PUBLICATION NUMBER: 10208-5033
AUGUST 1987

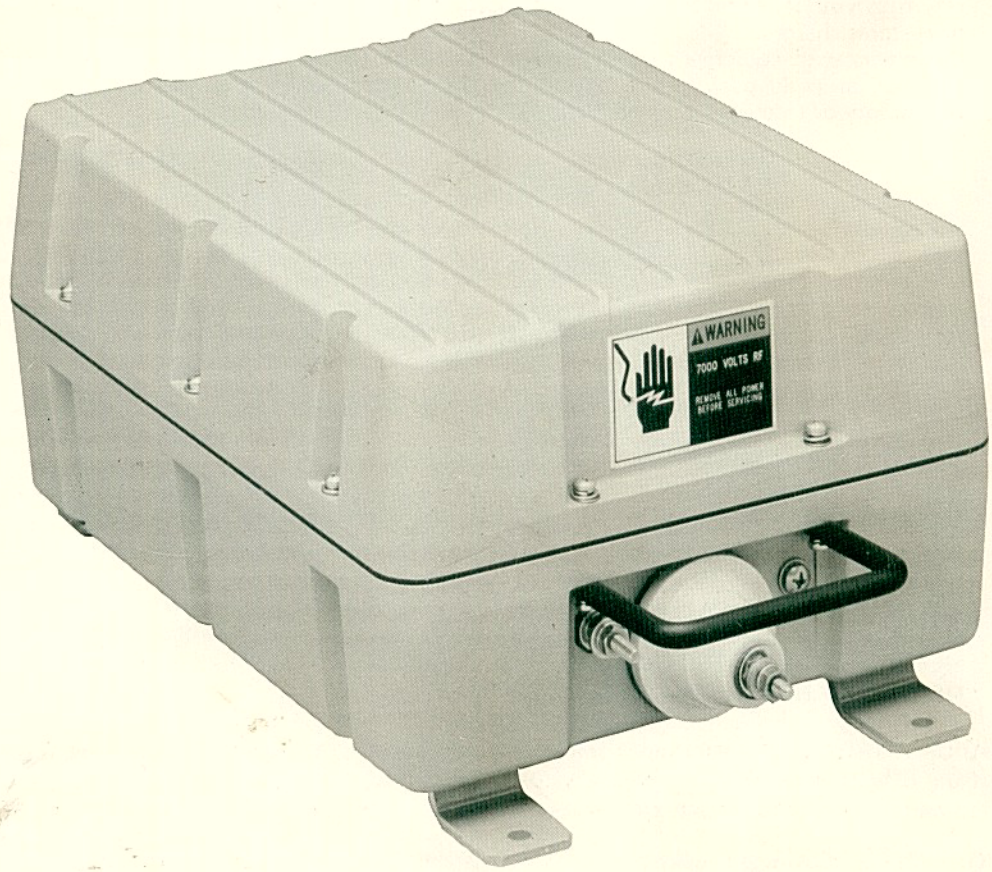
HARRIS

RF COMMUNICATIONS

CU-2397/G

FAST TUNE AUTOMATIC ANTENNA COUPLER

INSTRUCTION MANUAL



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CU-2397/G

FAST TUNE AUTOMATIC ANTENNA COUPLER

INSTRUCTION MANUAL

HARRIS

HARRIS CORPORATION RF COMMUNICATIONS GROUP
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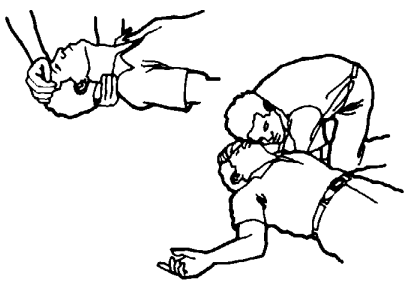
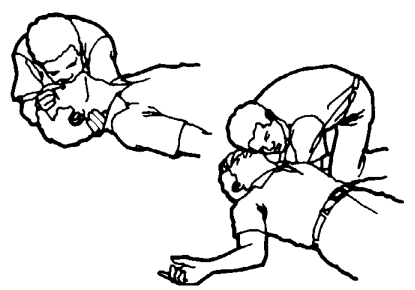
Equipment manufactured by Harris Corporation, RF Communications Group meets stringent quality and safety standards. However, high voltages are present in many radio products, and only a skilled technician should attempt to remove outer covers and make adjustments or repairs. All personnel who operate and maintain the equipment should be familiar with this page as a safety preparedness measure. Although this procedure is reproduced as a service to the personnel involved with this equipment, Harris Corporation assumes no liability regarding any injuries incurred during the operation and repair of such equipment, or the administration of this suggested procedure.

ELECTRICAL SHOCK: EMERGENCY PROCEDURE

The victim will appear unconscious and may not be breathing. If the victim is still in contact with the voltage source, disconnect the power source in a manner safe to you, or remove the victim from the source with an insulated aid (wooden pole or rope). Next, determine if the victim is breathing and has a pulse. If there is a pulse but no breathing, administer artificial respiration. If there is no pulse and no breathing, perform CPR (if you have been trained to do so). If you have not been trained to perform CPR, administer artificial respiration anyway. Never give fluids to an unconscious person.

WHEN BREATHING STOPS





FIRST, send someone to get a **DOCTOR**.
THEN, administer first aid to restore breathing (artificial respiration):

1 IF A VICTIM APPEARS TO BE UNCONSCIOUS
TAP VICTIM ON THE SHOULDER AND SHOUT, "ARE YOU OKAY?"

2 IF THERE IS NO RESPONSE
TILT THE VICTIM'S HEAD, CHIN POINTING UP. Place one hand under the victim's neck and gently lift. At the same time, push with the other hand on the victim's forehead. This will move the tongue away from the back of the throat to open the airway.

IMMEDIATELY LOOK, LISTEN, AND FEEL FOR AIR.
While maintaining the backward head tilt position, place your cheek and ear close to the victim's mouth and nose. Look for the chest to rise and fall while you listen and feel for the return of air. Check for about five seconds.

3 IF THE VICTIM IS NOT BREATHING
GIVE FOUR QUICK BREATHS.
Maintain the backward head tilt, pinch the victim's nose with the hand that is on the victim's forehead to prevent leakage of air, open your mouth wide, take a deep breath, seal your mouth around the victim's mouth, and blow into the victim's mouth with four quick but full breaths just as fast as you can. When blowing, use only enough time between breaths to lift your head slightly for better inhalation.

If you do not get an air exchange when you blow, it may help to reposition the head and try again.

AGAIN, LOOK, LISTEN, AND FEEL FOR AIR EXCHANGE.

4 IF THERE IS STILL NO BREATHING
CHANGE RATE TO ONE BREATH EVERY FIVE SECONDS.

For more information about these and other life-saving techniques, contact your Red Cross chapter for training.
"When Breathing Stops" reproduced with permission from an American Red Cross Poster

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SPECIFICATIONS

Rated RF Input Power, Frequency Range, and Tuning Capability:	**Up to 500 watts PEP, 250 watts average*:** 1.5 to 30 MHz: 75 to 150 ft. long-wires (long-wires longer than 75 feet require 1960-3006 Long-Wire Adapter), 40 to 100 ft. dipoles (including RF-1912 and AS-2259/GR). 2.5 to 30 MHz: 35 ft. whips 4 to 30 MHz: 24 ft. whips 6 to 30 MHz: 15 ft. whips **Up to 150 watts PEP and average**: 1.5 to 30** MHz: 9 to 35 ft. whips, 35 to 150 ft. long-wires (long-wires longer than 75 ft. require 1960-3006 Long-Wire Adapter), 40 to 100 ft. dipoles (including RF-1912 and AS-2259/GR).
Tuning Accuracy:	Automatically tunes to 50 ohms to within a VSWR of 1.5:1.
Tuning Time:	25 milliseconds tuning from memory based on prior tuneup of typically less than 1 second (4 seconds maximum).
Efficiency:	**Whips:** 1.5 to 4 MHz, 15 to 85%; 4 to 30 MHz, 50 to 95% **Long-wires and Dipoles:** 1.5 to 30 MHz, 60 to 95%
Features:	Protection from high VSWR, high temperature, RF overvoltage and overcurrent; Built-In Test; automatic and manually-controlled receive bypass; 25 ms tune time; 10 to 32 Vdc primary power; lightning surge protection on all control lines; 512-channel memory.
Tune Power Requirements:	10 to 50 watts forward power throughout tuning cycle.
Primary Power Requirements:	10 to 32 Vdc at 2.5 A maximum during tuning; 1.5 A maximum after tuning.
Remote Capability:	Up to 250 ft. separation between transmitter and coupler.
Enclosure Design:	Submersible to 3ft. (.9m) of water, designed for exposed installations.

* CU-2397/G operating with RT-1446/URC Transceiver and AM-7223/URC 500 W LPA
** CU-2397/G operating with RT-1446/URC Transceiver without AM-7223/URC LPA

SPECIFICATIONS (Cont.)

Weight:	29 pounds (13.2 kg).
Size:	7.5 x 11.1 x 18.5 inches (19.1 x 28.2 x 47.0 cm) including projections. 6.6 x 11.7 x 15.1 inches (16.8 x 28.2 x 38.4 cm) excluding projections. Four mounting holes dimensions: 7.25 x 14.85 inches (18.4 x 37.7 cm).
Operating Temperature Range:	-28°C to + 65°C (-18°F to + 150°F).
Control Lines:	Keyline, Key Disable, Tune Power Request, Fault and Thermal Fault Retune Pulse, Bypass.
Accessories Supplied:	Type N RF coaxial mating connector, control cable mating connector, cable installation material, coupler mounting hardware, installation material, and instruction manual.
VIBRATION	
MIL-STD-810D:	Method 514.3, category 8, test procedure 1-3.2.10 (random vibration) for ground mobile equipment.
MIL-STD-810B:	Method 514, procedure VIII, curve Y except 5 to 55 Hz and .15 inches D.A. or 3.5 G, whichever is less.
MIL-STD-167-1:	Type I for shipboard equipment.
SHOCK	
MIL-STD-810D:	Method 516.3, procedure I (functional shock) for ground mobile equipment (40 G, 11 ms sawtooth); procedure VI (bench handling shock) for equipment experiencing bench-type maintenance.
Temperature:	MIL-STD-810D, Method 501.2, procedures I and II (storage at 70°C and operation at 65°C); Method 502.2, procedures I and II (storage and operation at -40°C).
Humidity:	MIL-STD-810D; Method 507.2, procedure II (0 to 100% relative humidity at 65°C).
Altitude:	MIL-STD-810D; Method 500.2, procedures I and II (storage and operating to 15,000 ft.)
Salt Fog:	MIL-STD-810D; Method 509.2, procedure I (5% salt solution).

SPECIFICATIONS (Cont.)

Dust:	MIL-STD-810D; Method 510.2, procedures I and II (blowing dust and sand).
Rain:	MIL-STD-810D; Method 506.2, procedure I (blowing rain).
Leakage:	MIL-STD-810D; Method 512.2, procedure I (basic leakage-immersion).
Options:	Navy gray, or olive drab exterior finish. 1960-3006 Long-wire Adapter
Accessories:	RF-2066 Antenna Base Plate Kit RF-285-04 Mounting Tray RF-382-02/SSK, Site Spares Kit RF-382/ARK, Assembly Repair Kit RF-382/MRK-24, Maintenance Repair Kit RF-636 Dry Air Pump RF-628 Dry Nitrogen Kit

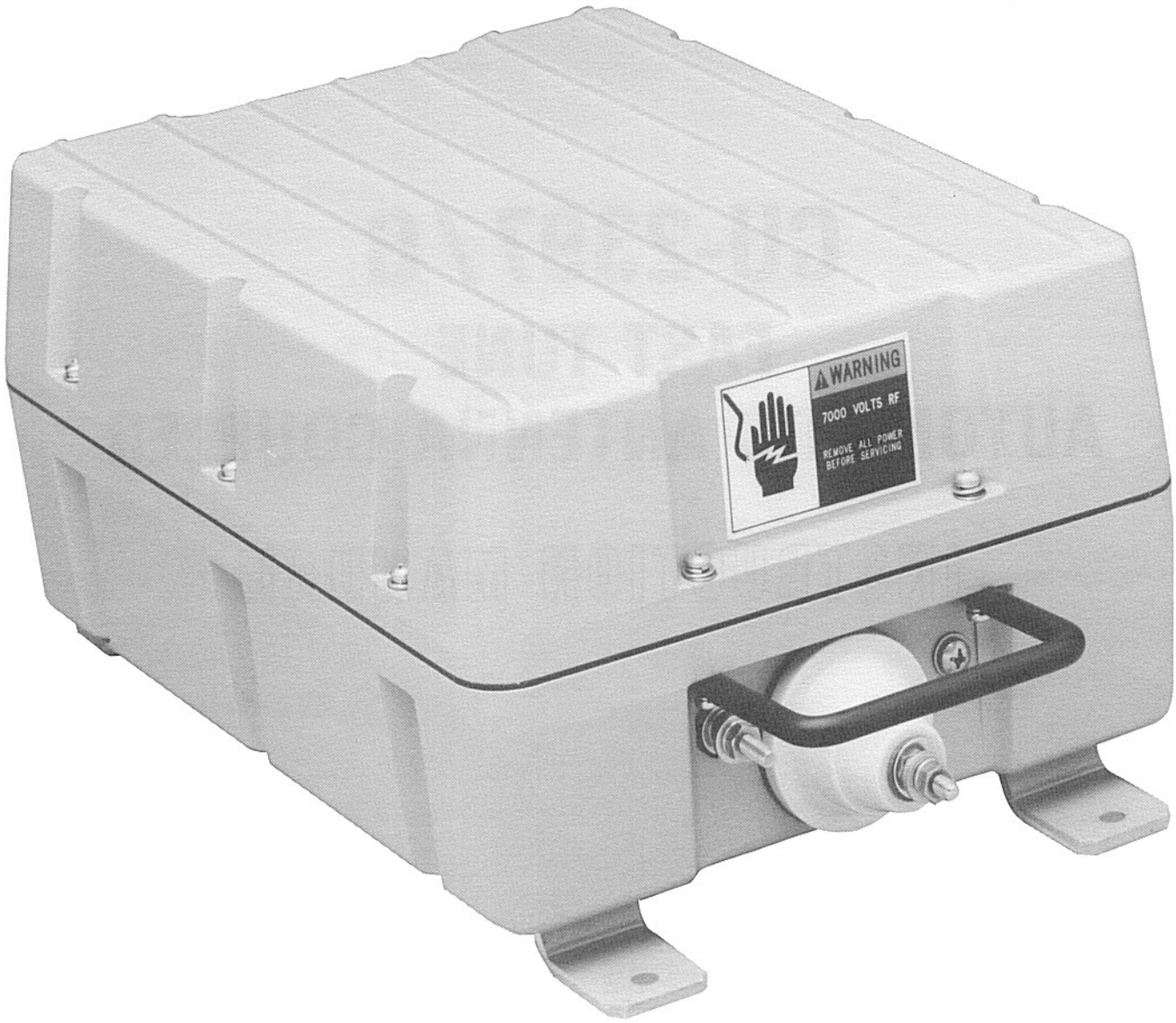
ABOUT THIS MANUAL

This manual provides comprehensive user information for the CU-2397/G Fast Tune Automatic Antenna Coupler. The blue tab sections provide instructions on how to install, operate, maintain, and troubleshoot the coupler. The white tab sections contain parts lists, component location drawings, and schematic diagrams for the individual assemblies of the coupler.

CU-2397/G

FAST TUNE
AUTOMATIC ANTENNA COUPLER

INSTRUCTION MANUAL



CU-2397/G Fast Tune Automatic Antenna Coupler

SECTION 1

GENERAL INFORMATION

1.1 GENERAL DESCRIPTION

The CU-2397/G Fast Tune Automatic Antenna Coupler matches the output of 125-watt and 500-watt transceivers to a wide variety of whip, dipole, and long-wire antennas. Network tuning and monitoring is automatic, eliminating operator intervention. The CU-2397/G is compatible with the RF-7100 series AUTOLINK® Adaptive Communications Systems.

A Built-In Test Equipment (BITE) feature utilizes more than forty LED indicators to provide status of major circuit functions. Four of these indicators illuminate in a binary-coded format to supply microprocessor-based failure analysis. Common screwdrivers are the only tools needed to disassemble the unit. Access to component assemblies does not require the use of card extenders.

1.2 FEATURES

The CU-2397/G incorporates many unique features, including:

- Fully automatic operation
- Fast tuning (25 msec) from memory
- Low probability of intercept (LPI) during tuning
- 500 W peak envelope power (PEP) rating (250 W average)
- Automatic protection to prevent unsafe operation
- Rugged construction that meets ground mobile and shipboard specifications
- Lightning surge protection
- BITE routine that eliminates need for test equipment down to module level
- 512-channel memory tune capability

Refer to the specifications page in the front of this manual for details.

1.3 PHYSICAL DATA

The coupler, including its projections, measures 7.5 x 11.1 x 18.5 inches (19.1 x 28.2 x 47.0 cm) and weighs approximately 29 pounds (13.2 kg). A rectangular enclosure that would enclose the coupler, including all of its projections, would have a volume of 0.891 cubic feet (0.025 cubic meters).

1.4 POWER REQUIREMENTS

The coupler requires + 10 to + 32 Vdc at 2.5 amperes maximum during tuning, 1.5 amperes maximum after tuning. Primary power for the coupler is provided by the transceiver via the control cable.

1.5 ENVIRONMENTAL REQUIREMENTS

The coupler is designed for use in exposed installations. Refer to the table of specifications for detailed environmental specifications.

1.6 ANCILLARY ITEMS AND OTHER ITEMS FURNISHED

The standard ancillary package includes an instruction manual and all necessary installation materials, including coupler mounting hardware. Because of the indeterminate cable lengths required for the control and RF cables, only the mating hardware is furnished. The cables must be ordered separately (see table 1-1) or fabricated during installation. Refer to the Installation section for cable fabrication procedures.

1.7 ACCESSORIES AND OPTIONS

1.7.1 Interconnecting Cables

Interconnecting cables for the CU-2397/G may be ordered from the factory or fabricated by the user. Refer to table 1-1 for part numbers of interconnecting cables.

Table 1-1. Interconnecting Cables for CU-2397/G Antenna Coupler

Part Number	Description
10085-0132	**RT-1446/URC to CU-2397/G Control Cable Assembly** - Preassembled control cable manufactured to a length of up to 150 feet (46 m). It consists of 19- conductor cable PN 755017A9036, with connectors attached to interconnect the RT-1446/URC with the CU-2397/G
10085-0134	**CU-2397/G Coaxial Cable Assembly** - Preassembled coaxial cable manufactured to a length (up to 250 ft [76 m]) specified by the customer. It consists of RG-213/U coaxial cable with UG-21B/U connectors on each end. This assembly is for RF interconnection with the RT-1446/URC Transceiver or AM-7223/URC 500-watt Power Amplifier
755017A9036	**19-Conductor Control Cable** - Mates with connectors supplied in ancillary kit. Black neopreme abrasion-proof outer jacketed cable has nineteen #22 AWG conductors and an overall braided shield. Temperature rating is -55 to + 65°C (-67 to + 150°F). Cable size is 0.5 inches (1.27 cm) outside diameter. Refer to section 2 for cable fabrication procedure.
RG-213/U	**50-Ohm Coaxial Cable** - Mates with connectors supplied. Recommended for lengths up to 250 feet (76 m).

1.7.2 Accessories

Accessories for the CU-2397/G are listed in table 1-2.

1.7.3 Spares Kits

Spares kits for the CU-2397/G are described in table 1-3.

Table 1-2. Accessories for CU-2397/G Antenna Coupler

Model Number	Description
RF-285-04	**Antenna Coupler Mounting Tray** - Provides a solid mounting surface, and simplifies mounting and removal of coupler. Recommended for vehicular and bulkhead installations.
RF-2066	**Antenna Base Plate Kit** - Provides a base, ground stakes, guy ropes, and counterpoise wire for field-mounting of the coupler with any of the following antennas: SB- V16A, SB-V16C, SB-V35A, or SB-V35C.
1960-3006	**Long-wire Adapter** - Used with 75 to 150 foot (22.9 to 45.7 m) long- wire antennas.
RF-636	**Dry Air Pump** - Hand pump recommended for pressurization of CU-2397/G coupler when dry nitrogen pressurization equipment is not available (see section 5.4).
RF-628	**Dry Nitrogen Kit** - For inert gas pressurization of CU-2397/G coupler (see section 5.4).

NOTE

Since provisioning has not been provided for the CU-2397/G, the following commercial spares kits are recommended.

Table 1-3. Spares Kits for CU-2397/G Antenna Coupler

Model Number	Description
RF-382-02/SSK	**RF-382 Site Spares Kit** - The RF-382-02 SSK includes a complete set of PWB assemblies for the coupler. Each SSK will generally support up to five pieces of equipment for a period of two to four years.
RF-382/ARK	**RF-382 Assembly Repair Kit** - The RF-382 ARK contains all parts required to repair defective assemblies or subassemblies. It supplements the Site Spares Kit to allow replaced assemblies to be repaired as time permits either at the equipment site or at a special depot facility. This kit can be properly utilized only with a well-equipped service shop and qualified technicians. Each ARK will generally support an SSK for a period of two to four years.
RF-382/MRK-24	**RF-382 Maintenance Repair Kit** - The RF-382/MRK-24 includes special items required for maintaining the coupler. (See section 5.2).

1.8 TACTICAL OPERATING CONSIDERATIONS

1.8.1 Tactical Security

An antenna is a potential target in many tactical operating situations. Vulnerability can be minimized by locating the radiating antenna away from the operating location. The coupler and antenna may be located up to 250 feet (76.2 m) from the transceiver.

1.8.2 Low Probability of Intercept (LPI)

When the transmitter is keyed, after selecting a new frequency or channel, tuning occurs within 25 milliseconds, using previously stored tuning information. This minimal on-the-air tuning time greatly reduces probability of intercept.

1.9 REQUIRED TOOLS AND TEST EQUIPMENT

The coupler is designed for complete disassembly using only common screwdrivers. There are no moving parts that require routine maintenance. Built-in test features eliminate the need for special test equipment. A high-impedance digital voltmeter is the only test equipment required for alignment of the coupler.

1.10 PREPARATION FOR USE AND STORAGE

Unpacking, inspection, setup, and checkout instructions are given in the Installation section of this manual.

1.11 WARRANTY INFORMATION

Unless otherwise specified, this product is covered by the standard Harris Corporation, RF Communications Group limited one-year warranty as printed on the back of the front cover of this manual.

SECTION 2

INSTALLATION

2.1 GENERAL INFORMATION

This section contains the following information necessary to install and verify the operation of the coupler:

- Unpacking and Inspection
- Items Required for Installation
- Mounting the Coupler
- Cable Fabrication and Installation
- Grounding
- Environmental Protection
- Initial Adjustments

2.2 UNPACKING AND INSPECTION

The coupler is packed in a corrugated cardboard box for shipment as shown in figure 2-1. A two-piece foam enclosure protects the equipment from rough handling.

2.2.1 External Inspection

When the unit is received, carefully inspect the exterior of the box for signs of rough handling, weather damage, or tampering. Note and report abnormalities. A sticker on the container provides additional instructions.

2.2.2 Inspecting for Completeness

A sharp knife will be required to cut through the reinforced strapping tape. Keep the packing carton, together with the packing material, for possible future use. Remove the equipment from the box and, using the packing list in the ancillary package, inspect for completeness.

