transmit Gain Control Tune Power Request (TGC TPR) messages are sent to the 100 Watt Transceiver. The message "rF" is sent to the METER LCD display to let the operator know that RF input power is required to complete the test. This message remains until the RF input signal level is greater than 5 watts. If the RF input signal is not greater than 5 watts in 20 seconds, FAULT 2-13 is declared. If the RF input signal level is sufficient, the power amplifier plate current is checked. If the power amplifier plate current is not between 325 mA and 480 mA, FAULT 2-14 is declared. The DC plate voltage is checked again at this point; and if it is not within the previously specified limits for the OPERATE mode (2000 to 5000 Vdc), FAULT 2-09 is declared.

10. Tuning Test. A TGC Lock command is sent to the 100 Watt Transceiver. Using the auto-tuning software, the coil is moved toward MIN L while searching for a tune peak. If no tune peak is found, FAULT 2-15 is declared. When the tune peak is found, forward power is checked. If the forward power is not between 100 watts and 400 watts, FAULT 2-16 is declared. If the forward power is normal, the VSWR is checked. If the VSWR is not less than 2.25:1, FAULT 2-17 is declared. If the VSWR is normal, the ratio of forward power to RF input power is checked. This ratio must be between 5

and 60. If not, FAULT 2-18 is declared. Tune Power Request Off, TGC Tune Power Request Off, and TGC Lock Off commands are sent to the 100 Watt Transceiver when this part of the test is completed.

11. Transceiver Serial Link Test. As in normal operation, certain failures in the serial link to the transceiver during the BIT test cause FAULT 2-21 to be declared.

12. Test Completion.

(a) The BIT tests described in the above paragraphs are continued until a fault is encountered. When a fault is flagged, all further testing is aborted.

(1) If the BIT test was initiated from the 100 Watt Transceiver, the fault code is displayed on the transceiver LCD display. The fault code will also appear on the LPA's LCD display if the METER selector switch is placed in the STATUS/FAULT position. The fault code may be cleared by commanding the LPA to OPERATE from the 100 Watt Transceiver or by moving the METER selector switch out of the STATUS/FAULT position.

(2) If the BIT test was initiated from the LPA, the fault code is displayed on the LPA's front panel meter. The fault code will also appear on the transceiver's LCD display if "2ND," "TEST" is pressed. To remove the LPA from the test mode, the METER selector switch must be moved out of the STATUS/FAULT position. The fault code may be cleared by commanding the LPA to OPERATE from the 100 Watt Transceiver (if the LPA is placed back in AUTO) or by moving the METER selector switch to the STATUS/FAULT position and then out again.

(b) If no fault is encountered during any of the tests, the following occurs:

(1) If the BIT test was initiated from the 100 Watt Transceiver, the message "PASSEd" is displayed on the transceiver front panel for 5 seconds; and the LPA front panel returns immediately to its normal operating mode.

(2) If the BIT test was initiated from the LPA, the message "PASS" is displayed on the meter. The message will remain there as long as the METER selector switch is in the STATUS/FAULT position. When the selector switch is moved out of the STATUS/FAULT position, the message disappears and the LPA front panel returns to its normal operating mode.

APPENDIX B

Meter Functions and Normal Operating Ranges

Position	Function	Range/Units	Normal (Stby/ Warmup)	Normal (Operate, Keyed in CW)
PRI PWR (%)	Displays the average primary power input as a percentage of the nominal value	0% to 166%	90 to 110	90 to 110
13.5 VDC	Displays the average output of the low voltage power supply	0 to +22 Vdc	11 to 16	11 to 16
DC PLATE (VOLTS)	Displays the average plate voltage of the power amplifier tube	0 to +5000 Vdc	0	2400 to 3200(1)
I_K	Displays the average cathode (plate) current of the power amplifier tube	0 to 2000 mA	0	700 to 1100(1)
RF IN (WATTS)	Displays the peak RF input power from the 100 Watt Transceiver	0 to 250 W	0 to 100(2)	40 to 100(1)
RF PLATE (VOLTS)	Displays the peak RF voltage at the plate of the power amplifier tube (with respect to the average DC voltage)	0 to 5000 Vdc	0	1800 to 2400(1)
FWD PWR (WATTS)	Displays the peak forward power at the RF output	0 to 1500 W	0	900 to 1100
REFL PWR (WATTS)	Displays the peak reflected power at the RF output	0 to 1500 W	0	0 to 100, depending on load(1)
ANT VSWR	Displays the peak ratio of the mismatch between the 1 KW LPA and its load, be it antenna, antenna coupler, or dummy load	1:1 to 999:1	0	1:1 to 2:1(1)
COIL POS	Displays the servo coil position	100 to 1770	See Figure 3-1	See Figure 3-1
STATUS/ FAULT	Displays a fault code. If the FAULT light is lit and the meter is switched to the STATUS/FAULT position, a fault code will be displayed. When the selector switch is moved out of the STATUS/FAULT position, the fault code will be cleared and the FAULT light will be turned off.	Fault codes		

(1) With a power output of 1 KW, as indicated on the FWD PWR meter.

(2) With the transceiver keyed; otherwise, the reading will be 0 W.

CHAPTER 7

ILLUSTRATED PARTS BREAKDOWN

Section 1. INTRODUCTION

7-1. PURPOSE. This chapter lists, illustrates, and describes the detail parts for the 1 KW LPA. Its purpose is for the identification, requisitioning, and issuance of parts at the depot level.

7-2. SCOPE. Bulk electrical items, such as terminals, wire, heat shrink tubing, etc., are not listed in this manual. Common hardware items, such as screws, washers, nuts, etc., when used to attach structural components that are not normally removed or disassembled, are also not listed. In general, the parts installed at the time the 1 KW LPA was manufactured are listed and identified in this chapter. When a part (including vendor items), which is different from the original, was installed during the manufacture of later items, series, or blocks, all parts are listed (and "Usable-On" coded). However, when the original part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred part is listed. Also, when a part was installed during modification, and the original does not have continued application, only the preferred item is listed. Interchangeable and substitute parts, subsequently authorized by the Government, are not listed in this chapter; such items are identified by information available through the Interchangeable and Substitute (I & S) Data Systems. Refer to T.O. 00-25-184. When a standard size part can be replaced with an oversize or undersize part, the latter parts, showing sizes, are also listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

7-3. CHAPTER ORGANIZATION. This chapter is divided into two sections. Section I, INTRODUCTION, explains the purpose, scope, and organization of the chapter. Section II, MAINTENANCE PARTS LIST, consists of illustrations, in which the detail parts of the 1 KW LP are identified by numbers (called index numbers), followed by lists which contain parts numbers, descriptions, and other relevant data for the items identified on the illustrations. Section II also contains two other lists: A numerical index, which lists the parts in alphanumerical sequence; and a reference designator index, which lists the electrical parts in alphabetical sequence by their reference designators.

7-4. SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES. This chapter contains Air Force Peculiar In-Being Source and Repair Codes only. Definitions of these SMR codes, as well as detailed coding criteria and transposition matrices for each coding method, may be obtained from T.O. 00-25-195. Refer to page 7-13.

7.5. FEDERAL SUPPLY CODES FOR MANUFACTURERS (FSCM). The codes used in this chapter are as follows. The first list is in numerical order by FSCM; the second is in alphabetical order by manufacturer name.

JOINT MILITARY SERVICES UNIFORM SMR CODING MATRIX T.O. 00-25-195

SOURCE				MAINTENANCE USE		MAINTENANCE REPAIR		RECOVERABILITY		ERRC CODE	
1st Position		2nd Position		3rd Position		4th Position		5th Position		6th Position	
P	Procurable	A	Stocked	O	Remove/ Replace at Organizational Level	Z	No Repair	Z	Nonreparable Condemn at 3rd Position Level	N	Nonrecoverable XB3 Condemn at Any Level
		B	Insurance								
		C	Deteriorative								
		E	Support Equipment, Stocked								
		F	Support Equipment, Nonstocked			B	No Repair Recondition	O	Reparable Condemn at Organizational	P	Recoverable XF3 Condemn at Field
		G	Sustained Life Support							C	Recoverable XD1 (SCARS) Condemn at Depot
K	Component of a Repair Kit	F	Intermediate Kit	F	Remove/ Replace at Inter-mediate Level	O	Repair at Organizational	F	Reparable Condemn at Intermediate	T	Recoverable XD2 Condemn at Depot
		D	Depot Kit								
		B	In Both Kits			F	Repair at Intermediate				
M	Manufacture	O	Organization								
		F	Intermediate								
		D	Depot	D	Remove/Replace at Depot Level	D	Limited Repair at O or F Level	D	Reparable Condemn at Depot	S	Nonexpendable Support Equipment, Depot ND2
A	Assemble	O	Organization								
		F	Intermediate				Overhaul at Depot				
		D	Depot							U	Nonexpendable Support Equipment, Organizational and Intermediate NF2
X	Nonprocured	A	Requisition NHA			L	Repair at Depot	A	Special Handling		
		B	Reclamation from IM								
		C	Mfg Drawings								

Section II. MAINTENANCE PARTS LIST

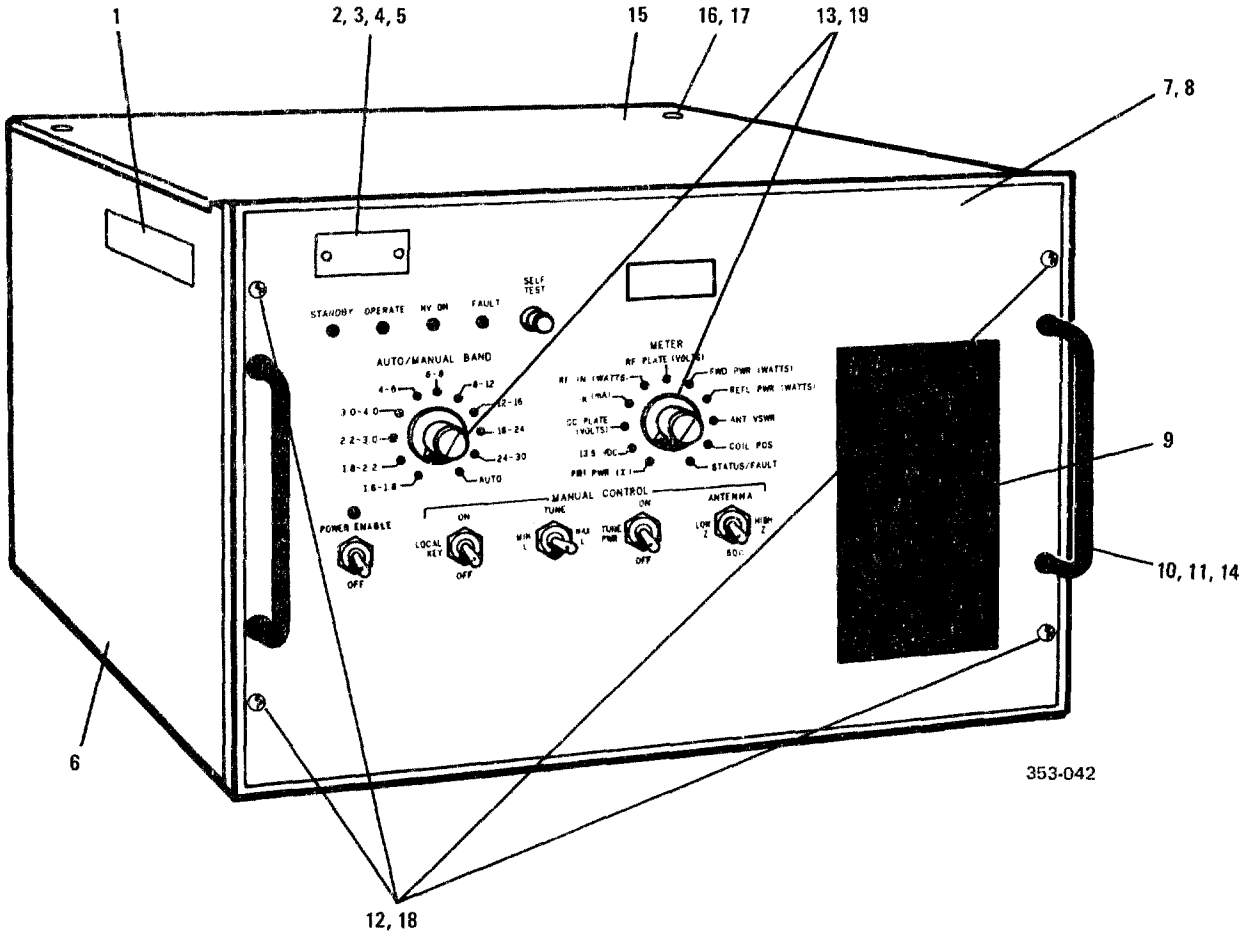

Figure 7-1. 1 KW LPA, AM-7224/URC, Front View

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-1 -	10087-0000	14304	AMPLIFIER,RF*	1		PEODD
- 1	10087-0071	14304	. PLATE,IDENT	1		MDO
- 2	10087-0008	14304	. NAMEPLATE	1		MDO
- 3	MS51957-14	96906	. SCREW,MACHINE (AP)	4		PAOZZ
- 4	MS35338-135	96906	. WASHER,LOCK (AP)	2		PAOZZ
- 5	MS15795-803	96906	. WASHER,FLAT (AP)	4		PAOZZ
- 6	10087-3100	14304	. CHASSIS,ELEC,EQPT	1		PAOLD
- 7	10087-2005	14304	. . PANEL	1		XB
- 8	10087-2006	14304	. . OVERLAY	1		XB
- 9	10087-2010	14304	. . FILTER,AIR	1		PAOZZ
- 10	A1013-29	06540	. . HANDLE	2		XB
- 11	16022-A2	06540	. . BUSHING	4		XB
- 12	10087-2011	14304	. . WASHER,FLAT (AP)	4		XB
- 13	MS91528-1F1B	96906	. . KNOB	2		PAOZZ
- 14	MS24693-C272	96906	. . SCREW,MACHINE (AP)	4		PAOZZ
- 15	10087-3104	14304	. . COVER	1		XB
- 16	AJ4-35-SS	32039	. . STUD	2		XB
- 17	SR-4	72794	. . RETAINER	2		PADZZ
- 18	10087-2012	14304	. . SCREW,MACHINE (AP)	4		XB
- 19	AN565DC4L4	96906	. . SCREW,MACHINE (AP)	4		PADZZ

*Installation requires Ancillary Kit 10087-0060. See figure 7-3.

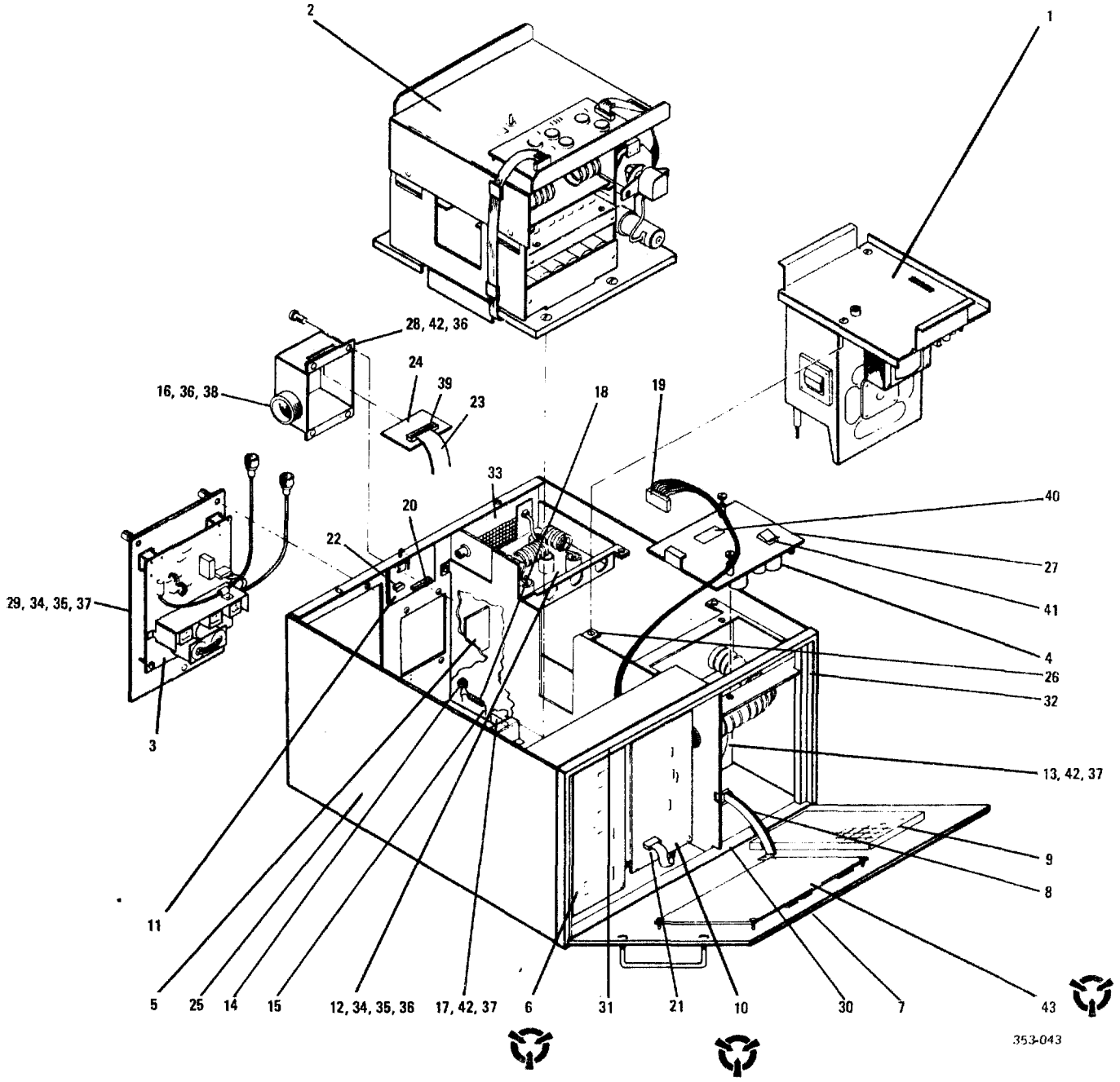

Figure 7-2. 1 KW LPA, AM-7224/URC, Exploded View

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-2 - 1	10087-3200	14304	ELECTRON TUBE ASSY,A1	1		PAODD
- 2	10087-3700	14304	TRANSFORMER ASSY,RF,A2	1		PAODD
- 3	10087-4600	14304	CIRCUIT CARD ASSY,A3	1		PAODD
- 4	10087-1500	14304	CIRCUIT CARD ASSY,A4	1		PAOLD
- 5	10086-7200	14304	CIRCUIT CARD ASSY,A5	1		PAODD
- 6	10086-9200	14304	CIRCUIT CARD ASSY,A6	1		PAODD
- 7	10087-2000	14304	PANEL ASSY,A7	1		XB
- 8	10087-2004	14304	BRACKET,ANGLE	1		XB
- 9	10087-2008	14304	RETAINER	1		XB
- 10	10086-7100	14304	CIRCUIT CARD ASSY,A8	1		PAOLD
- 11	10087-3140	14304	CIRCUIT CARD ASSY,A9	1		PAOLD
- 12	10087-4500	14304	FILTER ASSY,RF,A10	1		PAOLD
- 13	10086-1400	14304	FAN ASSY	1		PAOZZ
- 14	75GA-D25	56289	CAPACITOR,FXD,CER	1		PADZZ
- 15	2994-14-1	17117	SPACER	2		XB
- 16	MS3102R28-18P	96906	CONNECTOR,RCPT,ELEC	1		PADZZ
- 17	8101FSP-90	01009	CONNECTOR,RCPT,ELEC	1		PADZZ
- 18	5248	96804	TRANSFORMER,RF	1		PADZZ
- 19	22-01-3147	27264	CONNECTOR,PLUG,ELEC	2		PADZZ
- 20	09-91-0600	27264	CONNECTOR,RCPT,ELEC	2		PADZZ
- 21	22-01-3107	27264	CONNECTOR,PLUG,ELEC	1		PADZZ
- 22	22-01-3057	27264	CONNECTOR,RCPT,ELEC	2		PADZZ
- 23	10087-3135	14304	CABLE ASSY,INTERCONNECT	1		PAOZZ
- 24	10087-3170	14304	CIRCUIT CARD ASSY,A11	1		PAOZZ
- 25	10087-3103	14304	CHASSIS,ELEC,EQPT	1		XB
- 26	SQ-C4-20	32039	CATCH	3		XB
- 27	10087-3105	14304	PLATE,MTG	1		XB
- 28	10087-3109	14304	COVER	1		XB
- 29	10087-3113	14304	PLATE,MTG	1		XB
- 30	10087-3116	14304	BRACKET,ANGLE	1		XB
- 31	10087-3117	14304	BRACKET,ANGLE	1		XB
- 32	10087-3118	14304	BRACKET ANGLE	2		XB
- 33	10087-3119	14304	PANEL	1		XB
- 34	MS51957-14	96906	SCREW,MACHINE (AP)	8		PADZZ
- 35	MS35338-135	96906	WASHER,LOCK (AP)	10		PADZZ
- 36	MS51957-28	96906	SCREW,MACHINE (AP)	14		PADZZ
- 37	MS51957-30	96906	SCREW,MACHINE (AP)	1		PADZZ
- 38	H-6768	14304	NUT,CLINCH (AP)	11		XB
- 39	250817-1	00779	RETAINER	1		XB
- 40	MP-0745	14304	LABEL,HIGH VOLTAGE	3		MDO
- 41	3484-1000	54254	CLAMP CABLE	5		PADZZ
- 42	MS15795-806	96906	WASHER,FLAT (AP)	5		PADZZ
- 43	10087-2100	14304	CIRCUIT CARD ASSY,A7A1	1		PAODD

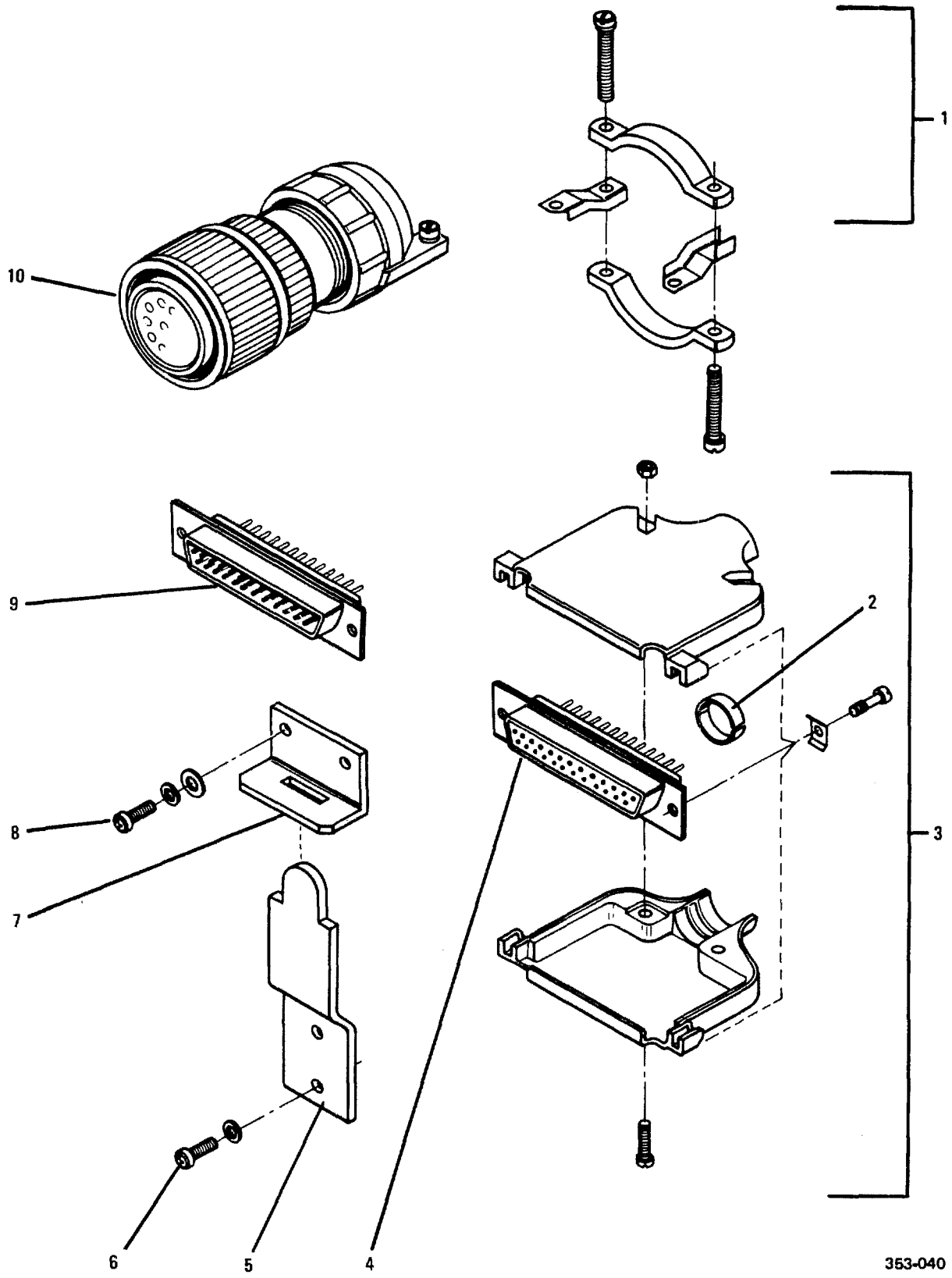

Figure 7-3. Installation Kit for 1 KW LPA

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-3 -	10087-0060	14304	INSTALLATION KIT	1		XB
- 1	10-36233-243	77820	. RETAINER	2		XB
- 2	745508-8	00779	. BUSHING	2		XB
- 3	745173-2	00779	. COVER,CONN	2		PAOZZ
- 4	17-80250-16	74868	. CONNECTOR,RCPT,ELEC	1		PAOZZ
- 5	10087-3107	14304	. BRACKET,ANGLE	8		XB
- 6	MS51957-30	96906	. SCREW,MACHINE (AP)	16		PAOZZ
- 7	10087-3106	14304	. BRACKET,ANGLE	4		XB
- 8	MS51957-17	96906	. SCREW,MACHINE (AP)	8		PAOZZ
- 9	DBM25P	71468	. CONNECTOR,RCPT,ELEC	1		PAOZZ
- 10	10-109628-18S	77820	. CONNECTOR,PLUG,ELEC	2		PADZZ