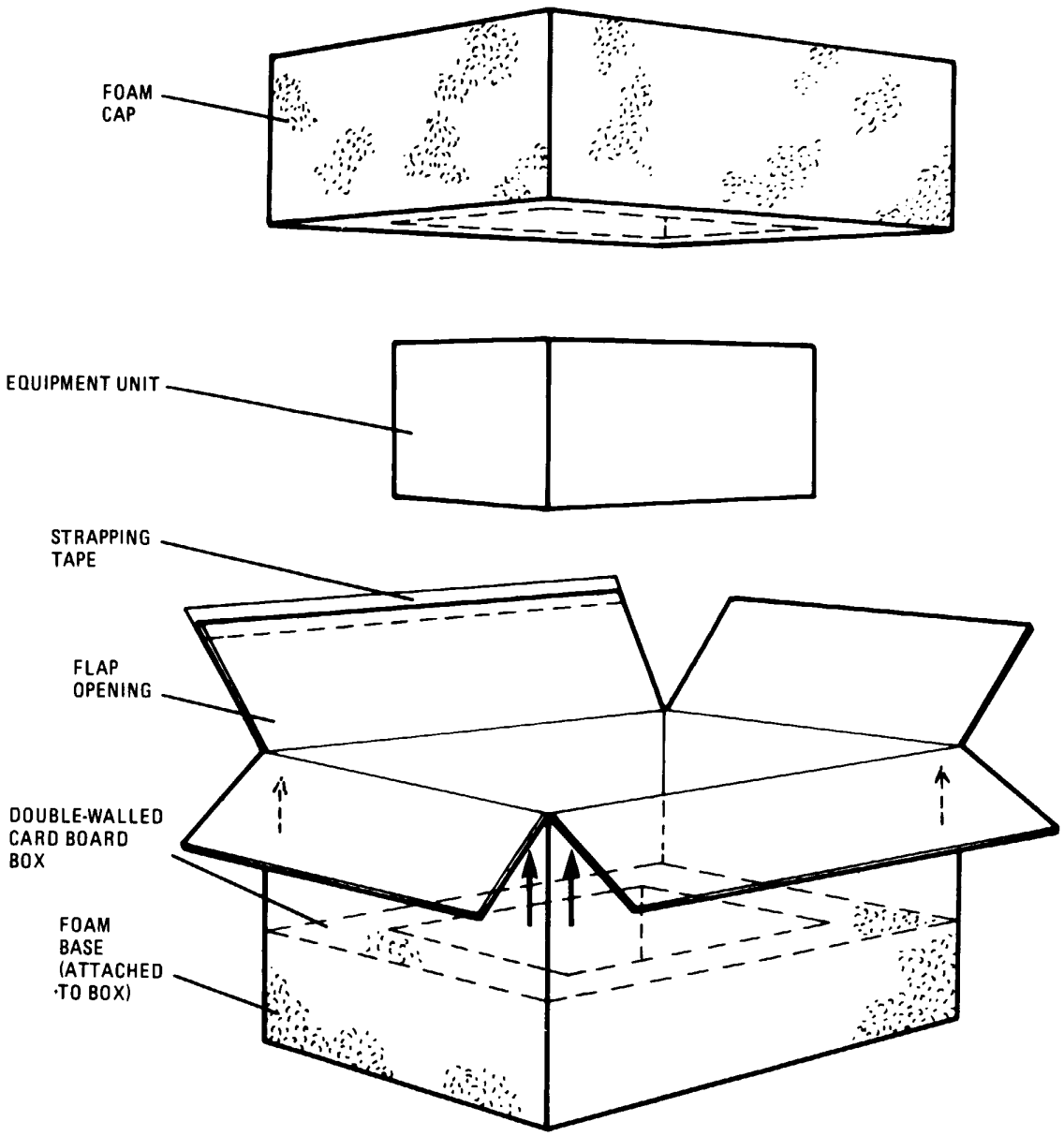
2.2.3 Inspecting for Proper Setup

Couplers are tested and set up for the intended service prior to shipment and do not require setup during installation.

2.3 ITEMS REQUIRED FOR INSTALLATION

2.3.1 Ancillary Kit

The items included in the ancillary kit are listed in table 2-1.



UNPACKING PROCEDURE

1. PLACE BOX ON FLOOR WITH ARROWS MARKED ON EACH SIDE POINTING UP.
2. CUT TAPE ON TOP OF BOX AND REMOVE FOAM CAP FROM BOX.
3. LIFT EQUIPMENT UNIT OUT OF BOX.
4. SAVE BOX AND FOAM CAP FOR RESHIPMENT.

382-001

Figure 2-1. Unpacking the Equipment

Table 2-1. CU-2397/G Ancillary Kit

Qty	Part Number	Description	Purpose
1	10075-1041	Connector, 14-pin	Mates with coupler control connector J2
1	MS35307-12A	Sleeve	See control cable fabrication procedure
1 ft	E50-0002-005	Tubing, Shrink, 3/16"	See control cable fabrication procedure
1 ft	E50-0002-008	Tubing, Shrink, 1/2"	See control cable fabrication procedure
3	F-0016	Fuse, 6.0 A	Spare for A7F1
8	MS15795-812	Flat washer, 5/16	For fastening coupler to mounting surface
4	MS35307-333	Screw, Hex, 5/16-18x7/8	For fastening coupler to mounting surface
4	MS35338-140	Lock washer, 5/16	For fastening coupler to mounting surface
4	MS35649-2314	Nut, Hex, 5/16-18	For fastening coupler to mounting surface
2 ft	W10-0008-222	Wire, Insulated, No.18, Red	See control cable fabrication procedure
1	UG-21D/U	Connector, Type N Male	Mates with coupler RF connector J1
1 ft.	W10-0006-000	Wire, Insulated No. 22, Black	See control cable fabrication procedure
1	10208-0009	Ground Strap	For making ground connection
1	10208-1006	Warning Label	For warning personnel of high voltage danger (affix near coupler antenna connection)
2	E59-0003-020	Lug, Ring, 1/4	For making antenna connection

2.3.2 Interconnecting Cables

The coupler control and RF cables may be ordered from the factory or fabricated by the user during installation. Part numbers for preassembled cables are listed in section 1. Specify the desired length when ordering.

If interconnecting cables will be fabricated during installation, use RG-213/U coaxial cable (part number W-0010) for the RF cable, and 19-conductor cable (part number 755017A9036) for the control cable. Mating connectors are supplied in the transceiver and coupler ancillary kits. Refer to paragraph 2.5 for cable fabrication procedures.

Since the CU-2397/G is a direct replacement for the CU-2310/URC Antenna Coupler, existing cables may be used if the maximum length detailed in table 2-2 is not exceeded.

Table 2-2. Maximum Length of Interconnecting Cables

Part Number	Description	Maximum Length
10085-0312	RT-1446/URC to CU-2397/G Control Cable	150 ft (46 m)
10085-0134	CU-2397/G RF Cable	250 ft (76 m)

2.4 MOUNTING THE COUPLER

The coupler can be mounted directly to a ship's bulkhead, an antenna mast, a vehicle frame, or to any other mechanically and electrically convenient surface. Mounting details are shown in figure 2-2. The coupler may also be installed on the RF-285-04 Rack Mount (optional) for increased mounting stability and ease of removal (see figure 2-2, detail A).

Contact a Harris field service representative for more complete antenna siting and selection information.

2.4.1 Fixed Station Installations

Fixed station installations allow a more versatile antenna selection over that of mobile installations; however, there are many factors that must be considered when making a selection. Select an antenna length of greater than one-tenth wavelength at the lowest operating frequency. Even though the coupler will operate with antennas as short as .014 wavelengths, antennas of greater than one-tenth wavelength will result in lower RF voltages and higher system RF efficiency.

Whip antenna lengths should not be much longer than five-eighths of a wavelength at the highest operating frequency. Even though the coupler will operate with antennas of much greater than five-eighths wavelength, longer antennas will exhibit radiation pattern lobes that may result in a deep null in the direction in which communication is being attempted.

A good ground system is necessary for optimum performance (see section 2.6).

2.4.1.1 Whip Antennas

Whip antennas are often used at fixed stations as backup antennas. Whip antennas often solve space problems and are also omnidirectional and exhibit low radiation-angle characteristics.When operating frequencies are high enough for the radiating element to represent a reasonable fraction of a wavelength, these antennas can be a good choice. Whip antennas are available with part numbers of SB-9V (B or C) through SB-V35 (B, C, or S).

Figure 2-3 shows a typical whip antenna installation at a fixed site.

2.4.1.2 Long-Wire Antenna Installations

The coupler should be mounted as close as possible to the base of the antenna for long-wire antenna installations. Refer to figure 2-4 for details and follow the same general instructions used for whip antenna installations.

2.4.2 Typical Vehicular Installation

Figure 2-5 shows a typical jeep installation. This same procedure can be used for any vehicular installation by making adjustments to fit the particular vehicle.

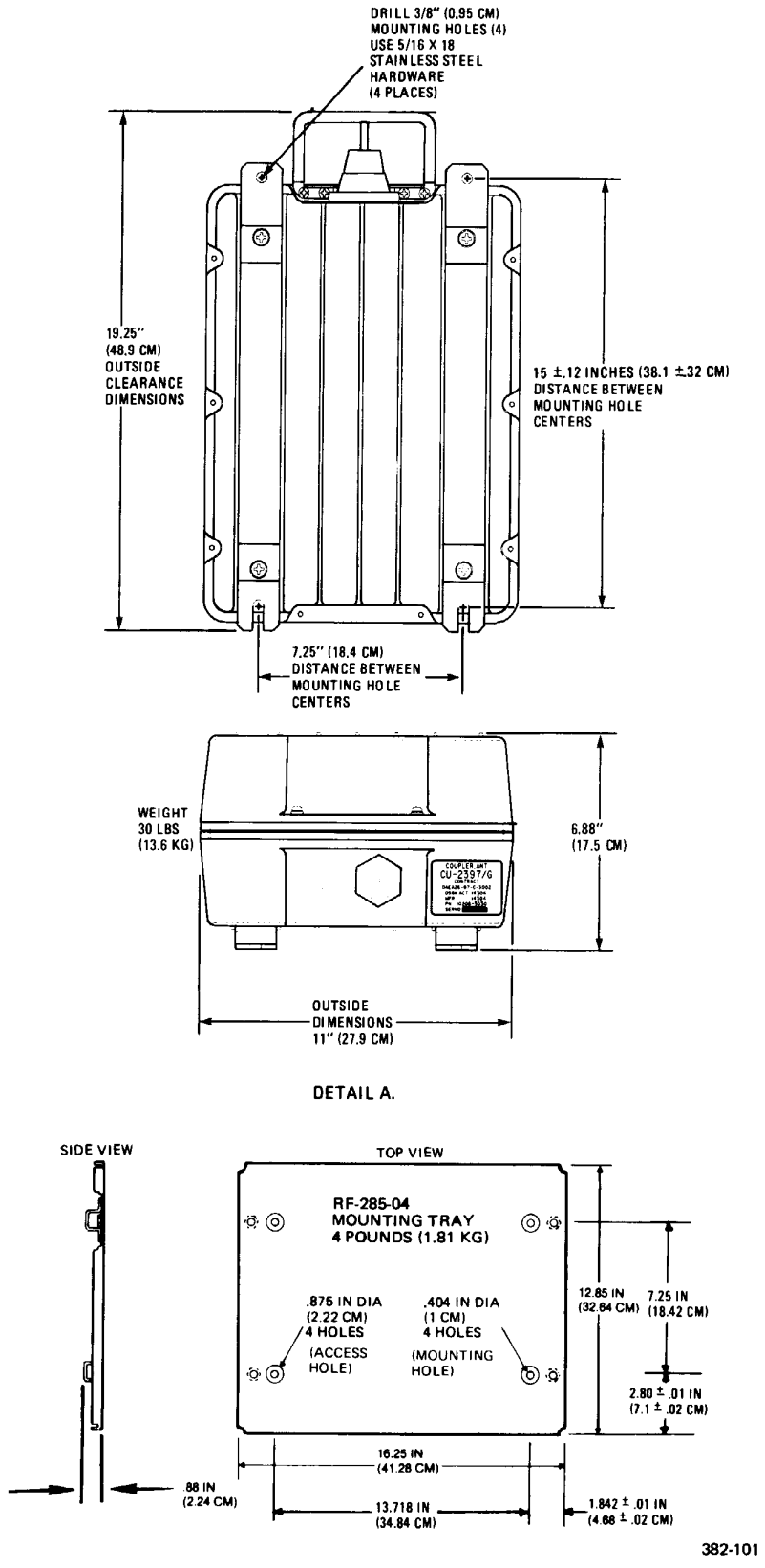


Figure 2-2. CU-2397/G Mounting Dimensions

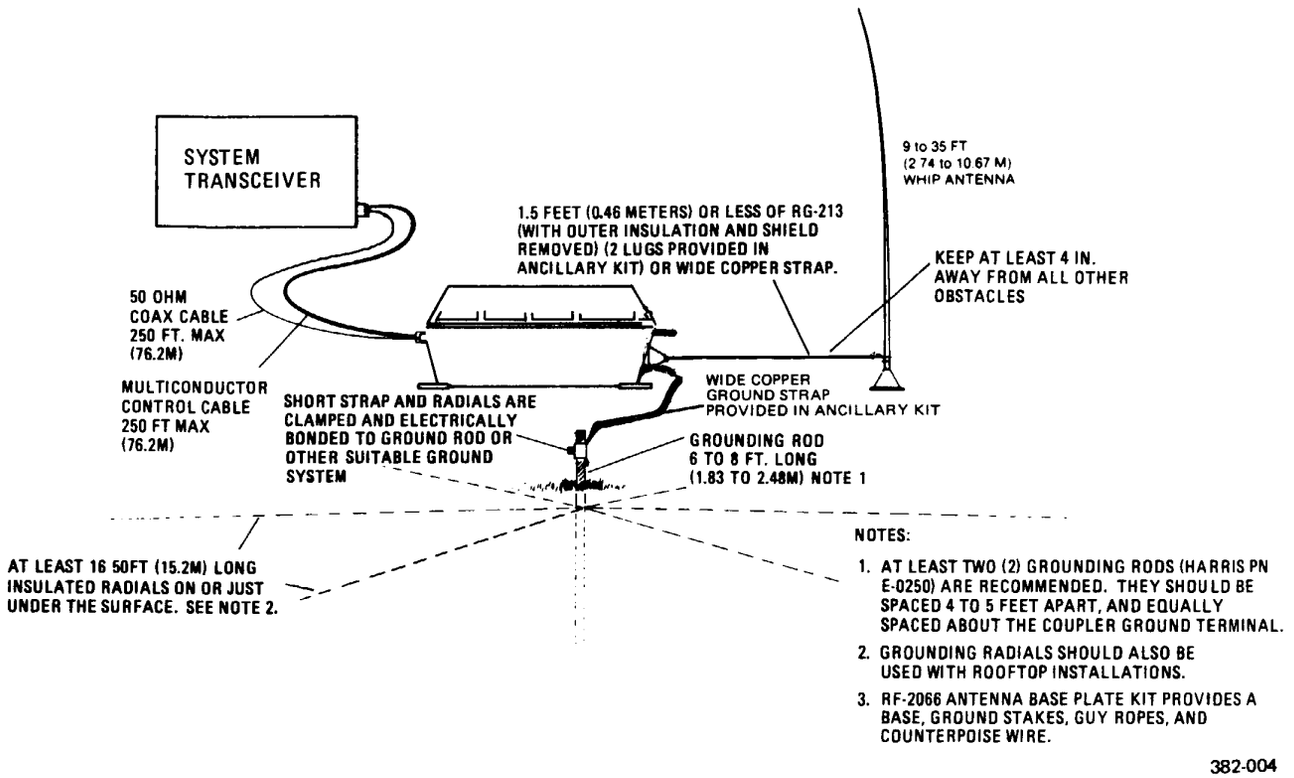


Figure 2-3. Typical Whip Antenna Installation

2.5 CABLE FABRICATION AND INSTALLATION

Figure 2-6 gives control cable interconnect information for the various system configurations.

2.5.1 RF Cable Fabrication

Refer to figure 2-7 for RF cable fabrication instructions. RG-213/U coaxial cable is recommended. Install the PL-259 or UG-21D/U connector (provided in the transceiver ancillary kit) on the transceiver end of the RF cable. Install the UG-21D/U connector (provided in the coupler ancillary kit) on the coupler end of the cable.

2.5.2 Control Cable Fabrication

Refer to figure 2-8 for control cable fabrication instructions. Mating connectors are provided in the transceiver and coupler ancillary kits.

2.6 GROUNDING

The coupler ground configuration is an integral part of the electrical antenna system. The importance of this ground to effective system operation cannot be overemphasized. Inadequate grounding will degrade system operation and cause RF voltages to be present on the chassis. These voltages could cause equipment damage and present a serious personnel hazard.

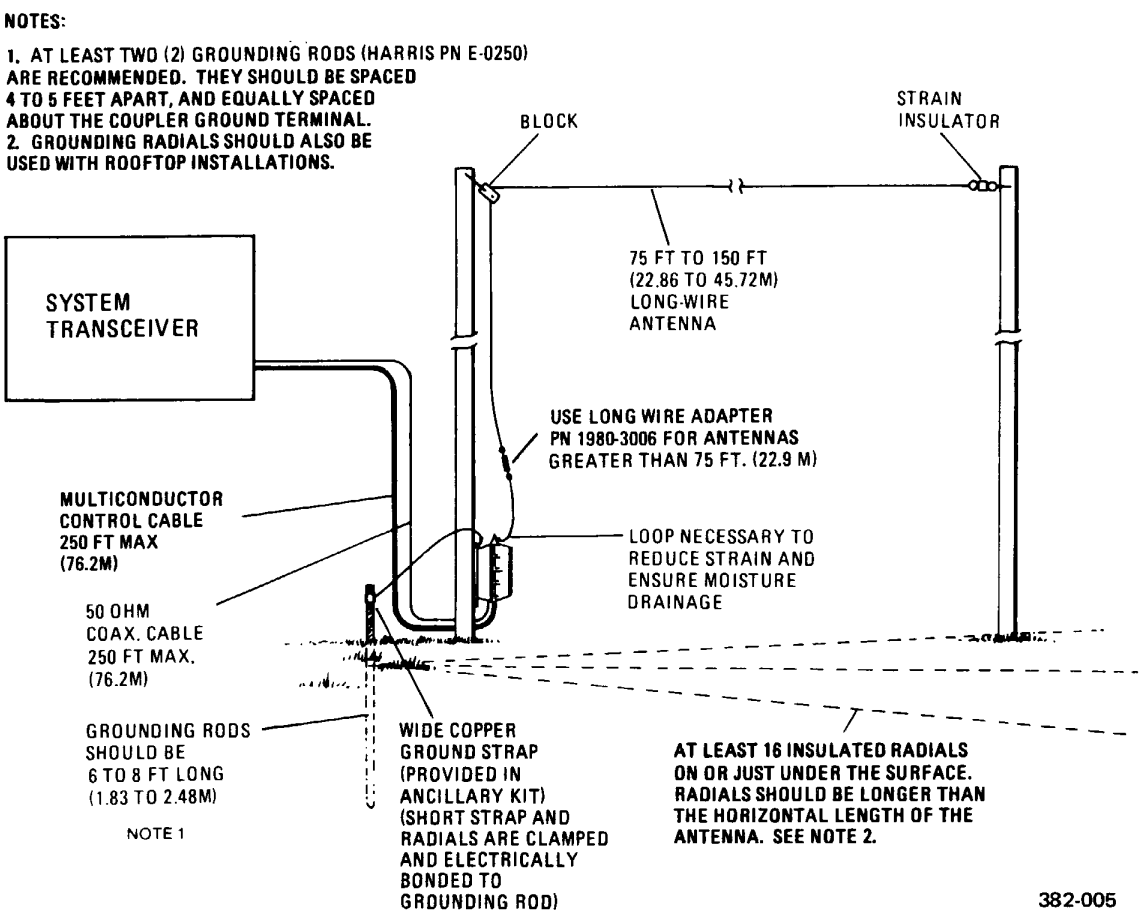


Figure 2-4. Typical Long-wire Antenna Installation

WARNING

Inadequate or defective grounding presents a personnel hazard that could result in serious injury or death.

CAUTION

Inadequate or defective grounding could damage the equipment.

Ground straps should be constructed of wide copper straps and be as short as possible. Ground straps should be clamped and bonded to at least two ground rods. The rods should be at least 6 to 8 feet (1.83 to 2.44 m.) long, and should be spaced 4 to 5 feet (1.22 to 1.52 m.) apart around the coupler ground terminal. If ground stakes cannot be used (e.g. roof installation or insufficient soil conductivity), a ground counterpoise must be constructed using at least 16 insulated ground radials, longer than the antenna. The radials should be laid on or just under the earth's surface and should be well-bonded to the ground rods.

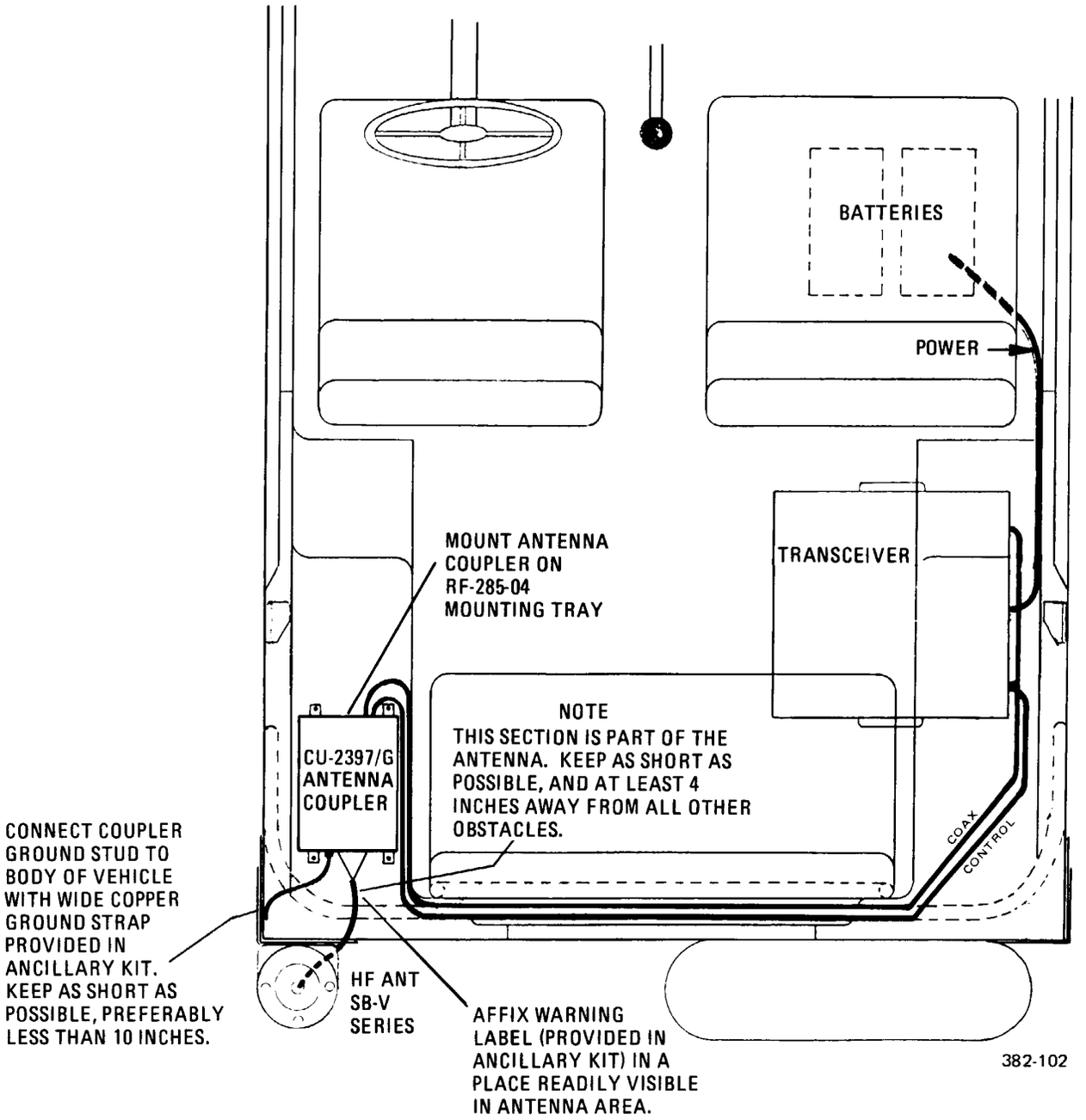
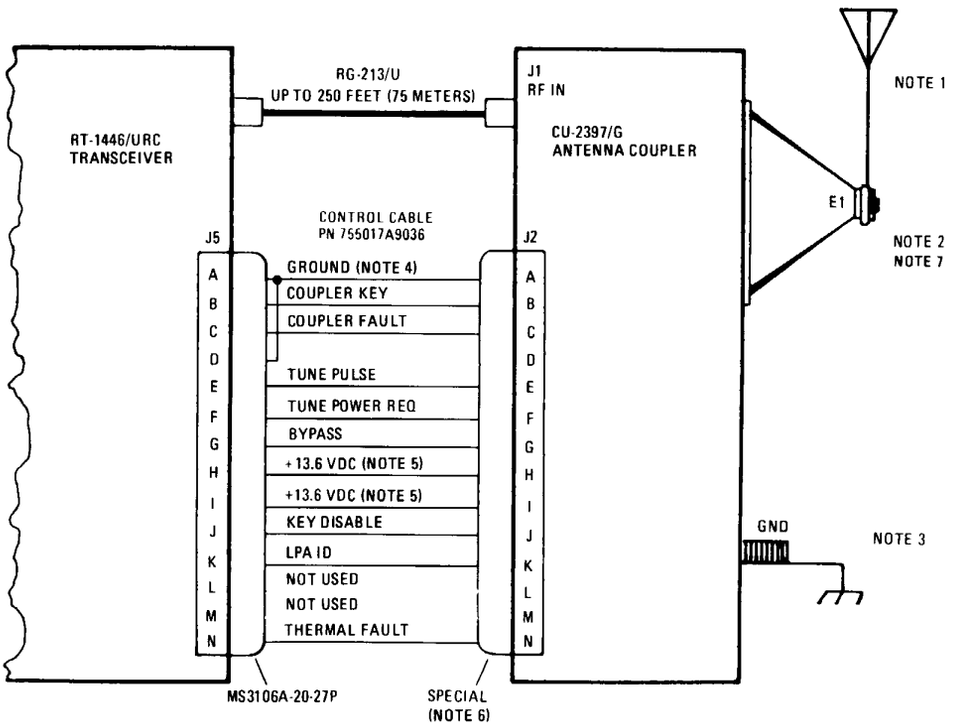


Figure 2-5. Typical Vehicular Installation



1. SEE SPECIFICATIONS PAGE FOR COMPATIBLE ANTENNA TYPES. FOR LONG-WIRE ANTENNAS GREATER THAN 75 FT, USE LONG-WIRE ADAPTER (PART NUMBER 1960-3006).
2. FOR DIPOLE OR LOG PERIODIC ANTENNAS, TERMINATE CENTER CONDUCTOR AT E1 AND SHIELD (OUTER CONNECTOR) AT GROUND LUG.
3. CONNECT GROUND STUD TO GOOD EARTH GROUND, SUITABLE COUNTERPOISE, OR SHIP'S GROUND PLATE AS APPROPRIATE.