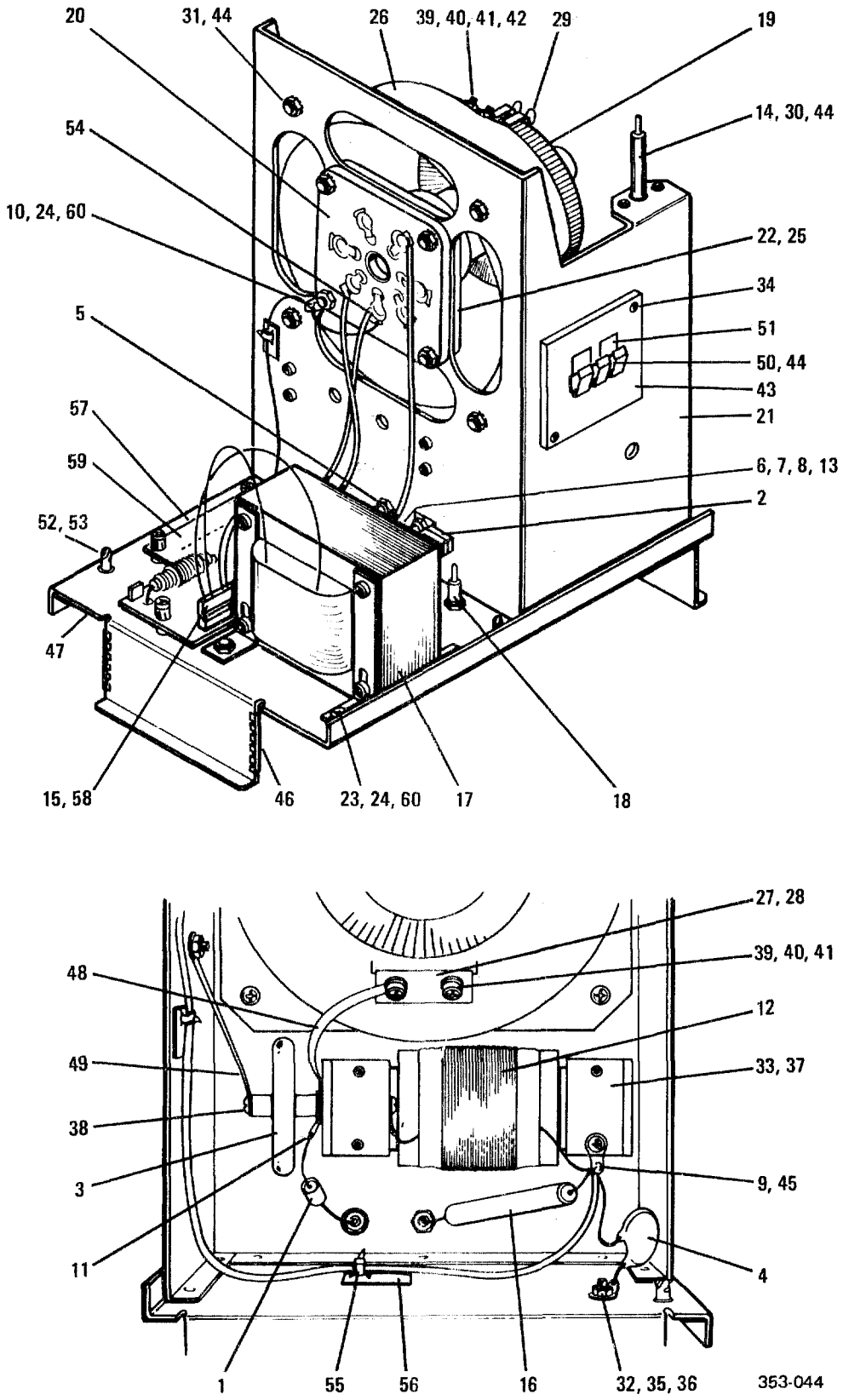

Figure 7-4. Tube Assy, A1

Tube assembly

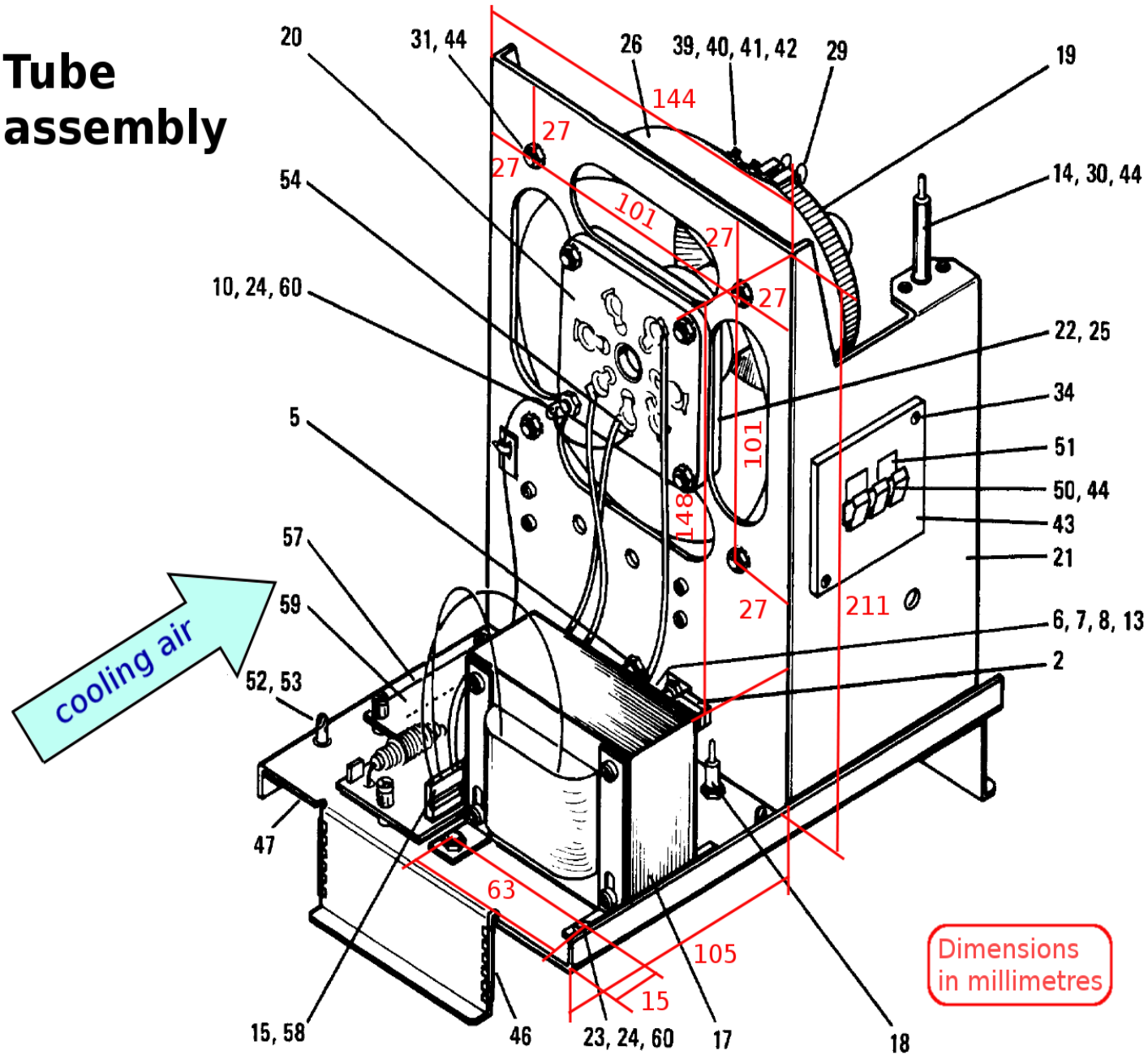

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-4 -	10087-3200	14304	ELECTRON TUBE ASSY,A1	1		PAODD
- 1	HT55T309CB	21052	. CAPACITOR,FXD,CER	1		PADZZ
- 2	10087-3230	14304	. CAPACITOR,FXD,CER	1		PADZZ
- 3	10043-0033	14304	. CAPACITOR,FXD,CER	1		PADZZ
- 4	75GA-D25	56289	. CAPACITOR,FXD,CER	1		PADZZ
- 5	CK70AW152M	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 6	M39014/2-1350	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 7	JAN1N5711	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 8	2308-14-1	17117	. SPACER	1		XB
- 9	MS77068-1	96906	. TERMINAL,LUG	3		PADZZ
- 10	MS77068-3	96906	. TERMINAL LUG	1		PADZZ
- 11	MS77068-2	96906	. TERMINAL LUG	2		PADZZ
- 12	8948-3307	14304	. COIL,RF	1		PADZZ
- 13	MS90539-11	96906	. COIL,RF	1		PADZZ
- 14	8101MP	01009	. CONNECTOR,PLUG,ELEC	1		PADZZ
- 15	22-01-3037	27264	. CONNECTOR,PLUG,ELEC	1		PADZZ
- 16	MS313-4994F	19647	. RESISTOR,FXD,WW	1		PADZZ
- 17	10087-3208	14304	. TRANSFORMER,RF	1		PADZZ
- 18	A2-61864	00159	. JACK,TIP	1		PADZZ
- 19	8877/3CX1500A7	06980	. TUBE,ELECTRON	1		PAOZZ
- 20	122-0247-202	74970	. SOCKET,ELCTRN TUBE	1		PADZZ
- 21	10087-3205	14304	. CHASSIS,ELEC,EQPT	1		XB
- 22	10019-1310	14304	. GRID RING ASSY	1		XB
- 23	MS51957-44	96906	. SCREW MACHINE	4		PAOZZ
- 24	MS15795-807	96906	. WASHER,FLAT (AP)	8		PADZZ
- 25	5612-18-20	86928	. WASHER,FLAT,TEFLON	4		PAOZZ
- 26	10087-3204	14304	. CHIMNEY	1		XB
- 27	10019-1308	14304	. CONTACT,ELEC	1		XB
- 28	10019-1309	14304	. BRACKET,ANGLE	1		XB
- 29	10019-1307	14304	. RETAINER	1		XB
- 30	MS51957-30	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 31	MS51957-29	96906	. SCREW,MACHINE (AP)	4		PAOZZ
- 32	MS35649-244	96906	. NUT PLAIN HEX	1		PAOZZ
- 33	391-3314	14304	. HOLDER,RF CHOKE	2		XB
- 34	MS24693-C28	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 35	MS35338-135	96906	. WASHER,LOCK (AP)	1		PADZZ
- 36	MS51957-13	96906	. SCREW MACHINE	1		PAOZZ
- 37	MS51957-14	96906	. SCREW,MACHINE (AP)	5		PADZZ
- 38	21050	73734	. SCREW,MACHINE (AP)	1		PAOZZ
- 39	AN921-6	73734	. WASHER,FLAT (AP)	5		PAOZZ
- 40	1384	73734	. WASHER,LOCK (AP)	5		PAOZZ
- 41	21045	73734	. SCREW,MACHINE (AP)	4		PAOZZ
- 42	MS35649-265	96906	. NUT,BRASS,HEX	2		PAOZZ
- 43	10087-3206	14304	. PLATE,INSULATOR	1		XB
- 44	H-6768	14304	. NUT,CLINCH (AP)	7		XB
- 45	21042	73734	. SCREW,MACHINE (AP)	1		PAOZZ
- 46	MS21266-2N	96906	. GUARD,EDGE	2		PADZZ
- 47	3484-1000	54254	. CLAMP CABLE	1		XB
- 48	10087-3210	14304	. CONTACT,ELEC	1		XB
- 49	10087-3209	14304	. CONTACT,ELEC	1		XB
- 50	10087-3211	14304	. PLATE,MTG	1		XB

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
- 51	10087-3212	14304	. CONTACT,ELEC	1		XB
- 52	AJ4-505-S	72794	. STUDTURNLOCKFAST	3		PAOZZ
- 53	SR-4	72794	. RETAINER	3		XB
- 54	D-142-50	06090	. SOLDER SLEEVE	2		XB
- 55	MS3367-4-9	96906	. STRAP,TIE DOWN	2		XB
- 56	TC-105A	59730	. BASE	2		XB
- 57	10087-3213	14304	. SEAL	1		XB
- 58	08-56-0110	27264	. CONTACT ELECTRICAL	6		PADZZ
- 59	10087-3220	14304	. CIRCUIT CARD ASSY,A1A1	1		XB
- 60	H-6767	96906	. NUT,CLINCH (AP)	8		XB

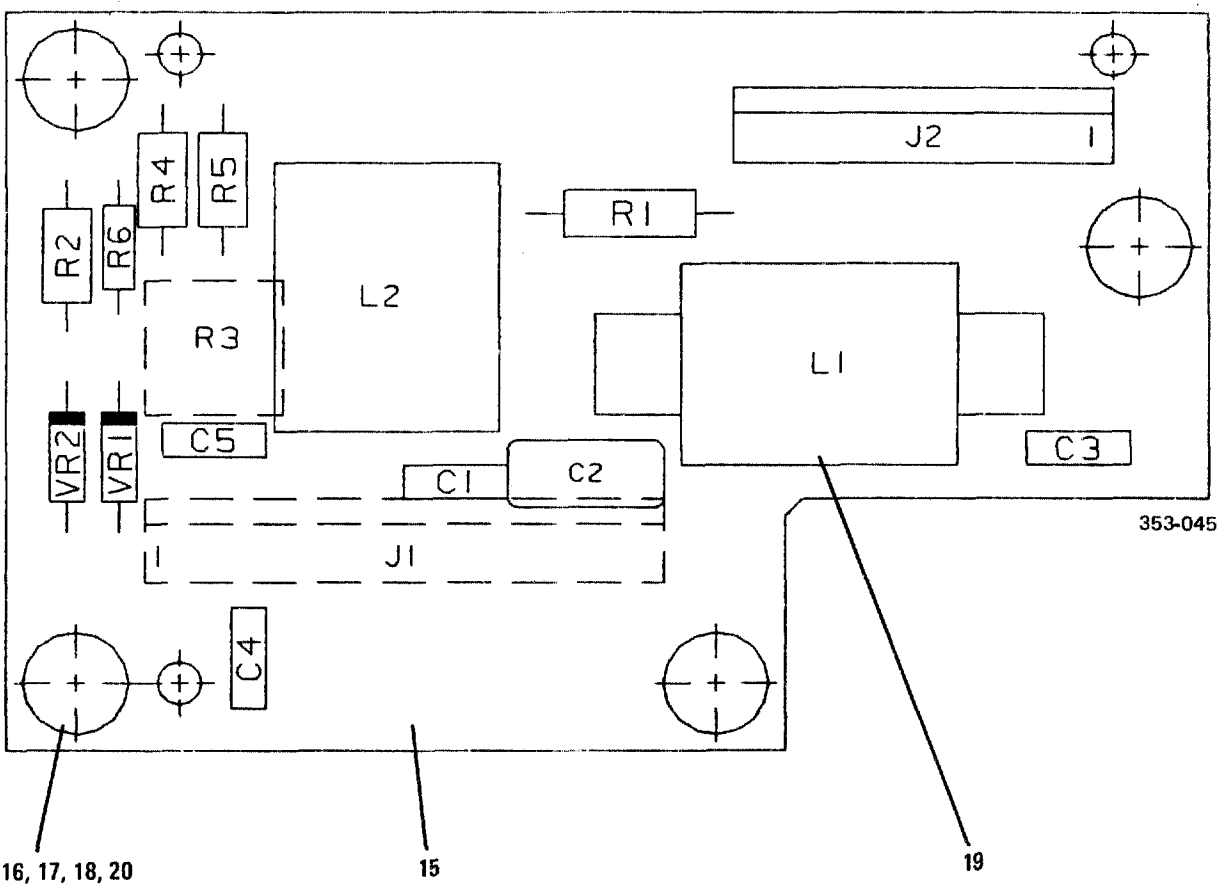

Figure 7-5. Bias/Sample PWB Assy, A1A1

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-5 -	10087-3220	14304	CIRCUIT CARD ASSY,A1A1	1		XB
- 1	CK06BX104K	81349	. CAPACITOR,FXD,CER	3		PADZZ
- 2	CMR05E470G0DR	81349	. CAPACITOR,FXD,MICA	1		PADZZ
- 3	M39014/02-1338	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 4	22-11-2142	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 5	22-11-2102	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 6	05801	76490	. TRANSFORMER,RF	1		PADZZ
- 7	10087-3207	14304	. TRANSFORMER	1		PADZZ
- 8	ERD50TJ224	54473	. RESISTOR,FXD,COMP	1		PADZZ
- 9	RNC55K5111FS	81349	. RESISTOR,RXD,FILM	1		PADZZ
- 10	3386F-1-203	32997	. RESISTOR FXD FILM	1		PADZZ
- 11	RNC55K1502FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 12	RNC55K1133FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 13	CF07-471J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 14	JAN1N751A	81349	. SEMICOND DEVICE,DIO	2		PADZZ
- 15	10087-3229	14304	. CIRCUIT CARD	1		XB
- 16	6611-0135	14304	. RETAINER,SCREW	4		XB
- 17	10085-5156	14304	. BUSHING	4		XB
- 18	MS51957-17	96906	. SCREW,MACHINE (AP)	4		PADZZ
- 19	904-380	52559	. SPACER	2		PADZZ
- 20	MS35338-135	96906	. WASHER,LOCK (AP)	4		PADZZ

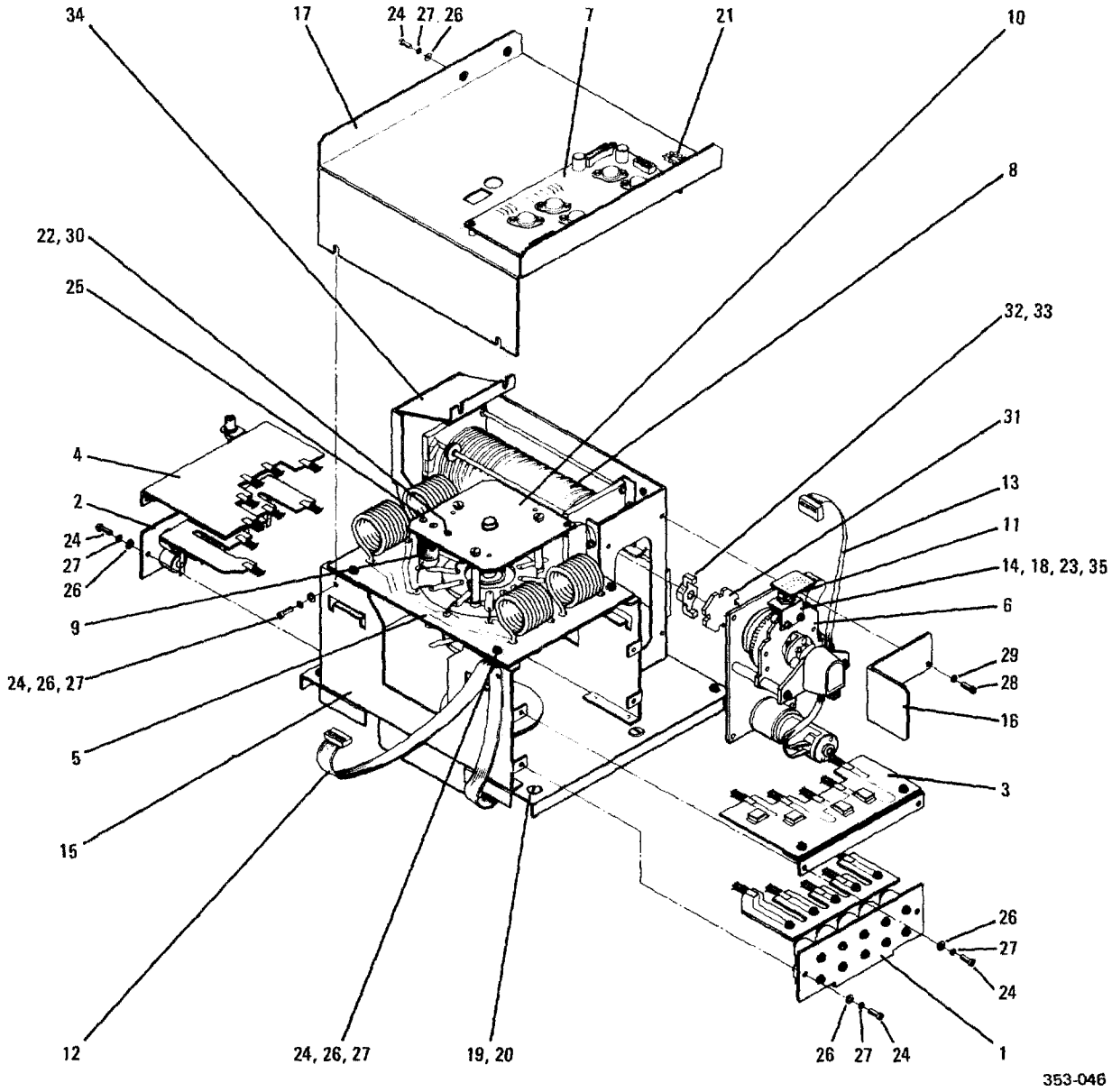

Figure 7-6. Tank Assy, A2, Exploded View

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-6 -	10087-3700	14304	TRANSFORMER ASSY,RF,A2	1		PAODD
- 1	10087-3740	14304	. TUNE CAP ASSY,A2A1	1		PADLD
- 2	10087-3750	14304	. TUNE CAP ASSY,A2A2	1		PADLD
- 3	10087-3760	14304	. CIRCUIT CARD ASSY,A2A3	1		XB
- 4	10087-3770	14304	. CIRCUIT CARD ASSY,A2A4	1		XB
- 5	10087-3780	14304	. CIRCUIT CARD ASSY,A2A5	1		XB
- 6	10086-3720	14304	. XFMR DRIVE ASSY,A2A6	1		XA
- 7	10086-3730	14304	. CIRCUIT CARD ASSY,A2A7	1		XB
- 8	10087-3709	14304	. TRANSFORMER,RF	1		PADZZ
- 9	10087-3785	14304	. TRANSFORMER,RF	1		PADZZ
- 10	10087-3708	14304	. SWITCH	1		PADZZ
- 11	7105TV30QE	09353	. SWITCH,TOGGLE	1		PADZZ
- 12	10086-3799	14304	. CABLE ASSY,RF	1		XB
- 13	10087-3819	14304	. CABLE ASSY,RF	1		XB
- 14	10086-3726	14304	. PLATE,MTG	1		XB
- 15	10087-3705	14304	. CHASSIS,ELEC,EQPT	1		XB
- 16	10087-3706	14304	. PROTECTOR,ELEC	1		XB
- 17	10087-3703	14304	. COVER	1		XB
- 18	8154-A-440-0	14304	. SPACER	2		XB
- 19	AJ4-35	32039	. STUD	4		XB
- 20	SR-4	72794	. RETAINER	4		XB
- 21	MS21266-1N	96906	. GUARD,EDGE	3		PADZZ
- 22	MS51957-13	96906	. SCREW MACHINE	4		PADZZ
- 23	MS35338-135	96906	. WASHER,LOCK (AP)	8		PADZZ
- 24	MS51957-28	96906	. SCREW,MACHINE (AP)	12		PADZZ
- 25	010632B037	13764	. SCREW,MACHINE,NYLON	2		PAOZZ
- 26	MS15795-805	96906	. WASHER,FLAT (AP)	18		PADZZ
- 27	MS35338-136	96906	. WASHER,LOCK (AP)	22		PAOZZ
- 28	MS51957-44	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 29	MS35338-137	96906	. WASHER,LOCK (AP)	4		PAOZZ
- 30	841-00	92967	. NUT,CLINCH (AP)	1		PAOZZ
- 31	10087-3721	14304	. BRACKET,MTG	1		PADZZ
- 32	10087-3722	14304	. WHEEL,INDEX	1		PADZZ
- 33	MS51021-22	96906	. SCREW,MACHINE (AP)	8		PADZZ
- 34	10087-3710	14304	. BRACKET,ANGLE	1		XB
- 35	MS51957-15	96906	. SCREW,MACHINE (AP)	2		PADZZ

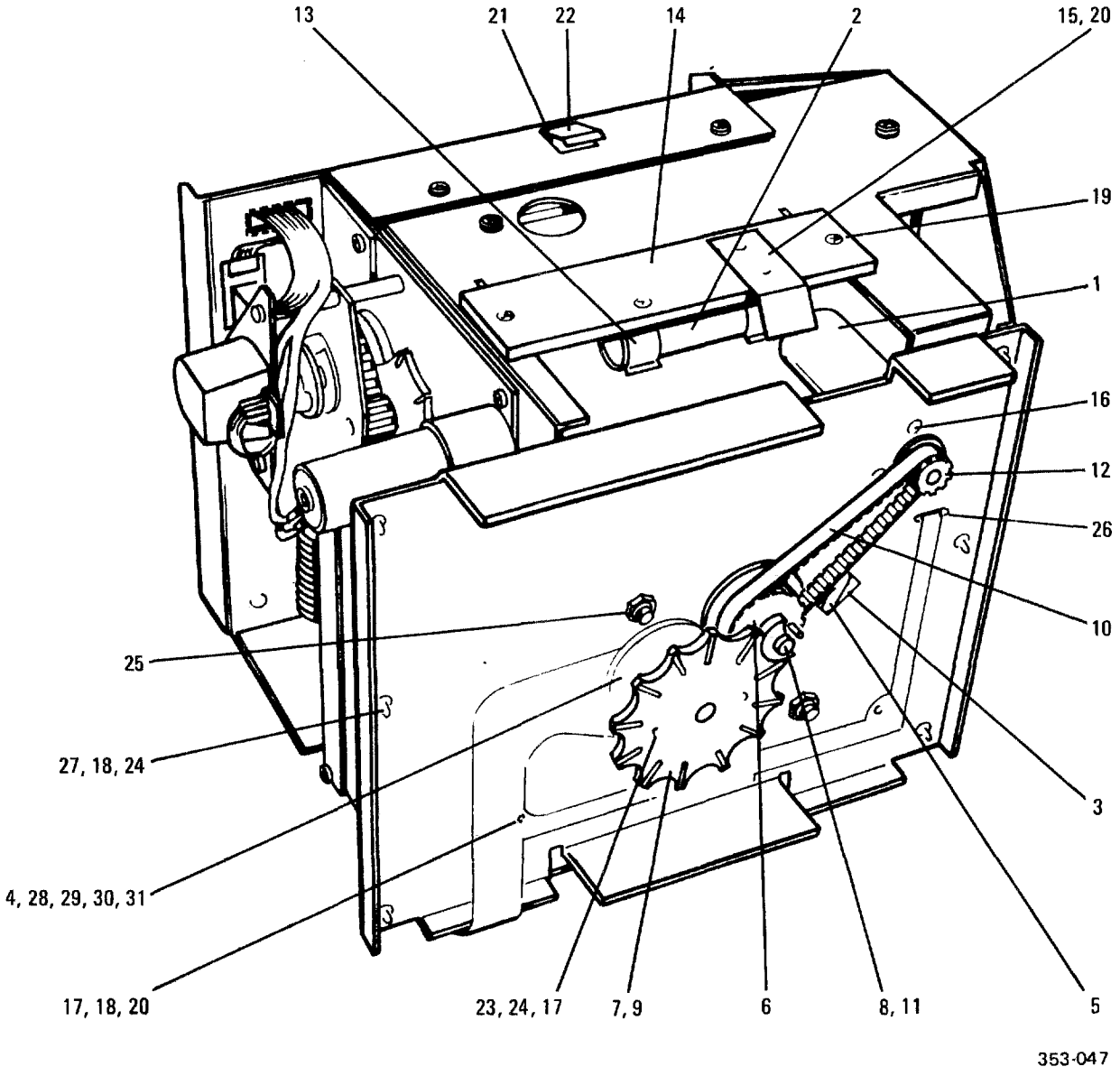

Figure 7-7. Tank Assy, A2, Bottom View

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-7 -	10087-3700	14304	TRANSFORMER ASSY,RF,A2	1		PAODD
- 1	10086-3703	14304	. MOTOR,ELEC	1		PADZZ
- 2	885SP220L	72819	. RESISTOR,FXD,WW	1		PADZZ
- 3	V3-343-D8	91929	. SWITCH SENSITIVE	1		PADZZ
- 4	6628-3460	14304	. SWITCH WAFER	1		PADZZ
- 5	JV-5	91929	. ACTUATOR	1		XB
- 6	10086-3806	14519	. PULLEY	1		PADZZ
- 7	10086-3712	14304	. WHEEL,INDEX	1		XB
- 8	43D33	29964	. BLOCK,BEARING	1		XB
- 9	10086-3788	14304	. DISC,MTG	1		XB
- 10	106XL037	61463	. BELT,ENDLESS	1		PADZZ
- 11	5144-25-S-ZD	79136	. RING,RETAINER	1		XB
- 12	10086-3709	14304	. SPACER,SHAFT	1		XB
- 13	4521-75-62-1T	86928	. RETAINER	2		XB
- 14	10087-3716	14304	. INSULATOR	1		XB
- 15	10087-3717	14304	. PROTECTOR,ELEC	1		XB
- 16	MS51959-14	96906	. SCREW,MACHINE (AP)	7		PAOZZ
- 17	MS15795-805	96906	. WASHER,FLAT (AP)	18		PADZZ
- 18	MS51957-27	96906	. SCREW,MACHINE (AP)	10		PADZZ
- 19	MS51959-28	96906	. SCREW,MACHINE (AP)	3		PAOZZ
- 20	H-6768	14304	. NUT,CLINCH (AP)	4		XB
- 21	10087-3211	14304	. PLATE,FINGER STK	1		PADZZ
- 22	10087-3212	14304	. CONTACT,ELECTRICAL	1		PADZZ
- 23	MS51957-28	96906	. SCREW MACHINE	12		PADZZ
- 24	MS35338-136	96906	. WASHER,LOCK (AP)	22		PAOZZ
- 25	H-6767	14304	. NUT,CLINCH (AP)	5		XB
- 26	MS21266-2N	96906	. GUARD,EDGE	3		PADZZ
- 27	P101-447-495	89032	. STUD FRICTION CATCH	2		PAOZZ
- 28	MS15795-803	96906	. WASHER,FLAT (AP)	2		PADZZ
- 29	8154-A-440-0	14304	. SPACER	2		XB
- 30	MS35338-135	96906	. WASHER,LOCK (AP)	8		PADZZ
- 31	MS51957-15	96906	. SCREW,MACHINE (AP)	2		PADZZ

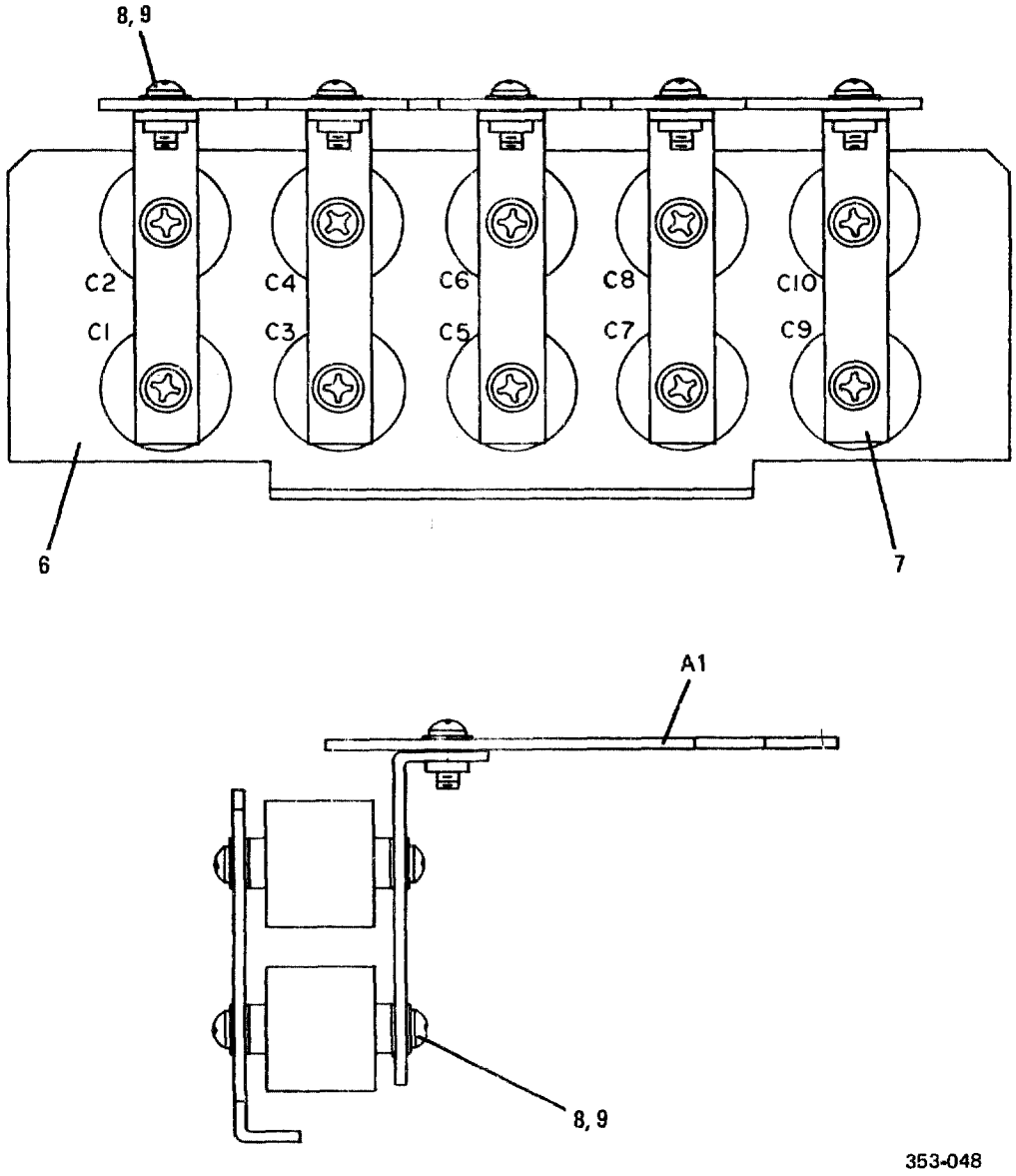

Figure 7-8. Tune Capacitor No. 1 Assy, A2A1

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-8 -	10087-3740	14304	TUNE CAP ASSY,A2A1	1		PADLD
- 1	10087-3745	14304	. CIRCUIT CARD ASSY	1		XB
- 2	J1HT50UJ141J252	73905	. CAPACITOR,FXD,CER	2		PADZZ
- 3	HT50T101JB	21052	. CAPACITOR,FXD,CER	4		PADZZ
- 4	HT50V500JA	21052	. CAPACITOR,FXD,CER	3		PADZZ
- 5	HT50V250JA	21052	. CAPACITOR,FXD,CER	1		PADZZ
- 6	10087-3742	14304	. PLATE,MTG	1		XB
- 7	10087-3743	14304	. PLATE,MTG	5		XB
- 8	MS51957-27	96906	. SCREW,MACHINE (AP)	25		PAOZZ
- 9	MS35333-71	96906	. WASHER,LOCK (AP)	45		PAOZZ