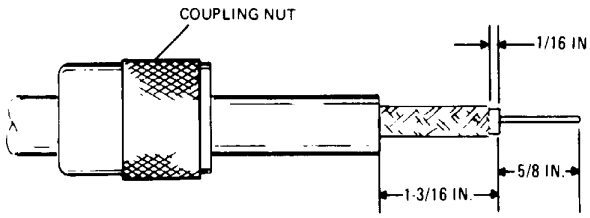
> WARNING
> MOUNTING FEET CANNOT BE USED
> AS A GROUND CONNECTION

4. GROUND CONSISTS OF SHIELD AND ONE WIRE CONNECTED AT BOTH ENDS OF CABLE.
5. CONNECT 2 WIRES IN PARALLEL FOR CABLE LENGTHS UP TO 150 FT. AND 4 WIRES IN PARALLEL UP TO 250 FT.
6. SPECIAL CONNECTOR IS SUPPLIED IN CU-2397/G ANCILLARY KIT. IT IS SIMILAR TO AN MS3106F20-27S EXCEPT WITH AN EXTENDER SHELL AND CABLE SEAL GLAND.
7. SEE SECTION 2, PARAGRAPH 2.7 FOR ENVIRONMENTAL PROTECTION OF CONNECTORS.

RT-1446/URC / CU-2397/G INTERFACE CONNECTIONS

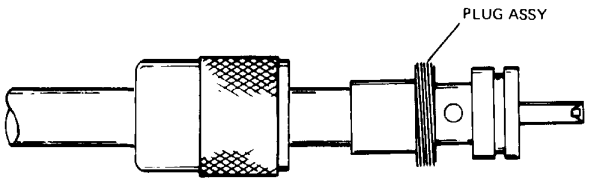
382-103

Figure 2-6. System Interconnect Data

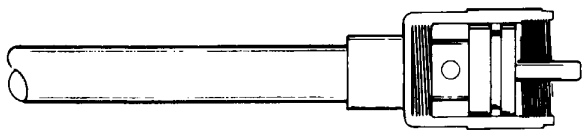


PL-259 Connector Assembly

Cut cable end square. Slide coupling nut on cable. Trim cable to dimensions shown. Tin braid and center conductor.



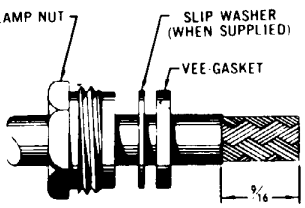
Screw plug assembly on cable. Solder braid through holes. To avoid deforming dielectric, use minimum heat required to produce good bond. Solder center conductor.



Complete assembly by screwing coupling nut over plug assembly. Check assembly by checking for shorts and continuity to other end of cable using ohmmeter.

STEP

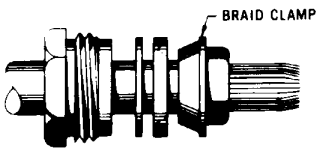
1



UG-21D/U Connector Assembly

Cut cable end square, place clamp-nut, slip washer (when supplied), and gasket over jacket. Remove 9/16" of vinyl jacket.

2

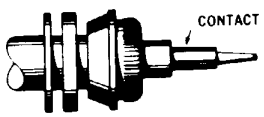


Place braid clamp over braid against jacket cut. Comb out copper braid as shown.

3

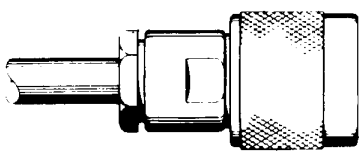
Fold braid back over braid clamp and trim as shown. Cut off dielectric 7/32" from end. Tin center conductor.

4



Solder contact to center conductor. Avoid use of excessive heat. See that end of dielectric is clean. Contact must be flush against dielectric. Outside of contact must be free of solder.

5



Thread assembly into connector, and lock securely. Vee gasket must be split by braid clamp.

After connector has been threaded onto Coupler (J1), wrap connector with several layers of plastic electrical tape as close to the coupler case as possible. This protects against corrosion of mating threads in wet or humid environments.

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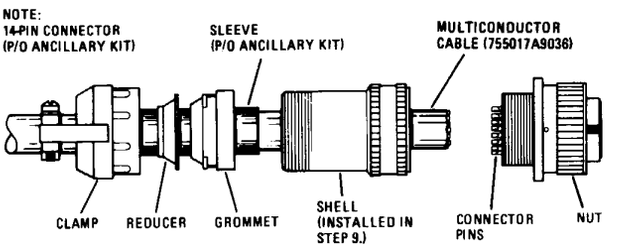
Figure 2-7. RF Cable Fabrication Procedure

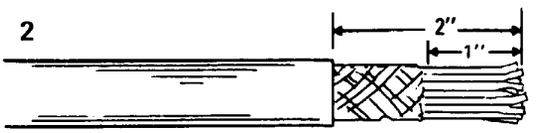
STEP

1



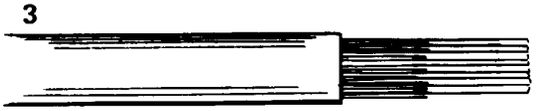
Install cable clamp, reducer, grommet, sleeve, and nut over cable as shown. Leave cable clamp loose. Align rubber sleeve flush with rubber grommet inside clamp. Push assembly back out of the way to perform the steps shown below.

2



Remove outer jacket from cable as shown. Do not cut into shield. Remove braided shield as shown. Take care not to damage insulation on wires in cable bundle.

3

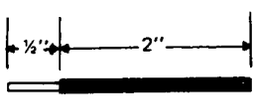


Carefully comb out braided shield wires as shown.

4

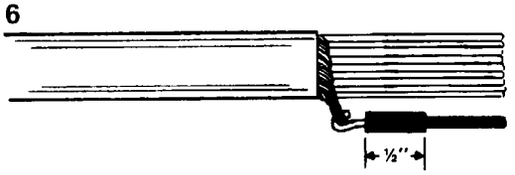
Make a part in the combed shield wires opposite the black wire in the cable. Pull the shield wires around both sides of the cable and twist together to make a pigtail as shown.

5



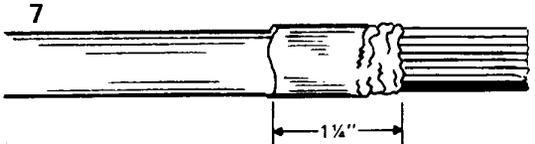
Remove 1/2" of insulation from a 2-1/2" length of No. 22 black stranded wire (supplied in Coupler Accessory Kit) and tin.

6



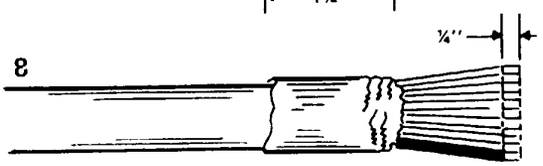
Twist the stripped end of black wire with the pigtail and solder. Cut 1/2" black shrink sleeving (supplied with the Coupler Accessory Kit) and install over soldered connection. Use a heat gun to shrink sleeving exercising caution to avoid getting heat onto cable jacket.

7



Install shrink sleeving (supplied in Coupler Accessory Kit) over cable as shown - apply heat and "shrink" in place. Use heat gun. Rotate cable for an even shrinkage.

8



Remove 1/4" insulation from wires to be used.

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Figure 2-8. Control Cable Fabrication Procedure (Sheet 1 of 2)

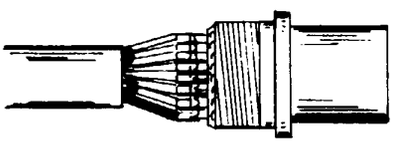
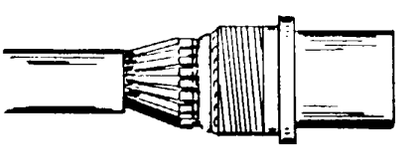
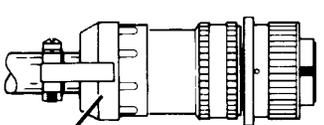
STEP	
9	Install Shell over cable.
10	 Refer to figure 2-7 for proper interface connections. Twist and tin stripped wires together to form parallel connections as specified. Use shrink tubing to insulate soldered connections. Twist and tin remaining stripped wires. Cut sleeving supplied in ancillary kit into 1/2-inch (1-1/4 cm) lengths and slide over each wire. Keep wires parallel as they come out of the cable bundle to the connector pins. Ensure the black wire installed in step 6 and the ground wire in the cable are lined up with and soldered together in connector solder cup. Solder wires to the solder cups. Slide sleeving over solder cups. Write down wire colors assigned to each pin number for reference when assembling the connector on the other end of the cable.
11	Repeat assembly and soldering procedures for the other end of the cable.
12	Check both ends of the cable for continuity, shorts between wires and shorts to the connector shell.
13	 Assemble the plug as shown. Assemble clamp and shell as tightly as possible to assure a watertight connection around the cable. DO NOT TWIST CABLE WHILE TIGHTENING. After control and RF connectors have been threaded on Coupler case connectors J1 and J2, it may be desirable to wrap both connectors with several layers of plastic electrical tape as close to the Coupler case as possible. (For protection against corrosion of mating threads in wet or humid environments.)
14	 **NOTE:** To convert inches to centimeters, multiply by 2.540.

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Figure 2-8. Control Cable Fabrication Procedure (Sheet 2 of 2)

2.7 ENVIRONMENTAL PROTECTION

If the coupler is exposed to a wet or humid environment, protect the exposed input connectors as follows:

a. Wrap the control and RF connectors with several layers of weather-resistant plastic electrical tape such as 3M Company 33 + , Permacel 29R, or equivalent (Harris Part No. P05-0001-000). Wrap the tape as close as possible to the coupler case, and far enough up the cable to prevent moisture from contacting the threads of the connector.

b. Coat the insulator at the antenna output connection and all ground connections with Dow Corning DC-5, General Electric G-635, or an equivalent dielectric compound (Harris Part No. P25-0002-000). Apply a coating approximately 1/8 inch (0.32 cm.) thick. This coating will prevent deterioration of the antenna connection and its associated hardware. This coating will also protect the insulator from conductive contaminants that could degrade the insulating properties of the output connector system, such as oil, dirt, dust, and corrosive material from the atmosphere. This is especially important in a salt-laden air environment.

2.8 INITIAL ADJUSTMENTS

There are no routine installation adjustments to the coupler. Refer to the Operation section for specialized information on a particular system.

If difficulty is experienced, verify the following:

- All connections are in place and secure.
- Appropriate transceiver connections are made.
- 10 to 32 Vdc operating voltage is present at the coupler input connector (see paragraph 5.3).

SECTION 3

OPERATION

3.1 GENERAL INFORMATION

There are no operator controls or externally-visible indicators on the coupler. Tuning is automatic in response to actions at the transceiver. The coupler tunes in less than 25 msec from memory based on prior tuneup, and typically less than 1 second when a new frequency must be learned.

3.2 FAULT IDENTIFICATION

A coupler fault will illuminate the RT-1446/URC FAULT lamp. Press the 2nd and TEST buttons to identify the fault. The fault code for a coupler tuning fault is **3 1**. The fault code for a thermal fault is **3 2**. Specific coupler faults can be identified by removing the coupler cover, observing the fault code LEDs (F0 thru F3) on the A3 assembly, and exercising the coupler BITE routine, if necessary. Refer to the Maintenance section for troubleshooting information.

NOTE

A troubleshooting card is included with the coupler (for quick reference). A copy of the card is also provided in paragraph 5.7.

3.3 FAULT RECOVERY

A coupler fault can be reset at the RT-1446/URC momentarily by changing the frequency by more than 1% and keying the transmitter. The coupler will automatically clear the fault and initiate a tune sequence.

3.4 BYPASS OPERATION

A Coupler Bypass command is software-controlled by the RT-1446/URC to permit automatic receive scan operations and to allow compatibility with RF-7100 series equipment. In bypass, the antenna system bypasses the coupler and is connected directly to the transceiver.

The RT-1446/URC BYPASS indicator will illuminate when the CU-2397/G is unable to tune or if a coupler fault occurs after tuning. The transceiver may transmit in bypass; however, RF power output will automatically be reduced, if required, to prevent transceiver damage.

3.5 OPERATION WITH RF-7100-04 ADAPTIVE SYSTEM

When used with the RF-7110 Adaptive Controller, the CU-2397/G must store the network frequencies in memory in order to tune from a memory mode. Perform the following procedure to store the frequencies in memory:

a. If an AM-7223/URC Power Amplifier is part of the Adaptive System, verify that its primary power is turned off during this procedure.

b. Place the RF-7110 in MANUAL mode.

c. One-by-one, select each channel in the network and tune the coupler on that frequency. This is accomplished by keying the system.

d. The TUNE Indicator on the front panel of the RT-1446/URC will stay on continuously while the coupler is tuning.

SECTION 4

FUNCTIONAL DESCRIPTION

4.1 GENERAL INFORMATION

This section provides unit and assembly level descriptions. The unit level information describes the overall operation of the coupler. The assembly level information provides component-level circuit descriptions and is intended to facilitate troubleshooting of the coupler at the assembly level.

4.2 UNIT-LEVEL FUNCTIONAL DESCRIPTION

Refer to figure 4-1 as necessary during these discussions.

4.2.1 RF Signal Path

The RF signal from the transceiver is fed to the A5 Discriminator Assembly, which extracts the following information:

- Forward and reflected power
- Frequency
- Phase
- Conductance (R_p)

The RF signal is then fed through the Discriminator PWB to the A4 RF PWB Assembly. This assembly incorporates all of the reactive elements necessary to tune the coupler, together with their related switching elements. All tuning is accomplished by fast-acting relays that are controlled by a microprocessor, responding to a preprogrammed algorithm and data inputs. The RF output from the A9 assembly is fed directly to the antenna.

The A4 RF PWB Assembly mounts directly to the A9 Coil Pack Assembly through mating connections on the A9A1 RF Interface PWB. The A4 RF PWB and the A9 Coil Pack Assembly can be considered one functional entity.

4.2.2 Control Functions

The A3 Control PWB Assembly includes an 80C31 microprocessor and all support control functions. The microprocessor operates at a clock speed of approximately 5 MHz. Refer to figure 4-1 for an overview of the A3 Assembly and paragraphs 4.3.4 through 4.3.4.5 for a circuit description.

4.2.3 Transceiver Interface

Interface with the transceiver is via the A8 Connector PWB. The control and input power lines are routed to the A7 Transceiver Interface PWB through the A2 Interconnect PWB.

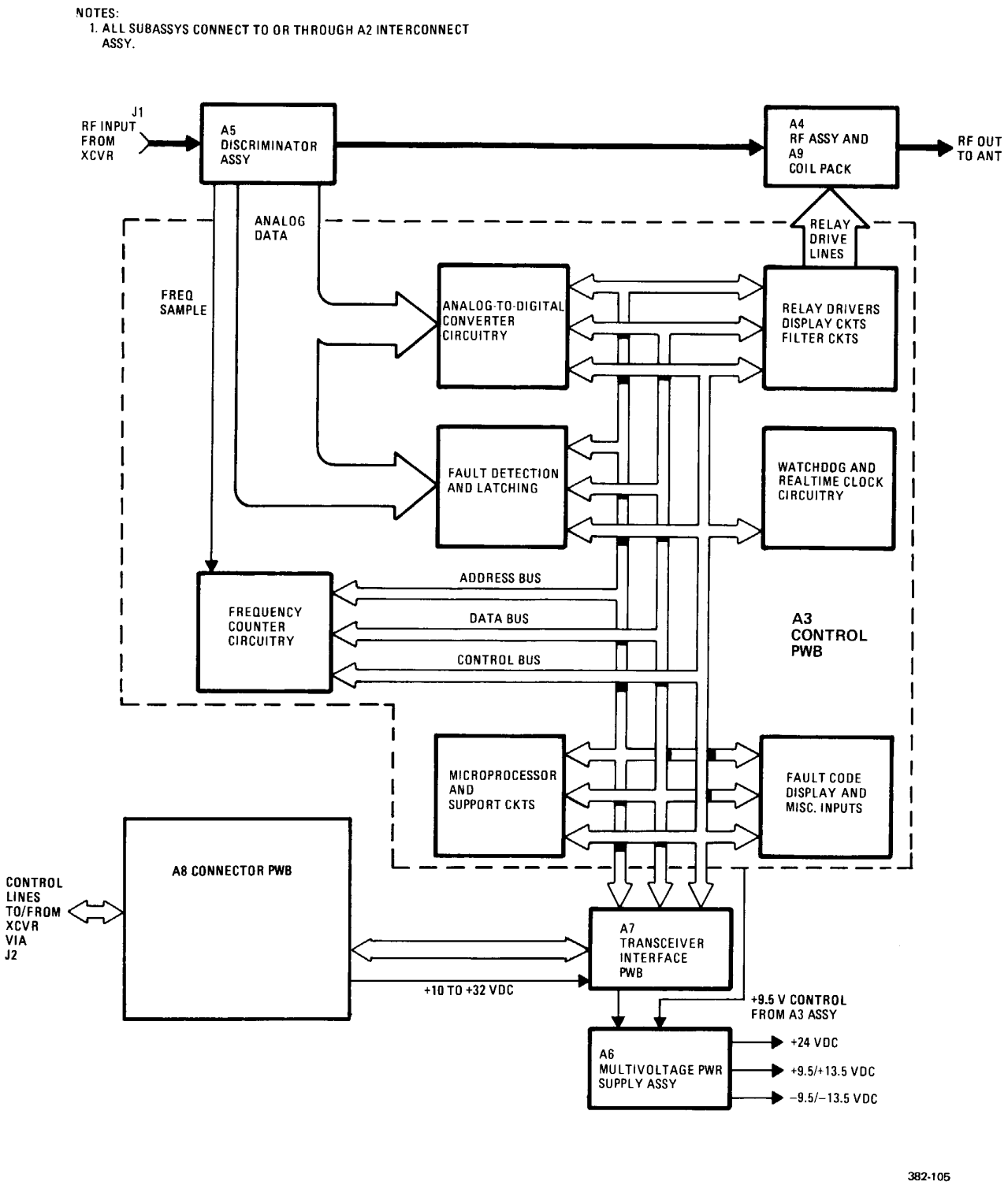


Figure 4-1. CU-2397/G Functional Block Diagram

4.2.4 Power Inputs and Requirements

The coupler operates from 10 Vdc to 32 Vdc primary power from the transceiver. The primary power input is routed to the A6 Power Supply PWB via the Transceiver Interface PWB. The Power Supply PWB provides + 24 V, + 13.5 V/ + 9.5 V, and -13.5 V/-9.5 V supply voltages. Separate + 5 V regulators are provided on the A5 Discriminator PWB and A3 Control PWB.

4.3 ASSEMBLY LEVEL CIRCUIT DESCRIPTIONS

All active components are on the A3, A4, A5, A6, and A7 assemblies (see figure 4-1). The following subparagraphs include functional diagrams and circuit descriptions for each assembly. Refer to the white tab sections for parts list, component location, and schematic information.

4.3.1 A6 Power Supply PWB Assembly

Refer to figure 4-2 and the A6 Power Supply schematic as necessary. The + 9.5 V/ + 13.5 V output is generated via a switching power supply design. Input power is passed to the output filter as a train of pulses. The output filter network has a choke input and diode that allow current to flow through the choke during the off-time of the transistors, yielding a constant dc voltage at the filter output. This output is compared to a reference in regulator U1 to maintain the proper pulse width.

4.3.1.1 Input Filter

The input voltage is filtered by EMI Filter Assembly A6A2 and L1, L4, C1, and C19. Transistor Q1 regulates the input to U1 and T1 driver stage at + 12 Vdc. The output sample feedback path to the Q1 emitter and to U1 is via CR1.

4.3.1.2 Output Sampling and + 9.5 V/ + 13.5 V Setup Control

This same feedback voltage is applied to transistor Q2. With Q2 off (0 Vdc at P1-7), R49 is switched out of the circuit such that R4, R5, and R6 establish the + 13.5 Vdc level. With Q2 on (+ 5 Vdc at P1-7), R49 is added to the circuit to establish the + 9.5 Vdc level. TP8 on the A5 Discriminator PWB is a convenient test point.

4.3.1.3 Pulse Width Modulator Driver Control

The pulse width modulator outputs at U1-12 and U1-13 drive Q3 and Q4 to produce square waves through the center-tapped primary of driver transformer T1. Bias current via Q1 is connected to the T1 center tap. T1 samples collector current to provide base drive.

4.3.1.4 Current Limiting

The current through power transformer T3 is sampled by routing each side of the center-tapped primary through one-turn primaries of current-sense transformer T2. The T2 secondary voltage is rectified by diodes CR10 and CR11, providing a voltage for the current-limit amplifier internal to U1.

4.3.1.5 Power Transformer T3

Transistors Q8 and Q9 alternately drive center-tapped power transformer T3. The T3 secondaries are fed to separate rectifier and output filter circuits. VR2 works in a voltage doubler circuit to produce a + 24 Vdc output. CR12, L2, and the output filter circuit (A2L1 and A2C1 through A2C3) provide the + 13.5 Vdc output. The -13.5 Vdc output is provided by U2. The + 13.5 and-13.5 V outputs are switched to the + 9.5 and -9.5 V

levels at the completion of the tune sequence. The voltage level can be manually controlled by A3S4 for test if necessary.

4.3.1.6 Overvoltage/Undervoltage Protection

Voltage comparators U3A and U3B provide overvoltage and undervoltage protection. U3 will shut down U1 when the line voltage is outside the + 10 V to + 32 V range. The input voltage is divided down by R24, R28, and R32, and compared to a stable reference voltage. If the voltage is outside of these limits, the comparators turn on Q6 to shut down the power supply. When Q6 turns on, C7 discharges through R37 to reduce the control voltage to zero.

4.3.2 A5 Discriminator PWB Assembly

Refer to figure 4-3, the A5 Discriminator PWB schematic, as necessary.

4.3.2.1 RF Input

The RF input to the Discriminator PWB is via RF input connector J1 and a short interconnecting coaxial cable. This cable terminates at J2 on the A5 PWB. The output of this connector is a rigid wire that is routed through T2 to the J3 output connector. T2 provides current samples that produce the following indications: phase, conductance (R_p), forward power, reflected power, and frequency sample.

4.3.2.2 RF Sample

T1 and T2A provide the RF sample at TP5. The gain of Q1 and Q2 can be progressively observed at TP6 and TP7. The TTL-compatible RF sample voltage at TP7 is sufficient to drive U4. When enabled by the frequency sample enable signal, U4 provides a divide-by-two output to the A3 Control PWB. This function is enabled only during tuning and BITE.