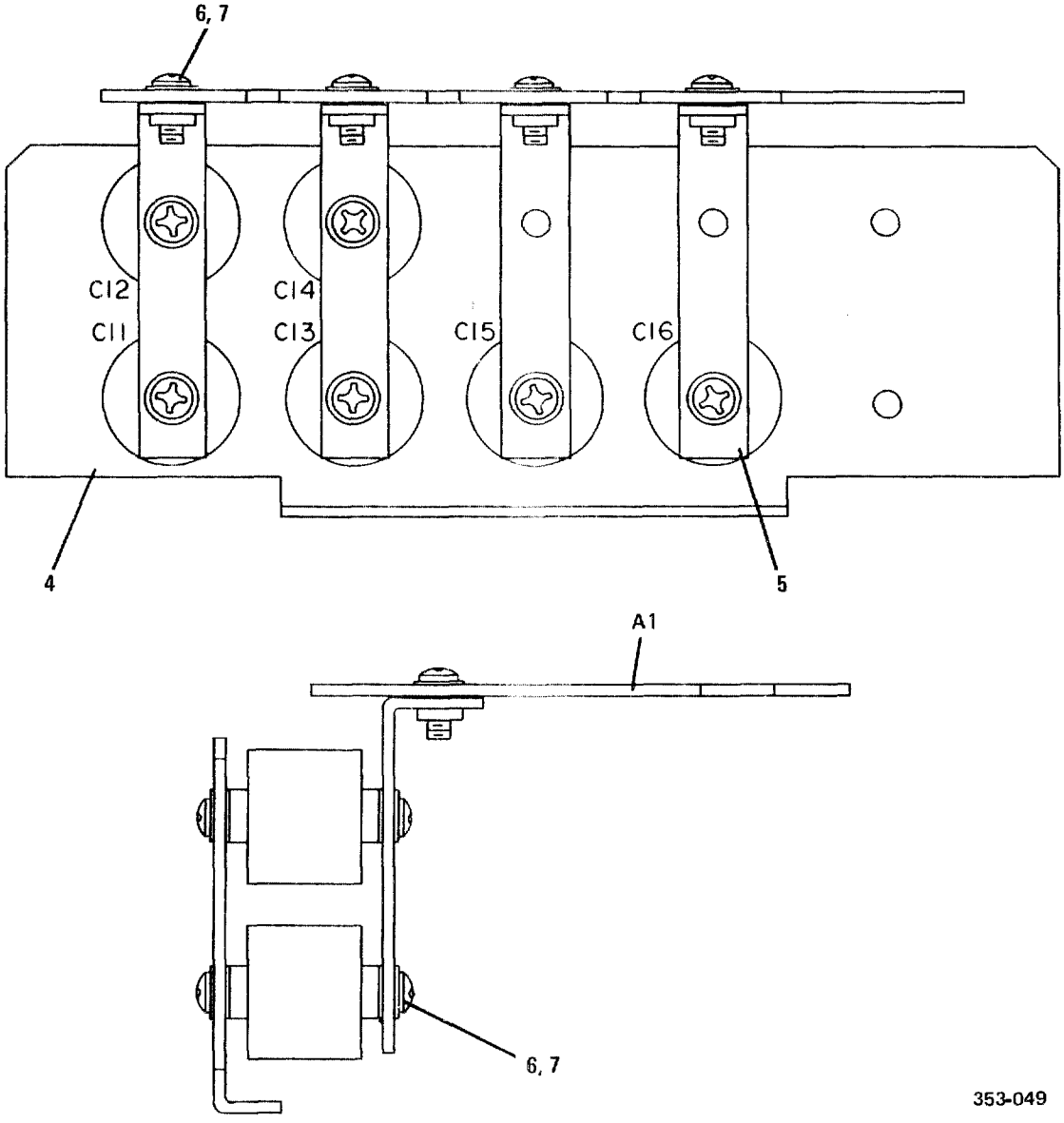

Figure 7-9. Tune Capacitor No. 2 Assy, A2A2

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-9 -	10087-3750	14304	TUNE CAP ASSY,A2A2	1		PADLD
- 1	10087-3745	14304	. CIRCUIT CARD ASSY	1		PAOZZ
- 2	HT50V250JA	21052	. CAPACITOR,FXD,CER	5		PADZZ
- 3	HT50T050JA	21052	. CAPACITOR,FXD,CER	1		PADZZ
- 4	10087-3742	14304	. PLATE,MTG	1		XB
- 5	10087-3743	14304	. PLATE,MTG	4		XB
- 6	MS51957-27	96906	. SCREW,MACHINE (AP)	16		PADZZ
- 7	MS35333-71	96906	. WASHER,LOCK (AP)	28		PADZZ

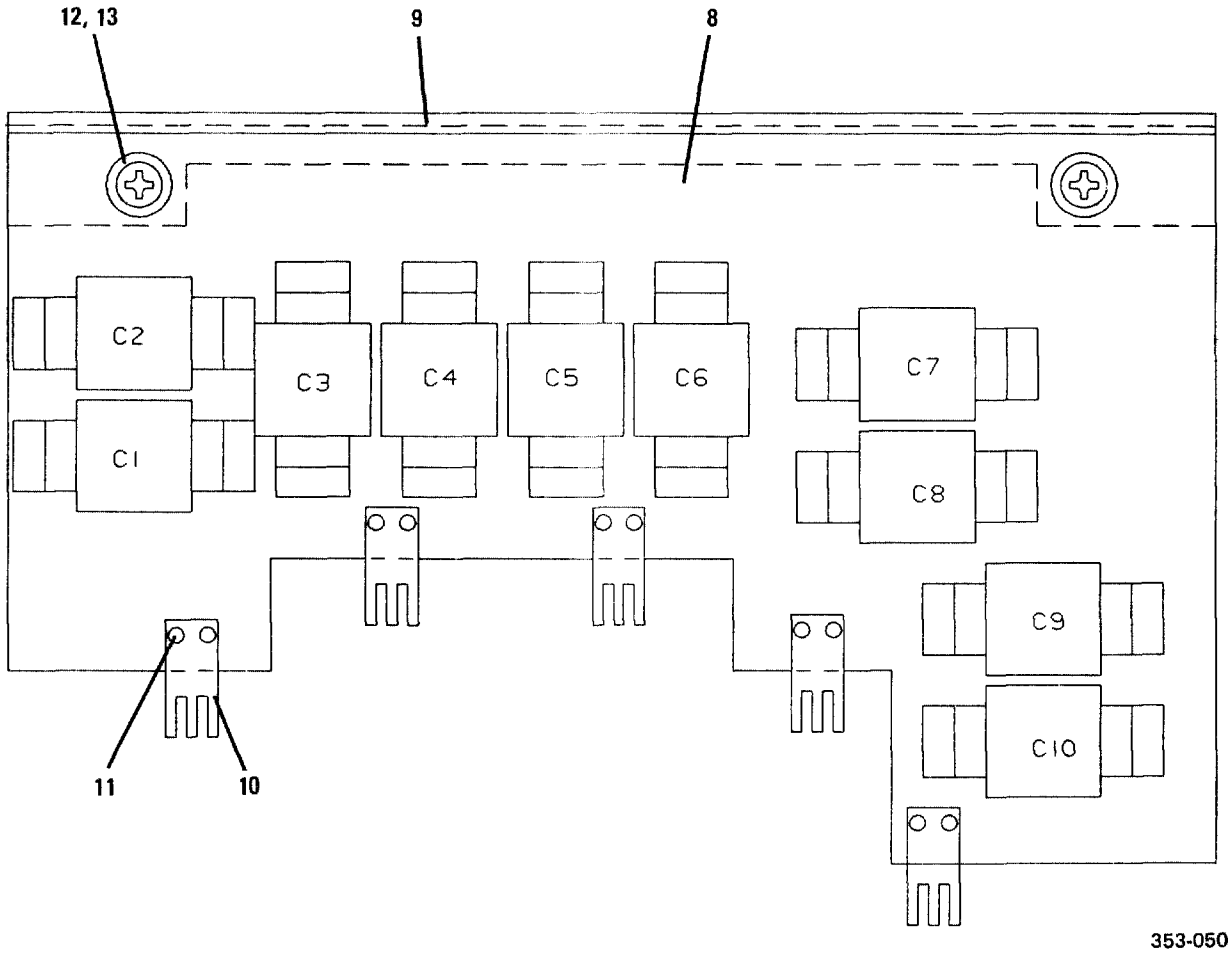

Figure 7-10. Load Capacitor No. 1 Assy, A2A3

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-10-	10087-3760	14304	CIRCUIT CARD ASSY,A2A3	1		XB
- 1	UFP1-110J	73899	. CAPACITOR,FXD,CER	2		PADZZ
- 2	UFP1-350J	73899	. CAPACITOR,FXD,CER	1		PADZZ
- 3	UFP1-340J	73899	. CAPACITOR,FXD,CER	3		PADZZ
- 4	755017A4514-1	14304	. CAPACITOR,FXD,CER	1		PADZZ
- 5	UFP1-100J	73899	. CAPACITOR,FXD,CER	1		PADZZ
- 6	C11-0004-029	14304	. CAPACITOR,FXD,CER	1		PADZZ
- 7	UFP1-290J	73899	. CAPACITOR,FXD,CER	1		PADZZ
- 8	10087-3769	14304	. CIRCUIT CARD	1		XB
- 9	10087-3762	14304	. BRACKET,MTG	1		XB
- 10	10087-3746	14304	. CONTACT,ELEC	10		XB
- 11	A1690	57771	. EYELET	10		XB
- 12	MS51957-14	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 13	MS35333-70	96906	. WASHER,LOCK (AP)	2		PAOZZ

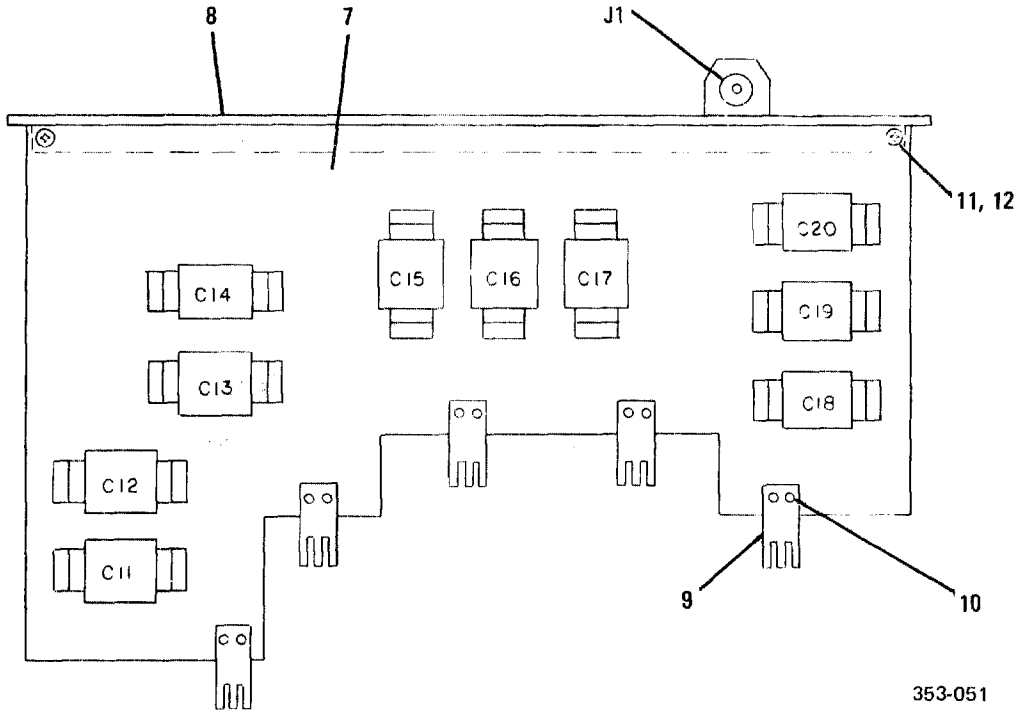

Figure 7-11. Load Capacitor No. 2 Assy, A2A4

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-11-	10087-3770	14304	CIRCUIT CARD ASSY,A2A4	1		XB
- 1	UFP1-320J	73899	. CAPACITOR,FXD,CER	4		PADZZ
- 2	UFP1-680J	73899	. CAPACITOR FXD,CER	2		PADZZ
- 3	UFP1-470J	73899	. CAPACITOR FXD CER	1		PADZZ
- 4	C11-0004-037	14304	. CAPACITOR,FXD,CER	2		PADZZ
- 5	UFP1-370J	73899	. CAPACITOR,FXD,CER	1		PADZZ
- 6	M39012/21-0003	81349	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 7	10087-3769	14304	. CIRCUIT CARD	1		XA
- 8	10087-3772	14304	. BRACKET,MTG	1		XB
- 9	10087-3746	14304	. CONTACT,ELEC	10		PADZZ
- 10	A1690	57771	. EYELET	10		PADZZ
- 11	MS51957-14	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 12	MS35333-70	96906	. WASHER,LOCK (AP)	2		PADZZ

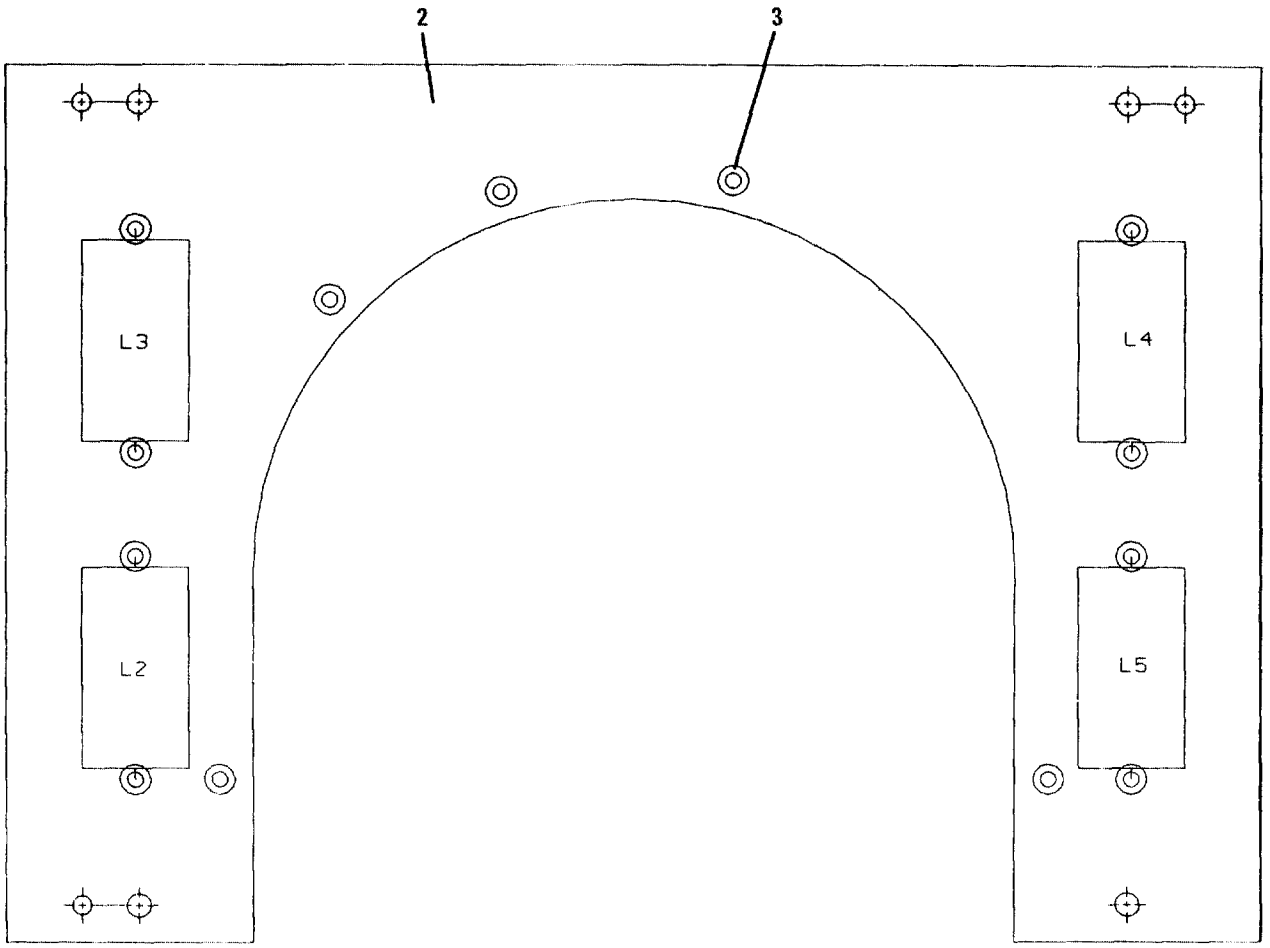

Figure 7-12. Coil PWB Assy, A2A5

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-12-	10087-3780	14304	CIRCUIT CARD ASSY,A2A5	1		XB
- 1	10087-3784	14304	. TRANSFORMER,RF	4		PADZZ
- 2	10087-3789	14304	. CIRCUIT CARD	1		XB
- 3	10087-3783	14304	. EYELET	13		XB

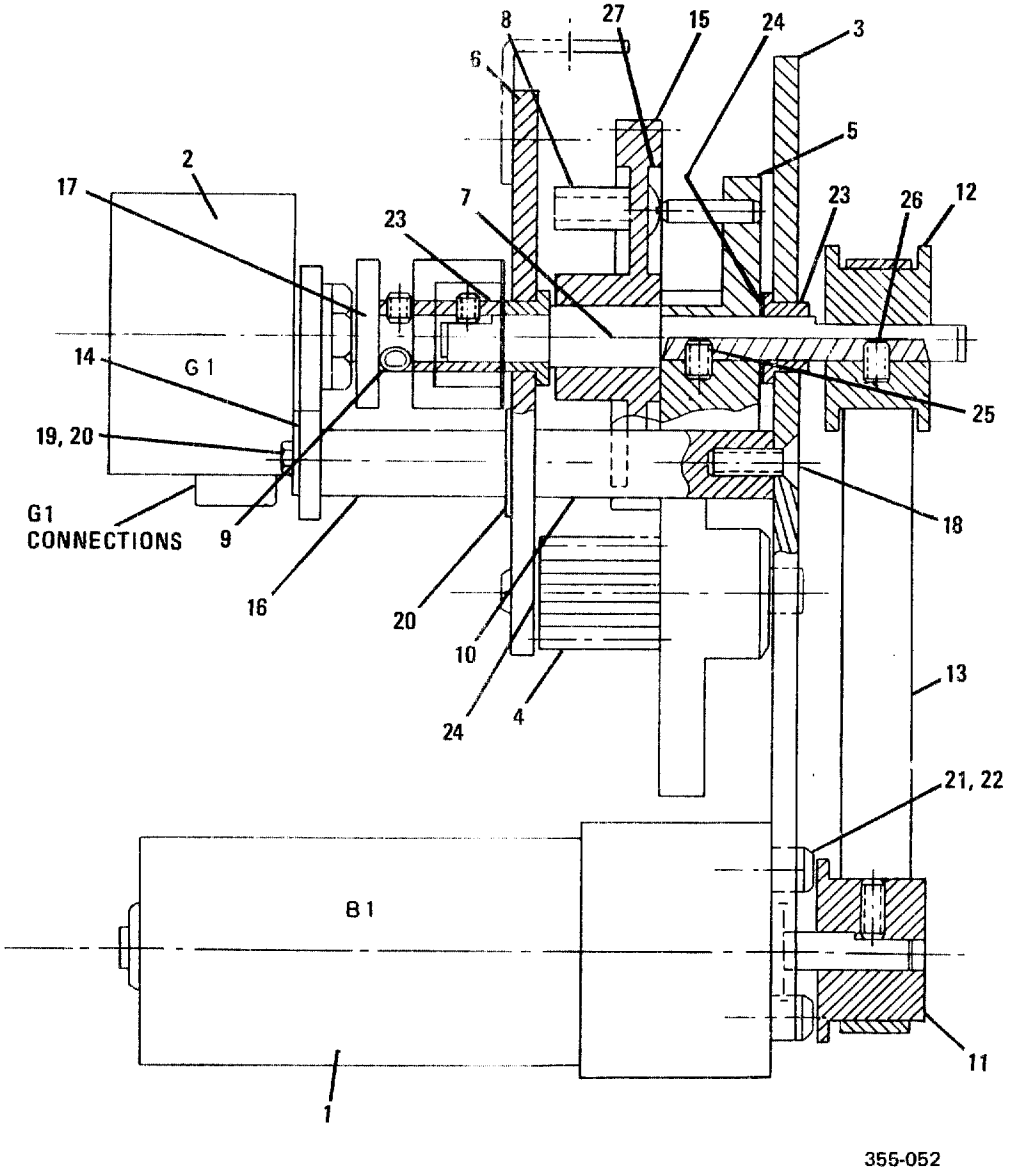

Figure 7-13. Coil Drive Assy, A2A6

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-13-	10086-3720	14304	XFMR DRIVE ASSY,A2A6	1		XA
- 1	10086-3703	14304	. MOTOR,ELEC	1		PADZZ
- 2	10086-3787	14304	. ENCODER	1		XB
- 3	10086-3721	14304	. BRACKET,MTG	1		XB
- 4	10086-3722	14304	. WHEEL,INDEX	1		XB
- 5	10086-3723	14304	. WHEEL,DRIVE	1		XB
- 6	10086-3724	14304	. BRACKET,END	1		XB
- 7	10086-3725	14304	. SHAFT,DRIVE	1		XB
- 8	8154-A-0440-0	06540	. SPACER	1		XB
- 9	FB-46-2	71041	. BEARING	2		XB
- 10	9817-A-0832-16	06540	. SPACER	2		XB
- 11	10086-3709	14304	. PULLEY	1		XB
- 12	6A3-12H3706	14519	. PULLEY	1		XB
- 13	90KL037	61463	. BELT,DRIVE,CONT	1		PADZZ
- 14	10086-3727	14304	. BRACKET,MTG	1		XB
- 15	10086-3719	14304	. GEAR	1		XB
- 16	8519-A-0832-16	06540	. SPACER	2		XB
- 17	Z06-0008-001	14304	. COUPLING	1		XB
- 18	MS51959-44	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 19	MS51957-44	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 20	MS35333-72	96906	. WASHER,LOCK (AP)	4		PAOZZ
- 21	MS51957-14	96906	. SCREW,MACHINE (AP)	3		PADZZ
- 22	MS35333-70	96906	. WASHER,LOCK (AP)	3		PADZZ
- 23	MS51021-22	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 24	5804-128-1	86928	. WASHER,SPRING	2		XB
- 25	MS51021-23	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 26	MS51021-32	96906	. SCREW,MACHINE (AP)	1		PAOZZ
- 27	MS51957-15	96906	. SCREW,MACHINE (AP)	1		PAOZZ

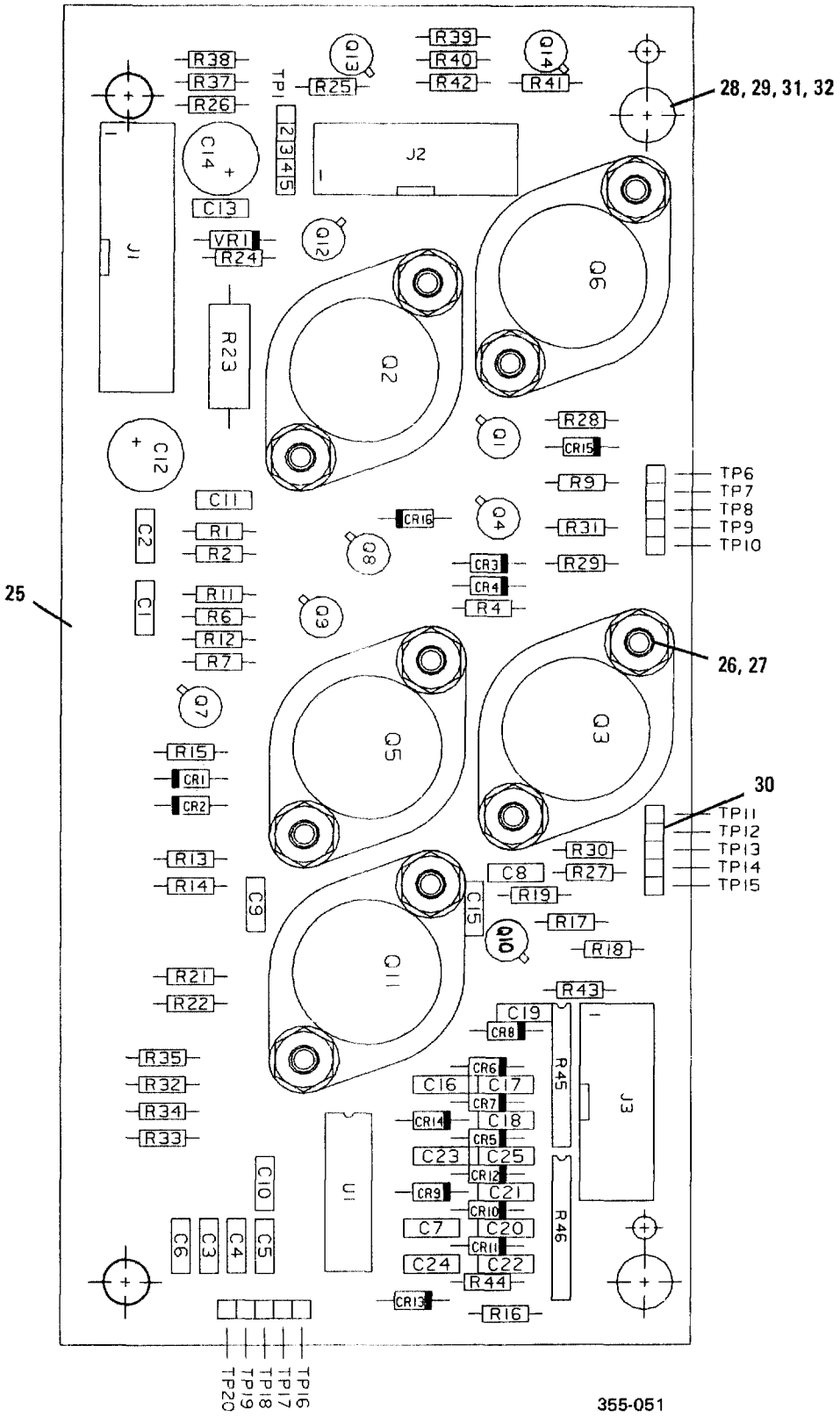

Figure 7-14. Servo/Bandswitch Drive PWB Assy, A2A7

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-14-	10086-3730	14304	CIRCUIT CARD ASSY,A2A7	1		XB
- 1	M39014/02-1332	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 2	CK06BX472K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 3	CK06BX103K	81349	. CAPACITOR,FXD,CER	21		PADZZ
- 4	801591-31	96214	. CAP,FXD,ELCTLT	1		PADZZ
- 5	672D686H025CD5C	56289	. CAP,FXD,ELCTLT	1		PADZZ
- 6	JAN1N4454	81349	. SEMICOND DEVICE,DIO	16		PADZZ
- 7	609-2627	59730	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 8	609-1627	15912	. CONNECTOR,RCPT,ELEC	2		PADZZ
- 9	JAN2N2907A	81349	. TRANSISTOR	4		PADZZ
- 10	JAN2N6648	81349	. TRANSISTOR	3		PADZZ
- 11	JAN2N6383	81349	. TRANSISTOR	2		PADZZ
- 12	JAN2N2222A	81349	. TRANSISTOR	4		PADZZ
- 13	JAN2N2219A	81349	. TRANSISTOR	1		PADZZ
- 14	CF07-103J	78488	. RESISTOR,FXD,COMP	10		PADZZ
- 15	CF07-472J	78488	. RESISTOR,FXD,COMP	12		PADZZ
- 16	CF07-102J	78488	. RESISTOR,FXD,COMP	7		PADZZ
- 17	CF07-270J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 18	CF07-183J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 19	RCR32G470JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 20	CF07-681J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 21	CF07-222J	78488	. RESISTOR,FXD,COMP	5		PADZZ
- 22	750-83-R4.7K	11236	. RESISTOR	2		PADZZ
- 23	MC14028BBEBS	04713	. MICROCIRCUIT	1		PADZZ
- 24	JAN1N752A	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 25	10086-3739	14304	. CIRCUIT CARD	1		XB
- 26	MS51957-28	96906	. SCREW,MACHINE (AP)	10		PAOZZ
- 27	H-6768	14304	. NUT,CLINCH (AP)	10		XB
- 28	6611-0135	14304	. RETAINER,SCREW	2		PADZZ
- 29	10085-5156	14304	. BUSHING	2		PADZZ
- 30	65499-105	22526	. JACK,TIP	4		PADZZ
- 31	MS51957-17	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 32	MS35338-135	96906	. WASHER,LOCK (AP)	2		PADZZ

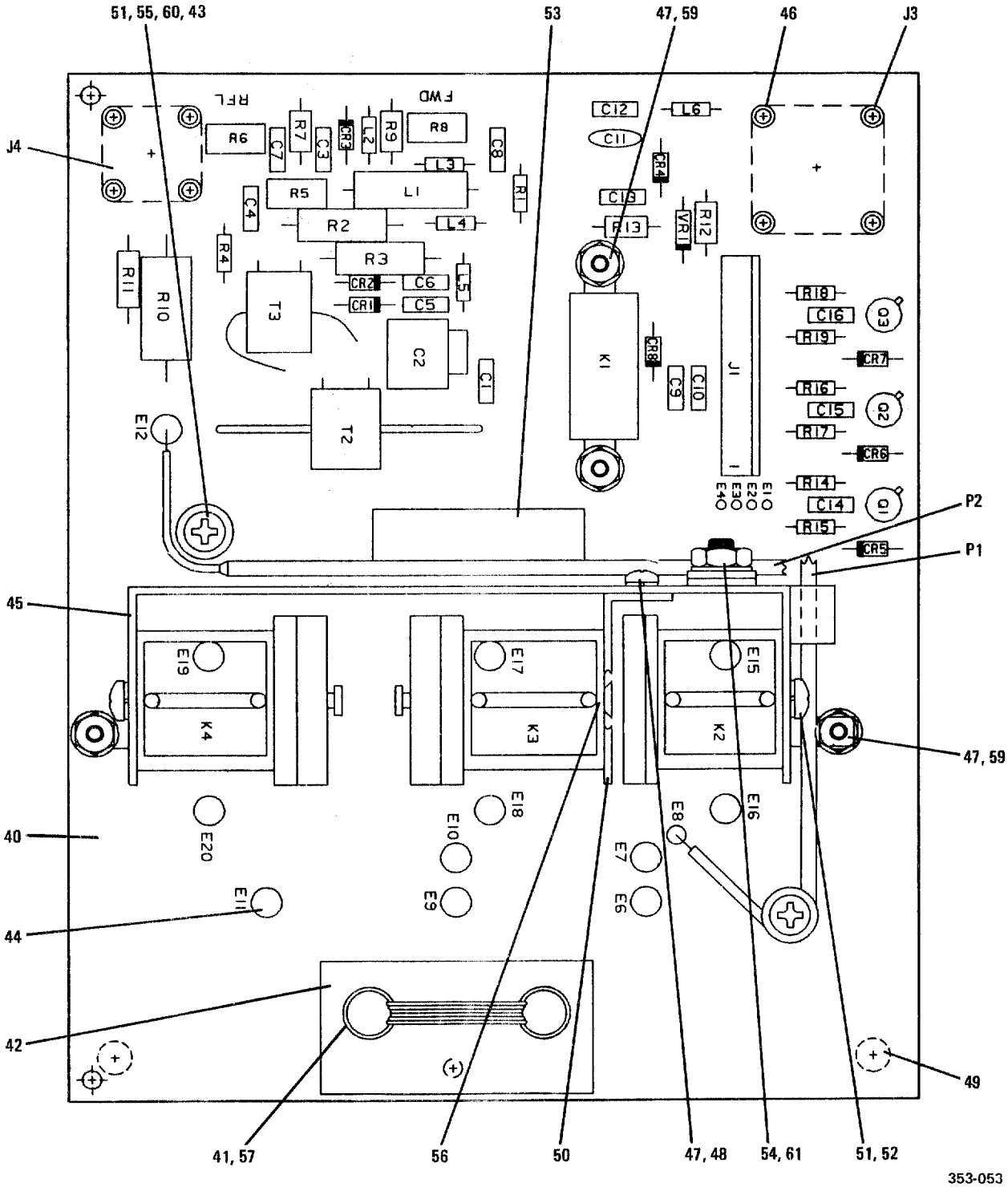

Figure 7-15. VSWR/XFMR PWB Assy, A3

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-15-	10087-4600	14304	CIRCUIT CARD ASSY,A3	1		PAODD
- 1	C-11-NP0-5	56289	. CAPACITOR,FXD,CER	1		PADZZ
- 2	MCM01-007EC621G0	61306	. CAPACITOR,FXD,MICA	1		PADZZ
- 3	CK06BX103K	81349	. CAPACITOR,FXD,CER	6		PADZZ
- 4	M39014/02-1337	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 5	M39014/01-1351	81349	. CAPACITOR,FXD,CER	2		PADZZ
- 6	CK05BX471K	81349	. CAPACITOR,FXD,CER	2		PADZZ
- 7	CMR05C100D0DR	81349	. CAPACITOR,FXD,MICA	1		PADZZ
- 8	CMR05E750G0DR	81349	. CAPACITOR,FXD,MICA	1		PADZZ
- 9	CK06BX104K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 10	JAN1N5711	81349	. SEMICOND DEVICE,DIO	4		PADZZ
- 11	JAN1N3611	81349	. SEMICOND DEVICE,DIO	4		PADZZ
- 12	22-11-2142	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 13	M39012/04-0002	81349	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 14	KC-79-123	91836	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 15	2T-4603-1	02289	. RELAY	1		PADZZ
- 16	W88KDX-2	94696	. RELAY	2		PADZZ
- 17	W88UKDX-2	94696	. RELAY	1		PADZZ
- 18	MS90541-05	96906	. COIL,RF	1		PADZZ
- 19	MS75085-7	96906	. COIL,RF	2		PADZZ
- 20	MS75083-1	96906	. COIL,RF	2		PADZZ
- 21	MS75085-17	96906	. COIL,RF	1		PADZZ
- 22	M39012/16-007	80131	. CONNECTOR,RCPT,ELEC	2		PADZZ
- 23	JAN2N2907A	81349	. TRANSISTOR	3		PADZZ
- 24	CF07-103J	78488	. RESISTOR,FXD,COMP	4		PADZZ
- 25	RLR32C56R2FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 26	RLR32C56R0FM	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 27	CF07-221J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 28	3386B-1-202	32997	. RESISTOR,VARIABLE	1		PADZZ
- 29	3386B-1-203	32997	. RESISTOR,VARIABLE	2		PADZZ
- 30	RNC55K1152FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 31	RN55D1152F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 32	RCR42G104JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 33	ERD50TJ510	54473	. RESISTOR,FXD,COMP	1		PADZZ
- 34	RNC55K6811FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 35	RNC55K3011FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 36	CF07-102J	78488	. RESISTOR,FXD,COMP	3		PADZZ
- 37	10087-4614	14304	. TRANSFORMER,RF	6		PADZZ
- 38	10086-4520	14304	. TRANSFORMER,RF	2		PADZZ
- 39	JAN1N750A	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 40	10087-4609	14304	. CIRCUIT CARD	1		XB
- 41	10087-4611	14304	. TUBING,BRASS	2		XB
- 42	10087-4619	14304	. PLATE	1		XB
- 43	226619-3	00779	. TERMINAL	2		PADZZ
- 44	10087-4613	14304	. EYELET	12		XB

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
- 45	10087-4624	14304	. BRACKET,MTG	1		XB
- 46	18099C-B044014A	06540	. SPACER	8		XB
- 47	MS51957-14	96906	. SCREW,MACHINE (AP)	10		PADZZ
- 48	MS35338-135	96906	. WASHER,LOCK (AP)	6		PADZZ
- 49	18100C-B-0440	06540	. SPACER	2		XB
- 50	10087-4626	14304	. BRACKET,MTG	1		XB
- 51	MS51957-27	96906	. SCREW,MACHINE (AP)	4		PADZZ
- 52	MS35338-136	96906	. WASHER,LOCK (AP)	2		PADZZ
- 53	10087-4608	14304	. CONTACT,ELEC	1		XB
- 54	MS25281R-3	96906	. CLAMP,LOOP	2		PADZZ
- 55	MS35333-71	96906	. WASHER,LOCK (AP)	2		PADZZ
- 56	MS24693-C26	96906	. SCREW,MACHINE (AP)	1		PADZZ
- 57	MS35489-1	96906	. GROMMET	2		PADZZ
- 58	MS3367-4-9	96906	. STRAP,TIE DOWN	3		PADZZ
- 59	841-00	92967	. NUT,CLINCH (AP)	4		PADZZ
- 60	H-6768	14304	. NUT,CLINCH (AP)	2		XB
- 61	H-6767	14304	. NUT,CLINCH (AP)	2		XB

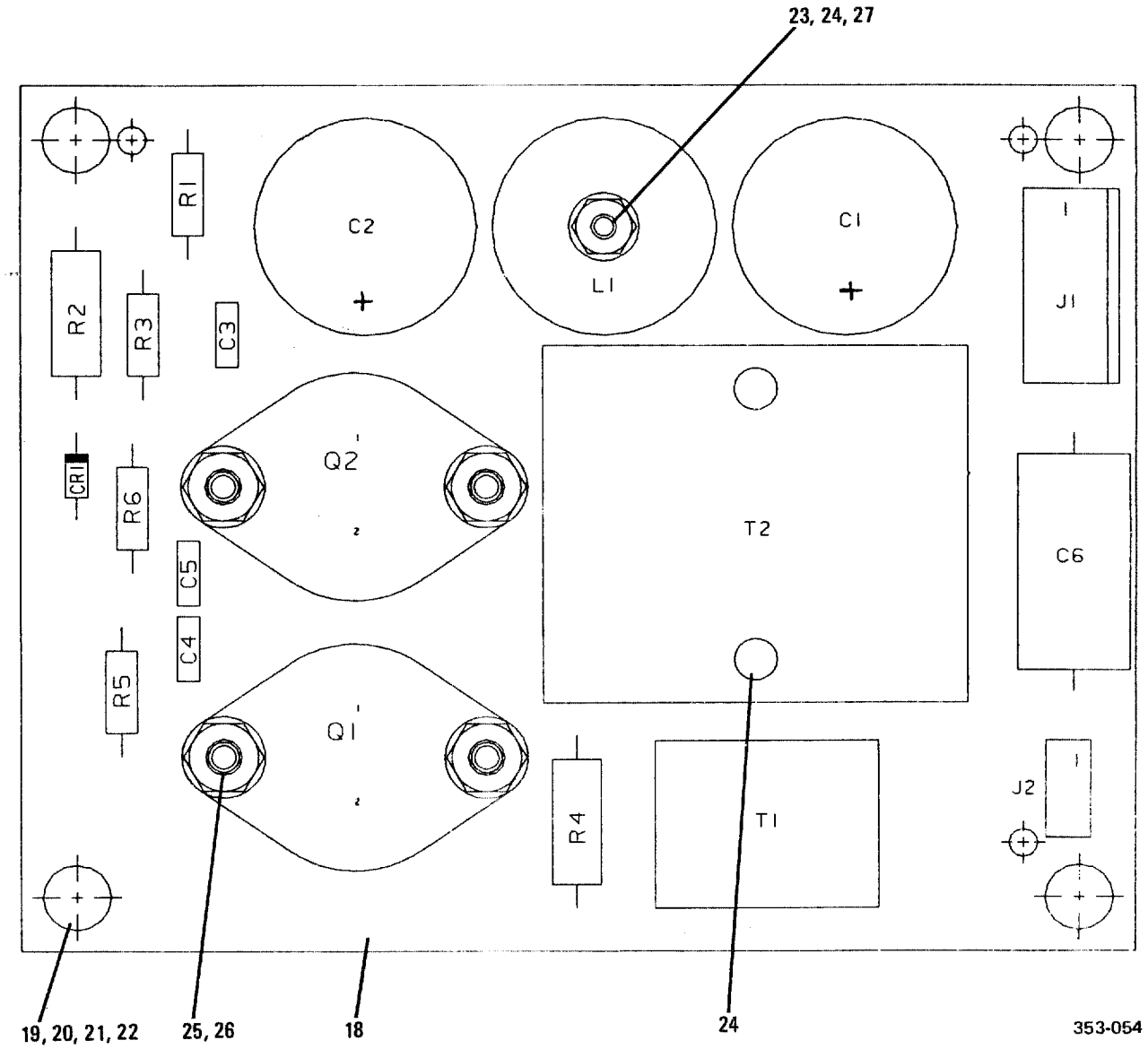

Figure 7-16. Fan Inverter PWB Assy, A4

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-16-	10087-1500	14304	CIRCUIT CARD ASSY,A4	1		PAOLD
- 1	674D128H025JE5A	56289	. CAP,FXD,ELCTLT	2		PADZZ
- 2	CK06BX104K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 3	M39014/02-1360	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 4	CK06BX474K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 5	439P4749220	56289	. CAPACITOR,FXD,FILM	1		PADZZ
- 6	JAN1N3611	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 7	09-65-1061	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 8	3-102202-4	00779	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 9	L13-0001-101	14304	. COIL,RF	1		PADZZ
- 10	2N5881	80131	. TRANSISTOR	2		PADZZ
- 11	ERD50TJ182	54473	. RESISTOR,FXD,COMP	1		PADZZ
- 12	RCR32G2R7JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 13	ERD50TJ101	54473	. RESISTOR,FXD,COMP	1		PADZZ
- 14	RCR32G100JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 15	ERD50TJ3R9	54473	. RESISTOR,FXD,COMP	2		PADZZ
- 16	10086-1516	14304	. TRANSFORMER,RF	1		PADZZ
- 17	10086-1519	14304	. TRANSFORMER,RF	1		PADZZ
- 18	10087-1509	14304	. CIRCUIT CARD	1		XB
- 19	6611-0135	14304	. RETAINER,SCREW	4		PADZZ
- 20	10085-5156	14304	. BUSHING	4		PADZZ
- 21	MS51957-17	96906	. SCREW,MACHINE (AP)	4		PADZZ
- 22	MS35338-135	96906	. WASHER,LOCK (AP)	4		PADZZ
- 23	MS51957-122	96906	. SCREW,MACHINE (AP)	1		PAOZZ
- 24	841-00	92967	. NUT,CLINCH (AP)	3		PADZZ
- 25	MS51957-28	96906	. SCREW,MACHINE (AP)	4		PADZZ
- 26	H-6768	14304	. NUT,CLINCH (AP)	4		XB
- 27	MS15795-804	96906	. WASHER,FLAT (AP)	1		PAOZZ

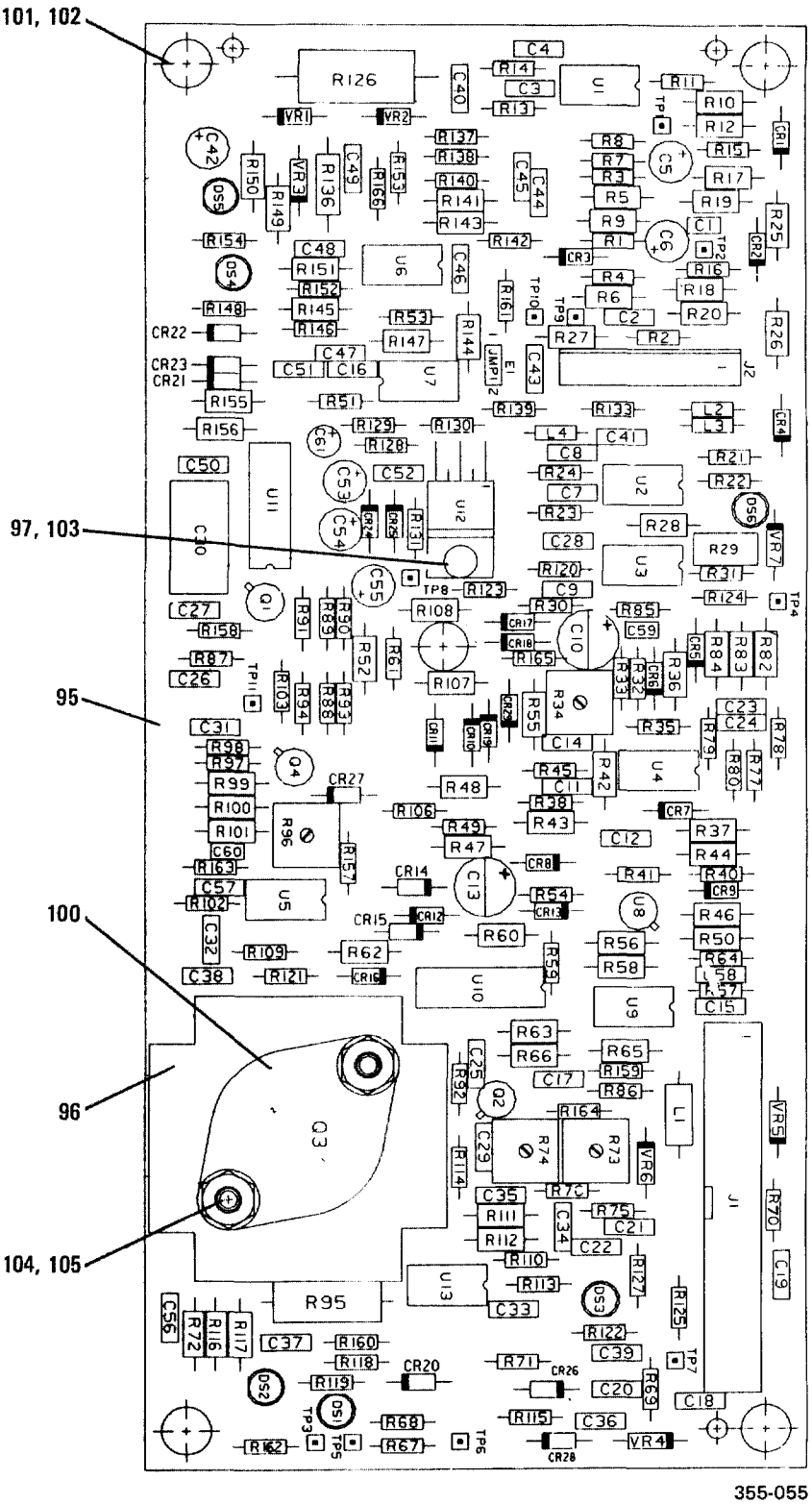

Figure 7-17. Power Control PWB Assy, A5

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-17-	10086-7100	14304	CIRCUIT CARD ASSY,A5	1		PAODD
- 1	CK05BX471K	81349	. CAPACITOR,FXD,CER	2		PADZZ
- 2	CK06BX103K	81349	. CAPACITOR,FXD,CER	40		PADZZ
- 3	T392C105K050AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 4	T392C105M050AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 5	T392F157M016AS	31433	. CAP,FXD,ELCTLT	2		PADZZ
- 6	CK06BX104K	81349	. CAPACITOR,FXD,CER	7		PADZZ
- 7	C280MAH/A1M	25403	. CAPACITOR,FXD,FILM	1		PADZZ
- 8	T392C106M025AS	31433	. CAP,FXD,ELCTLT	4		PADZZ
- 9	M39014/01-1321	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 10	M39014/01-1357	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 11	T392B685K016AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 12	JAN1N5711	81349	. SEMICOND DEVICE,DIO	3		PADZZ
- 13	JAN1N4454	81349	. SEMICOND DEVICE DIO	22		PADZZ
- 14	JAN1N3611	81349	. SEMICOND DEVICE,DIO	4		PADZZ
- 15	5082-4955	01295	. LED	1		PADZZ
- 16	5082-4555	01295	. LED	2		PADZZ
- 17	5082-4655	01295	. LED	3		PADZZ
- 18	65499-102	22526	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 19	609-4027	59730	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 20	22-11-2102	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 21	3720046010	13499	. CONN PLUG ELECTRICA	1		PADZZ
- 22	MS14046-8	96906	. COIL,RF	1		PADZZ
- 23	MS75085-19	96906	. COIL,RF	2		PADZZ
- 24	MS75084-3	81349	. COIL,RF	1		PADZZ
- 25	JAN2N2222A	81349	. TRANSISTOR	2		PADZZ
- 26	JAN2N2907A	81349	. TRANSISTOR	1		PADZZ
- 27	JAN2N6383	81349	. TRANSISTOR	1		PADZZ
- 28	CF07-100J	78488	. RESISTOR,FXD,COMP	37		PADZZ
- 29	CF07-222J	78488	. RESISTOR,FXD,COMP	9		PADZZ
- 30	RNC55K9762FS	81349	. RESISTOR,FXD,FILM	2		PADZZ
- 31	RN55D9762F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 32	CF07-103J	78488	. RESISTOR,FXD,COMP	20		PADZZ
- 33	RNC55K2613FS	81349	. RESISTOR,FXD,FILM	3		PADZZ
- 34	RNC55K4752FS	81349	. RESISTOR,FXD,FILM	4		PADZZ
- 35	CF07-273J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 36	RNC55K1823FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 37	RNC55K3923FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 38	RN55D2613F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 39	RNC55K9092FS	81349	. RESISTOR,FXD,FILM	2		PADZZ
- 40	CF07-104J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 41	CF07-683J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 42	RN55D4752F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 43	RNC55K4751FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 44	RNC55K7502FS	81349	. RESISTOR,FXD,FILM	1		PADZZ

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
- 45	3386B-1-203	32997	. RESISTOR,VARIABLE	1		PADZZ
- 46	CF07-123J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 47	CF07-223J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 48	3386F-1-104	32997	. RESISTOR,VARIABLE	1		PADZZ
- 49	CF07-101J	78488	. RESISTOR,FXD,COMP	3		PADZZ
- 50	RN55D1002F	81349	. RESISTOR,FXD,FILM	15		PADZZ
- 51	CF07-472J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 52	CF07-105J	78488	. RESISTOR,FXD,COMP	3		PADZZ
- 53	RN55D3923F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 54	RNC55K7151FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 55	CF07-102J	78488	. RESISTOR,FXD,COMP	7		PADZZ
- 56	RNC55K3322FS	81349	. RESISTOR,FXD,FILM	4		PADZZ
- 57	CF07-153J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 58	RN55D3322F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 59	RNC55K2211FS	81349	. RESISTOR,FXD,FILM	3		PADZZ
- 60	RN55D2211F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 61	RNC55K4322FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 62	3386F-1-102	80294	. RESISTOR,VARIABLE	2		PADZZ
- 63	CF07-471J	78488	. RESISTOR,FXD,COMP	3		PADZZ
- 64	RNC55K6812FS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 65	RN55D2554F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 66	RN55D9092F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 67	CF07-122J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 68	CF07-562J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 69	RWR89S1R00FS	81349	. RESISTOR,FXD,WW	1		PADZZ
- 70	3386F-1-203	32997	. RESISTOR,VARIABLE	1		PADZZ
- 71	RNC55K4321FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 72	RNC55K1501FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 73	RNC55K1303FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 74	RNC55K5621FS	81349	. RESISTOR,FXD,FILM	2		PADZZ
- 75	RN55D1502F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 76	RCR42G330JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 77	CF07-822J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 78	CF07-333J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 79	ERD50TJ151	54473	. RESISTOR,FXD,COMP	1		PADZZ
- 80	CF07-682J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 81	RNC55K2493FS	81349	. RESISTOR,FXD,FILM	2		PADZZ
- 82	RNC55K3481FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 83	RN55D5621F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 84	RN55D2491F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 85	65499-101	22526	. CONNECTOR,RCPT,ELEC	11		PADZZ
- 86	MC1558U	04713	. MICROCIRCUIT	9		PADZZ
- 87	2N5566	80131	. TRANSISTOR	1		PADZZ
- 88	SM-A-938092	80063	. MICROCIRCUIT	1		PADZZ
- 89	CD40106BF/3	02735	. MICROCIRCUIT	1		PADZZ
- 90	TDA2002H	04713	. MICROCIRCUIT	1		PADZZ
- 91	JAN1N3825A	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 92	1N4733A	80131	. SEMICOND DEVICE,DIO	1		PADZZ
- 93	0.5M6.8AZ1	04713	. SEMICOND DEVICE,DIO	1		PADZZ
- 94	JAN1N751A	81349	. SEMICOND DEVICE,DIO	3		PADZZ
- 95	10086-7109	14304	. CIRCUIT CARD	1		XA

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
- 96	6051B	13103	. HEATSINK	1		XB
- 97	MS51957-14	96906	. SCREW,MACHINE	1		PADZZ
- 98	MS51957-17	96906	. SCREW MACHINE	5		PADZZ
- 99	MS35338-135	96906	. WASHER,LOCK	5		PADZZ
-100	56-03-2	13103	. INSULATOR PLATE	1		XB
-101	6611-0135	14304	. RETAINER SCREW	5		PADZZ
-102	10085-5156	14304	. BUSHING	5		PADZZ
-103	841-00	92967	. NUT,CLINCH	1		PADZZ
-104	H-6768	14304	. NUT PLAIN HEX	2		XB
-105	MS51957-29	96906	. SCREW,MACHINE	2		PADZZ

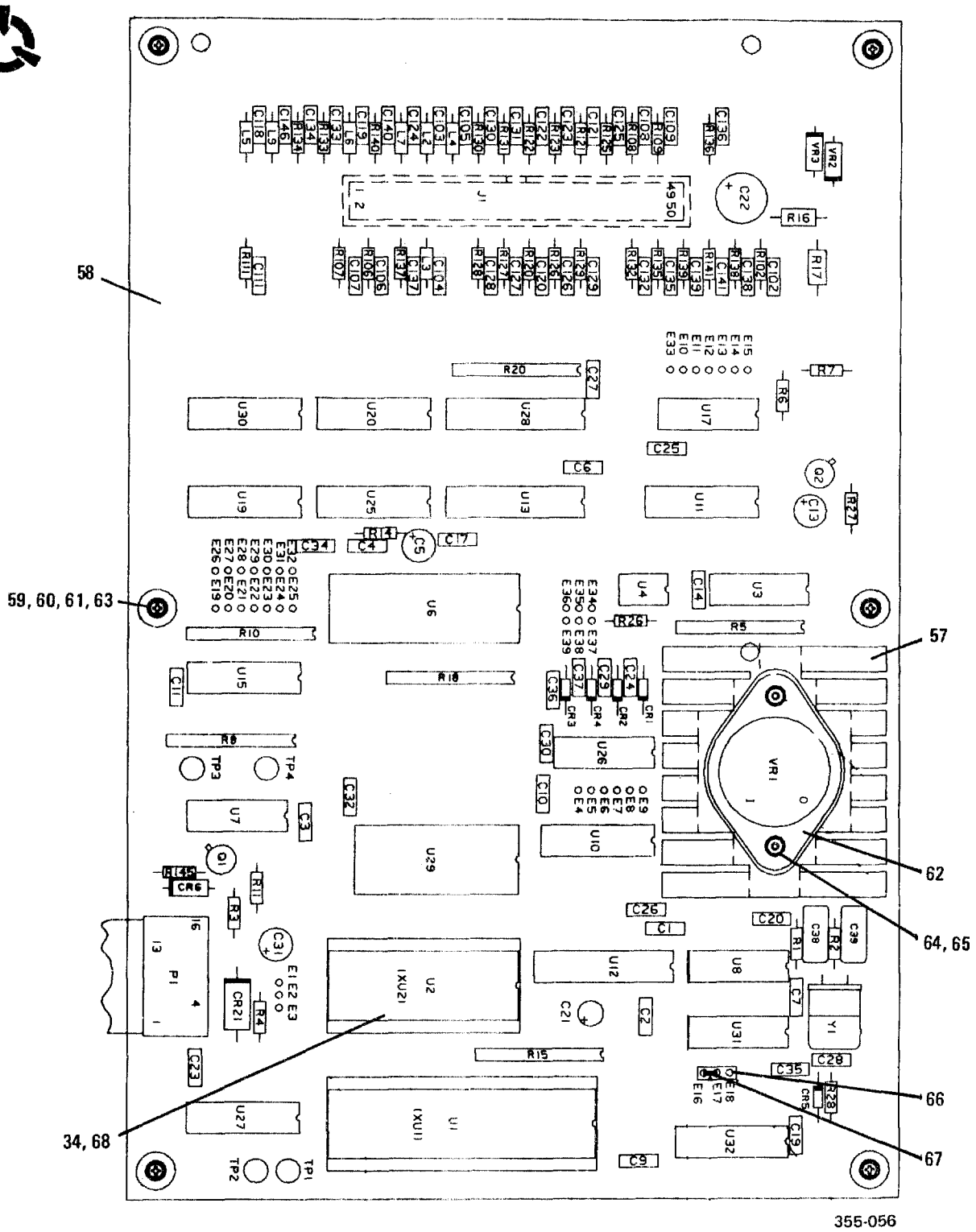

Figure 7-18. Micro Control PWB Assy, A6

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-18-	10086-9200	14304	CIRCUIT CARD ASSY,A6	1		PAODD
- 1	CK06BX103K	81349	. CAPACITOR,FXD,CER	54		PADZZ
- 2	199D476X0025EA2	56289	. CAP,FXD,ELCTLT	2		PADZZ
- 3	CK06BX104K	81349	. CAPACITOR,FXD,CER	6		PADZZ
- 4	T392B106M010AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 5	672D476H040CD5C	56289	. CAP,FXD,ELCTLT	1		PADZZ
- 6	T392F157K010AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 7	CMR05E330G0DR	81349	. CAPACITOR,FXD,MICA	1		PADZZ
- 8	CM05ED330J03	81349	. CAPACITOR,FXD,MICA	1		PADZZ
- 9	JAN1N4454	81349	. SEMICOND DEVICE DIO	5		PADZZ
- 10	JAN1N755A	81349	. SEMICOND DEVICE,DIO	1		PADZZ
- 11	1N5817	80131	. SEMICOND DEVICE,DIO	1		PADZZ
- 12	500-5027-E	15912	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 13	MS75085-2	96906	. COIL,RF	7		PADZZ
- 14	10086-9210	14304	. CABLE ASSY,RF	1		XB
- 15	JAN2N2222A	81349	. TRANSISTOR	2		PADZZ
- 16	CF07-471J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 17	CF07-472J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 18	CF07-363J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 19	4310R-101-103	32997	. RESISTOR NETWORK	6		PADZZ
- 20	CF07-105J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 21	4310-101-103	32997	. RESISTOR NETWORK	1		PADZZ
- 22	CF07-104J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 23	CF07-223J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 24	RN55D1502F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 25	RN55D4751F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 26	CF07-103J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 27	CF07-102J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 28	CF07-101J	78488	. RESISTOR,FXD,COMP	37		PADZZ
- 29	105-0858-001	74970	. JACK,TIP	1		PADZZ
- 30	105-0852-001	74970	. JACK,TIP	1		PADZZ
- 31	1168004P6	94117	. JACK,TIP	1		PADZZ
- 32	105-0857-001	74970	. JACK,TIP	1		PADZZ
- 33	TD8031AH	34649	. MICROCIRCUIT	1		PADZZ
- 34	10086-9530	14304	. EPROM,PROGRAMMED	1		PADZZ
- 35	CD4011BD/3	02735	. MICROCIRCUIT	1		PADZZ
- 36	H11L1	03508	. MICROCIRCUIT	1		PADZZ
- 37	ADC0808CCJ	27014	. MICROCIRCUIT	1		PADZZ
- 38	M38510/31004BCB	81349	. MICROCIRCUIT	1		PADZZ
- 39	M38510/30003BCB	81349	. MICROCIRCUIT	1		PADZZ
- 40	SN54LS367AJ	01295	. MICROCIRCUIT	1		PADZZ
- 41	ULQ-2003R	56289	. MICROCIRCUIT	3		PADZZ
- 42	M38510/32502BRB	81349	. MICROCIRCUITS	3		PADZZ
- 43	SN54LS373J	01295	. MICROCIRCUITS	1		PADZZ
- 44	CD4021BF	02735	. MICROCIRCUIT	1		PADZZ