4.3.2.3 Forward and Reflected Power

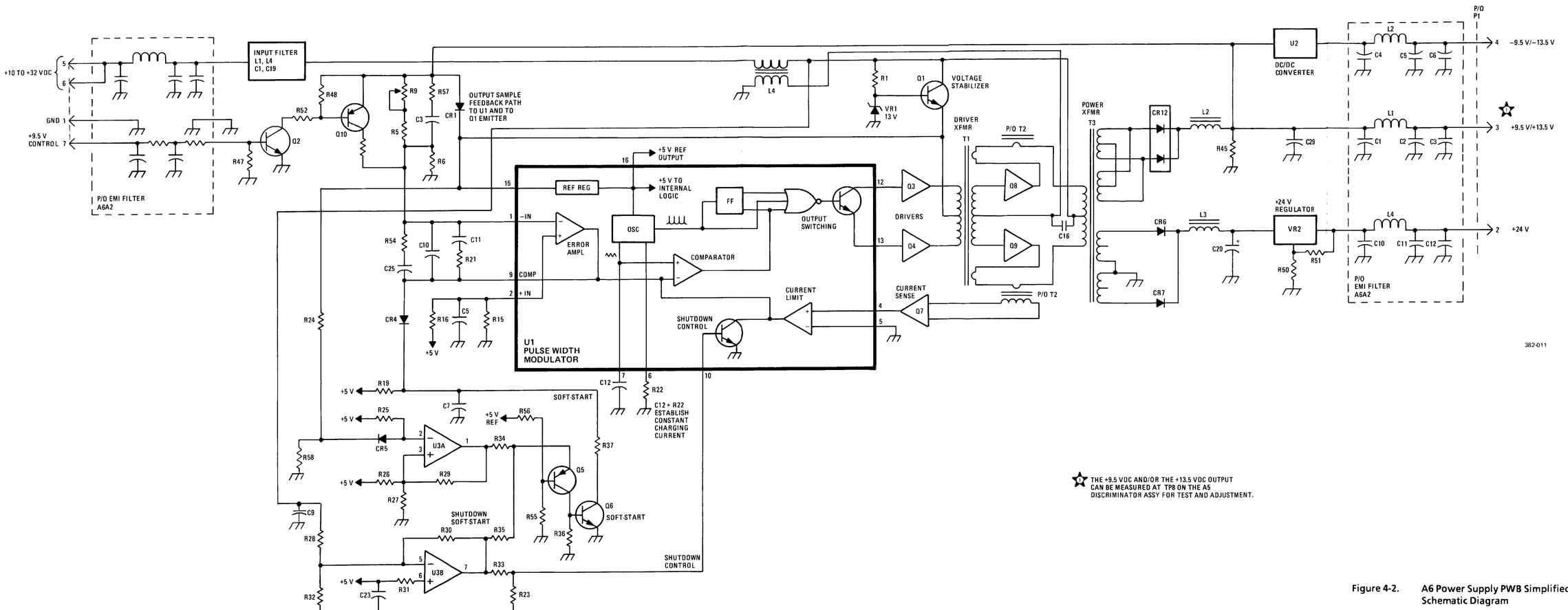
The forward power sample is sensed by T1 and T2A, detected by CR1, and applied to operational amplifier U1A. U1A is set up for unity gain and will produce an output of approximately 4 Vdc at TP1 for 150 watts of forward power.

The reflected power sample is sensed by T1 and T2A, detected by CR2, and applied to operational amplifier U1B. U1B is set up for a gain of 1.7, and will produce approximately 5 Vdc at TP2 for a reflected power level of 88.75 watts.

4.3.2.4 Phase Discriminator

T2B and T2C provide the RF current samples used in phase detection. C8 and C11 provide the RF voltage sample for phase detection. The output voltage of the phase detector is proportional to the phase of the RF signal.

U3A is set up as a unity gain amplifier to drive differential amplifier U2B. The (+) input to U2B is tied to a precision 1.66 Vdc reference voltage. The source voltage for this voltage reference is the regulated + 5 Vdc supply on the A3 Control PWB. U2B is set up such that, with no phase shift, exactly + 2.5 V will be present at TP3. Voltages in the 0 to + 2.5 V range indicate an inductive phase relationship. Voltages in the + 2.5 to + 5.0 V range indicate a capacitive phase relationship.



THE +9.5 VDC AND/OR THE +13.5 VDC OUTPUT CAN BE MEASURED AT TP8 ON THE A5 DISCRIMINATOR ASSY FOR TEST AND ADJUSTMENT.

Figure 4-2. A6 Power Supply PWB Simplified Schematic Diagram

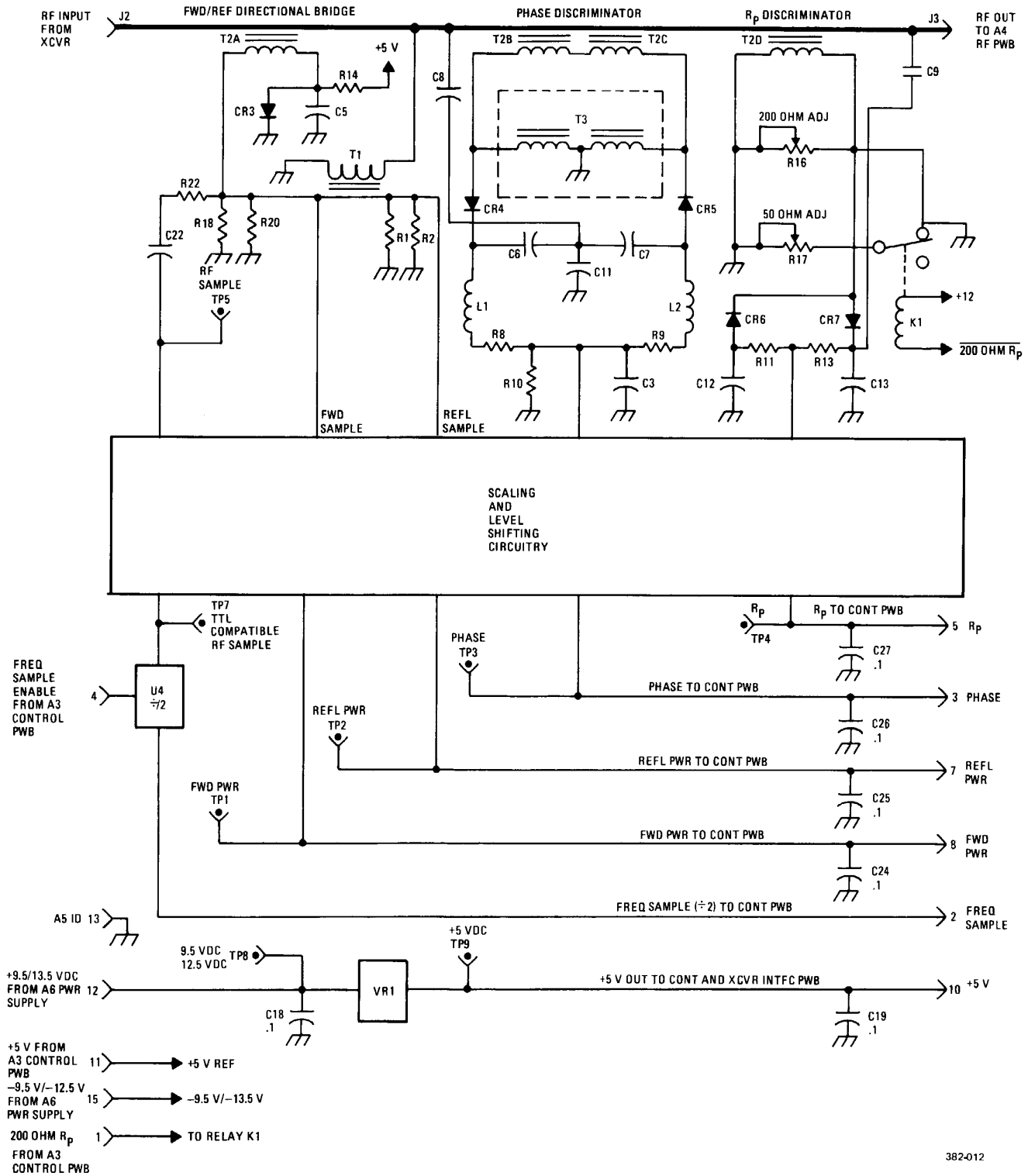


Figure 4-3. A5 Discriminator PWB Simplified Schematic Diagram

4.3.2.5 R_p Discriminator

NOTE

R16 and R17 are factory-adjusted and should only be adjusted if R16, R17, or R5 are replaced. Refer to the Maintenance section for the adjustment procedure.

T2D is the R_p discriminator RF current sample element. C9 and C13 provide the voltage sample. R17 and R16 are adjusted to detect the 50 and 200 ohm tune points, respectively. As the coupler tunes to these points, the associated circuit will produce a + 2.5 V output.This voltage is applied to operational amplifier U3B. U3B is a non- inverting amplifier with a gain of 2. The output of U3B is applied to the inverting input of differential amplifier U2A. The (+) input is tied to a regulated + 1.66 V reference to produce a 0 to + 5 V output for the A3 Control PWB. A voltage at TP4 that is greater than + 2.5 V indicates that the R_p (200 or 50 ohms) is less than desired; a voltage in the 0 to just less than + 2.5 V range indicates a greater than desired R_p.

4.3.2.6 + 5 Vdc Regulator

VR1 is the on-board + 5 Vdc Regulator. This regulator satisfies all general + 5 Vdc requirements of the coupler. The + 9.5 or + 13.5 Vdc input to VR1 is from the A6 Power Supply Assembly. The + 9.5 V/ + 13.5 V power supply output can be measured at TP8 on the A5 Assembly. The microprocessor automatically switches this power supply output between these two levels: + 13.5 Vdc during tune mode and BITE, and + 9.5 Vdc for normal non-tune conditions.

4.3.3 A4 RF PWB Assembly

Figure 4-4 is a simplified diagram of the A9 Coil Pack Assembly, A9A1 RF Interface PWB, and the A4 RF PWB Assembly. These assemblies are packaged as one functional assembly. All coupler tuning elements are included in this group.

4.3.3.1 New Frequency Tune Sequence

Any frequency change at the transmitter will automatically generate a retune pulse. The frequency change must be greater than 1% and must be followed by a keyline closure. A retune pulse will command the coupler into bypass. The microprocessor waits for a grounded keyline and for input power to reach a 10 watt level, sensed at the Discriminator PWB. When these conditions are met, K2 and K15 activate. K2 bypasses T1 so that the coupler will initially tune at the 200 ohm level. K15 completes the circuit to the output. The microprocessor will select L1 through L8 to tune as close as possible to a parallel resistance of 200 ohms (a conductance of 5 milliohms). C19 through C27 are then selected to minimize the reactance component such that the Discriminator PWB detects a 200 ohm, purely resistive impedance.

With this rough tuning complete, K2 is deenergized, placing 50/200 ohm transformer T1 in the signal path. A fine-tuning algorithm is then performed to tune the network to 50 ohms.

4.3.3.2 Tune from Memory Sequence

When the frequency counter identifies a frequency to which the coupler has previously been tuned (and automatically memorized), the microprocessor will supply stored data to the output latches and relay drivers. Tune response time from this existing data base is typically less than 25 milliseconds.

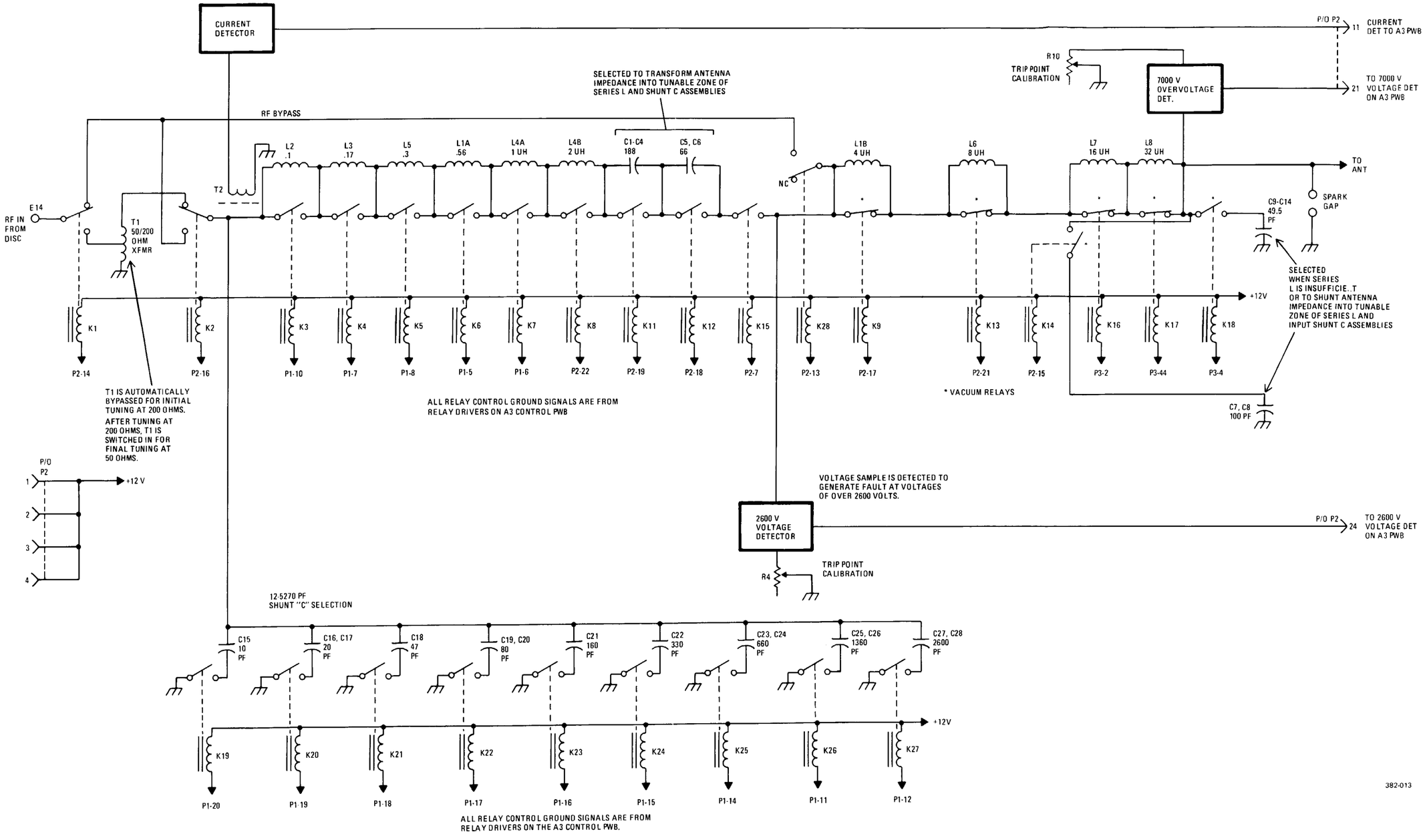


Figure 4-4. RF PWB Assembly Simplified Schematic Diagram

4.3.3.3 Antenna Modifiers

K11, K12, K14, and K18 control circuit elements are best described as antenna modifiers. Certain antenna impedances cannot be tuned with series inductance (L1 through L8) and shunt capacitance (C19 through C27) alone. This is especially true at the high and low frequency ends of the HF band. In these regions, the antenna modifiers are used to tune the antenna.

4.3.3.4 Bypass

The coupler is bypassed when K1 and K28 are open. In this condition, all reactive components in the coupler are bypassed.

4.3.3.5 Voltage and Current Samples

The voltage and current samples provide outputs that generate a fault to protect the coupler when damaging conditions are detected. Sampling levels have been chosen to provide analog dc outputs that will vary between 0 and + 4.1 Vdc with the RF output.

4.3.3.6 Spark Gap

The ball gap assembly at the antenna output provides a safe discharge path for excessive energy build-up on the antenna. Refer to the Maintenance section for the adjustment procedure.

4.3.4 A3 Control PWB Assembly

Refer to figure 4-5 and the A3 Control PWB schematic diagram. The control board can be grouped into input/output, protection, and housekeeping functions, data processing functions, and tune control functions. The input/output, protection, and housekeeping functions consist of the clock oscillator and its associated dividers, fault detection logic, watchdog timer, wake-up alarm, and A/D converter. The data processing functions consist of the microprocessor, memory block, and support chips. The tune control function consists of the output latches and relay drivers that select the relays on the A4 RF PWB and A9A1 RF Interface PWB.

4.3.4.1 Input/Output, Protection, and Housekeeping Functions

The microprocessor receives data from within the coupler via A/D Converter U11. The analog inputs from the A5 Discriminator PWB can be measured as shown at TP3, TP4, TP5, and TP6. The microprocessor also senses other analog inputs (overvoltage, overcurrent, overtemperature) for fault protection.

The following input commands are received from the A7 Transceiver Interface PWB:

- Retune pulse sense data
- Keyline data
- Coupler bypass command data
- LPA ID data

Retune pulse sense data originates at the system transceiver. A retune pulse is generated whenever there is a frequency change at the transceiver. The falling edge of this pulse shuts off A7Q9 and generates a momentary retune sense pulse through exclusive-OR gate A7U4A. The same coupler input generates a wakeup pulse which starts up the microprocessor.

When the transceiver keyline goes low, an optocoupler on the A7 Transceiver Interface PWB senses the condition and feeds the data to latch A7U2. As the keyline goes low, exclusive-OR gates A7U4D and A7U5A sense this transition and generate another wakeup pulse. The microprocessor enables A7U2 using its CS7 control line and reads the active keyline condition. When input power from the transceiver reaches the tune power level, the microprocessor enables the frequency sample on the Discriminator PWB and the frequency counter on the Control PWB.

4.3.4.2 Data Processing Function

When the coupler receives RF input power from the transceiver, the frequency sampling circuit is enabled and U7 and U8 count the frequency (which has already been divided by two by the Discriminator PWB). The microprocessor looks up this frequency for previously stored setup information. (Each time the coupler tunes successfully, it automatically stores all related setup information.)

If the measured VSWR is greater than about 2:0, the microprocessor runs the tuning algorithm to retune the RF network. If the measured VSWR is less than about 2:0, the microprocessor sets the coupler in a ready condition.

4.3.4.3 Tune Control Function

If prior setup information is in memory, it is immediately written to output latches U12 through U16. Chip select elements CS8 through CS12 clock the information to relay drivers U17 through U21 to activate control relays on the A4 RF PWB. VSWR measurements are always taken to establish the validity of setup data. Corrective tuning sequences are run as necessary. The coupler tunes in less than 25 msec from memory, and in typically less than one second when the new frequency algorithm must be used.

4.3.4.4 Transceiver Control Outputs

Output commands to the transceiver are discussed in detail in paragraph 4.3.6. The transceiver-to-coupler input commands have already been noted and discussed. The coupler-to-transceiver output commands or conditions are:

- Coupler Fault (active low)
- TX Inhibit (active low)
- Thermal Fault
- Tune Power Request

4.3.5 A8 Input Connector PWB Assembly

Table 4-1 lists the signal names for input connector J2.

4.3.6 A7 Transceiver Interface PWB Assembly

Figure 4-6 is a simplified diagram of the A7 Transceiver Interface Assembly.

All transceiver input and output lines are lightning surge-protected by metal-oxide varistors, Zener and rectifier diodes, and chokes.

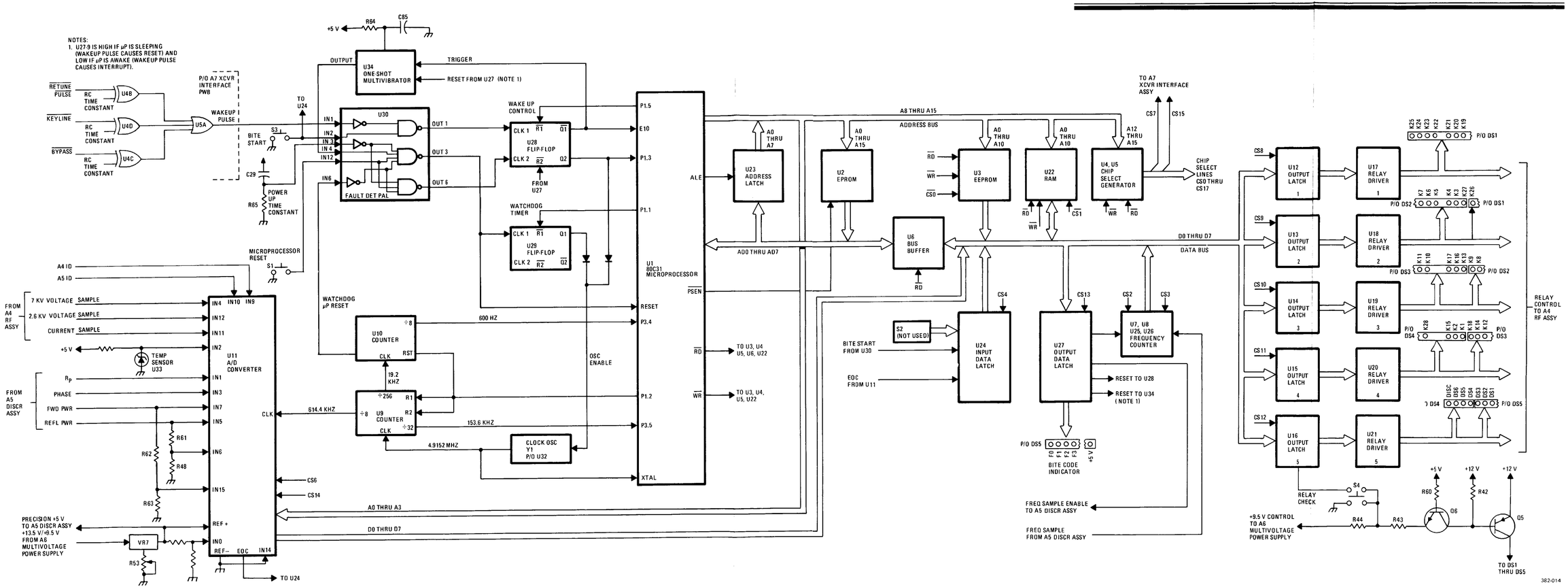


Figure 4-5. A3 Control PWB Assembly Simplified Schematic Diagram

Table 4-1. Input Connector J2 Signal Names

Connector Pin	Signal Name
J2-A	Ground
J2-B	Coupler Key
J2-C	Coupler Fault
J2-D	Coupler ID (Ground)
J2-E	Tune Pulse
J2-F	Tune Power Request
J2-G	Bypass
J2-H	10 to 32 Vdc
J2-I	10 to 32 Vdc
J2-J	Key Disable
J2-K	LPA ID
J2-L	Not Used
J2-M	Not Used
J2-N	Thermal Fault

4.3.6.1 Control Board Interface

The following transceiver inputs are routed to the microprocessor via input data latch U2: Retune Pulse (Rechannel Pulse), Bypass, and Coupler Keyline.

The Retune Pulse, Bypass, and Coupler Keyline inputs are also applied to AND gate U5A via exclusive-OR gates U4B through U4D. If any one of these lines changes state, U5A will send a wakeup pulse to the Control PWB.

The following output commands are routed to the transceiver via output data latch U1 and transistor driver array U3:

- Coupler Keyline
- TX Inhibit (Key Enable)
- Tune Power Request
- Thermal Fault
- Coupler Fault

4.3.6.2 Retune Pulse

During normal operation, transistor Q9 is normally biased on through R16, and the output of exclusive-OR gate U4A is high. When the transceiver frequency is changed, the retune (rechannel) pulse line is momentarily pulled low to remove the drive from Q9. This action produces a momentarily low output on the retune pulse sensor line. At the same time, capacitor C15 charges through R23 to produce a high output from

U4B. The output of U5A then momentarily goes high to send a wakeup pulse to the Control PWB. This output pulse alerts the microprocessor to watch for an active keyline.

For testing purposes, a retune pulse can be produced manually by momentarily pressing switch S1.

4.3.6.3 Bypass

When the bypass line is pulled low, optocoupler U6 is biased on. Capacitor C16 then discharges through R24 to produce a high output from U4C. The output of U5A then momentarily goes high to send a wakeup pulse to the microprocessor.

4.3.6.4 Coupler Keyline

When the keyline is pulled low, optocoupler U6 is biased on and keyline indicator DS1 is illuminated. Capacitor C17 discharges through R25 to produce a high output from U4D. The output of U5A then momentarily goes high to send a wakeup pulse to the Microprocessor.

During the tuning cycle, the microprocessor sends a keyhold signal to octal latch U1. The output of U3-10 then turns on transistor Q7 to hold the keyline low.

For testing purposes, the keyline can be manually activated by momentarily pressing switch S2.

4.3.6.5 Key Disable

When the transmitter inhibit line from U3 is high, Q6 is biased on via R26 to pull the Key Disable line low. When the transmitter inhibit line is low, drive is removed from Q6 and the Key Disable line is in the open collector state.

4.3.6.6 Tune Power Request

When the microprocessor sends a tune power request, the output of U3-12 goes high and biases transistor Q4 on. The tune power request line to the transceiver is then pulled low. Tune power request indicator DS2 is illuminated by collector current through Q4.

4.3.6.7 Coupler Fault

The output of U3-16 goes high when a fault is detected in the coupler. When U3-16 is high, Q1 is biased on via R1. This action pulls the coupler fault line low and illuminates DS3. The transceiver operator can clear the fault by changing frequency and keying the transmitter. The frequency change must be greater than 1%.

4.3.6.8 Overtemperature Fault

If an overtemperature fault occurs inside the coupler, the output of U3-14 will go high to bias Q8 via R4. When Q8 is on, the overtemperature fault line to the transceiver is pulled low.

4.3.6.9 LPA ID

When the LPA ID is pulled low, the LPA ID input to latch U2 is pulled low via optocoupler U7 to indicate if an AM-7223/URC Linear Power Amplifier is connected.

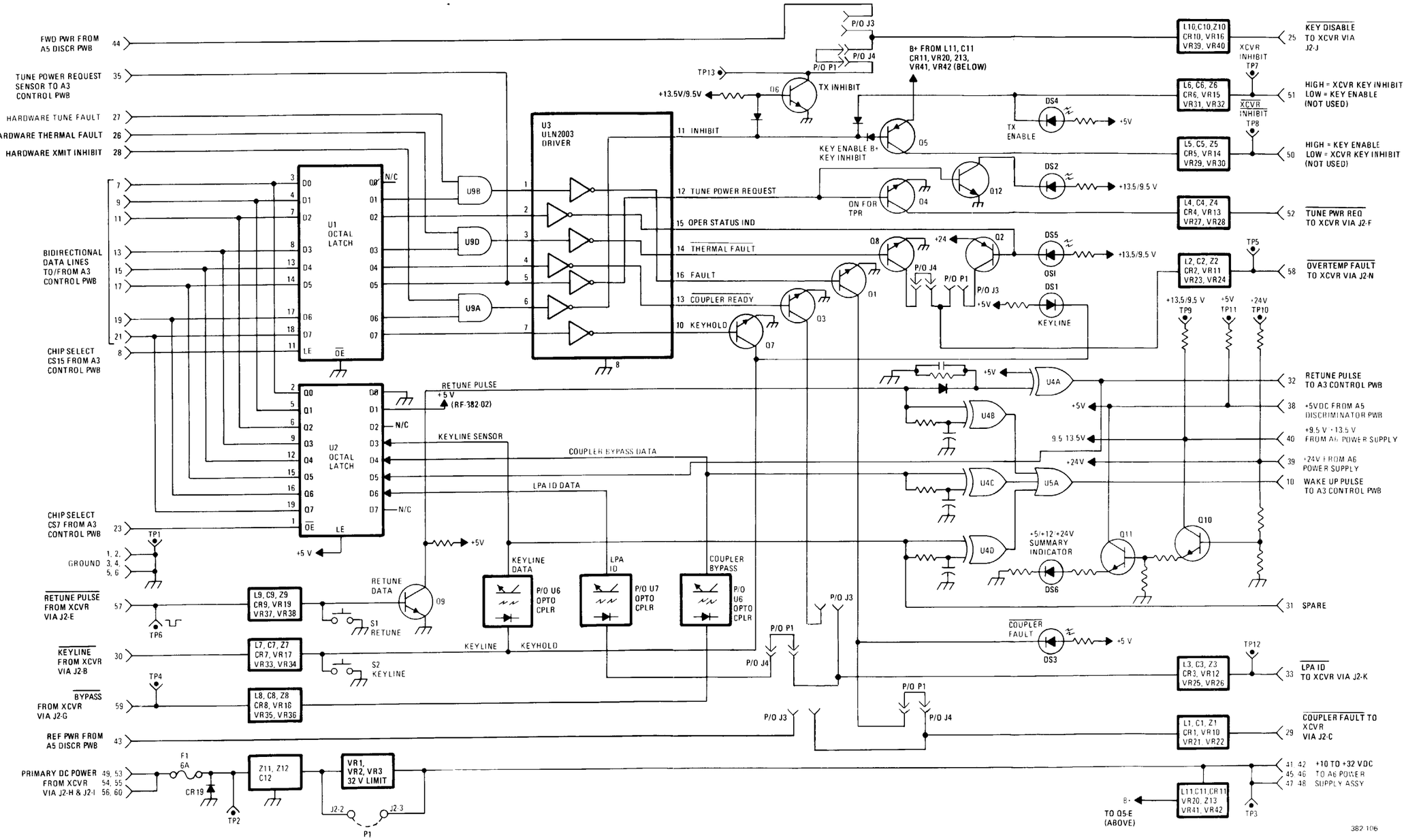


Figure 4-6. A7 Transceiver Interface PWB Simplified Schematic Diagram

4.3.6.10 Power Supply Circuits

All coupler operating voltages are developed from the + 10 to + 32 Vdc input from the transceiver. This dc power input is routed to the A6 Power Supply via the A7 Transceiver Interface. The Power Supply provides + 24 V, + 13.5 V/ + 9.5 V, and -13.5 V/-9.5 V operating voltages for the A7 Assembly. CR29 indicates the presence of these supply voltages. + 5 V is derived from the + 13.5 V/ + 9.5 V supply on the A5 assembly.

SECTION 5

MAINTENANCE

5.1 GENERAL INFORMATION

This section contains the following maintenance information:

- Troubleshooting
- Periodic Maintenance
- Adjustments

5.2 TROUBLESHOOTING

If a fault is detected at the transceiver that is thought to be coupler-related, proceed as follows:

a. Check all of the cables and connections to the coupler, including the antenna. Look for loose or broken wires, rust, or oxidation that would cause a bad connection. Correct any apparent problems.

b. Pick a frequency that doesn't tune, and attempt to tune the coupler.

c. If the fault still occurs, continue as described below.

d. Identify the fault condition.

1) A coupler fault will illuminate the RT-1446/URC fault indicator LED on the front panel. Press the "2nd" and "test" buttons to determine the type of fault:

3 1 - general coupler fault
3 2 - thermal fault

This information is shown on the RT-1446/URC LCD display. For a **3 1** general coupler fault continue with the steps outlined below. For a **3 2** thermal fault refer to table 5-1, fault condition "overtemperature fault". Then continue with step e.

NOTE

At this time, it may be desirable to move the coupler to the repair shop in order to facilitate repair of the unit. The RF-382 MRK-24 includes the following items that will simplify repair of the coupler: control cable, RF coaxial cable, RF test cable, long-wire adapter, pressure test assembly, hand pump, tuning tool, and DC-5 (or G-635) protective compound. The RF test cable is used to connect the 50 ohm load to the antenna terminal. The long-wire adapter may be connected between the coupler and the 50 ohm load to produce higher stress voltage to the coupler RF network.

Table 5-1. Tuning Fault Codes

Fault Code				Fault Condition	Possible Cause	Corrective Action
F3	F2	F1	F0			
0	0	0	0	No Fault Detected	No Fault Detected	
0	0	0	1	Tune Time-Out Fault	Broken or untunable antenna, RF component failure in antenna coupler.	a. Momentarily change frequency to clear the fault and attempt to tune again. b. Check antenna.
0	0	1	0	High Tune Power Fault	Tune power is too high, component failure in tune power request circuitry in transceiver or coupler.	a. Check transmitter output power level. b. Check tune power request circuitry in transceiver and coupler.
0	0	1	1	Low/No Tune Power Fault	Insufficient or no RF input power, problem with transmitter output power level, RF power circuitry, antenna coupler input, or coaxial cable.	a. Check transmitter output power level. b. Check RF input cable.
0	1	0	0	Frequency Count Fault	Coupler is inhibited from tuning by near-field interference, or RF component failure in frequency counter.	a. Check nearby transmitting antenna for near-field interference.
0	1	0	1	Overvoltage/Over-current Fault	RF output current too high, RF output voltages too high.	a. Reduce RF input power and attempt to tune again.
0	1	1	0	Overtemperature Fault	Operating temperature inside coupler exceeded 100°C.	a. Wait for coupler to cool, reduce RF input power and attempt to tune again.
0	1	1	1	VSWR Fault	Loose or broken antenna connections, arc-over in antenna coupler, antenna or antenna lead.	a. Check antenna. b. Inspect coupler for signs of arcing.
1	0	0	0	Tune Solution Fault	Tuning algorithm has reached dead end.	a. Momentarily change frequency to clear fault and attempt to tune again. b. Check antenna.

1 = On, 0 = Off

2) Remove the coupler cover. Loosen the captive screws in ten places. Care must be taken not to damage the gasket when removing the cover.

3) If none of the LEDs inside the coupler are on, and the transceiver is on, a power supply failure is likely. Refer to paragraph 5.3 for power supply checks.

NOTE

The presence of LEDs that are lit does not rule out a power supply problem. Continue with next step.

4) Read the fault code indicated on the control board LEDs F3-F0. Refer to figure 5-1 for the location of the LEDs. LEDs that are on are recorded as a 1, and LEDs that are off are recorded as a 0.

5) Refer to table 5-1 for the fault description and corrective action corresponding to the BITE fault code displayed on LEDs F3-F0.

e. If the corrective action described in table 5-1 is implemented and the coupler still faults, continue with step f.

f. Confirm that the transceiver is on, but not keyed.

g. Disconnect the antenna lead E1 that goes to the arc ball assembly A1E1. Refer to figure 5-2.

h. Place the AM-7223/URC in standby mode (if used). Set the transceiver frequency to 7.7000 MHz. Momentarily key the transceiver. After the tune cycle is complete continue with step i.

i. Press the A3S3 switch on the control board. This initiates a series of tests that are performed by the microprocessor. If a fault is detected, a fault code will be displayed on the control board LEDs F3-F0. Refer to table 5-2 to identify the fault and corrective action. Major assemblies are shown in figure 5-2.

j. Upon pressing A3S3 the relays will be activated in a sequence corresponding to a left-to-right progression of the LED indicators on the A3 board. As each relay is activated an audible click should be heard as the LED turns on and as it turns off. If a relay fails to click as the LED switches, or if an LED fails to light, or if an LED lights out of sequence (this includes continuously on LEDs), then note the relay number and refer to table 5-3 for corrective action.

k. If steps i. and j. do not indicate a fault or relay problem, then continue with step l.

l. Momentarily key the transceiver.

m. The coupler will attempt to tune, then the relays will be checked by the microprocessor under tune power conditions. After these checks are completed the relays will stop changing. If any faults were detected, the fault code LEDs F3-F0 on the control board will be lit. Refer to table 5-4 to identify the fault and corrective action. Major assemblies are shown in figure 5-2.

n. To repeat the relay tests, continue with step i.

o. Reconnect the antenna lead E1 to the arc ball assembly A1E1 (removed in step g.).

p. Reinstall coupler cover. This completes the troubleshooting procedure.

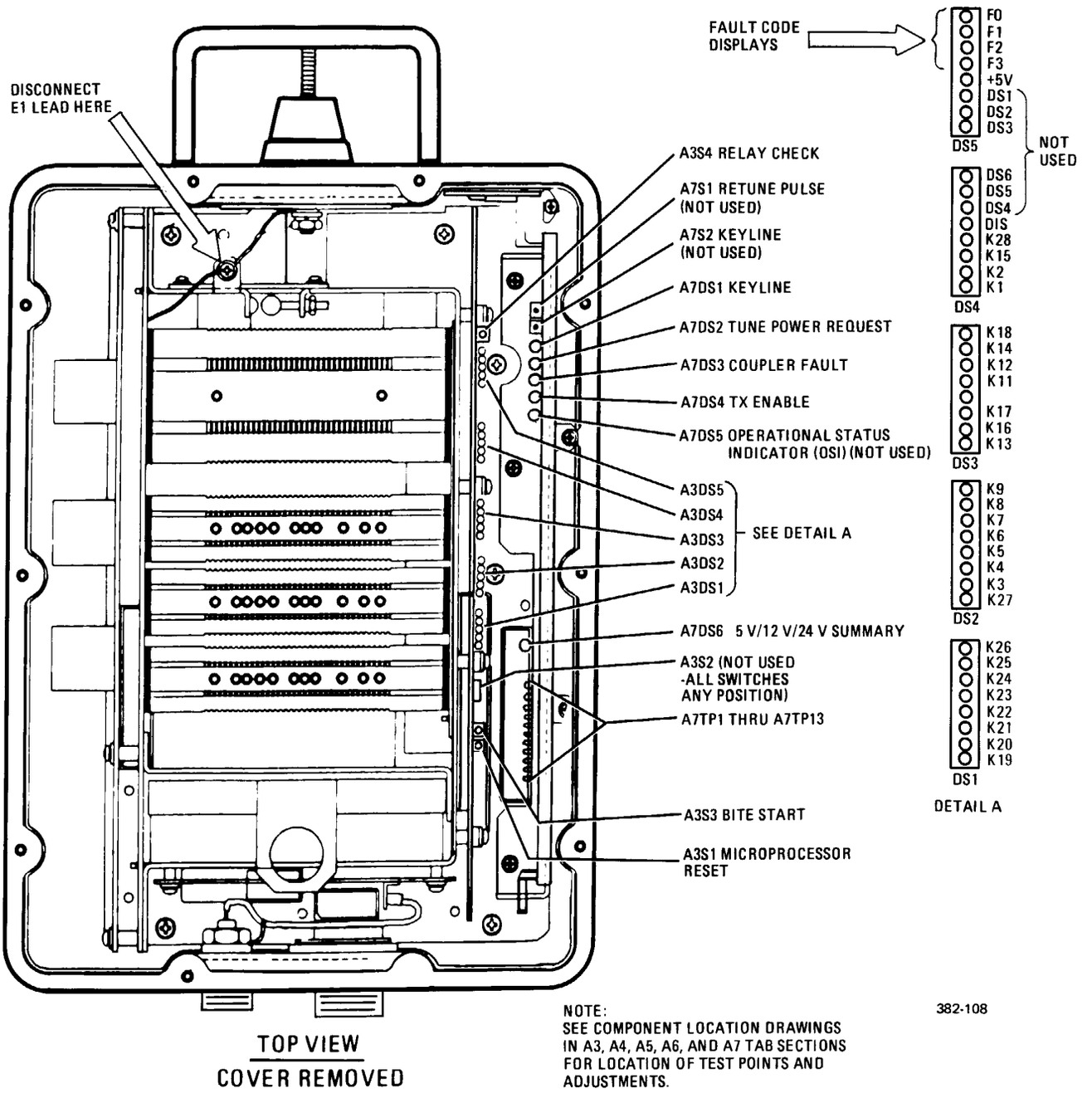


Figure 5-1. Coupler Indicator Identification

Table 5-2. Static BITE Fault Codes

Fault Codes				BITE Result	Replace Assembly
F3	F2	F1	F0		
0	0	0	0	BITE Passed	
0	0	0	1	RAM Failure	A3, A7
0	0	1	0	EEPROM Failure	A3, A7
0	0	1	1	Real Time Clock Failure	A3, A7
0	1	0	0	5 V Reference Failure	A3, A5
0	1	0	1	A/D Converter Failure	A3, A5
0	1	1	1	Detected Forward Power Failure	A5, A3, A2
1	0	0	0	Detected Reflected Power Failure	A5, A3, A2
1	0	0	1	R_p Reading Failure	A5, A3, A2, A6
1	0	1	0	Phase Reading Failure	A5, A3, A2, A6
1	0	1	1	Overvoltage Detector Failure	A4, A3, A9
1	1	0	0	Overcurrent Detector Failure	A4, A3
1	1	1	0	Frequency Counter Failure	A5, A3
1	1	1	1	Fault Logic Failure	A3

Table 5-3. LED and Relay Test

Fault Condition	Replace Assembly
Any relay LED fails to illuminate (except DS1 through DS6 which are not used)	A3
DIS (discriminator) relay fails to click in sequence	A5, A3, A2
K9, K13, K14, K16, K17, or K18 relay fails to click in sequence	A9, A3, A2
Any other relay fails to click in sequence	A4, A3, A2

Table 5-4. Transmit BITE Fault Codes

Fault Codes				BITE Result	Replace Assembly
F3	F2	F1	F0		
0	0	0	0	BITE Passed	
0	0	0	1	Tune Fault	A3, A4, A5

*The LED for the faulty relay should remain on after BITE is completed.

Table 5-4. Transmit BITE Fault Codes (Cont.)

Fault Codes				BITE Result	Replace Assembly
F3	F2	F1	F0		
0	0	1	0	High Tune Power Fault	A7, A5, A3, transceiver RF output
0	0	1	1	Low/No Tune Power Fault	Check RF input path, transceiver RF output, A5, A3
1	0	0	0	Frequency Counter Fault	Check transceiver frequency, A5, A3
1	0	0	1	RF Relay Fault*	A4, A9, A3
1	0	1	0	Phase Reading Fault	A5, A3, A6
1	0	1	1	R_p Reading Fault	A5, A3, A6
1	1	0	0	Reflected Power Fault	A5, A3

*The LED for the faulty relay should remain on after BITE is completed.

5.3 POWER SUPPLY CHECKS

This procedure requires a digital voltmeter (Fluke 73, HP-3435A, or equivalent). If the transceiver is on but none of the LEDs inside the coupler are on, a power supply failure is likely. Check the power supply voltages as follows:

a. Verify that the transceiver is on, but not keyed.

NOTE

The presence of LEDs that are lit does not rule out a power supply problem.

b. Refer to figure 5-1. Locate 5 V/12 V/24 V indicator A7DS6. If A7DS6 is on, proceed to step j.

c. Refer to figure 5-1. Locate + 5 V indicator A3DS1-1. If A3DS1-1 is on, proceed to step i.

d. Measure A7TP2 for + 12 to + 50 Vdc. If voltage is not present, check fuse A7F1. Check transceiver for power to coupler.

e. Measure A7TP3 for + 12 to + 32 Vdc. If voltage is not present, check Q10 or jumper P2 (if Q10 is not installed).

f. Measure A7TP11 for + 5 Vdc. If voltage is not present, replace the A5 Discriminator PWB.

g. Measure A7TP9 for + 9.5 V or + 13.5 V. If voltage is not present, replace the A6 Power Supply.

h. Measure A7TP10 for + 24 V. If voltage is not present, replace the A6 Power Supply.

i. Measure A5TP11 for -9.5 V or -13.5 V. If voltage is not present, replace the A6 Power Supply.

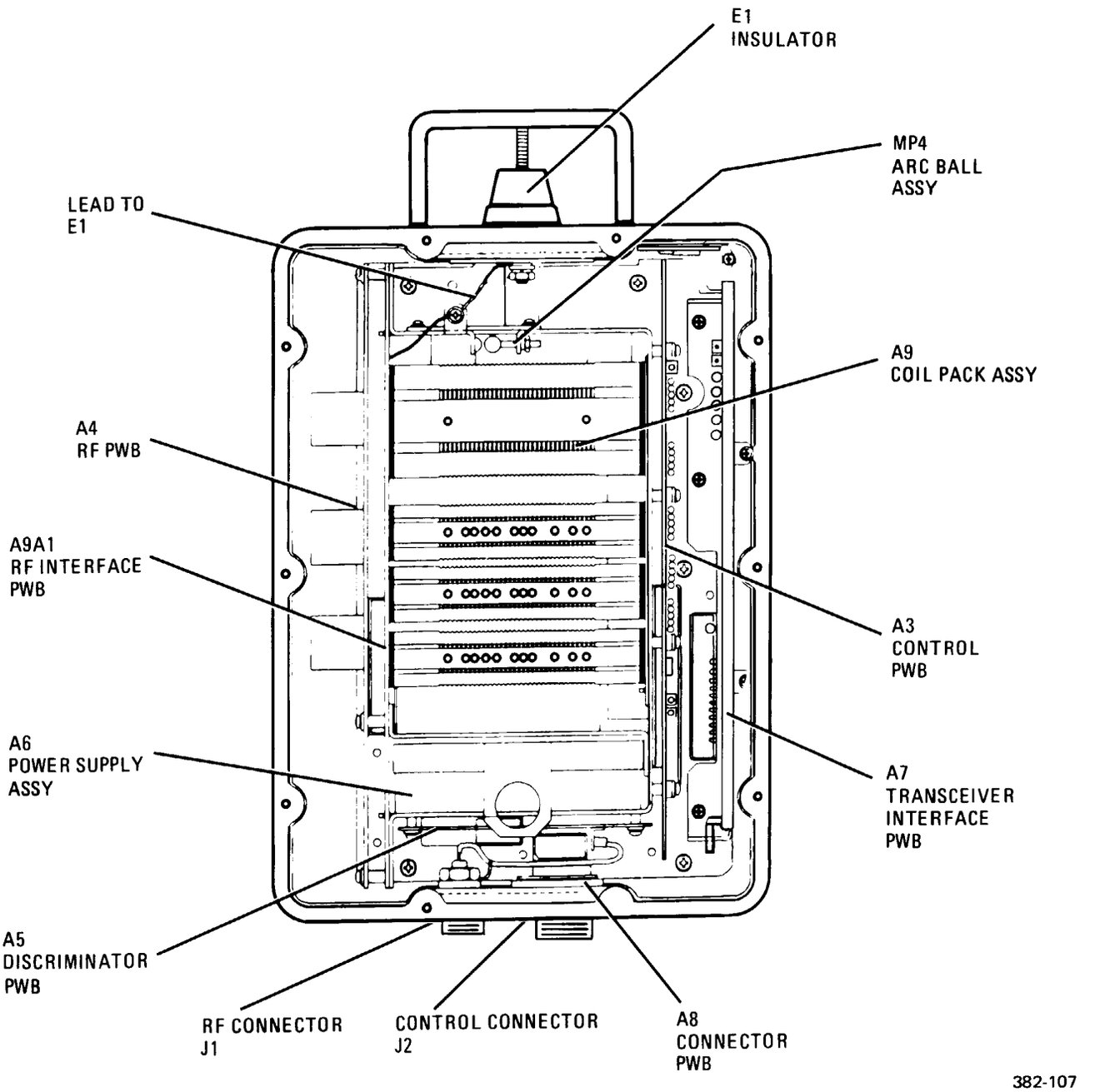


Figure 5-2. Coupler Major Assemblies

j. Measure A3TP1 for +5 ± .02 V. If voltage is not present, replace the A3 Control PWB. If voltage is out of tolerance, adjust A3R53 as described in paragraph 5.5.2.1.

5.4 PERIODIC MAINTENANCE

There are no routine cleaning requirements for the coupler interior. As a rule, the coupler should not be opened unless required by the maintenance procedure. It is necessary to maintain a dry air environment inside the coupler to prevent corrosion. Use of an RF-636 Dry Air Pump, RF-628 Dry Nitrogen Kit, or equivalent is recommended. Pressurize coupler to 5 to 6 psig (paragraph 5.4.1). Relieve pressure to purge moist air. Purge the coupler at least two more times before resealing the coupler.

NOTE

For optimum dryness, purge and repressurize once a day for at least three days to allow maximum absorption of moisture. Relieve pressure before resealing on the last day.

It may also be necessary to keep the external insulator clean to reduce the tendancy to arc. The coupler insulator and all ground connections should be coated with Dow Corning DC-5 or General Electric G-635 protective compound. This coating will prevent deterioration of the ground connections, and will protect the insulator from dirt, dust, and/or salt accumulation that could degrade its insulating properties.

If the gasket is replaced, the new gasket should be coated with Dow Corning DC-5 or General Electric G-635 protective compound to prevent gasket from sticking to cover.

NOTE

If the insulator has been coated with DC-5 or G-635 (see paragraph 2.7), it may leak RF current to ground when it is subjected to heavy rain squalls or spray; however, the leakage will stop immediately when the water path is broken.

5.4.1 Pressure Test Procedure

The CU-2397/G is an airtight unit and should be leak-tested after any internal maintenance. The test adapter and hand pump required for this procedure are included in the RF-382/MRK-24. Refer to figure 5-3 and proceed as follows:

a. Remove the 1/4-28 screw and seal washer from the antenna end of the case.

b. Connect a pressure test assembly and hand pump (both part of maintenance repair kit) as shown in figure 5-3.

c. Pressurize the coupler to 5 to 6 psig.

d. Brush a soap and water solution on all portions of the case where leakage might occur (i.e., gasket, antenna insulator E1, cable connectors).

e. Check for bubbling. If bubbling occurs, check hardware for tightness and/or replace the applicable seal or gasket.