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
- 45	MM54C14J	04713	. MICROCIRCUITS	1		PADZZ
- 46	CD4094BF	02735	. MICROCIRCUIT	2		PADZZ
- 47	CD4002BF	02735	. MICROCIRCUIT	1		PADZZ
- 48	M38510/30702BEB	81349	. MICROCIRCUIT	1		PADZZ
- 49	TC5516ADL	61802	. MICROCIRCUIT	1		PADZZ
- 50	M38510/32702BCB	81349	. MICROCIRCUIT	1		PADZZ
- 51	CD4020BF	02735	. MICROCIRCUIT	1		PADZZ
- 52	UA7805KMQB	07263	. MICROCIRCUIT	1		PADZZ
- 53	JAN1N751A	81349	. SEMICOND DEVICE,DIO	2		PADZZ
- 54	540-AG11D	91506	. SOCKET PLUGIN ELECT	1		PADZZ
- 55	528-AG11D	91506	. SOCKET PLUGIN ELECT	1		PADZZ
- 56	MP042	71450	. CRYSTAL	1		PADZZ
- 57	330-TO-3	53894	. HEATSINK	1		XB
- 58	10086-9209	14304	. CIRCUIT CARD	1		XA
- 59	6611-0135	14304	. RETAINER SCREW	6		PADZZ
- 60	10085-5156	14304	. BUSHING	6		PADZZ
- 61	MS51957-17	96906	. SCREW MACHINE	6		PADZZ
- 62	56-03-2	13103	. MICA,TO-3	1		PADZZ
- 63	MS35338-135	96906	. WASHER,LOCK	6		PADZZ
- 64	MS51957-28	96906	. SCREW,MACHINE	2		PADZZ
- 65	H-6768	14304	. NUT PLAIN HEX	2		XB
- 66	65499-103	22526	. JACK,TIP	1		PADZZ
- 67	65474-001	22526	. CONTACT,ELEC	1		PADZZ
- 68	TD271-28-4	34649	. EPROM,UNPROGRAMMED	1		PADZZ

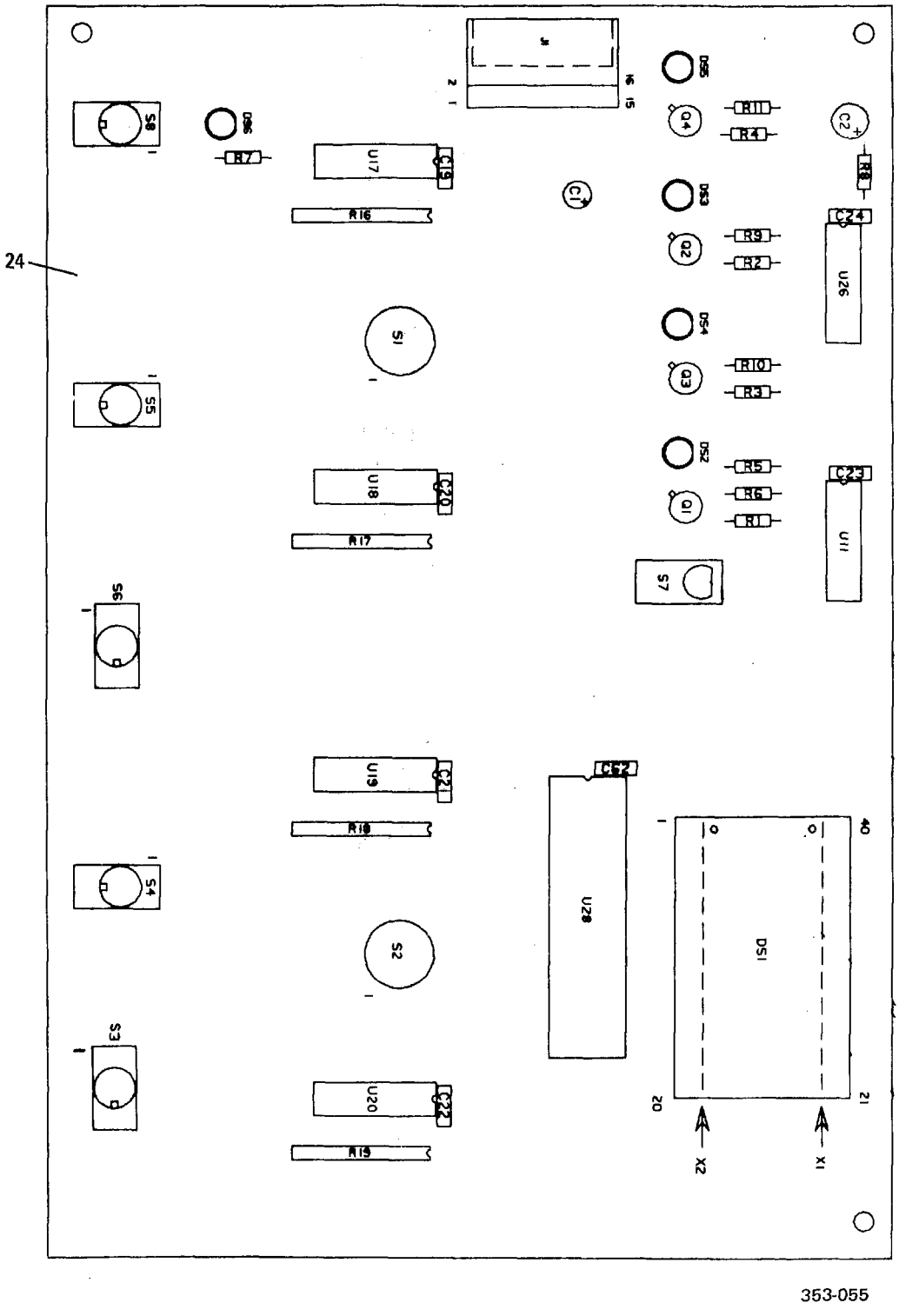

Figure 7-19. Front Panel PWB Assy, A7A1

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-19-	10087-2100	14304	CIRCUIT CARD ASSY,A7A1	1		PAODD
- 1	T392B106M010AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 2	T392C226M010AS	31433	. CAP,FXD,ELCTLT	1		PADZZ
- 3	CK06BX103K	81349	. CAPACITOR,FXD,CER	7		PADZZ
- 4	44R3F03KGBJ	51984	. SEMICOND DEVICE	1		PADZZ
- 5	561-2101-080	72619	. SEMICOND DEVICE,DIO	1		PADZZ
- 6	561-2301-080	72619	. SEMICOND DEVICE,DIO	3		PADZZ
- 7	561-2201-080	72619	. SEMICOND DEVICE,DIO	1		PADZZ
- 8	609-1607	15912	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 9	JAN2N2222A	81349	. TRANSISTOR	4		PADZZ
- 10	CF07-271J	78488	. RESISTOR,FXD,COMP	5		PADZZ
- 11	CF07-103J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 12	CF07-472J	78488	. RESISTOR,FXD,COMP	4		PADZZ
- 13	CF07-223J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 14	4310R-101-103	32997	. RESISTOR NETWORK	4		PADZZ
- 15	55DP30011AJNC	81073	. SWITCH ROTARY	2		PADZZ
- 16	7101TV30QE	09353	. SWITCH TOGGLE	3		PADZZ
- 17	7105TV30QE	09353	. SWITCH,TOGGLE	1		PADZZ
- 18	8168SHV30QE	09353	. SWITCH PUSH	1		PADZZ
- 19	SN54LS367AJ	01295	. MICROCIRCUIT	1		PADZZ
- 20	CD4021BF	77609	. MICROCIRCUIT	4		PADZZ
- 21	CD4094BF	77609	. MICROCIRCUIT	1		PADZZ
- 22	HLCD0438AY	61587	. MICROCIRCUIT	1		PADZZ
- 23	ESS-120-T/04	55322	. SOCKET,LCD	2		PADZZ
- 24	10086-2109	14304	. CIRCUIT CARD	1		XA
- 25	7103TV30QE	09353	. SWITCH TOGGLE	1		PAOZZ

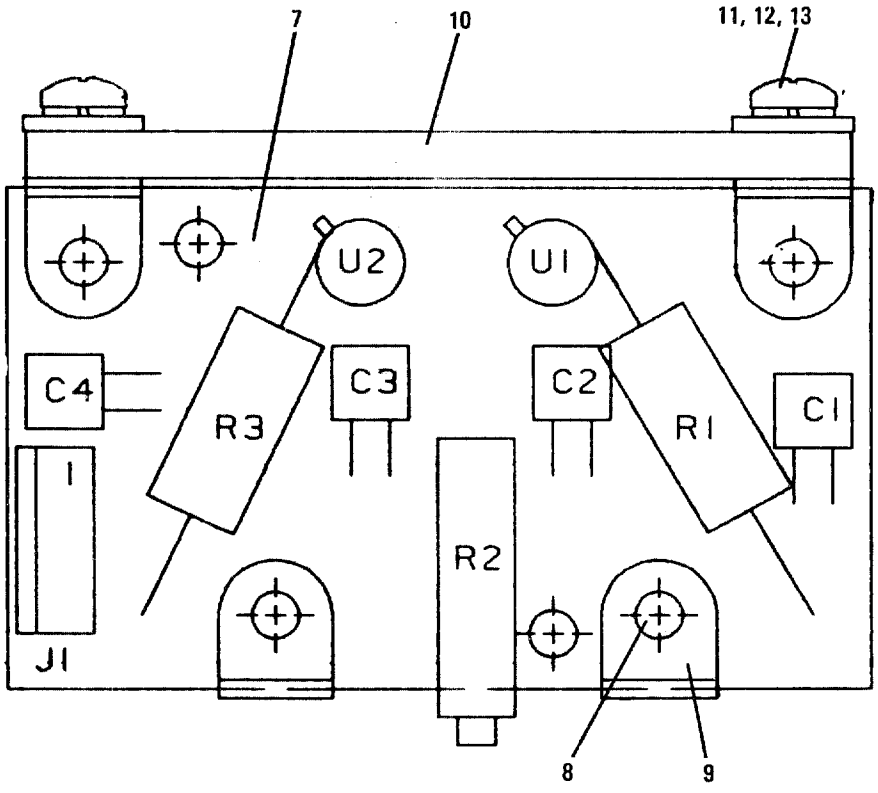

Figure 7-20. Temp Sensor PWB Assy, A8

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-20-	10086-7200	14304	CIRCUIT CARD ASSY,A8	1		PAOLD
- 1	8121-050-651-103	72982	. CAPACITOR,FXD,CER	4		PADZZ
- 2	22-11-2052	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 3	FP69-180R0J	14674	. RESISTOR,FXD,FILM	2		PADZZ
- 4	013334	31922	. RESISTOR,VARIABLE	1		PADZZ
- 5	FP69-180R-5PCT	14674	. RESISTOR,FXD,FILM	1		PADZZ
- 6	LM135H	27014	. MICROCIRCUIT	2		PADZZ
- 7	10086-7209	14304	. CIRCUIT CARD	1		XA
- 8	AB4-2A	10054	. RIVET,BLIND	4		XB
- 9	741	79963	. BRACKET,ANGLE	4		XB
- 10	10086-7203	14304	. HONEYCOMB	1		XB
- 11	MS51957-16	96906	. SCREW,MACHINE (AP)	2		PAOZZ
- 12	MS15795-803	96906	. WASHER,FLAT (AP)	2		PADZZ
- 13	MS35338-135	96906	. WASHER,LOCK (AP)	2		PADZZ

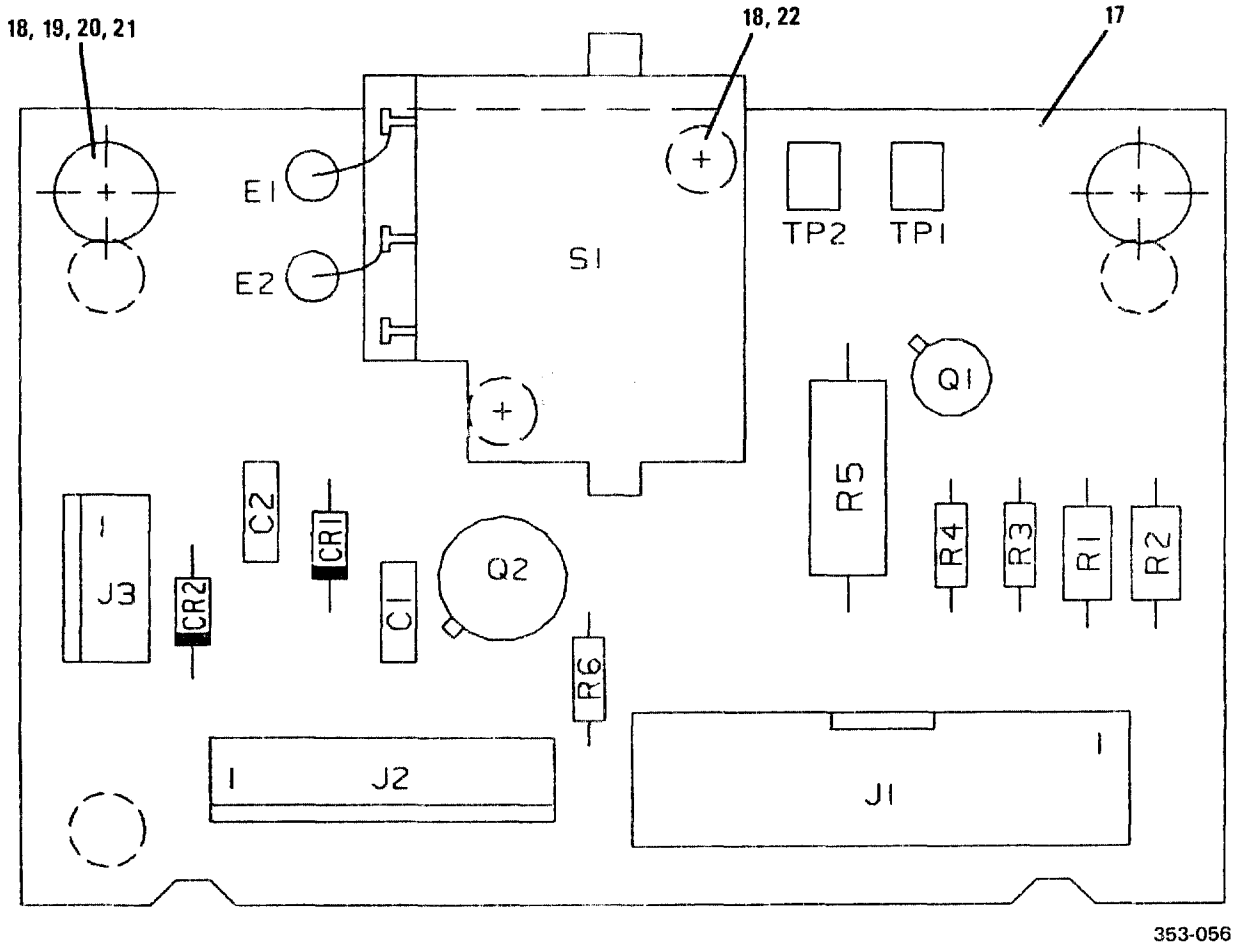

Figure 7-21. Interconnect PWB Assy, A9

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-21-	10087-3140	14304	CIRCUIT CARD ASSY,A9	1		PAOLD
- 1	CK06BX103K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 2	CK06BX104K	81349	. CAPACITOR,FXD,CER	1		PADZZ
- 3	JAN1N3611	81349	. SEMICOND DEVICE,DIO	2		PADZZ
- 4	609-2627	59730	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 5	09-65-1061	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 6	22-11-2052	27264	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 7	JAN2N2907A	81349	. TRANSISTOR	1		PADZZ
- 8	JAN2N2219A	81349	. TRANSISTOR	1		PADZZ
- 9	RN55D1152F	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 10	RNC55K3321FS	81349	. RESISTOR,FXD,FILM	1		PADZZ
- 11	CF07-472J	78488	. RESISTOR,FXD,COMP	1		PADZZ
- 12	CF07-102J	78488	. RESISTOR,FXD,COMP	2		PADZZ
- 13	RCR32G271JS	81349	. RESISTOR,FXD,COMP	1		PADZZ
- 14	MS16106-4	96906	. SWITCH INTERLOCK	1		PAOZZ
- 15	105-1102-001	74970	. JACK,TIP	1		PADZZ
- 16	105-1108-001	74970	. JACK TIP	1		PADZZ
- 17	10087-3149	14304	. CIRCUIT CARD	1		XA
- 18	MS35338-135	96906	. WASHER,LOCK (AP)	4		PADZZ
- 19	6611-0135	14304	. RETAINER,SCREW	2		PADZZ
- 20	10085-5156	14304	. BUSHING	2		PADZZ
- 21	MS51957-17	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 22	MS51957-13	96906	. SCREW MACHINE	2		PADZZ

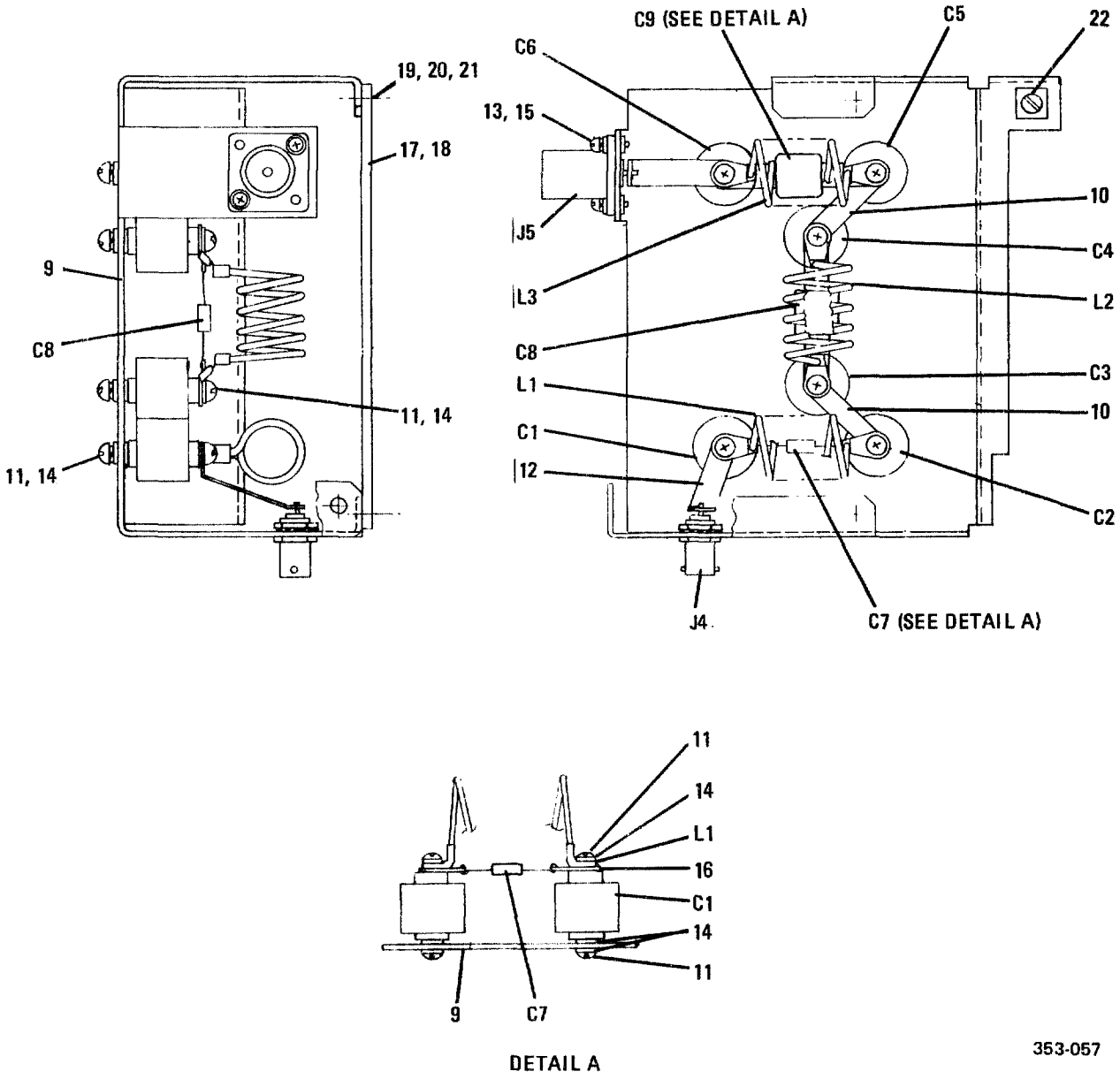

Figure 7-22. Low Pass Filter PWB Assy, A10

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-22-	10087-4500	14304	FILTER ASSY,RF,A10	1		PAOLD
- 1	HT50V500JA	21052	. CAPACITOR,FXD,CER	2		PADZZ
- 2	J1HT50CG620J452	73905	. CAPACITOR,FXD,CER	4		PADZZ
- 3	VY81C150	95275	. CAPACITOR,FXD,CER	1		PADZZ
- 4	VY81C360J	95275	. CAPACITOR,FXD,CER	1		PADZZ
- 5	VY81C360	95275	. CAPACITOR,FXD,CER	1		PADZZ
- 6	M39012/21-0003	80131	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 7	M39012/04-0002	80131	. CONNECTOR,RCPT,ELEC	1		PADZZ
- 8	10087-4515	14304	. TRANSFORMER,RF	3		PADZZ
- 9	10087-4511	14304	. CASE,MTG	1		XB
- 10	10087-4514	14304	. CONTACT,ELEC	2		XB
- 11	MS51957-26	96906	. SCREW,MACHINE (AP)	12		PAOZZ
- 12	10087-4516	14304	. CONTACT,ELEC	1		XB
- 13	MS51957-14	96906	. SCREW,MACHINE (AP)	2		PADZZ
- 14	MS35333-71	96906	. WASHER,LOCK (AP)	18		PADZZ
- 15	841-00	92967	. NUT,CLINCH (AP)	2		PADZZ
- 16	MS77067-2	96906	. TERMINAL,LUG	2		PADZZ
- 17	10085-4518	14304	. COVER LPF	1		XB
- 18	MP-0745	14304	. LABEL,WARNING	1		XB
- 19	MS51957-28	96906	. SCREW,MACHINE (AP)	3		PADZZ
- 20	MS15795-806	96906	. WASHER,FLAT (AP)	3		PADZZ
- 21	MS35338-136	96906	. WASHER,LOCK (AP)	3		PADZZ
- 22	SQ-C4-20	72794	. RECEPTOR,CATCH	1		XB

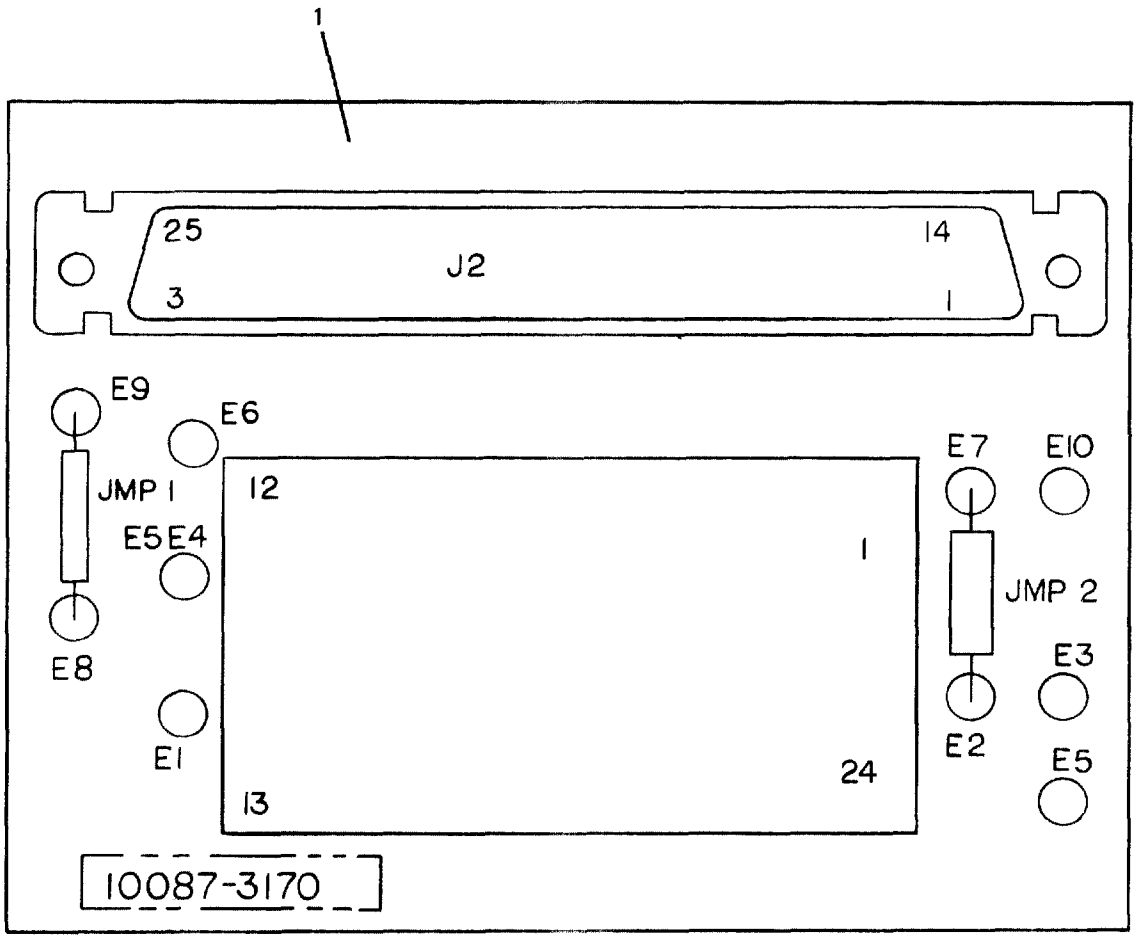

Figure 7-23. Connector PWB Assy, A11

NOTE

To find index numbers for circuit board components, use the reference designator index at the end of this chapter. The complete reference designator for a circuit board component consists of "1," followed by the assembly designator (A1, A2, etc.), then the reference designator on the illustration. For example, the complete reference designator for R25 on the Front Panel PWB Assy is 1A7A1 R25.