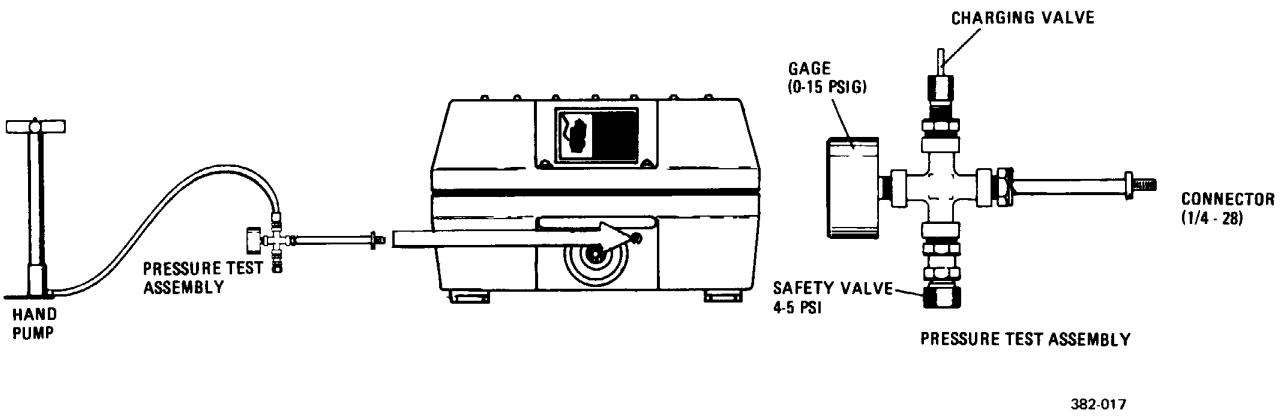


Figure 5-3. Pressure Test Setup

f. If there is no apparent leakage, bleed off the air pressure. If necessary, purge with dry air as explained in paragraph 5.4. Remove the pressure test assembly, and replace the 1/4-28 screw and seal washer on the case. Clean coupler of all soap and water solution.

5.5 ADJUSTMENT PROCEDURES

All coupler adjustments have been made at the factory and should not require routine readjustment. Adjust only when related components are changed or when out-of-tolerance performance is indicated.

5.5.1 A6 Power Supply PWB Adjustments

Refer to the A6 tab section for the parts list, component location drawing, and schematic diagram for the A6 Power Supply PWB Assembly.

5.5.1.1 + 13.5 V/ + 9.5 V Setup Adjustment

This procedure requires a digital voltmeter (HP-3435A, Fluke 73, or equivalent). To adjust potentiometer A6R4, proceed as follows:

a. Verify that the transceiver is off and there is no power to the coupler.

b. Loosen the hardware (10 places) and remove the coupler top cover.

c. Loosen the hardware (2 places) securing the A6 Power Supply PWB to the chassis frame.

d. Lift the A6 Power Supply PWB from the chassis.

e. Loosen the hardware and remove the power supply cover.

f. Connect the positive lead of the voltmeter to A7TP9 and the common lead to A7TP1 (ground).

g. Turn on the transceiver.

h. Press and hold S4 on the A3 Control PWB. (Refer to figure 5-1 for A3S4 location.)

i. Adjust A6R4 until the voltmeter reads + 13.5 V.

j. Release A3S4. Verify that the voltmeter reads approximately + 9.5 V.

k. Turn off the transceiver.

l. Reinstall the power supply cover.

m. Reinstall the A6 Power Supply in the coupler chassis.

n. Disconnect voltmeter from A7 PWB.

o. Reinstall coupler top cover.

5.5.2 A3 Control PWB Adjustments

Refer to the A3 tab section for the parts list, component location drawing, and schematic diagram for the A3 Control PWB Assembly.

5.5.2.1 Precision + 5 Vdc Setup Adjustment

This procedure requires a digital voltmeter (HP-3435A, Fluke 73, or equivalent).

a. Measure the precision + 5 Vdc output at A3TP1 to ground.

b. Adjust A3R53 for a digital voltmeter reading of 4.95 to 5.05 Vdc.

c. Press A3S4.

d. Verify that the digital voltmeter still reads between 4.95 and 5.05 Vdc.

5.5.2.2 Switch S2 Setup

DIP switch S2 is reserved for future use. Switches S2-1 through S2-4 may be left in any position.

5.5.3 A5 Discriminator PWB Adjustments

Refer to the A5 tab section for parts list, component location drawing, and schematic diagram for the A5 Discriminator PWB Assembly.

5.5.3.1 R_p Discriminator Setup Adjustment

This procedure requires the following test equipment and materials:

- Digital voltmeter (Fluke 73, HP-3435A, or equivalent)

- Coaxial rf test cable (Type "N" connector on one end, alligator clips on the other)
- 50 ohm load
- Platform sheet of cardboard, wood, or equivalent material
- Spacer (thin piece of insulating material)

To adjust potentiometer A5R16, proceed as follows:

a. Verify that the transceiver is off and there is no power to the coupler.

b. Loosen the captive hardware (10 places) and remove the top cover of the coupler.

c. Refer to figure 5-4. Disconnect the E1 lead at the arc ball assembly.

d. Loosen the captive hardware (10 places) and remove coupler chassis from case. Slide a platform sheet of cardboard, wood, or equivalent material underneath chassis onto bottom half of case. Place chassis on top of this platform. (This will prevent possible shorting of traces under coupler chassis.)

e. Refer to figure 5-4. Place an insulating spacer between clip A5J3 and pin A4E14 to break the continuity in the RF path. Use caution not to damage clip or pin from excessive force when installing spacer.

NOTE

The rf test cable used in step f. is included in RF-382/MRK-24.

f. Fabricate a test cable as shown in figure 5-4. Connect a 50 ohm load to the RF output on the A5 Assembly. Connect the coaxial cable center conductor to A5J3 and the shield to the A5 PWB ground plane.

g. Refer to the component location diagram in the A5 tab section. Connect the positive lead of a digital voltmeter to A5TP4 (R_p) and the common lead to A5TP10 (ground).

h. Turn on the transceiver. Verify that the voltage at A5TP4 is 2.50 ± .04 V. If the voltage is slightly out of tolerance, adjust the + 5 V supply on the A3 Assembly (paragraph 5.5.2.1). Otherwise, check test setup, board interconnections, and R_p circuit connections and components.

i. Turn off the transceiver. Verify that power to coupler is off.

NOTE

The revision level of the A5 PWB is the letter after the part number 10208-1509.

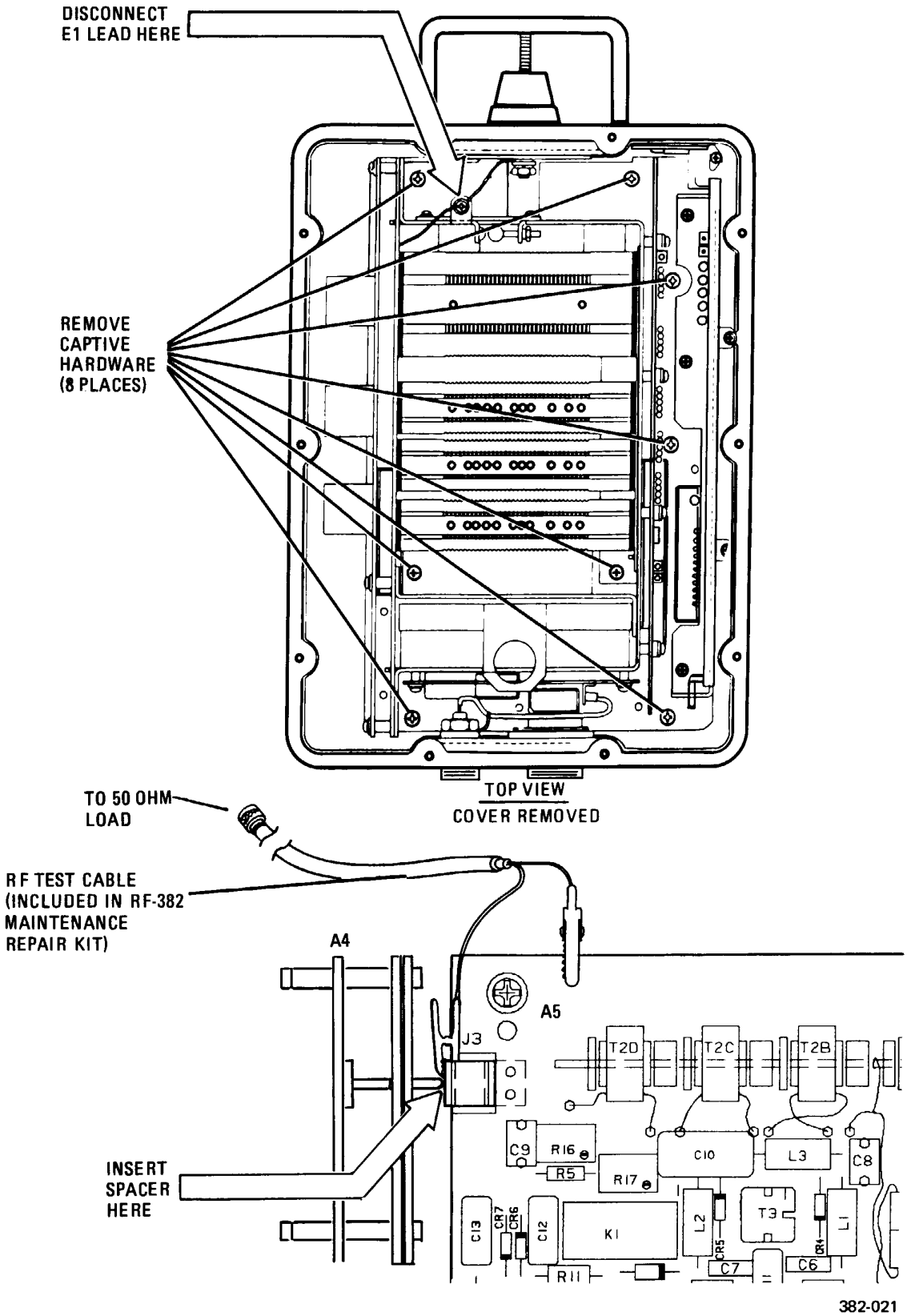


Figure 5-4. A5 Discriminator PWB Test Setup

j. Energize relay A5K1:

- For revision B boards, connect the anode of A5CR10 (located immediately below A5K1) to ground.
- For revision C boards or higher, connect A5TP12 to ground.

k. Connect a 5.11 K 1% resistor across A5R13:

- For revision B boards, connect a 5.11 K 1% resistor between two clip leads and connect this resistor across A5R13. Be careful not to short the clip leads to the PWB. Use short leads (less than 1 inch).
- For revision C boards or higher, connect a short between A5TP13 and A5TP14.

l. Turn the transceiver on.

m. Key the transceiver in AM mode at 2 MHz.

n. Adjust A5R16 until the digital voltmeter reads exactly + 2.5 V.

o. Unkey the transceiver.

p. Remove the ground connected in step j. There should be an audible click from the relay.

q. Key the transceiver in AM.

r. Verify that the digital voltmeter does not read 2.5 volts. If the voltmeter still reads 2.5 volts, then the relay was not properly energized. Repeat from step j.

s. Turn off the transceiver.

t. Remove the 5.11 K resistor that was connected in step k.

u. Turn the transceiver on.

v. Key transceiver in AM mode at 2 MHz.

w. Adjust A5R17 until the digital voltmeter reads exactly + 2.5 Vdc.

x. Unkey the transceiver.

y. Turn off the transceiver.

z. Remove the spacer that was installed in step e.

aa. Disconnect the 50 ohm load.

ab. Disconnect the digital voltmeter.

ac. Reinstall coupler chassis in bottom of coupler case, and secure hardware (10 places).

ad. Reconnect the E1 lead at the arc ball.

ae. Verify adjustments by tuning coupler to an antenna or an antenna simulator.

af. Reinstall the top cover.

5.5.4 A4 RF PWB Adjustments

Refer to the A4 tab section for the parts list, component location drawing, and schematic diagram for the A4 RF PWB Assembly.

5.5.4.1 7000 V Overvoltage Threshold Adjustment

This procedure requires a high-impedance voltmeter (HP-3435A, Fluke 73, or equivalent) and a platform sheet of cardboard, wood, or equivalent material. To adjust potentiometer A4R10, proceed as follows:

CAUTION

Incorrect alignment of this setting may seriously degrade coupler performance.

NOTE

This adjustment has been set at the factory for optimum coupler performance. It should not be adjusted in the field unless any of the following parts have been replaced: C65, C66, C67, C68, C69, CR32, CR34, R8, R9, or R10 on the A4 RF PWB; C63 or C64 on the A9A1 RF Interface PWB.

a. Turn off transceiver to remove power from the coupler.

b. Loosen the captive hardware (10 places) and remove the coupler top cover.

c. Disconnect lead from A1E1 (arc ball) to E1 (antenna) as shown in figure 5-4.

d. Loosen the captive hardware (10 places) and remove coupler chassis from case. Slide a platform sheet of cardboard, wood, or equivalent material underneath chassis onto bottom half of case. Install chassis on top of this platform. (This will present possible shorting of traces under the coupler chassis.)

NOTE

The voltmeter used in this procedure must be RFI-immune with an input impedance of at least 10 M ohm.

e. Refer to the A4 component location drawing. Connect a high-impedance, battery-powered voltmeter (or equivalent meter that can read dc voltage in the presence of high RF fields) between either end of A4L3 and chassis (A1) ground. Set the voltmeter to DC VOLTS.

f. Turn on transceiver. Tune the coupler to 17.000 MHz.

g. Key the transceiver in CW mode. Note the forward power to coupler with a calibrated RF power meter.

h. Adjust A4R10 to correct voltage listed in table 5-5.

Table 5-5. Overvoltage Threshold Setup

Forward Power (Watts)	7000 V Setup Dc Voltage at A4L3 (Volts)	2600 V Setup Dc Voltage at A4L1 (Volts)
80	1.63	1.61
90	1.75	1.73
100	1.86	1.84
110	1.97	1.95
120	2.07	2.05
130	2.17	2.15
140	2.27	2.25
150	2.36	2.34
160	2.45	2.43

i. Unkey the transceiver.

j. This completes the 7000 V adjustment procedure. Proceed with 2600 V adjustment procedure (paragraph 5.5.4.2) if desired.

k. Disconnect the voltmeter.

l. Remove platform and reinstall coupler chassis

m. Reconnect lead from A1E1 to E1.

n. Reinstall the coupler top cover.

5.5.4.2 2600 V Overvoltage Threshold Adjustment

This procedure requires a high impedance voltmeter (HP-3435A, Fluke 73, or equivalent) and a platform sheet of cardboard, wood, or equivalent material. To adjust potentiometer A4R4, proceed as follows:

NOTE

This adjustment has been set at the factory for optimum coupler performance. It should not be adjusted in the field unless any of the following parts on the A4 RF PWB have been replaced: C55, C57, C58, C54, C56, CR29, CR30, R5, R6, or R4.

CAUTION

Incorrect alignment of this setting may seriously degrade coupler performance.

a. Turn off transceiver to remove power from the coupler.

b. Loosen the captive hardware (10 places) and remove the coupler top cover.

c. Disconnect lead from A1E1 (arc ball) to E1 (antenna) as shown in figure 5-5.

d. Loosen the captive hardware (10 places) and remove coupler chassis from case. Slide a platform sheet of cardboard, wood, or equivalent material underneath chassis onto bottom half of case. Install chassis on top of this platform. (This will prevent possible shorting of traces under the coupler chassis.)

NOTE

The voltmeter used in this procedure must be RFI-immune with an input impedance of at least 10 M ohm.

e. Refer to the A4 component location drawing. Connect a high-impedance, battery-powered voltmeter (or equivalent meter that can read dc voltage in the presence of high RF fields) between either end of A4L1 and chassis (A1) ground. Set the voltmeter to DC VOLTS.

f. Turn on transceiver. Tune the coupler to 17.000 MHz.

g. Key the transceiver in CW mode. Note the forward power to coupler with a calibrated RF power meter.

h. Adjust A4R4 to correct voltage listed in table 5-5.

i. Unkey the transceiver.

j. This completes the 2600 V adjustment procedure. Disconnect the voltmeter.

k. Remove platform and reinstall coupler chassis.

l. Reconnect lead from A1E1 to E1.

m. Reinstall the coupler top cover.

5.5.5 Arc Ball Adjustment

Refer to figure 5-5. Adjust the arc ball assembly for a .077 to .078 inch (1.95 to 1.98 mm) spark gap.

5.6 CMOS HANDLING PROCEDURES

To protect static-sensitive devices from damage, the following suggested precautions should be followed:

a. Keep all static-sensitive devices in their protective packaging until needed. This packaging is usually conductive and should provide adequate protection for the device. Storing or

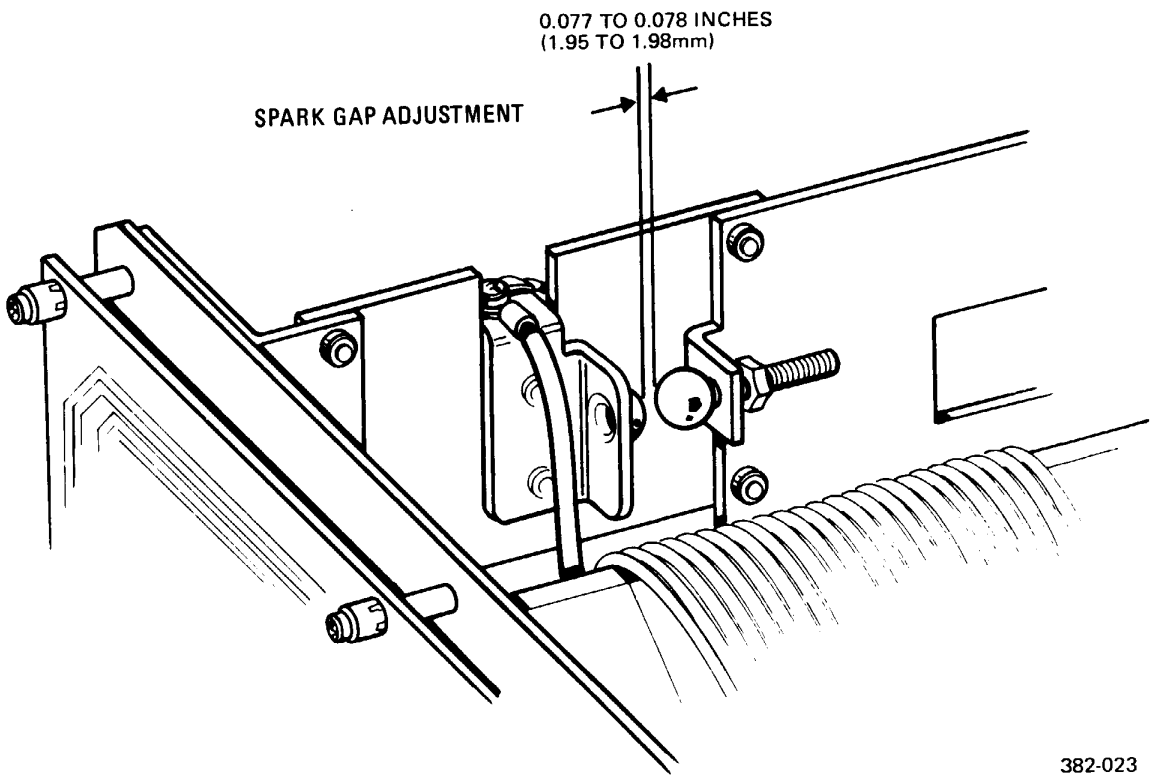


Figure 5-5. Spark Gap Adjustment

transporting static-sensitive devices in conventional plastic containers could be destructive to the device.

b. Disengage power prior to insertion or extraction of sensitive devices. This also applies to printed wiring boards containing sensitive devices.

c. Double check test equipment voltages and polarities prior to conducting any tests. Verify that no transients exist.

d. Use only soldering irons and tools that are properly grounded. Ungrounded soldering tips will destroy these devices. NEVER USE SOLDERING GUNS.

e. Avoid contact with the leads of the device. The component should always be handled very carefully by the ends or the side opposite the leads.

f. Avoid contact between printed wiring board circuits or component leads and synthetic clothing while handling static-sensitive devices or assemblies containing them.

5.7 TROUBLESHOOTING SUMMARY

Table 5-6 provides troubleshooting instructions to the assembly level. This table contains the same information as the pocket-sized CU-2397/G Troubleshooting Card (Publication Number 10208-5032) contained in the ancilliary kit.

Table 5-6. CU-2397/G Troubleshooting Instructions

CU-2397/G ANTENNA COUPLER
TROUBLESHOOTING INSTRUCTIONS TO ASSEMBLY LEVEL

1) POWER SUPPLY CHECKS — **IF NOT SATISFACTORY, THEN REPLACE**

A)	5/12/24 VDC LED IS ON	(IF ON, GO TO B; IF OFF, GO TO C)
B)	5 VDC LED IS ON	(IF ON, GO TO G; IF OFF, CONTINUE)
C)	A7 TP2 IS +12 TO +50 VDC	A7 F1 OR TRANSCEIVER
D)	A7 TP3 IS +12 TO +32 VDC	JUMPER P1
E)	A7 TP11 FOR +5 VDC	A5
F)	A7 TP9 FOR +9.5 OR +13.5 VDC	A6
G)	A7 TP10 FOR +24 VDC	A6
H)	A5 TP11 FOR -9.5 OR -13.5 VDC	A6
I)	A3 TP7 FOR +5 ± .02 VDC	A3

2) ATTEMPT TO TUNE AT FREQUENCY WHERE FAULT OCCURS. NOTE STATUS OF FAULT LEDS (1 = ON).

FAULT CODES F3	F2	F1	F0	OSI SEQ.	CONDITION	LIKELY PROBLEM, IN ORDER
0	0	0	0	NONE	NO FAULT DETECTED	
0	0	0	1	1	TUNE TIME-OUT FAULT	CHECK ANTENNA. IF OK, GO TO STEP 3 (STATIC BITE).
0	0	1	0	2	HIGH TUNE PWR FAULT	A7, XCVR, A5, A3
0	0	1	1	3	LOW/NO TUNE PWR FAULT	RF INPUT PATH, XCVR, A5, A3
0	1	0	0	1-2	FREQ COUNT FAULT	NEARBY XMTG ANT., A5, A3
0	1	0	1	1-3	OVER-VOLT/CURRENT FAULT	RF INPUT POWER TOO HIGH
0	1	1	0	2-3	OVER TEMPERATURE FAULT	COUPLER TEMP > 100°C (WAIT-THEN REDUCE RF INPUT POWER)
0	1	1	1	4	VSWR FAULT	ARCING OR BAD ANTENNA
1	0	0	0	1-4	TUNE SOLUTION FAULT	CHECK ANTENNA. IF OK, GO TO STEP 3 (STATIC BITE).

ASSEMBLY DESIGNATIONS

A2 INTERCONNECT PWB	A7 XCVR INTERFACE PWB
A3 CONTROL PWB	A8 CONNECTOR PWB
A4 RF PWB	A9 COIL PACK
A5 DISCRIMINATOR PWB	A9A1 RF INTERFACE PWB
A6 POWER SUPPLY	E1 ANT. INSULATOR

3) STATIC BITE: REMOVE ANTENNA INSULATOR LEAD FROM ARC BALL. MOMENTARILY KEY XMTR AT 7.7000 MHZ. DEPRESS A3S3. CHECK LAMPS & FAULT CODE. REPLACE ASSY SHOWN, IN ORDER.

CONDITON	ASSY
ANY LABELED RELAY LED FAILS TO LIGHT (EXCEPT DS1-DS6 WHICH ARE NOT USED)	A3
DIS RELAY FAILS TO CLICK, IN SEQUENCE	A5,A3,A2
K9, K13,K14, K16, K17 OR K18 FAILS TO CLICK, IN SEQUENCE	A9,A3,A2
ANY OTHER RELAY FAILS TO CLICK, IN SEQUENCE	A4,A3,A2

F3	F2	F1	F0	BITE FAILURE	ASSY
0	0	0	0	BITE PASSED	
0	0	0	1	RAM	A3,A7
0	0	1	0	EEPROM	A3,A7
0	0	1	1	REAL TIME CLOCK	A3,A7
0	1	0	0	5 VOLT REFERENCE	A3,A5
0	1	0	1	A/D CONVERTER	A3,A5
0	1	1	1	DETECTED FWD PWR	A5,A3,A2
1	0	0	0	DETECTED REFL PWR	A5,A3,A2
1	0	0	1	RP READING	A5,A3,A2,A6
1	0	1	0	PHASE READING	A5,A3,A2,A6
1	0	1	1	OVER VOLTAGE DETECTOR	A4,A3,A9
1	1	0	0	OVER CURRENT DETECTOR	A4,A3
1	1	1	0	FREQUENCY COUNTER	A5,A3
1	1	1	1	FAULT LOGIC	A3

4) XMIT BITE: XMIT BITE IS ONLY ACTIVE AFTER STATIC BITE HAS PASSED. MOMENTARILY KEY TRANSCEIVER AFTER STATIC BITE. REPLACE ASSY SHOWN, IN ORDER.

F3	F2	F1	F0	BITE FAILURE	ASSY
0	0	0	0	BITE PASSED	
0	0	0	1	TUNE FAULT	A3,A4,A5
0	0	1	0	HIGH TUNE PWR	A7,A5,A3,XCVR
0	0	1	1	LOW/NO TUNE POWER	RF INPUT PATH, XCVR,A5,A3
1	0	0	0	FREQ COUNTER	XCVR FREQ,A5,A3
1	0	0	1	RF RELAY (*)	A4,A9,A3
1	0	1	0	PHASE READING	A5,A3,A6
1	0	1	1	RP READING	A5,A3,A6
1	1	0	0	REFLECTED PWR	A5,A3

(*) PROBABLE DEFECTIVE RELAY LED WILL BE ON.

5) IF BITE DOES NOT PROVIDE IDENTIFICATION OF FAILED ASSY, CONSULT CU-2397/G TECHNICAL MANUAL, SECTION 5.

SECTION 6

PARTS LISTS, ASSEMBLY DRAWINGS, AND SCHEMATICS

6.1 GENERAL INFORMATION

This section contains an illustration showing the location of the major assemblies of the coupler. A cross-reference is provided for quick location of the tab section information.

6.2 COUPLER MAJOR ASSEMBLIES

The assemblies of the coupler are listed in table 6-1 and identified in figure 6-1. Refer to the assembly level tab sections for parts lists, component location drawings, and schematic diagrams.

Table 6-1. CU-2397/G Antenna Coupler Assemblies

Assembly	Tab Section
A1 Coupler Assembly	Main Chassis
A2 Interconnect PWB Assembly	Main Chassis
A3 Control PWB Assembly	A3
A4 RF PWB Assembly	A4
A5 Discriminator PWB Assembly	A5
A6 Power Supply Assembly	A6
A6A1 Power Supply PWB Assembly	A6
A6A2 EMI Filter Assembly	A6
A7 Transceiver Interface PWB Assembly	A7
A8 Connector PWB Assembly	Main Chassis
A9 Coil Pack Assembly	A4
A9A1 RF Interface PWB Assembly	A4

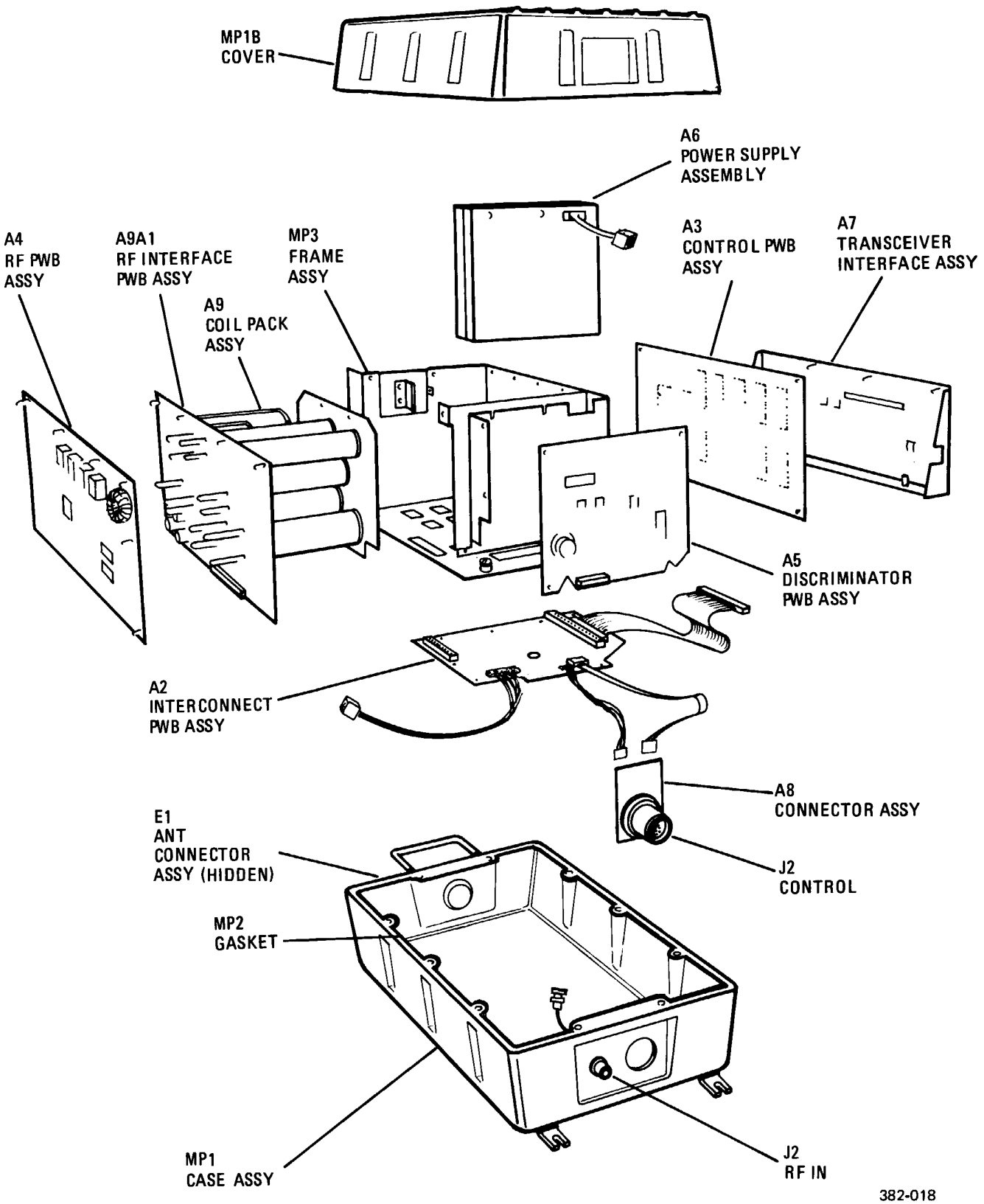


Figure 6-1. Coupler Major Assembly Locations

MAIN CHASSIS

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MAIN CHASSIS

1. GENERAL INFORMATION

This section contains top-level schematic and parts list information for the coupler. Parts lists and drawings for the A2 Interconnect PWB Assembly and the A8 Connector PWB Assembly are also included.

2. PARTS LIST, COMPONENT LOCATION, AND SCHEMATIC DIAGRAM

The parts lists, component location drawings, and schematic diagrams contained in this tab section are listed in table 1.

NOTE

Parts lists and drawings for the A9 Coil Pack Assembly and the A9A1 RF Interface PWB Assembly are located in the A4 tab section.

Table 1. Main Chassis Tab Section Parts Lists and Drawings

Assembly	Parts List Table No.	Component Location Figure No.	Schematic Diagram Figure No.
CU-2397/G Antenna Coupler	2	6-1	3
A2 Interconnect PWB*	-	1	3
A8 Connector PWB*	-	2	3

*These PWBs are not repairable; replace with new assembly.

Table 2. CU-2397/G Antenna Coupler Parts List

Ref. Desig.	Part Number	Description
--	10208-5010	CU-2397/G ANTENNA COUPLER, GRAY (INCLUDES ANCILLARY KIT, MANUAL AND TROUBLESHOOTING GUIDE)
A1	10208-5110	COUPLER ASSY, GRAY
--	10208-5020	CU-2397/G ANTENNA COUPLER, O.D. (INCLUDES ANCILLARY KIT, MANUAL AND TROUBLESHOOTING GUIDE)
A1	10208-5120	COUPLER ASSY, OLIVE DRAB
A2	10208-1270	INTERCONNECT PWB ASSY
A3	10208-1300	CONTROL PWB ASSY
A4	10208-5400	RF PWB ASSY
A5	10208-1500	DISCRIMINATOR ASSY
A6	10208-3000	POWER SUPPLY ASSY
A7	10208-3100	TRANSCEIVER INTERFACE PWB ASSY
A8	10208-5300	CONNECTOR PWB ASSY
A9	10208-5250	COIL PACK ASSY
A9A1	10208-5260	RF INTERFACE PWB ASSY
E1	1960-4000	INSULATOR ASSY
J1	UG-680A/U	JACK,PANEL,STR,N-F
MP1A-01	10208-1009-01	CASE ASSY,TOP,NAVY GRAY
MP1A-02	10208-1009-02	CASE ASSY,TOP,OLIVE DRAB
MP1B-01	10208-1008-01	CASE ASSY,BOTTOM,NAVY GRAY
MP1B-02	10208-1008-02	CASE ASSY,BOTTOM,OLIVE DRAB
MP2	10208-1004	GASKET
W1	10208-3260	RF INPUT CABLE ASSY

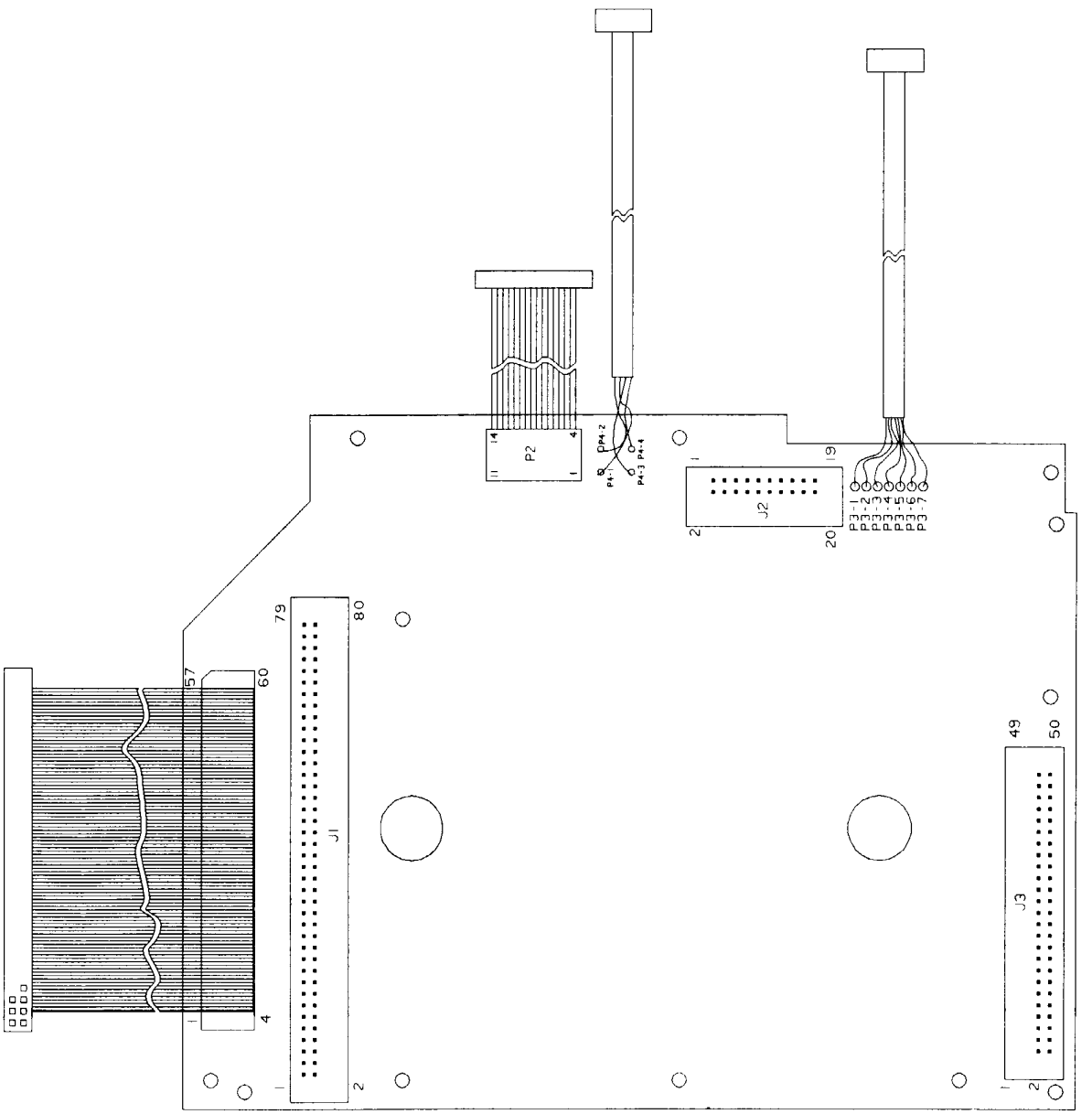

Figure 1. A2 Interconnect PWB Assembly (10208-1270) Component Locations

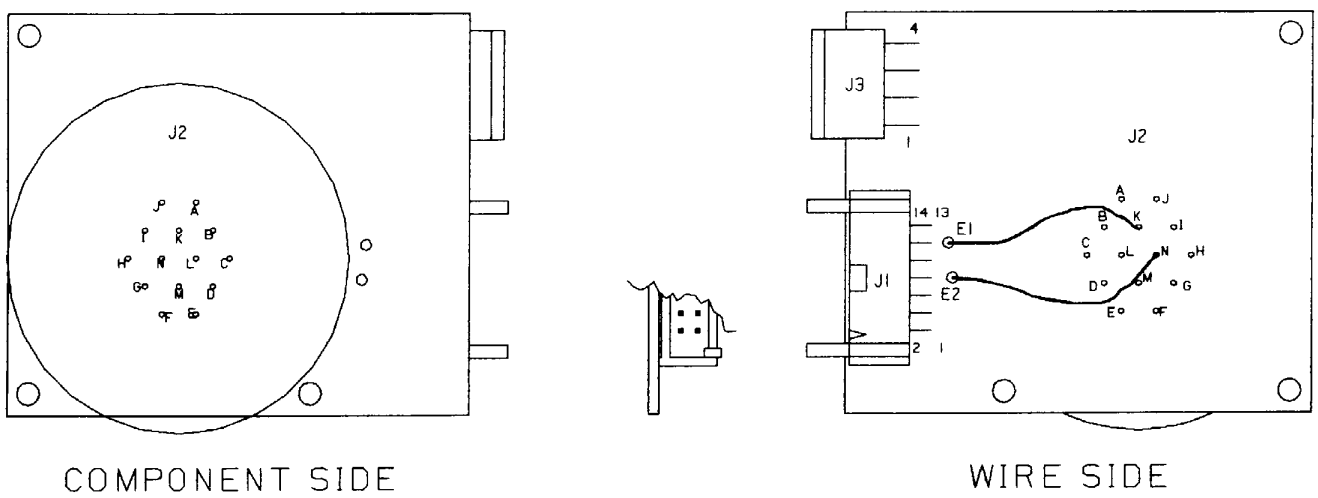

Figure 2. A8 Connector PWB Assembly (10208-5300) Component Locations

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.

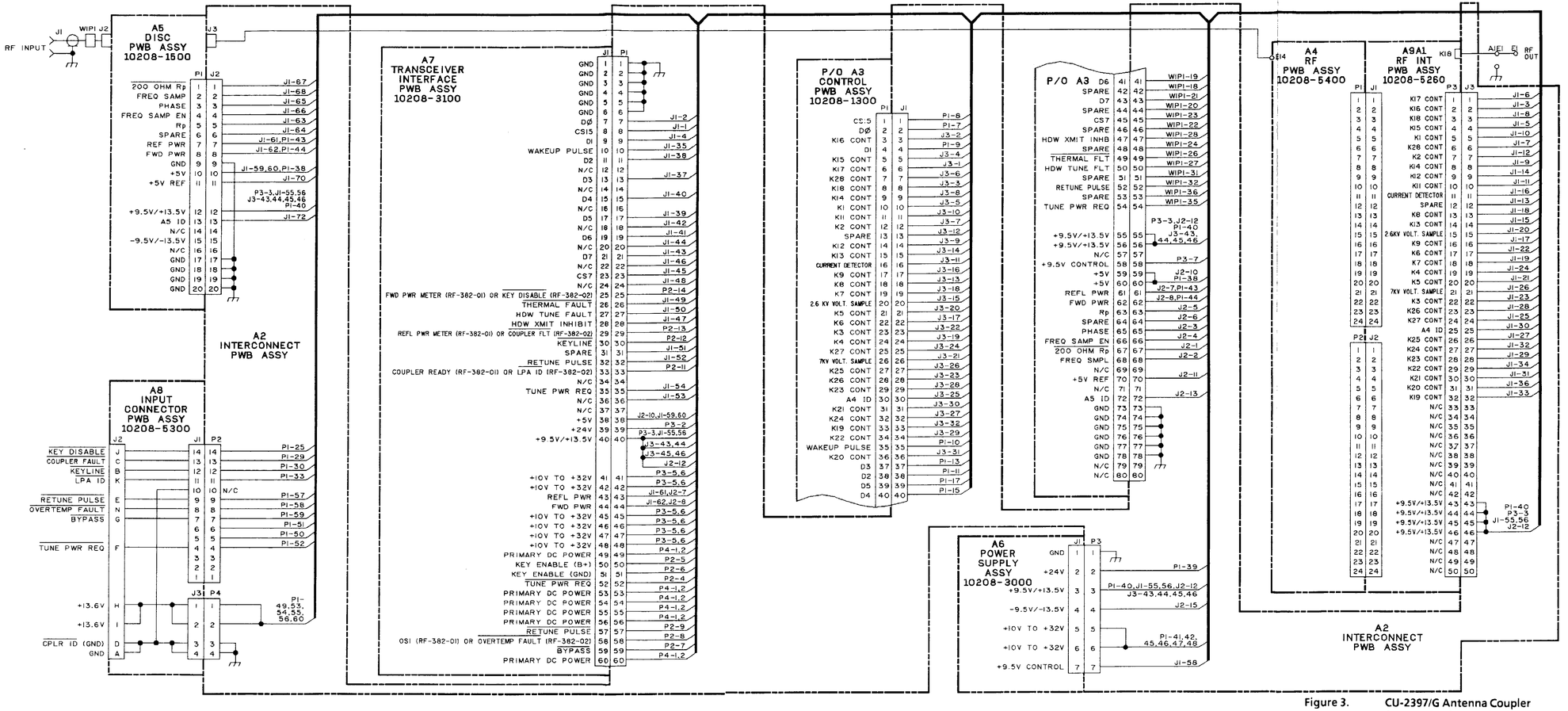

Figure 3. CU-2397/G Antenna Coupler Schematic Diagram (10208-5001, Rev. B)

A3
CONTROL PWB ASSEMBLY

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A3 CONTROL PWB ASSEMBLY

1. GENERAL INFORMATION

This tab section contains the parts list, component location drawing, and schematic diagram for the A3 Control PWB Assembly.

2. CIRCUIT DESCRIPTION

Refer to paragraphs 4.3.4 through 4.3.4.4 for a circuit description of the A3 Control PWB.

3. MAINTENANCE INFORMATION

Refer to paragraphs 5.5.2 through 5.5.2.2 for adjustment procedures. Test point voltages are shown on the A3 schematic diagram.

4. PARTS LIST, COMPONENT LOCATIONS, AND SCHEMATIC

Table 1 is the parts list for the A3 Control PWB. Component locations are shown in figure 1. Figure 2 is the schematic diagram.

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List

Ref. Desig.	Part Number	Description
C1	M39014/02-1310	CAP .1 UF
C2	M39014/02-1310	CAP .1 UF
C3	M39014/02-1310	CAP .1 UF
C4	M39014/02-1310	CAP .1 UF
C5	M39014/02-1310	CAP .1 UF
C6	M39014/02-1310	CAP .1 UF
C7	M39014/02-1310	CAP .1 UF
C8	M39014/02-1310	CAP .1 UF
C9	M39014/02-1310	CAP .1 UF
C10	M39014/02-1310	CAP .1 UF
C11	M39014/02-1310	CAP .1 UF
C12	M39014/02-1310	CAP .1 UF
C13	M39014/02-1310	CAP .1 UF
C14	M39014/02-1310	CAP .1 UF
C15	M39014/02-1310	CAP .1 UF
C16	M39014/02-1310	CAP .1 UF
C19	M39014/02-1310	CAP .1 UF
C20	M39014/02-1310	CAP .1 UF
C21	M39014/02-1310	CAP .1 UF
C22	M39014/02-1310	CAP .1 UF
C23	M39014/02-1310	CAP .1 UF
C24	M39014/02-1310	CAP .1 UF
C25	M39014/02-1310	CAP .1 UF
C26	NOT USED	
C27	NOT USED	
C28	NOT USED	
C29	C26-0010-689	CAP 68 UF 20% 10V TANT
C30	M39014/02-1310	CAP .1 UF

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List (Cont.)

Ref. Desig.	Part Number	Description
C31	C26-0050-109	CAP,FXD,ELCTLT,1 UF,50V
C32	M39014/02-1310	CAP .1 UF
C33	M39014/02-1298	CAP 01UF
C34	NOT USED	
C35	M39014/02-1298	CAP 01UF
C36	M39014/02-1298	CAP 01UF
C37	M39014/02-1298	CAP 01UF
C38	M39014/01-1317	CAP,CER,1000PF
C39	M39014/01-1317	CAP,CER,1000PF
C40	M39014/01-1317	CAP,CER,1000PF
C41	M39014/01-1317	CAP,CER,1000PF
C42	M39014/01-1317	CAP,CER,1000PF
C43	M39014/01-1317	CAP,CER,1000PF
C44	M39014/01-1317	CAP,CER,1000PF
C45	M39014/02-1298	CAP 01UF
C46	M39014/02-1298	CAP 01UF
C47	M39014/02-1298	CAP 01UF
C48	M39014/02-1298	CAP 01UF
C49	M39014/02-1298	CAP 01UF
C50	M39014/02-1298	CAP 01UF
C51	M39014/02-1298	CAP 01UF
C52	M39014/02-1298	CAP 01UF
C53	M39014/02-1298	CAP 01UF
C54	M39014/02-1298	CAP 01UF
C55	M39014/02-1298	CAP 01UF
C56	M39014/02-1298	CAP 01UF
C57	M39014/02-1298	CAP 01UF
C58	M39014/02-1298	CAP 01UF
C59	M39014/02-1298	CAP 01UF
C60	M39014/02-1298	CAP 01UF
C61	M39014/02-1298	CAP 01UF
C62	M39014/02-1298	CAP 01UF
C63	M39014/02-1298	CAP 01UF
C64	M39014/02-1298	CAP 01UF
C65	M39014/02-1298	CAP 01UF
C66	M39014/02-1298	CAP 01UF
C67	M39014/02-1298	CAP 01UF
C68	M39014/02-1298	CAP 01UF
C69	M39014/02-1298	CAP 01UF
C70	M39014/02-1298	CAP 01UF
C71	M39014/02-1298	CAP 01UF
C72	M39014/02-1298	CAP 01UF
C73	M39014/02-1298	CAP 01UF
C74	NOT USED	
C75	NOT USED	
C76	NOT USED	
C77	NOT USED	
C78	NOT USED	
C79	NOT USED	
C80	M39014/02-1310	CAP .1 UF
C81	CM05ED390J03	CAP 39PF 5% 500V MICA
C82	CM05ED390J03	CAP 39PF 5% 500V MICA

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List (Cont.)

Ref. Desig.	Part Number	Description
C83	M39014/02-1298	CAP 01UF
C84	M39014/02-1310	CAP .1 UF
C85	M39014/02-1310	CAP .1 UF
C86	M39014/02-1310	CAP .1 UF
C87	M39014/02-1310	CAP .1 UF
C88	C26-0025-339	CAP,FXD,ELCTLT,3.3 UF,25
C89	M39014/02-1310	CAP .1 UF
C90	M39014/02-1310	CAP .1 UF
CR1	NOT USED	
CR2	NOT USED	
CR3	NOT USED	
CR4	NOT USED	
CR5	NOT USED	
CR6	1N4454	DIODE, SS SILICON
CR7	1N4454	DIODE, SS SILICON
CR8	1N4454	DIODE, SS SILICON
CR9	1N4454	DIODE, SS SILICON
CR10	1N4454	DIODE, SS SILICON
CR11	1N4454	DIODE, SS SILICON
CR12	1N4454	DIODE, SS SILICON
CR13	1N4454	DIODE, SS SILICON
CR14	NOT USED	
CR15	NOT USED	
CR16	NOT USED	
CR17	1N4454	DIODE, SS SILICON
CR18	1N4454	DIODE, SS SILICON
CR19	1N6263	DIODE,HOT CARRIER
CR20	1N6263	DIODE,HOT CARRIER
CR21	1N5711	DIODE,HOT CARRIER
CR22	1N5711	DIODE,HOT CARRIER
CR23	1N4454	DIODE, SS SILICON
CR24	1N6263	DIODE,HOT CARRIER
CR25	1N6263	DIODE,HOT CARRIER
CR26	1N6263	DIODE,HOT CARRIER
CR27	1N4454	DIODE, SS SILICON
DS1	N25-0005-208	LED,PACK
DS2	N25-0005-208	LED,PACK
DS3	N25-0005-208	LED,PACK
DS4	N25-0005-208	LED,PACK
DS5	N25-0005-208	LED,PACK
J1	NOT USED	
J2	J46-0022-007	CONN, 7 PIN SINGLE
JMP1	MP-1142	CIRCUIT JUMPER
JMP2	MP-1142	CIRCUIT JUMPER
JMP3	MP-1142	CIRCUIT JUMPER
JMP4	MP-1142	CIRCUIT JUMPER
JMP5	J46-0047-002	HEADER, 2 POS
L1	MS75085-3	COIL, RF 47 UH 10%
L2	MS75085-3	COIL, RF 47 UH 10%
L3	MS75085-3	COIL, RF 47 UH 10%
L4	MS75085-3	COIL, RF 47 UH 10%
L5	MS75085-3	COIL, RF 47 UH 10%

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List (Cont.)