Figure & Index Number	Part Number	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-23-	10087-3170	14304	CIRCUIT CARD ASSY,A11	1		PA0ZZ
- 1	DS-25-P07-1E	72835	. CONNECTOR,RCPT,ELEC	1		XA
- 2	MP-1142	14304	. JUMPER,ELEC	2		XA
- 3	10086-3179	14304	. CIRCUIT CARD	1		XA

Section III. NUMERICAL INDEX

Part Number	Fig No.	Index No.	Qty per End Item
A1690	7-10	11	20
A2-61864	7-4	18	1
AB4-2A	7-20	8	4
ADC0808CCJ	7-18	37	1
AJ4-35	7-6	19	4
AJ4-505-S	7-4	52	3
AN565DC4L4	7-1	19	4
AN921-6	7-4	39	5
C-11-NP0-5	7-15	1	1
C11-0004-029	7-10	6	2
C11-0004-037	7-11	4	3
C280MAH/A1M	7-17	7	1
CD4002BF	7-18	47	1
CD40106BF/3	7-17	89	1
CD4011BD/3	7-18	35	1
CD4020BF	7-18	51	1
CD4021BF	7-19	20	6
CD4094BF	7-19	21	3
CF07-100J	7-17	28	39
CF07-101J	7-17	49	5
CF07-102J	7-14	16	20
CF07-103J	7-14	14	37
CF07-104J	7-17	40	3
CF07-105J	7-17	52	5
CF07-122J	7-17	67	1
CF07-123J	7-17	46	1
CF07-153J	7-17	57	1
CF07-183J	7-14	18	1
CF07-221J	7-15	27	1
CF07-222J	7-14	21	14
CF07-223J	7-19	13	3
CF07-270J	7-14	17	1
CF07-271J	7-19	10	5
CF07-273J	7-17	35	3
CF07-333J	7-17	78	1
CF07-363J	7-18	18	1
CF07-471J	7-5	13	7
CF07-472J	7-14	15	21
CF07-562J	7-17	68	1
CF07-681J	7-14	20	1
CF07-682J	7-17	80	4
CF07-683J	7-17	41	1
CF07-822J	7-17	77	1
CK05BX471K	7-15	6	2
CK06BX103K	7-14	3	23
CK06BX104K	7-5	1	5
CK06BX472K	7-14	2	2
CK06BX474K	7-16	4	2
CK70AW152M	7-4	5	1
CM05ED330J03	7-18	8	2
CMR05C100D0DR	7-15	7	1
CMR05E330G0DR	7-18	7	2
CMR05E470G0DR	7-5	2	1
CMR05E750G0DR	7-15	8	1
D-142-50	7-4	54	2
DBM25P	7-3	9	1
DS-25-P07-1E	7-23	1	1
ERD50TJ101	7-16	13	1
ERD50TJ151	7-17	79	1
ERD50TJ182	7-16	11	1
ERD50TJ224	7-5	8	1
ERD50TJ3R9	7-16	15	2
ERD50TJ510	7-15	33	1
ESS-120-T/04	7-19	23	2
FB-46-2	7-13	9	2
FP69-180R-5PCT	7-20	5	2
FP69-180R0J	7-20	3	2
H-6767	7-7	25	7
H-6768	7-4	44	39
H11L1	7-18	36	1
HLCD0438AY	7-19	22	1
HT50T050JA	7-9	3	1
HT50T101JB	7-8	3	4
HT50V250JA	7-8	5	6
HT50V500JA	7-8	4	5
HT55T309CB	7-4	1	1
J1HT50CG620J452	7-22	2	4
J1HT50UJ141J252	7-8	2	2
JAN1N3611	7-15	11	11
JAN1N3825A	7-17	91	1
JAN1N4454	7-14	6	43
JAN1N5711	7-4	7	8
JAN1N750A	7-15	39	1
JAN1N751A	7-5	14	7
JAN1N752A	7-14	24	1
JAN1N755A	7-18	10	1
JAN2N2219A	7-14	13	2
JAN2N2222A	7-14	12	12
JAN2N2907A	7-14	9	9
JAN2N6383	7-14	11	3
JAN2N6648	7-14	10	3
JV-5	7-7	5	1
KC-79-123	7-15	14	1
L13-0001-101	7-16	9	1
LM135H	7-20	6	2
M38510/30003BCB	7-18	39	1
M38510/30702BEB	7-18	48	1
M38510/31004BCB	7-18	38	1
M38510/32502BRB	7-18	42	3
M38510/32702BCB	7-18	50	1
M39012/04-0002	7-15	13	2
M39012/16-007	7-15	22	2
M39012/21-0003	7-11	6	2

Part Number	Fig No.	Index No.	Qty per End Item
M39014/01-1321	7-17	9	1
M39014/01-1351	7-15	5	6
M39014/01-1357	7-17	10	2
M39014/02-1332	7-14	1	2
M39014/02-1337	7-15	4	1
M39014/02-1338	7-5	3	130
M39014/02-1360	7-16	3	2
M39014/2-1350	7-4	6	20
MC14028BBEBS	7-14	23	1
MC1558U	7-17	86	9
MCM01-007EC621G0	7-15	2	1
MM54C14J	7-18	45	1
MP-0745	7-22	18	1
MP-1142	7-23	2	2
MP042	7-18	56	1
MS14046-8	7-17	22	1
MS15795-803	7-7	28	4
MS15795-804	7-16	27	26
MS15795-805	7-7	17	20
MS15795-806	7-22	20	3
MS15795-807	7-4	24	8
MS16106-4	7-21	14	1
MS21266-1N	7-6	21	33
MS21266-2N	7-4	46	5
MS24693-C26	7-15	56	4
MS24693-C28	7-4	34	2
MS25281R-3	7-15	54	2
MS3102R28-18P	7-2	16	1
MS313-4994F	7-4	16	1
MS3367-4-9	7-4	55	45
MS35333-70	7-10	13	7
MS35333-71	7-8	9	93
MS35333-72	7-13	20	4
MS35338-135	7-4	35	3
MS35338-136	7-6	27	24
MS35338-137	7-6	29	4
MS35489-1	7-15	57	2
MS35649-244	7-4	32	1
MS35649-265	7-4	42	2
MS51021-22	7-13	23	10
MS51021-23	7-13	25	2
MS51021-32	7-13	26	1
MS51957-122	7-16	23	1
MS51957-13	7-4	36	7
MS51957-14	7-4	37	7
MS51957-15	7-13	27	3
MS51957-16	7-20	11	2
MS51957-17	7-3	8	31
MS51957-26	7-22	11	12
MS51957-27	7-8	8	60
MS51957-28	7-14	26	42
MS51957-29	7-4	31	6
MS51957-30	7-3	6	19
MS51957-44	7-4	23	8
MS51959-14	7-7	16	7
MS51959-28	7-7	19	3
MS51959-44	7-13	18	2
MS75083-1	7-15	20	2
MS75084-3	7-17	24	1
MS75085-17	7-15	21	1
MS75085-19	7-17	23	2
MS75085-2	7-18	13	7
MS75085-7	7-15	19	2
MS77067-2	7-22	16	2
MS77068-1	7-4	9	5
MS77068-2	7-4	11	4
MS77068-3	7-4	10	1
MS90539-11	7-4	13	1
MS90541-05	7-15	18	1
P101-447-495	7-7	27	2
RCR32G100JS	7-16	14	1
RCR32G271JS	7-21	13	1
RCR32G2R7JS	7-16	12	1
RCR32G470JS	7-14	19	1
RCR42G104JS	7-15	32	1
RCR42G330JS	7-17	76	1
RLR32C56R0FM	7-15	26	2
RLR32C56R2FS	7-15	25	2
RN55D1002F	7-17	50	17
RN55D1152F	7-15	31	2
RN55D1502F	7-17	75	3
RN55D2211F	7-17	60	2
RN55D2491F	7-17	84	3
RN55D2554F	7-17	65	1
RN55D2613F	7-17	38	2
RN55D3322F	7-17	58	2
RN55D3923F	7-17	53	2
RN55D4751F	7-18	25	3
RN55D4752F	7-17	42	2
RN55D5621F	7-17	83	2
RN55D9092F	7-17	66	2
RN55D9762F	7-17	31	2
RNC55K1133FS	7-5	12	1
RNC55K1152FS	7-15	30	3
RNC55K1303FS	7-17	73	1
RNC55K1501FS	7-17	72	2
RNC55K1502FS	7-5	11	3
RNC55K1823FS	7-17	36	1
RNC55K2211FS	7-17	59	5
RNC55K2493FS	7-17	81	2
RNC55K2613FS	7-17	33	3
RNC55K3011FS	7-15	35	1

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RNC55K3011FS	7-15	35	1
RNC55K3321FS	7-21	10	1
RNC55K3322FS	7-17	56	4
RNC55K3481FS	7-17	82	1
RNC55K3923FS	7-17	37	2
RNC55K4321FS	7-17	71	1
RNC55K4322FS	7-17	61	1
RNC55K4751FS	7-17	43	2
RNC55K4752FS	7-17	34	4
RNC55K5111FS	7-5	9	1
RNC55K5621FS	7-17	74	2
RNC55K6811FS	7-15	34	1
RNC55K6812FS	7-17	64	1
RNC55K7151FS	7-17	54	1
RNC55K7502FS	7-17	44	1
RNC55K9092FS	7-17	39	2
RNC55K9762FS	7-17	30	3
RWR89S1R00FS	7-17	69	1
SM-A-938092	7-17	88	1
SN54LS367AJ	7-19	19	3
SN54LS373J	7-18	43	2
SQ-C4-20	7-22	22	1
SR-4	7-4	53	9
T392B106M010AS	7-19	1	3
T392B685K016AS	7-17	11	1
T392C105K050AS	7-17	3	2
T392C105M050AS	7-17	4	2
T392C106M025AS	7-17	8	4
T392C226M010AS	7-19	2	3
T392F157K010AS	7-18	6	1
T392F157M016AS	7-17	5	2
TC-105A	7-4	56	8
TC5516ADL	7-18	49	1
TD271-28-4	7-18	68	1
TD8031AH	7-18	33	1
TDA2002H	7-17	90	1
UA7805KMQB	7-18	52	1
UFP1-100J	7-10	5	2
UFP1-110J	7-10	1	2
UFP1-290J	7-10	7	2
UFP1-320J	7-11	1	4
UFP1-340J	7-10	3	3
UFP1-350J	7-10	2	1
UFP1-370J	7-11	5	2
UFP1-470J	7-11	3	1
UFP1-680J	7-11	2	2
ULQ-2003R	7-18	41	3
V3-343-D8	7-7	3	1
VY81C150	7-22	3	1
VY81C360	7-22	5	1
VY81C360J	7-22	4	1
W88UKDX-2	7-15	17	2
Z06-0008-001	7-13	17	1
0.5M6.8AZ1	7-17	93	1
010632B037	7-6	25	2
013334	7-20	4	1
05801	7-5	6	2
08-56-0110	7-4	58	49
09-65-1061	7-16	7	2
09-91-0600	7-2	20	2
10-109628-18S	7-3	10	2
10-36233-243	7-3	1	2
10019-1307	7-4	29	1
10019-1308	7-4	27	1
10019-1309	7-4	28	1
10019-1310	7-4	22	1
10043-0033	7-4	3	1
10085-4518	7-22	17	1
10085-5156	7-5	17	23
10086-1400	7-2	13	1
10086-1516	7-16	16	1
10086-1519	7-16	17	1
10086-2109	7-19	24	1
10086-3179	7-23	3	1
10086-3703	7-13	1	2
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10086-3712	7-7	7	1
10086-3719	7-13	15	1
10086-3720	7-6	6	1
10086-3721	7-13	3	2
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10086-3724	7-13	6	1
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10086-3726	7-6	14	1
10086-3727	7-13	14	1
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10086-3787	7-13	2	1
10086-3788	7-7	9	1
10086-3799	7-6	12	1
10086-3806	7-7	6	3
10086-4520	7-15	38	2
10086-7100	7-2	5	1
10086-7109	7-17	95	1
10086-7200	7-2	10	1
10086-7203	7-20	10	1
10086-7209	7-20	7	1
10086-9200	7-2	6	1
10086-9209	7-18	58	1
10086-9210	7-18	14	1
10086-9530	7-18	34	1
10087-0000	7-X	0	1

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10087-1509	7-16	18	1
10087-2000	7-2	7	1
10087-2004	7-2	8	1
10087-2008	7-2	9	1
10087-2100	7-2	43	1
10087-3103	7-2	25	1
10087-3105	7-2	27	1
10087-3106	7-3	7	4
10087-3107	7-3	5	8
10087-3109	7-2	28	1
10087-3113	7-2	29	1
10087-3116	7-2	30	1
10087-3117	7-2	31	1
10087-3118	7-2	32	2
10087-3119	7-2	33	1
10087-3135	7-2	23	1
10087-3140	7-2	11	1
10087-3149	7-21	17	1
10087-3170	7-2	24	1
10087-3200	7-2	1	1
10087-3204	7-4	26	1
10087-3205	7-4	21	1
10087-3206	7-4	43	1
10087-3207	7-5	7	1
10087-3208	7-4	17	1
10087-3209	7-4	49	1
10087-3210	7-4	48	1
10087-3211	7-4	50	1
10087-3212	7-4	51	1
10087-3213	7-4	57	1
10087-3220	7-4	59	1
10087-3229	7-5	15	1
10087-3230	7-4	2	1
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10087-3703	7-6	17	1
10087-3705	7-6	15	1
10087-3706	7-6	16	1
10087-3708	7-6	10	1
10087-3709	7-6	8	1
10087-3710	7-6	34	1
10087-3716	7-7	14	1
10087-3717	7-7	15	1
10087-3721	7-6	31	1
10087-3722	7-6	32	1
10087-3740	7-6	1	1
10087-3742	7-8	6	2
10087-3743	7-8	7	9
10087-3745	7-8	1	2
10087-3746	7-10	10	20
10087-3750	7-6	2	1
10087-3760	7-6	3	1
10087-3762	7-10	9	1
10087-3769	7-10	8	2
10087-3770	7-6	4	1
10087-3772	7-11	8	1
10087-3780	7-6	5	1
10087-3783	7-12	3	13
10087-3784	7-12	1	4
10087-3785	7-6	9	1
10087-3789	7-12	2	1
10087-3819	7-6	13	1
10087-4500	7-2	12	1
10087-4511	7-22	9	1
10087-4514	7-22	10	2
10087-4515	7-22	8	3
10087-4516	7-22	12	1
10087-4600	7-2	3	1
10087-4608	7-15	53	1
10087-4609	7-15	40	1
10087-4611	7-15	41	2
10087-4613	7-15	44	12
10087-4614	7-15	37	6
10087-4619	7-15	42	1
10087-4624	7-15	45	1
10087-4626	7-15	50	1
105-0852-001	7-18	30	1
105-0857-001	7-18	32	1
105-0858-001	7-18	29	1
105-1102-001	7-21	15	1
105-1108-001	7-21	16	1
106XL037	7-7	10	1
1168004P6	7-18	31	1
122-0247-202	7-4	20	1
1384	7-4	40	5
17-80250-16	7-3	4	1
18099C-B044014A	7-15	46	8
18100C-B-0440	7-15	49	2
199D476X0025EA2	7-18	2	3
1N4733A	7-17	92	1
1N5817	7-18	11	1
21042	7-4	45	1
21045	7-4	41	4
21050	7-4	38	1
22-01-3037	7-4	15	1
22-01-3057	7-2	22	2
22-01-3107	7-2	21	1
22-01-3147	7-2	19	2
22-11-2052	7-20	2	2
22-11-2102	7-5	5	2
22-11-2142	7-5	4	2
226619-3	7-15	43	2
2308-14-1	7-4	8	1

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250817-1	7-2	39	1
2994-14-1	7-2	15	2
2N5566	7-17	87	1
2N5881	7-16	10	2
2T-4603-1	7-15	15	1
3-102202-4	7-16	8	1
330-T0-3	7-18	57	1
3386B-1-202	7-15	28	1
3386B-1-203	7-15	29	3
3386F-1-102	7-17	62	2
3386F-1-104	7-17	48	1
3386F-1-203	7-5	10	2
3484-1000	7-4	47	10
3720046010	7-17	21	3
391-3314	7-4	33	2
4310-101-103	7-18	21	2
4310R-101-103	7-19	14	4
439P4749220	7-16	5	1
43D33	7-7	8	1
44R3F03KGBJ	7-19	4	1
4521-75-62-1T	7-7	13	2
500-5027-E	7-18	12	1
5082-4555	7-17	16	2
5082-4655	7-17	17	3
5082-4955	7-17	15	1
5144-25-S-ZD	7-7	11	1
5248	7-2	18	3
528-AG11D	7-18	55	1
540-AG11D	7-18	54	1
55DP30011AJNC	7-19	15	2
56-03-2	7-17	100	2
561-2101-080	7-19	5	1
561-2201-080	7-19	7	1
561-2301-080	7-19	6	3
5612-18-20	7-4	25	4
5804-128-1	7-13	24	2
6051B	7-17	96	1
609-1607	7-19	8	1
609-1627	7-14	8	2
609-2627	7-14	7	2
609-4027	7-17	19	1
65474-001	7-18	67	3
65499-101	7-17	85	11
65499-102	7-17	18	3
65499-103	7-18	66	1
65499-105	7-14	30	4
6611-0135	7-5	16	23
6628-3460	7-7	4	1
672D476H040CD5C	7-18	5	3
672D686H025CD5C	7-14	5	2
674D128H025JE5A	7-16	1	2
6A3-12H3706	7-13	12	2
7101TV30QE	7-19	16	3
7103TV30QE	7-19	25	1
7105TV30QE	7-6	11	2
741	7-20	9	4
745173-2	7-3	3	2
745508-8	7-3	2	2
750-83-R4.7K	7-14	22	2
755017A4514-1	7-10	4	2
75GA-D25	7-4	4	2
801591-31	7-14	4	2
8101FSP-90	7-2	17	1
8101MP	7-4	14	1
8121-050-651-103	7-20	1	4
8154-A-0440-0	7-13	8	1
8154-A-440-0	7-6	18	2
8168SHV30QE	7-19	18	1
841-00	7-6	30	11
8519-A-0832-16	7-13	16	2
885SP220L	7-7	2	1
8877/3CX1500A7	7-4	19	1
8948-3307	7-4	12	1
904-380	7-5	19	2
90KL037	7-13	13	1
9817-A-0832-16	7-13	10	2

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1A1A1C4	7-5	1
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1A1A1J1	7-5	4
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1A1A1R6	7-5	13
1A1A1VR1	7-5	14
1A1A1VR2	7-5	14
1A1C2	7-4	1
1A1C3	7-4	2
1A1C4	7-4	3
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1A1C7	7-4	6
1A1CR1	7-4	7
1A1E1	7-4	8
1A1E2	7-4	9
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1A1E5	7-4	11
1A1E6	7-4	11
1A1E7	7-4	9
1A1L1	7-4	12
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1A1TP1	7-4	18
1A1V1	7-4	19
1A1XV1	7-4	20
1A2	7-2	2
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1A2A1C2	7-8	3
1A2A1C3	7-8	3
1A2A1C4	7-8	3
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1A2A1C6	7-8	4
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1A2A1C10	7-8	4
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1A2A2A1	7-9	1
1A2A2C11	7-9	2
1A2A2C12	7-9	2
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1A2A2C14	7-9	2
1A2A2C15	7-9	2
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1A2A3	7-6	3
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1A2A4J1	7-11	6
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1A2A7Q14	7-14	12
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1A2A7R44	7-14	15
1A2A7R45	7-14	22
1A2A7R46	7-14	22
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1A2A7VR1	7-14	24
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1A2L6	7-6	9
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1A2S3	7-7	3
1A2S4	7-6	11
1A2W1	7-6	12
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1A2W2	7-6	13
1A2W2	7-6	14
1A3	7-2	3
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1A3C6	7-15	6
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1A3C15	7-15	3
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1A3CR7	7-15	11
1A3CR8	7-15	11
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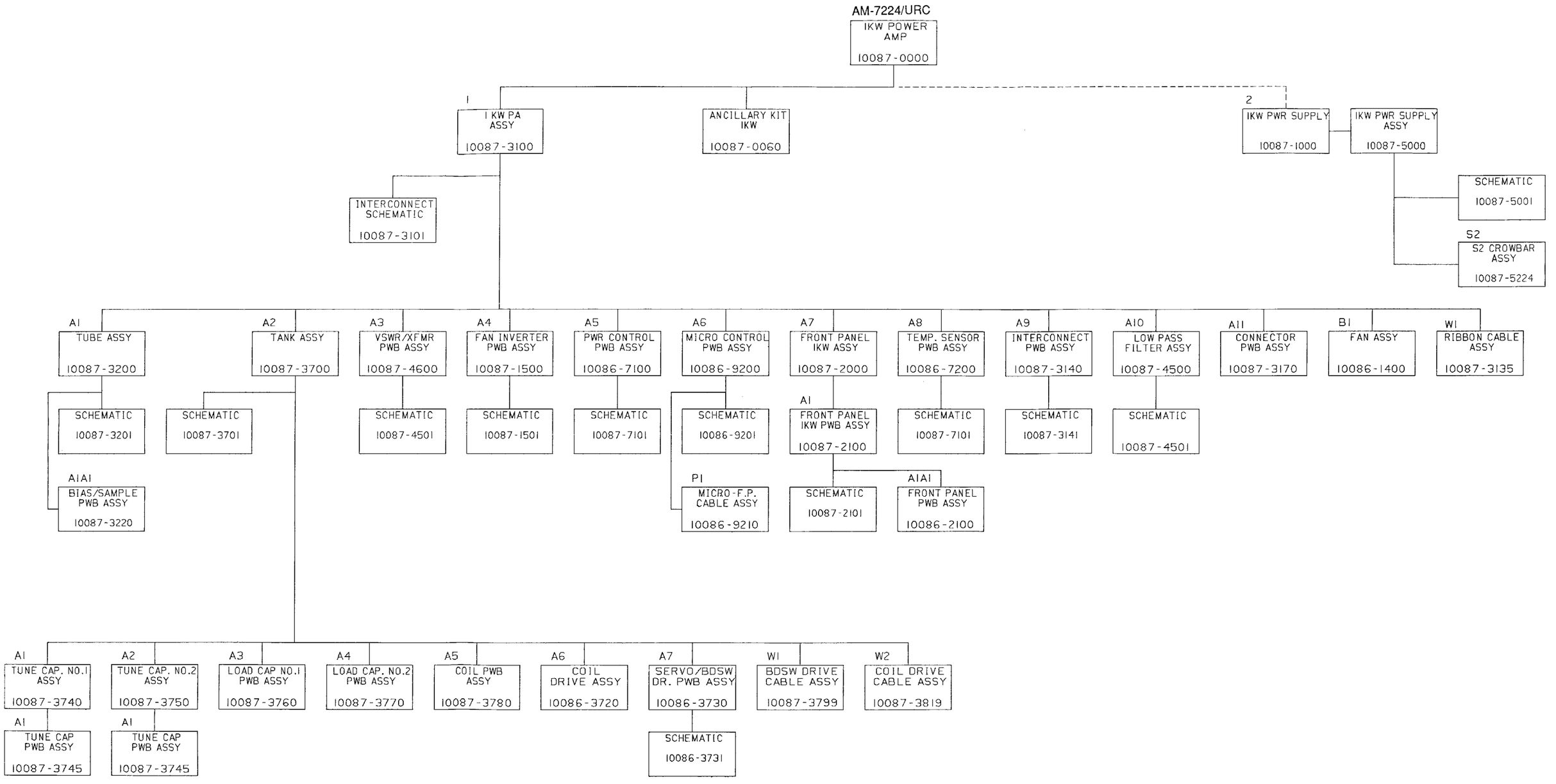
1A10J5	7-22	7
1A10L1	7-22	8
1A10L2	7-22	8
1A10L3	7-22	8
1B1	7-2	13
1C10	7-2	14
1E13	7-2	15
1E14	7-2	15
1J1	7-2	16
1J3	7-2	17
1JMP1	7-23	2
1JMP2	7-23	2
1L1	7-2	18
1P1	7-2	19
1P3	7-2	19
1P4	7-2	20
1P7	7-2	21
1P8	7-2	22
1P10	7-2	20
1P11	7-2	22
1W1	7-2	23
1W1J2	7-23	1

CHAPTER 8

FOLDOUT DRAWINGS

LIST OF 1 KW LPA FOLDOUT DRAWINGS

GPO 687-000/41879

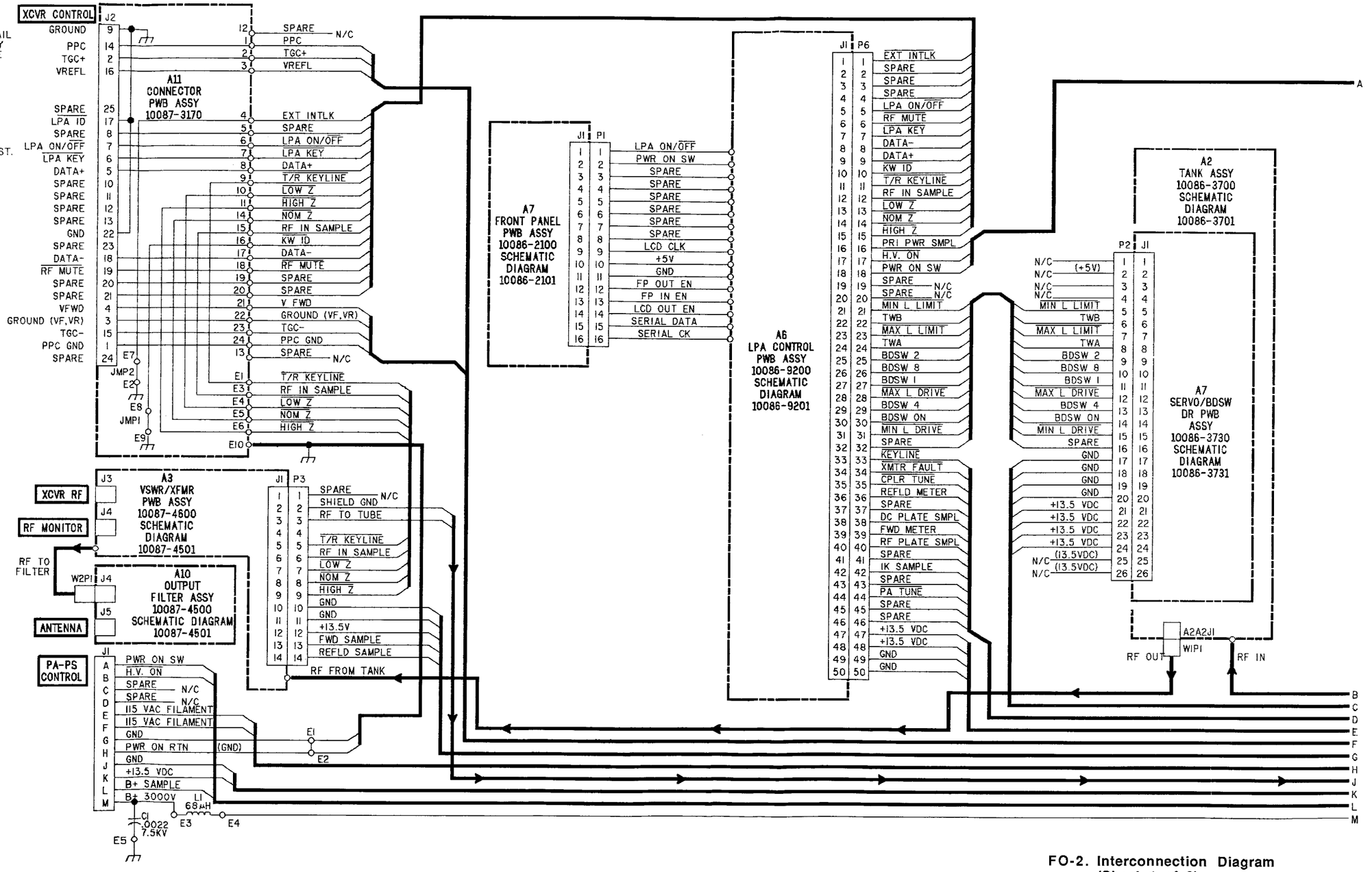


FO-1. Family Tree 1 KW

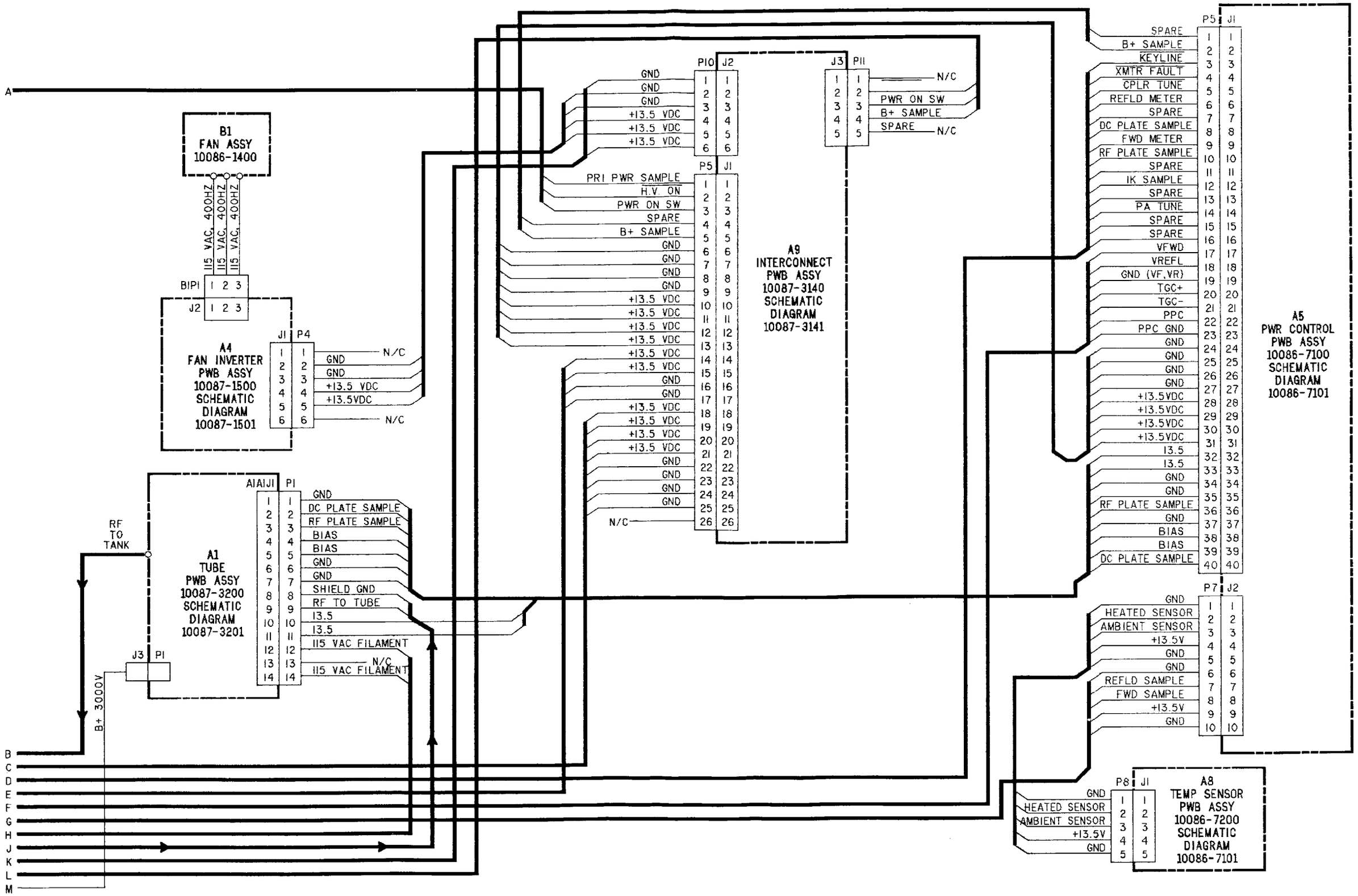
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF** .
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
REFERENCE DESIGNATIONS NOT USED				



FO-2. Interconnection Diagram (Sheet 1 of 2)



FO-2. Interconnection Diagram (Sheet 2 of 2)

NOTE: UNLESS OTHERWISE SPECIFIED:

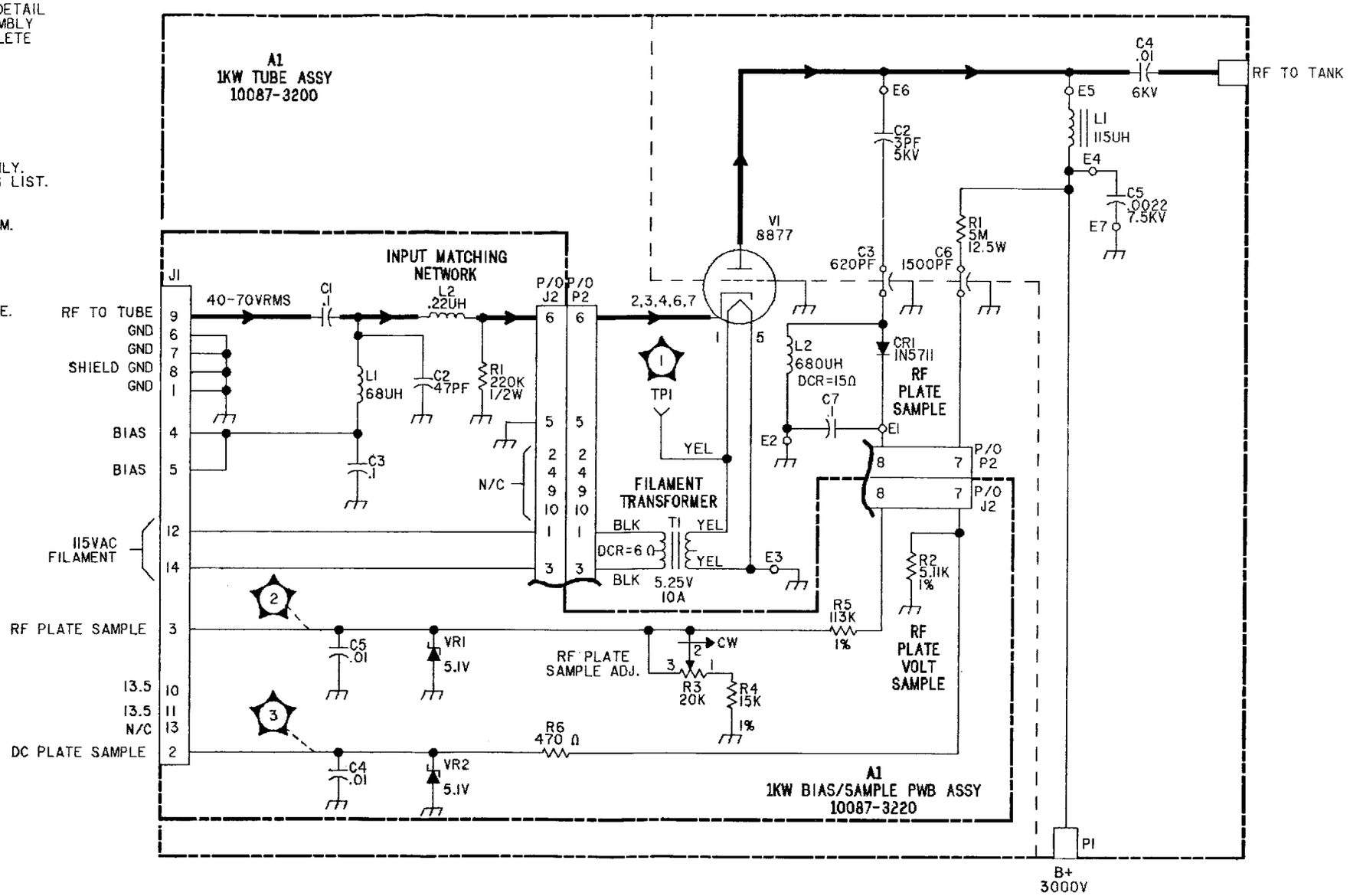
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF** .
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
A1	C7	CR1	L2	P2
R1	T1	TP1	V1	
REFERENCE DESIGNATIONS NOT USED				
C1				

(1) 5.25 VAC

(2) 1V ≡ 1KV(PEAK)

(3) 1V ≡ 1KV

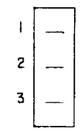


FO-3. Tube Assy, A1

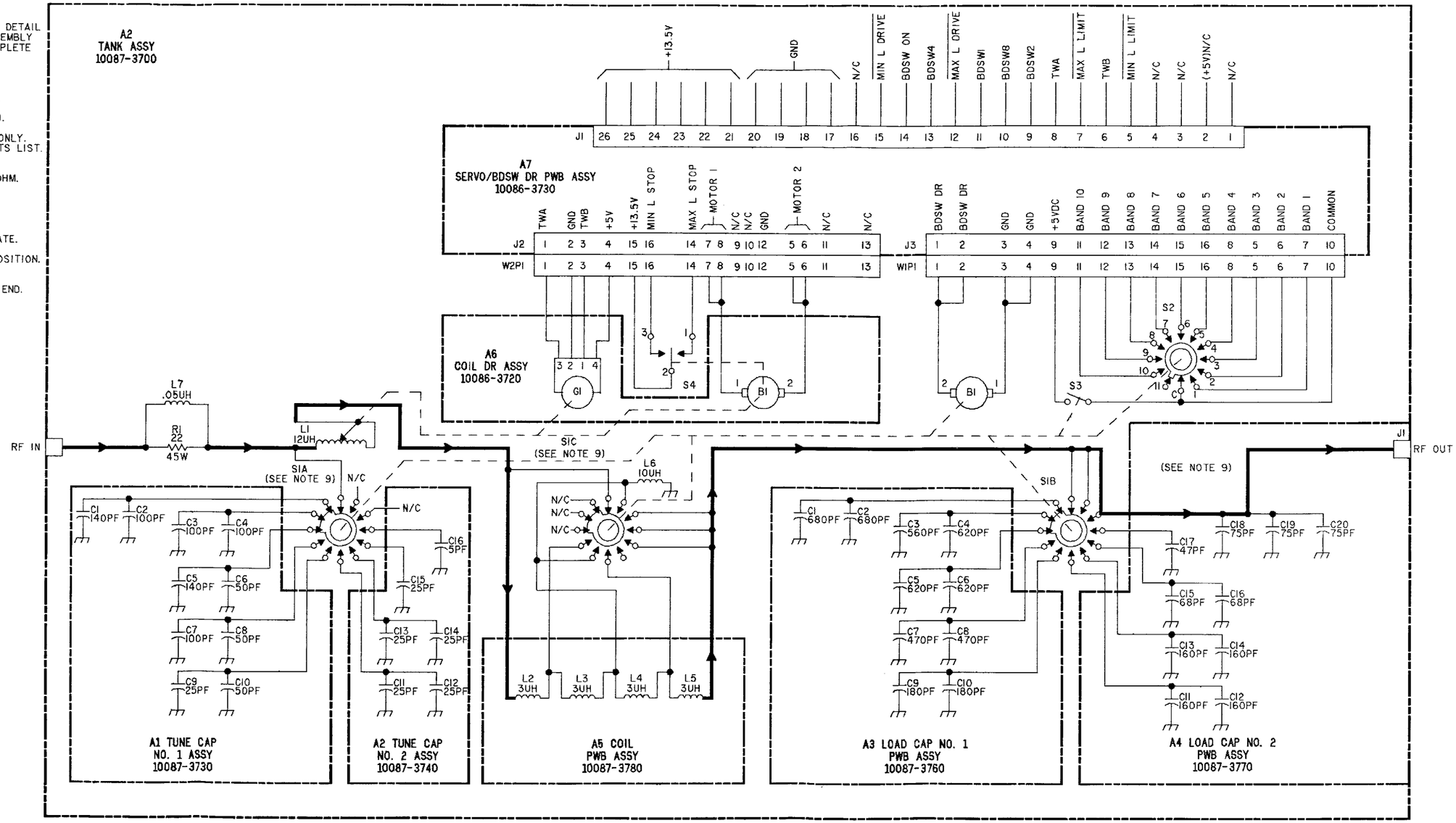
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.
9. ALL SWITCH WAFERS ARE SHOWN IN THE BAND 1 POSITION. ROTATION IS CCW FOR BAND 2 THRU BAND 10.
10. ROTATION OF L1 FOR MIN. L IS CCW FROM DRIVEN END.

HIGHEST REFERENCE DESIGNATION				
A7	B1	J1	L7	R1
S4	W2P1			
REFERENCE DESIGNATIONS NOT USED				
L2	L3	L4	L5	



VIEW OF S4 FROM REAR



FO-4. Tank Assy, A2

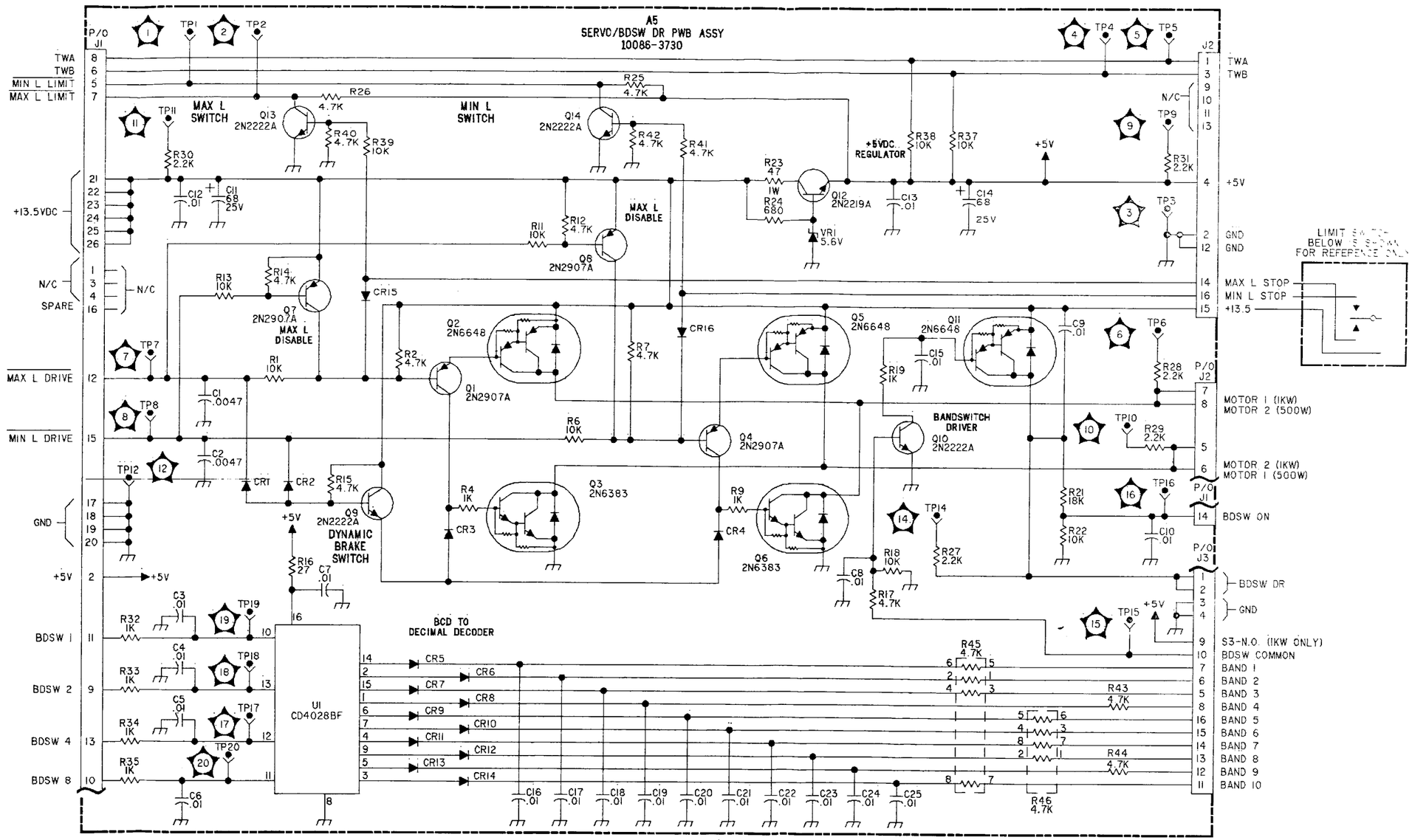
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF** .
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.
9. PART NO.'S OF CRI THRU CRI4 ARE IN4454.

HIGHEST REFERENCE DESIGNATION				
C25	CRI4	J3	QI2	R36
UI	VRI			
REFERENCE DESIGNATIONS NOT USED				
R3	R5	R8	RI0	R20

1	≈ +5V TO 0V
2	≈ +5V TO 0V
3	GND
4	+5V / 0V
5	+5V / 0V
6	0.5V TO +12.5V
7	0.5V TO +13.5V
8	0.5V TO +13.5V
9	+5VDC REG SUPPLY
10	0.5V TO +12.5V
11	≈ +13V UNREG SUPPLY
12	GND
14	0V TO +13V
15	0V TO +5V
16	0V TO +4.5V
17	0V TO +5V
18	0V TO +5V
19	0V TO +5V
20	0V TO +5V

	FROM DRIVEN END	
MAX L	500W	IKW
	CCW	CW
MIN L	CW	CCW

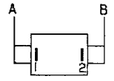


FO-5. Servo/Band Switch Drive PWB Assy, A2A7

NOTE: UNLESS OTHERWISE SPECIFIED:

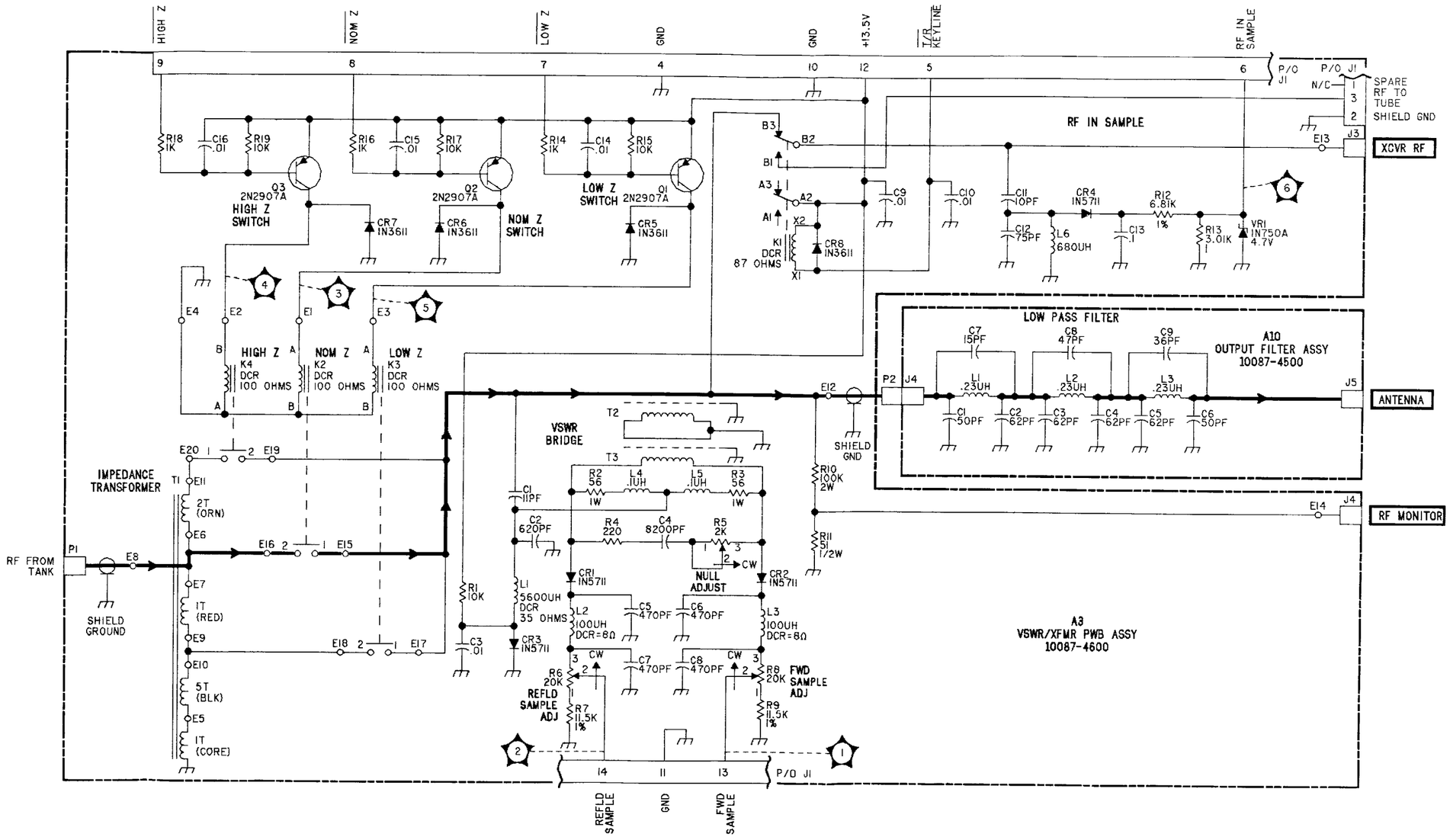
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF** .
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
A3	C9	J5	L5	
REFERENCE DESIGNATIONS NOT USED				
A1	J2	J3	L2	



K2,K3,K4

1. 7.0V ≡ 1KW FWD PWR
2. 7.0V ≡ 1KW REFLD PWR
3. 13.5V ≡ NOMZ; 0V ≡ NOMZ
4. 13.5V ≡ HIGHZ; 0V ≡ HIGHZ
5. 13.5V ≡ LOWZ; 0V ≡ LOWZ
6. 5V ≡ 250W; 3.16V ≡ 100W



FO-6. VSWR/XFMR PWB Assy, A3

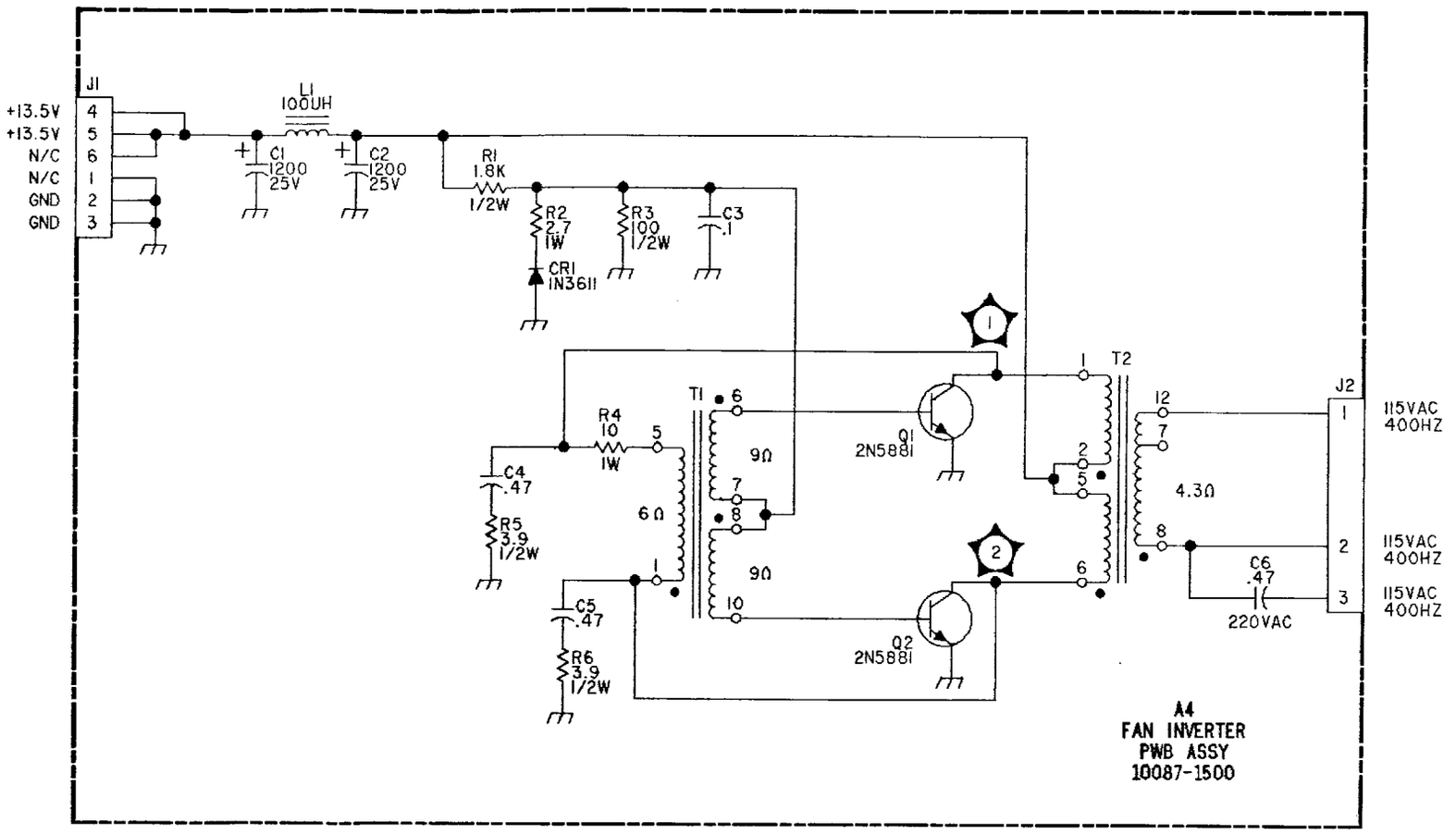
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (MF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
C6	CR1	J2	L1	Q2
R6	T2			
REFERENCE DESIGNATIONS NOT USED				

1 — 13.5V .5V — 400HZ NOMINAL WITH 13.5V INPUT

2 — 13.5V .5V — 400HZ NOMINAL WITH 13.5V INPUT



FO-7. Fan Inverter PWB Assy, A4

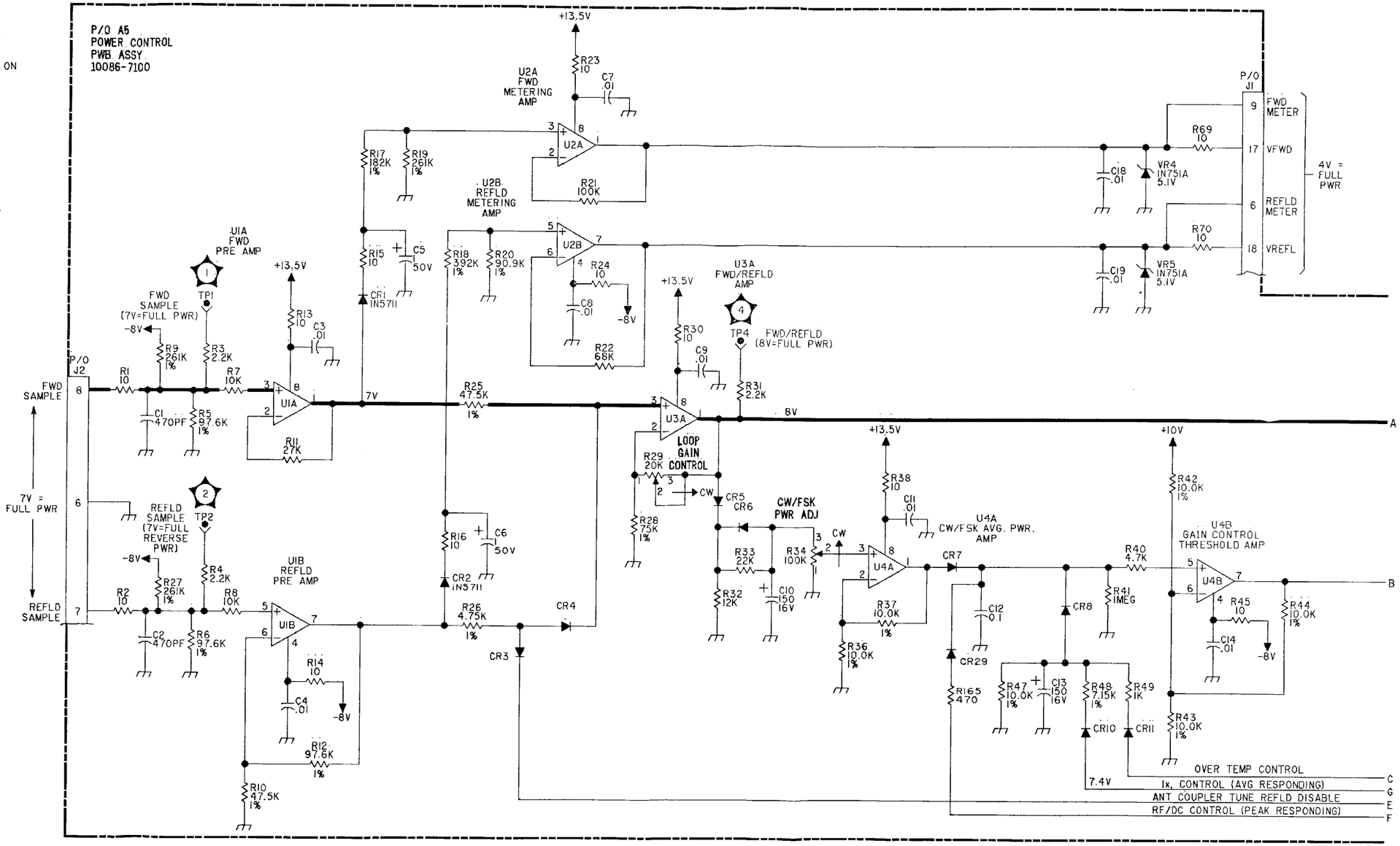
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS A8/A10 REF DESIGNATORS ARE AT ZONE 7E ON SHEET 4 OF 4. PREFIX ALL OTHER COMPONENTS WITH A5.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL DIODES ARE TYPE IN4454.
4. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
5. ALL IC'S ARE TYPE MC1558U.
6. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
7. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
8. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
9. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
10. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

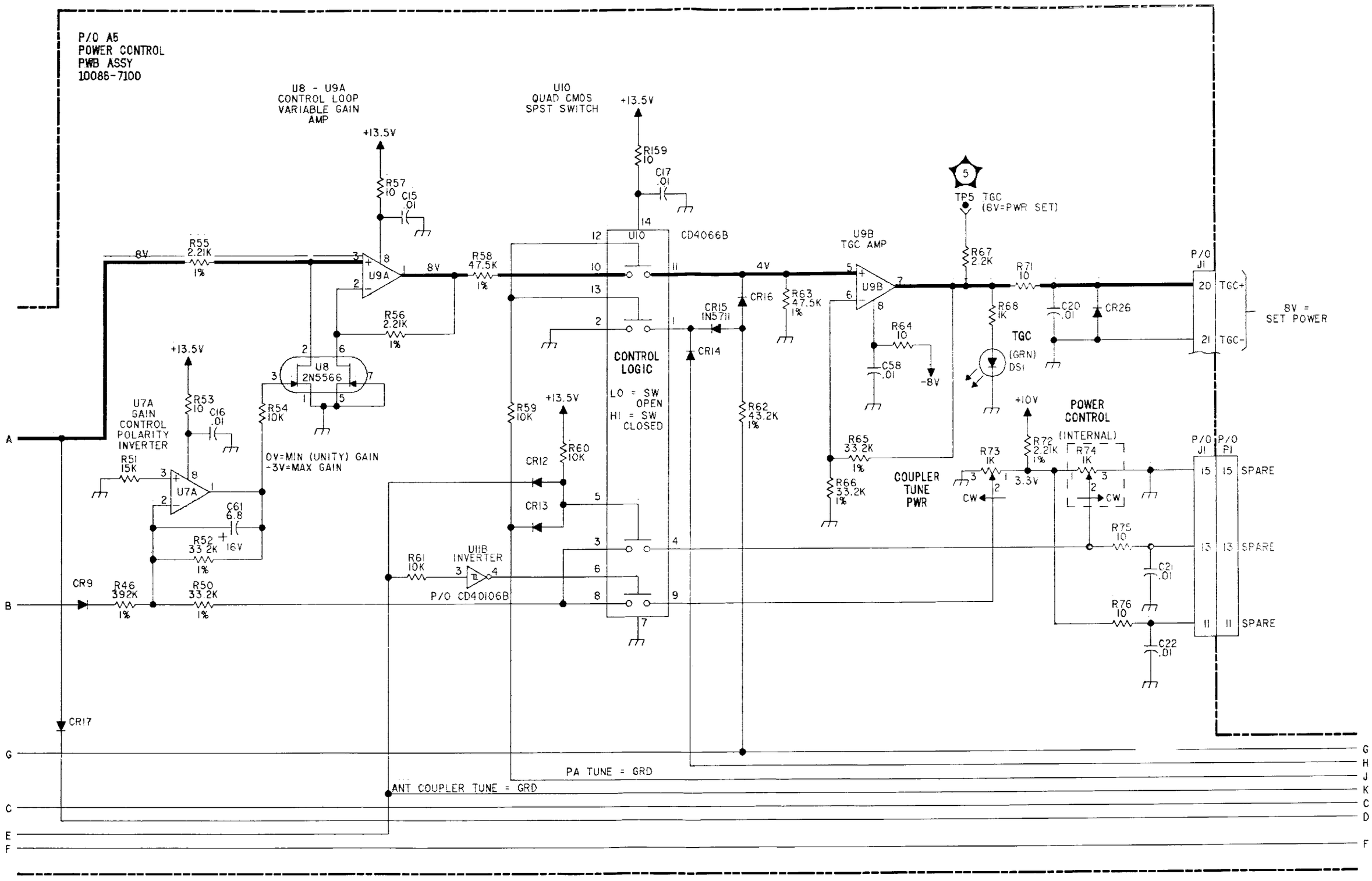
HIGHEST REFERENCE DESIGNATION				
C61	CR29	DS6	J2	L1
Q4	R166	TP11	U13	VR7

REFERENCE DESIGNATIONS NOT USED				
CR17	CR26	R35	R81	R104
R105				

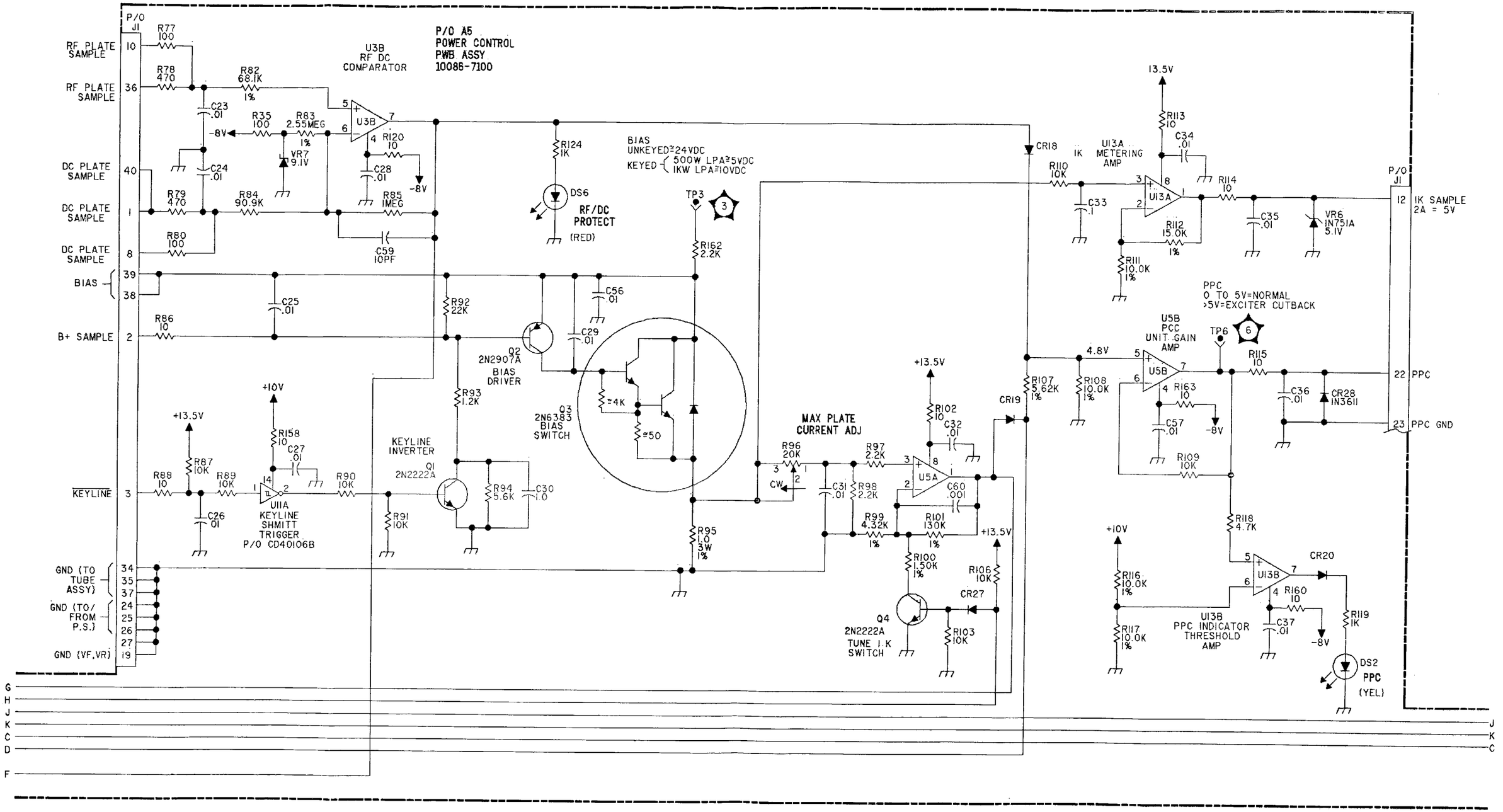
1. 7V = FULL POWER
2. 7V = FULL REVERSE PWR
3. UNKEY ≅ 24VDC, KEYED (500W LPA ≅ 5VDC), KEYED (1KW LPA ≅ 10VDC)
4. 8V = FULL PWR
5. 8V = PWR SET
6. 0 TO 5V = NORMAL, >5V = EXCITER CUTBACK
7. +13.5VDC
8. -8V UNREG
9. AT 21°C (70°F) AMBIENT "FAULT" AT 18°C ± 3° (180MV ± 30MV) GREATER THAN TP10
10. TP10 VOLTAGE = 10MV/DEGREE KELVIN
    0°C = 273° KELVIN = 2.73VDC
    100°C = 373° KELVIN = 3.73VDC
    150°C = 423° KELVIN = 4.23VDC
11. LOW = FAULT, +5V = NORMAL



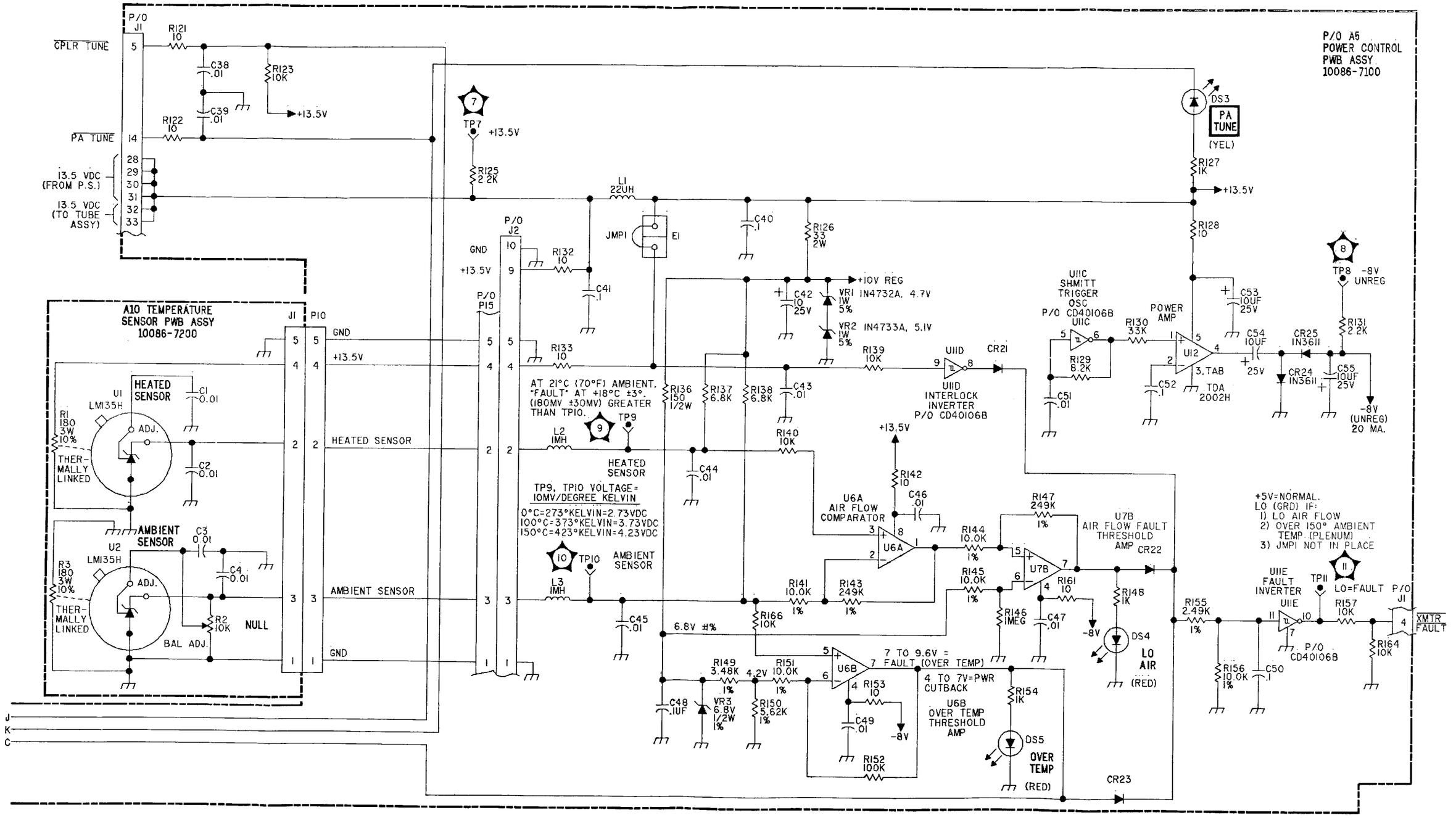
FO-8. Power Control PWB Assy, A5 (Sheet 1 of 4)



FO-8. Power Control PWB Assy, A5 (Sheet 2 of 4)



FO-8. Power Control PWB Assy, A5 (Sheet 3 of 4)



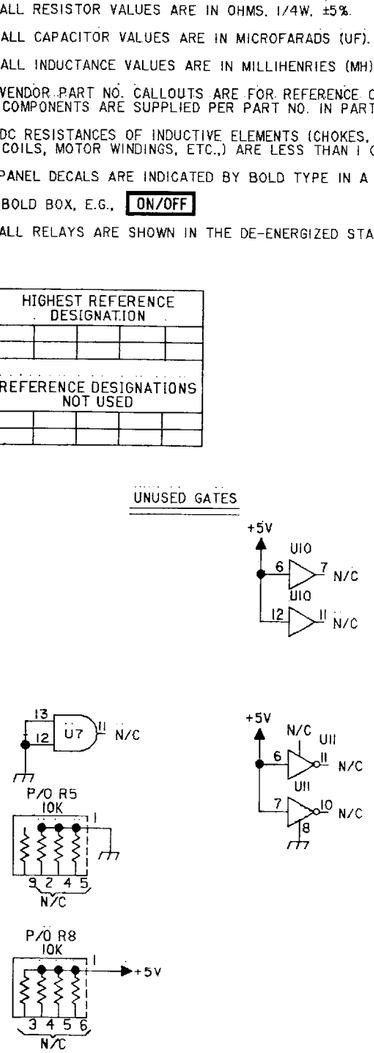
FO-8. Power Control PWB Assy, A5 (Sheet 4 of 4)

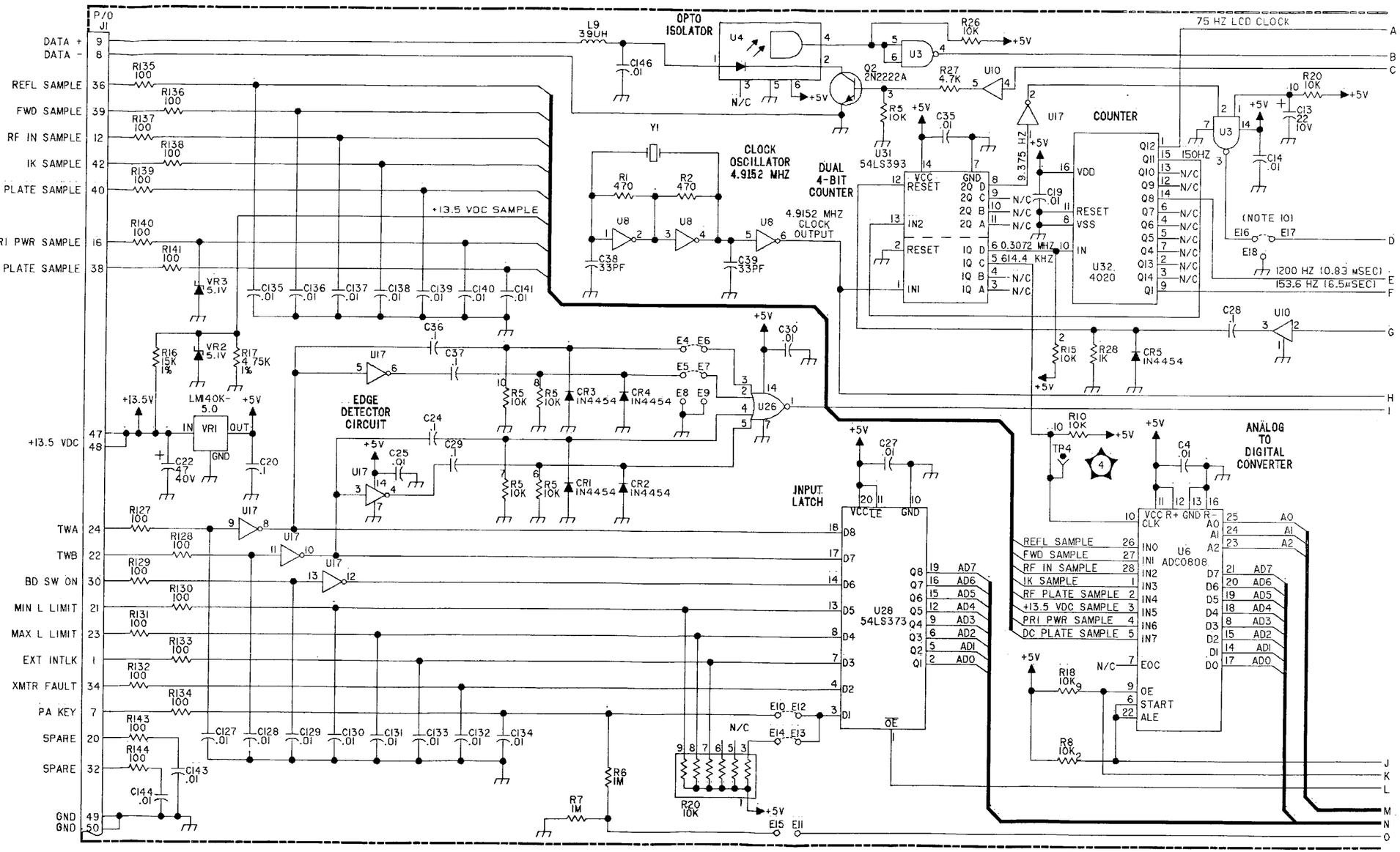
NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

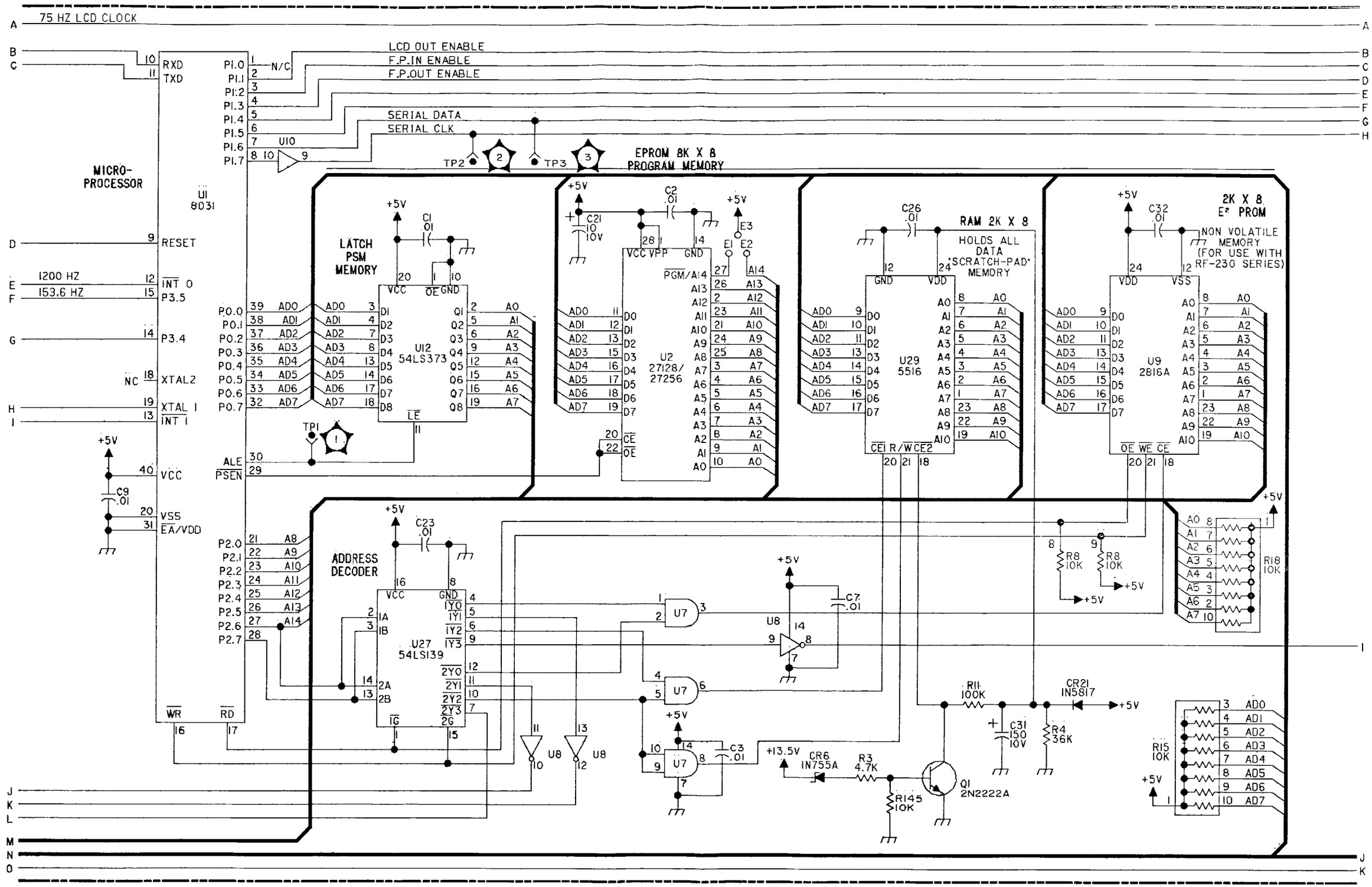
HIGHEST REFERENCE DESIGNATION
REFERENCE DESIGNATIONS NOT USED

UNUSED GATES

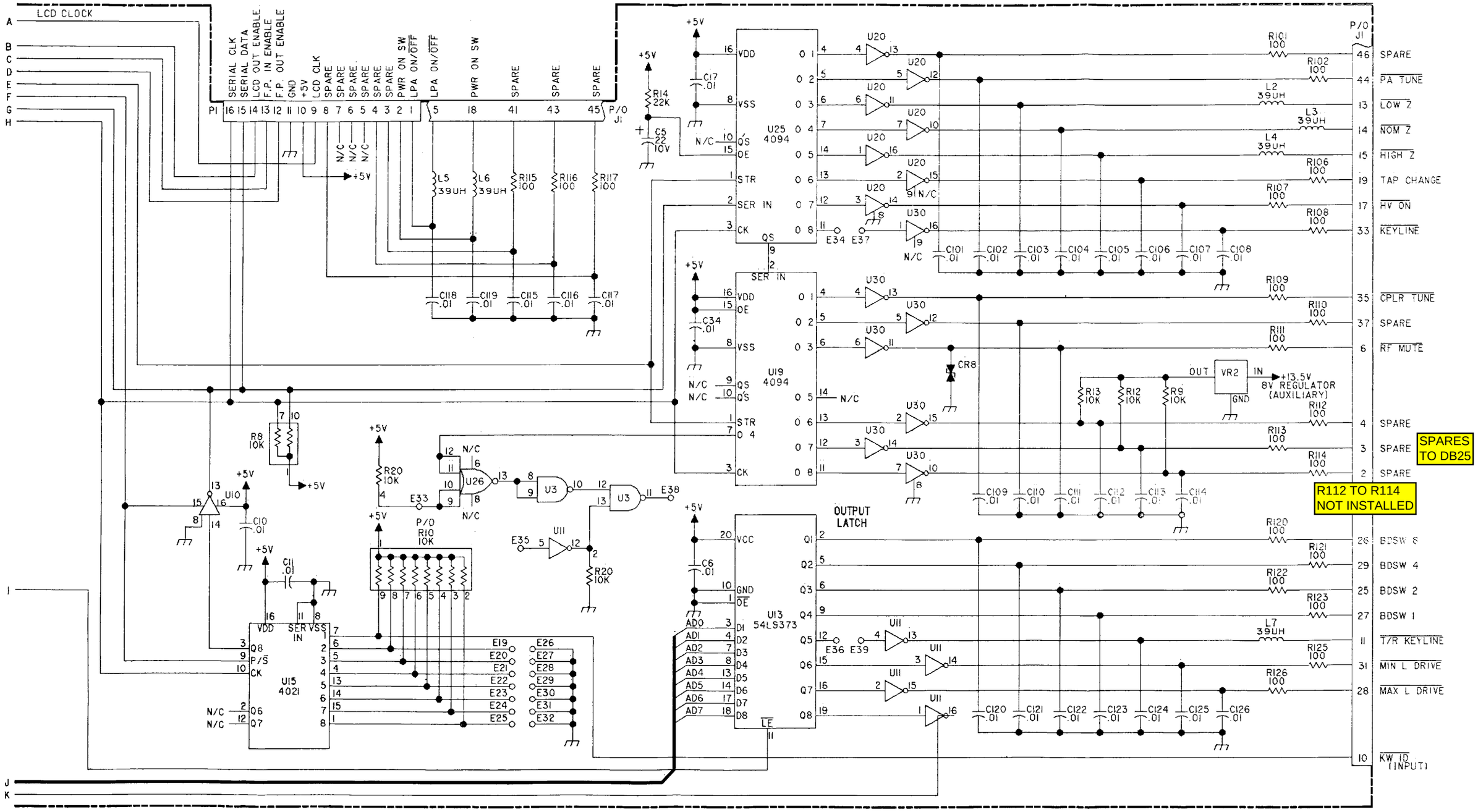




FO-9. Micro Control PWB Assy, A6 (Sheet 1 of 3)



FO-9. Micro Control PWB Assy, A6 (Sheet 2 of 3)



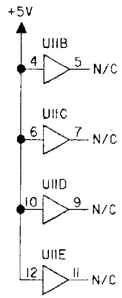
FO-9. Micro Control PWB Assy, A6 (Sheet 3 of 3)

NOTE: UNLESS OTHERWISE SPECIFIED:

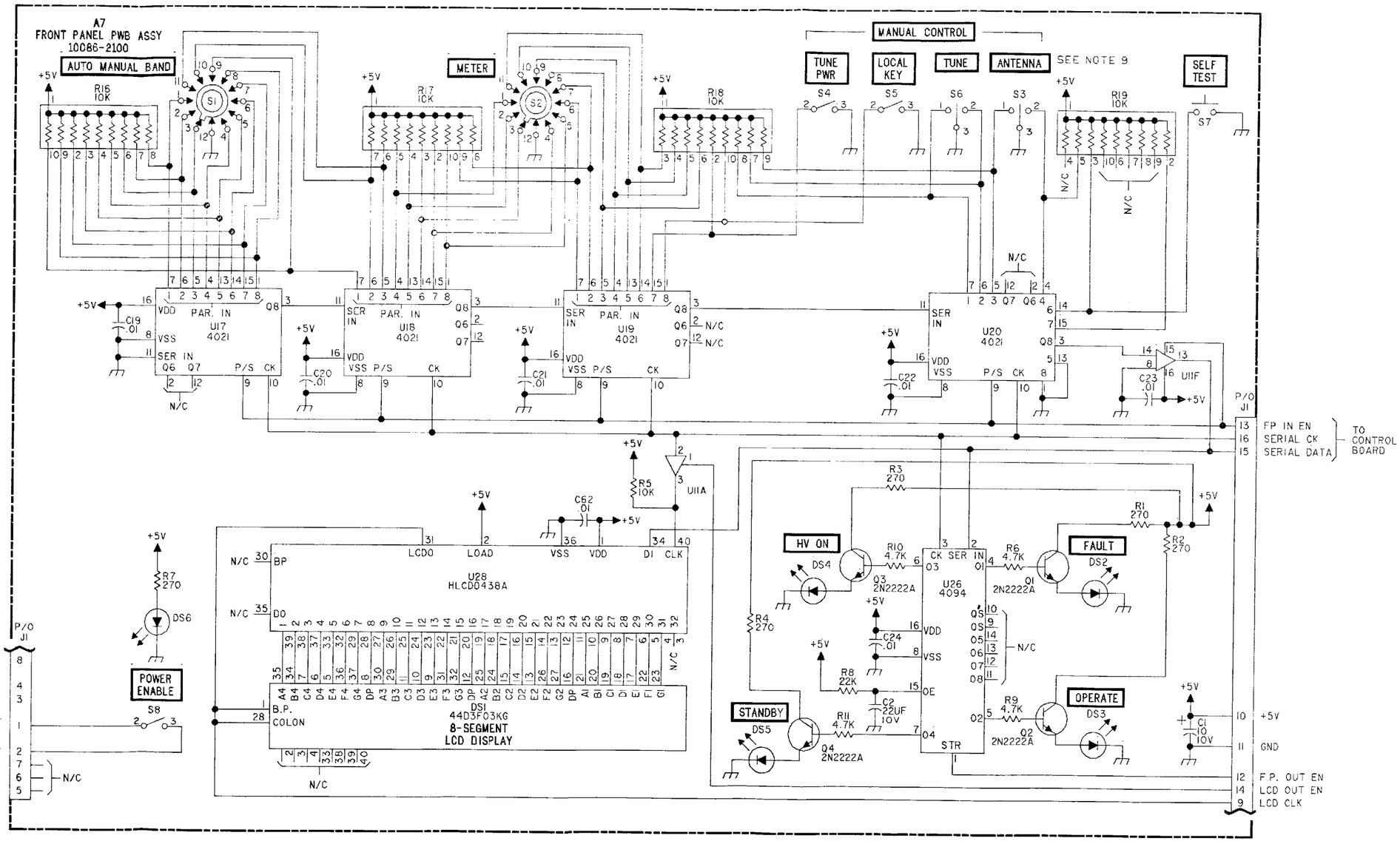
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
C62	CR5	DS1	J1	Q4
R19	S9	U28		
REFERENCE DESIGNATIONS NOT USED				
C2-18	C25-61	R8	R13-15	U1-10
U12-16	U21-25	U27		

UNUSED GATES



9. S3 **ANTENNA** SWITCH IS NOT USED ON 10086-2100 ASSY. IT IS PRESENT ON 10087-2100.



FO-10. Front Panel PWB Assy, A7A1

NOTE: UNLESS OTHERWISE SPECIFIED:

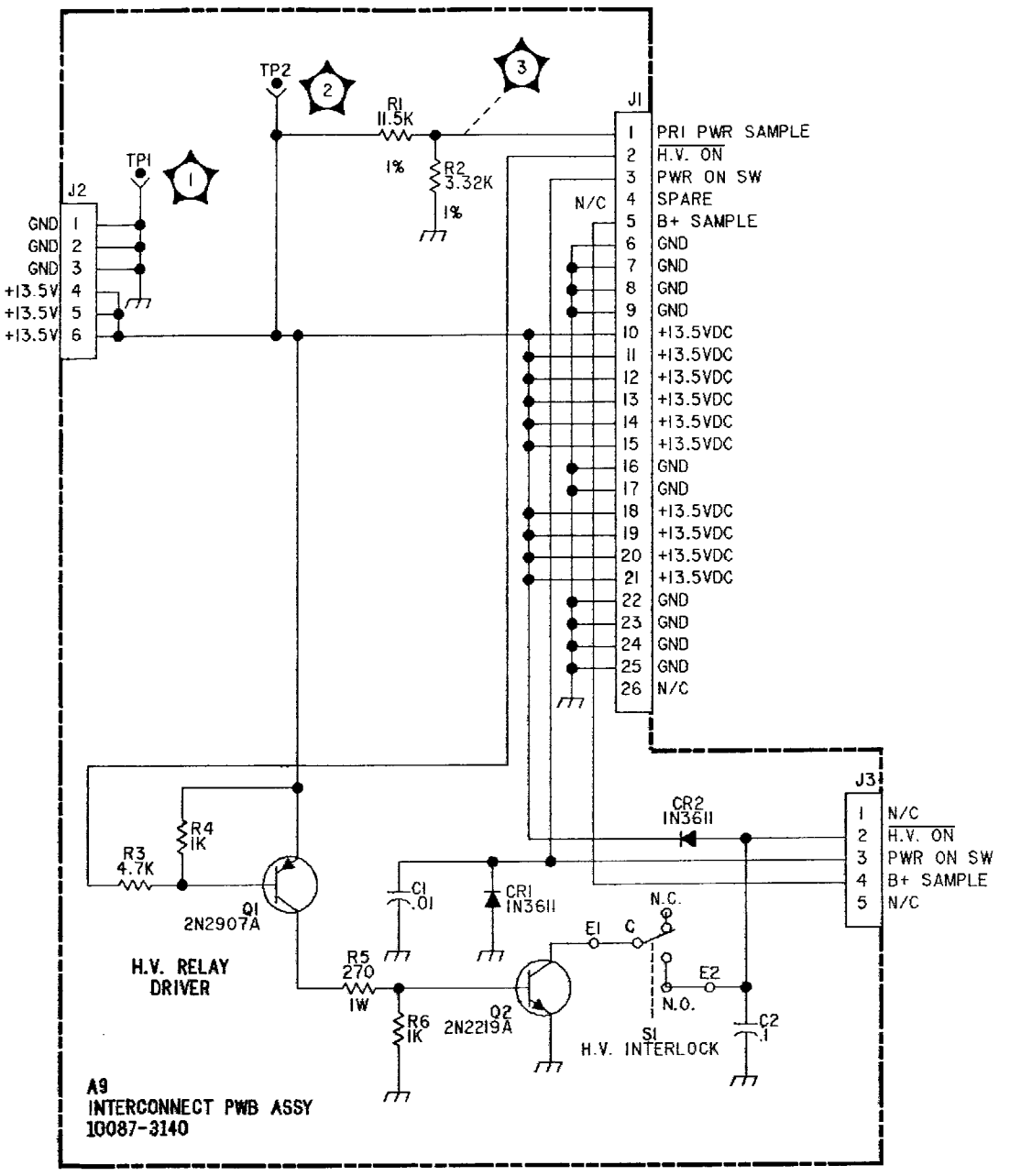
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (UF).
4. ALL INDUCTANCE VALUES ARE IN MILLIHENRIES (MH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION				
J3	Q2	R6	TP2	
REFERENCE DESIGNATIONS NOT USED				

(1) 0V

(2) 13.5V

(3) 3.0V ≡ 13.5V



FO-11. Interconnect PWB Assy, A9