Ref. Desig.	Part Number	Description
L6	MS75085-3	COIL, RF 47 UH 10%
L7	MS75085-3	COIL, RF 47 UH 10%
L8	MS75085-3	COIL, RF 47 UH 10%
L9	MS75085-3	COIL, RF 47 UH 10%
L10	MS75085-3	COIL, RF 47 UH 10%
L11	MS75085-3	COIL, RF 47 UH 10%
L12	MS75085-3	COIL, RF 47 UH 10%
L13	MS75085-3	COIL, RF 47 UH 10%
L14	MS75085-3	COIL, RF 47 UH 10%
L15	MS75085-3	COIL, RF 47 UH 10%
L16	MS75085-3	COIL, RF 47 UH 10%
L17	MS75085-3	COIL, RF 47 UH 10%
L18	MS75085-3	COIL, RF 47 UH 10%
L19	MS75085-3	COIL, RF 47 UH 10%
L20	MS75085-3	COIL, RF 47 UH 10%
L21	MS75085-3	COIL, RF 47 UH 10%
L22	MS75085-3	COIL, RF 47 UH 10%
L23	MS75085-3	COIL, RF 47 UH 10%
L24	MS75085-3	COIL, RF 47 UH 10%
L25	MS75085-3	COIL, RF 47 UH 10%
L26	MS75085-3	COIL, RF 47 UH 10%
L27	MS75085-3	COIL, RF 47 UH 10%
L28	MS75085-3	COIL, RF 47 UH 10%
L29	MS75085-3	COIL, RF 47 UH 10%
L30	NOT USED	
L31	NOT USED	
L32	NOT USED	
L33	NOT USED	
L34	NOT USED	
L35	NOT USED	
L36	MS75085-3	COIL, RF 47 UH 10%
L37	MS75085-3	COIL, RF 47 UH 10%
P1	J46-0056-080	RECEPTACLE 80 PI
Q1	NOT USED	
Q2	NOT USED	
Q3	NOT USED	
Q4	2N2222A	XSTR, SS/GP, NPN
Q5	2N2907A	XSTR, SS/GP, PNP
Q6	2N2907A	XSTR, SS/GP, PNP
R1	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R2	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R3	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R4	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R5	R65-0003-224	RES,220K 5% 1/4W CAR FILM
R6	R65-0003-105	RES,1.0M 5% 1/4W CAR FILM
R7	R65-0003-682	RES,6.8K 5% 1/4W CAR FILM
R8	R50-0010-122	RES,10SIP,1.2K,2
R9	R50-0010-122	RES,10SIP,1.2K,2
R10	R50-0010-122	RES,10SIP,1.2K,2
R11	R50-0010-122	RES,10SIP,1.2K,2
R12	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R13	R50-0006-103	RES,6 SIP, 10K,2.0%, 5RES

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List (Cont.)

Ref. Desig.	Part Number	Description
R14	R50-0006-103	RES,6 SIP, 10K,2.0%, 5RES
R15	R51-0010-103	RES 10P SIP 10K
R16	R51-0010-103	RES 10P SIP 10K
R17	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R18	NOT USED	
R19	NOT USED	
R20	NOT USED	
R21	NOT USED	
R22	NOT USED	
R23	NOT USED	
R24	NOT USED	
R25	NOT USED	
R26	NOT USED	
R27	NOT USED	
R28	NOT USED	
R29	NOT USED	
R30	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM
R31	NOT USED	
R32	NOT USED	
R33	NOT USED	
R34	NOT USED	
R35	NOT USED	
R36	NOT USED	
R37	R65-0003-225	RES,2.2M 5% 1/4W CAR FILM
R38	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R39	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R40	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R41	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R42	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R43	R65-0003-681	RES,680 5% 1/4W CAR FILM
R44	R65-0003-101	RES,100 5% 1/4W CAR FILM
R45	R65-0003-681	RES,680 5% 1/4W CAR FILM
R46	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R47	R65-0003-393	RES,39K 5% 1/4W CAR FILM
R48	R65-0003-563	RES,56K 5% 1/4W CAR FILM
R49	NOT USED	
R50	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R51	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R52	RN55D6040F	RES,604.0 1% 1/8W MET FLM
R53	R30-0008-201	RES,VAR,200 3/4W
R54	RN55D2430F	RES,243.0 1% 1/8W MET FLM
R55	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R56	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R57	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R58	R50-0006-331	RES,6 SIP, 330,2
R59	R50-0006-122	RES,6 SIP,1.2K,2
R60	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R61	R65-0003-333	RES,33K 5% 1/4W CAR FILM
R62	R65-0003-333	RES,33K 5% 1/4W CAR FILM
R63	R65-0003-563	RES,56K 5% 1/4W CAR FILM
R64	R65-0003-563	RES,56K 5% 1/4W CAR FILM
R65	R65-0003-182	RES,1.8K 5% 1/4W CAR FILM

Table 1. A3 Control PWB Assembly (10208-1300, Rev. D) Parts List (Cont.)

Ref. Desig.	Part Number	Description
R66	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R67	R65-0003-224	RES,220K 5% 1/4W CAR FILM
S1	S10-0010-911	SW PB SPST NO MO
S2	S50-0001-004	SWITCH, DIP, 4 SECTION
S3	S10-0010-911	SW PB SPST NO MO
S4	S10-0010-912	SWITCH,PB,SPDT
TP1	J65-0009-001	TEST POINT
TP2	J65-0009-001	TEST POINT
TP3	J65-0009-001	TEST POINT
TP4	J65-0009-001	TEST POINT
TP5	J65-0009-001	TEST POINT
TP6	J65-0009-001	TEST POINT
U1	I27-0017-311	EXTENDED TEMP,80
U2	10208-8100	IC,PROGRAMMED
U3	I25-0003-001	EXTENDED TEMP,28
U4	I15-0000-138	IC 74HC138 PLASTIC CMOS
U5	10208-8200	IC,PROGRAMMED
U6	I15-0000-245	IC 74HC245 PLASTIC CMOS
U7	I15-0000-393	IC 74HC393 PLASTIC CMOS
U8	I15-0000-393	IC 74HC393 PLASTIC CMOS
U9	I15-0000-393	IC 74HC393 PLASTIC CMOS
U10	I01-0000-102	IC 4020B PLASTIC CMOS
U11	I40-0010-001	IC ADC0817 PLASTIC CMOS
U12	I15-0000-374	IC 74HC374 PLASTIC CMOS
U13	I15-0000-374	IC 74HC374 PLASTIC CMOS
U14	I15-0000-374	IC 74HC374 PLASTIC CMOS
U15	I15-0000-374	IC 74HC374 PLASTIC CMOS
U16	I15-0000-374	IC 74HC374 PLASTIC CMOS
U17	I90-0006-004	IC 2003 XISTOR ARRAY CER
U18	I90-0006-004	IC 2003 XISTOR ARRAY CER
U19	I90-0006-004	IC 2003 XISTOR ARRAY CER
U20	I90-0006-004	IC 2003 XISTOR ARRAY CER
U21	I90-0006-004	IC 2003 XISTOR ARRAY CER
U22	I26-0010-001	IC STATIC RAM CMOS 2048X8
U23	I15-0000-373	IC 74HC373 PLASTIC CMOS
U24	I15-0000-373	IC 74HC373 PLASTIC CMOS
U25	I15-0000-373	IC 74HC373 PLASTIC CMOS
U26	I15-0000-373	IC 74HC373 PLASTIC CMOS
U27	I15-0000-374	IC 74HC374 PLASTIC CMOS
U28	I15-0000-074	IC 74HC74 PLASTIC CMOS
U29	I15-0000-074	IC 74HC74 PLASTIC CMOS
U30	10208-8300	IC,PROGRAMMED
U31	NOT USED	
U32	I15-0000-000	IC 74HC00 PLASTIC CMOS
U33	I23-0001-202	IC 335 TEMP SENS
U34	I01-0000-353	IC 4538B PLASTIC CMOS
VR1	IC-0358	IC VR 317 ADJ V 1.5A
XU1	J77-0008-007	SOCKET,40PIN
XU2	J77-0008-006	SOCKET, IC, 28 PIN
XU11	J77-0008-007	SOCKET,40PIN
XU30	J77-0008-004	SKT IC MACH
Y1	Y15-0005-042	CRYSTAL,4.9152 MHZ

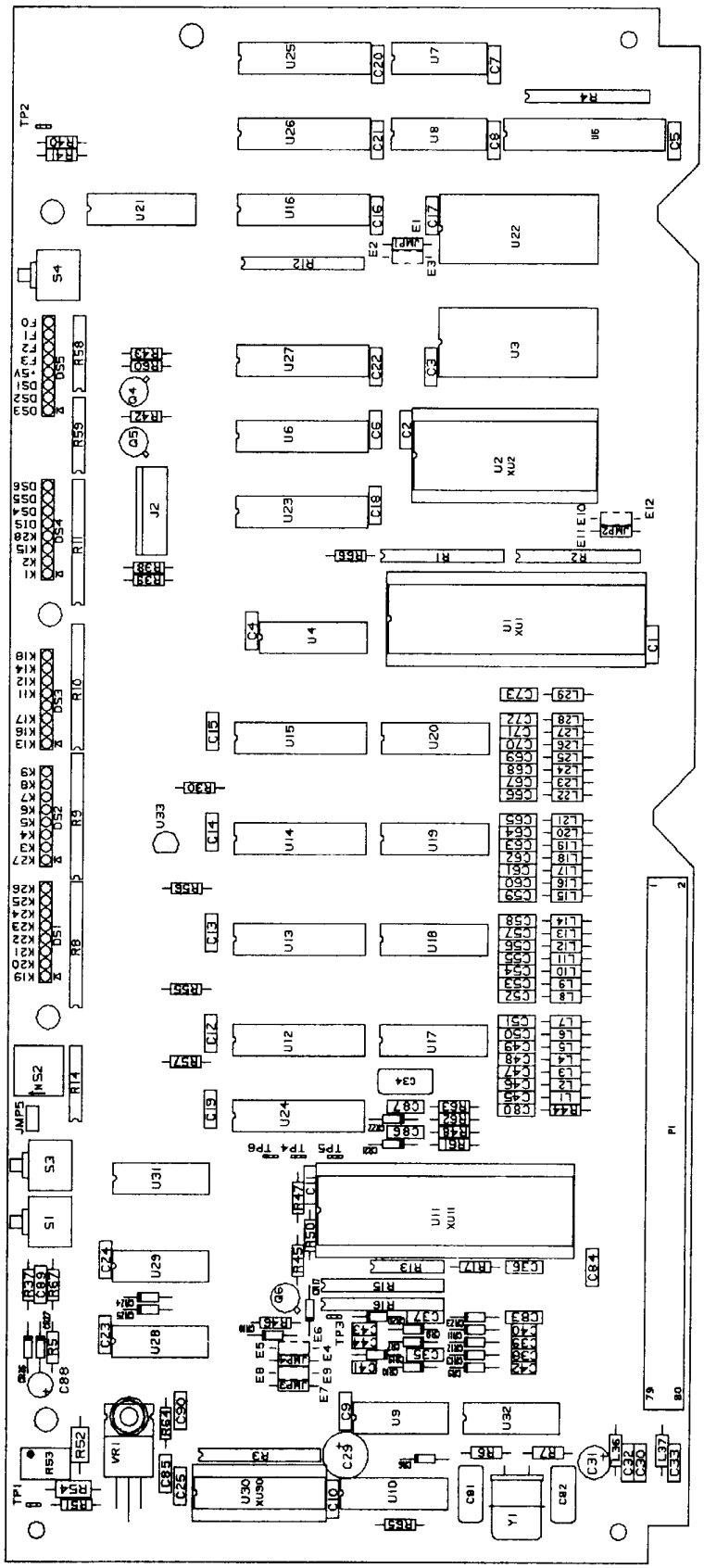

Figure 1. A3 Control PWB Assembly (10208-1300) Component Locations

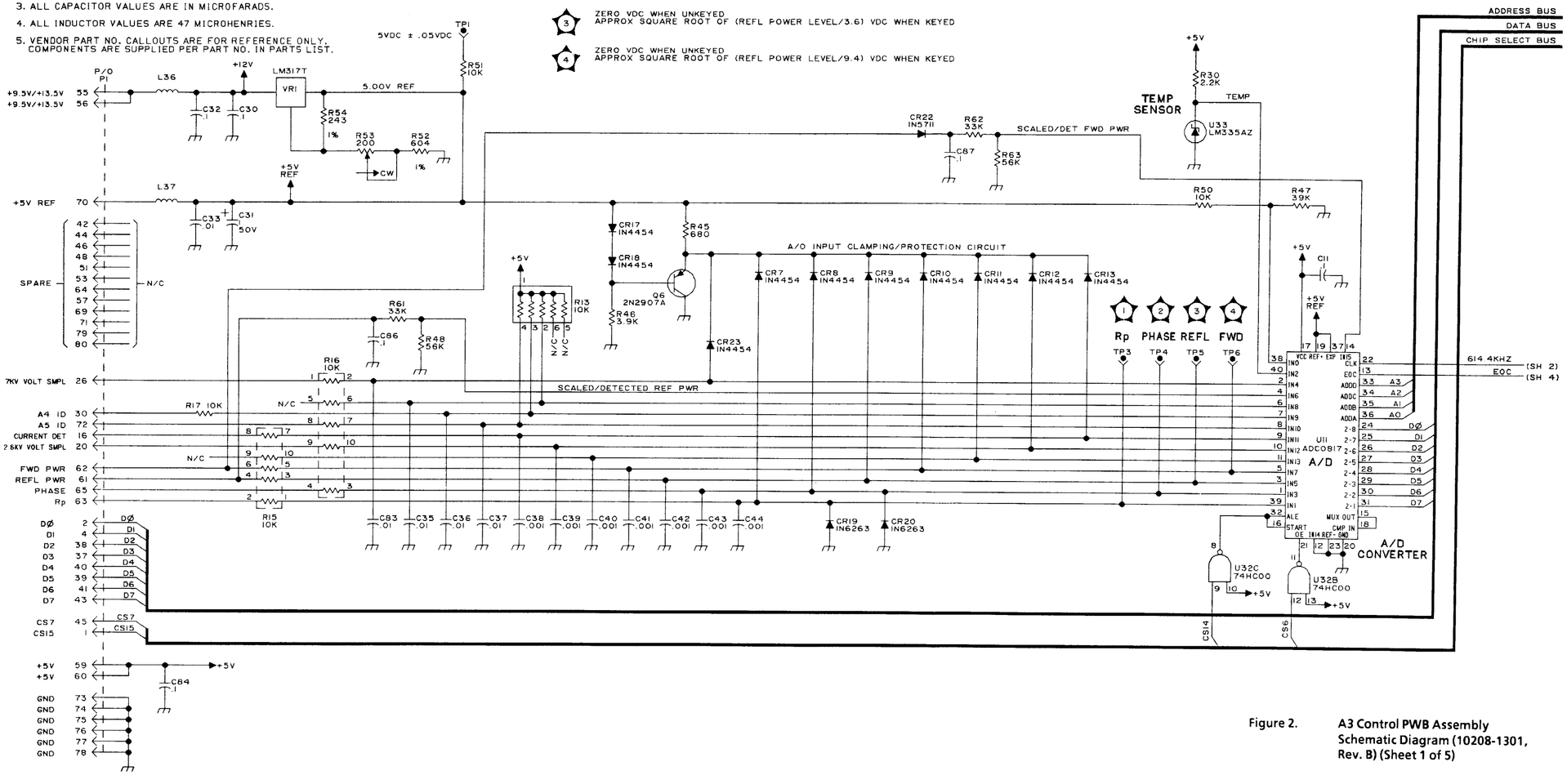

Figure 2. A3 Control PWB Assembly Schematic Diagram (10208-1301, Rev. B) (Sheet 1 of 5)

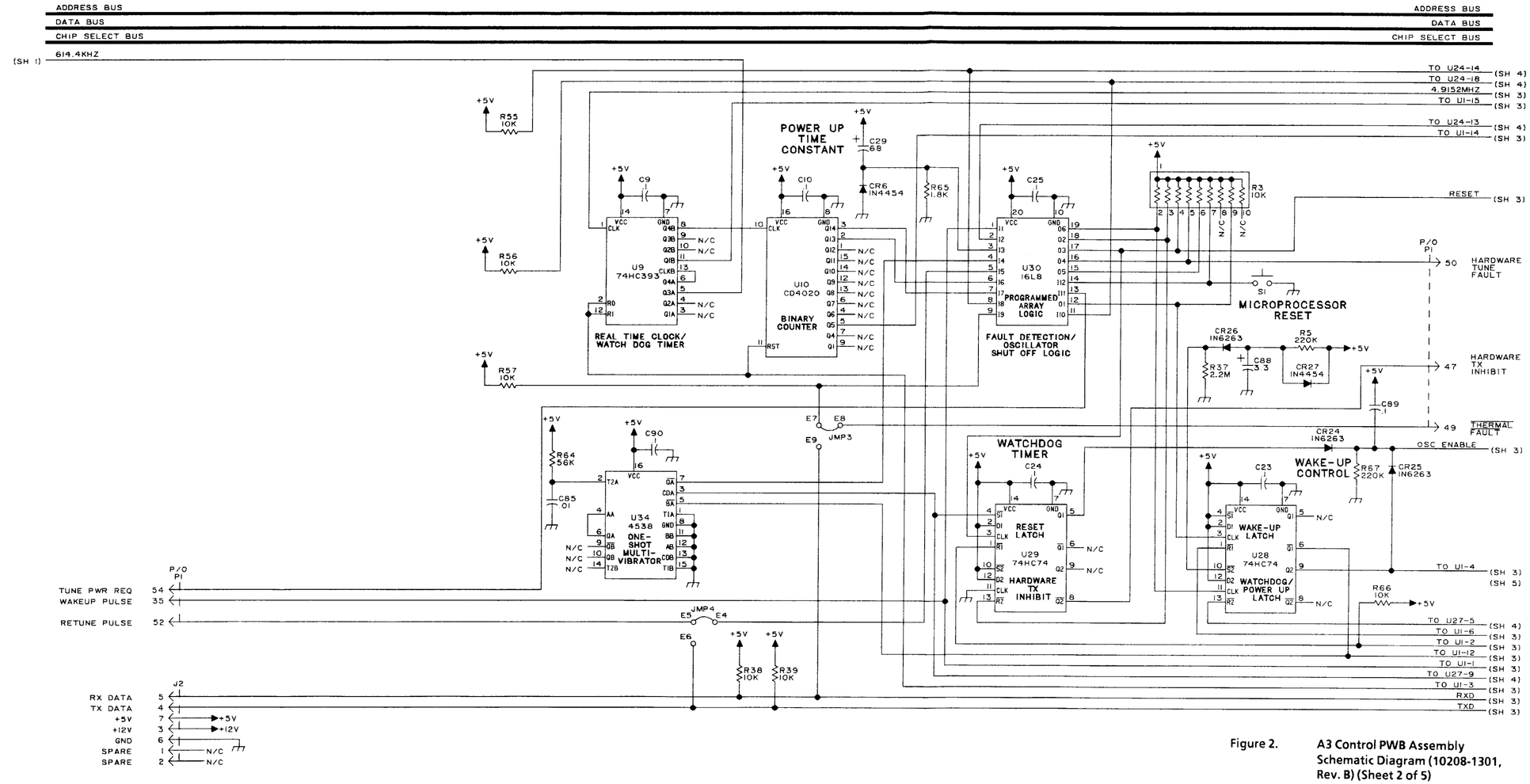

Figure 2. A3 Control PWB Assembly Schematic Diagram (10208-1301, Rev. B) (Sheet 2 of 5)

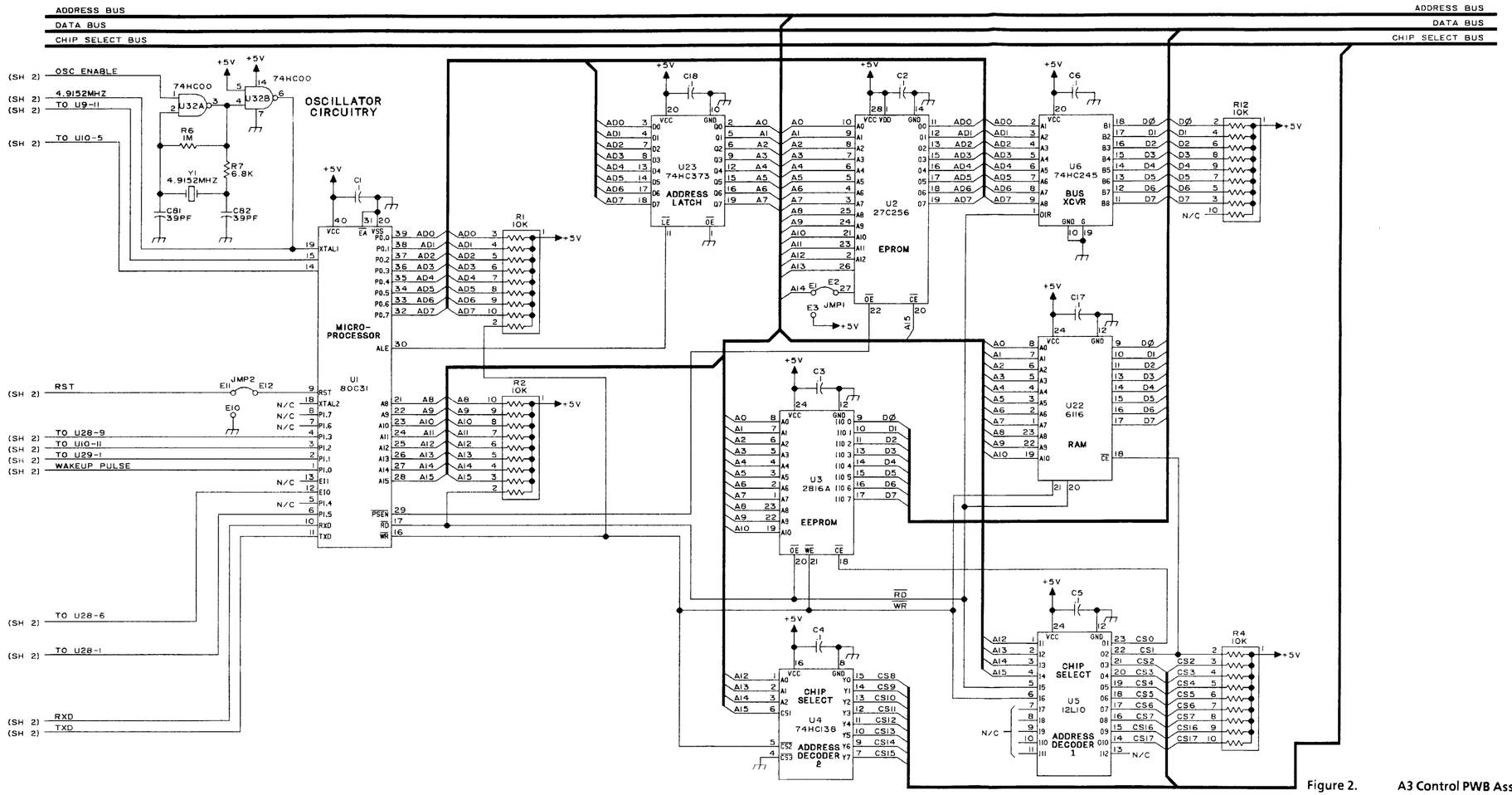

Figure 2. A3 Control PWB Assembly Schematic Diagram (10208-1301, Rev. B) (Sheet 3 of 5)

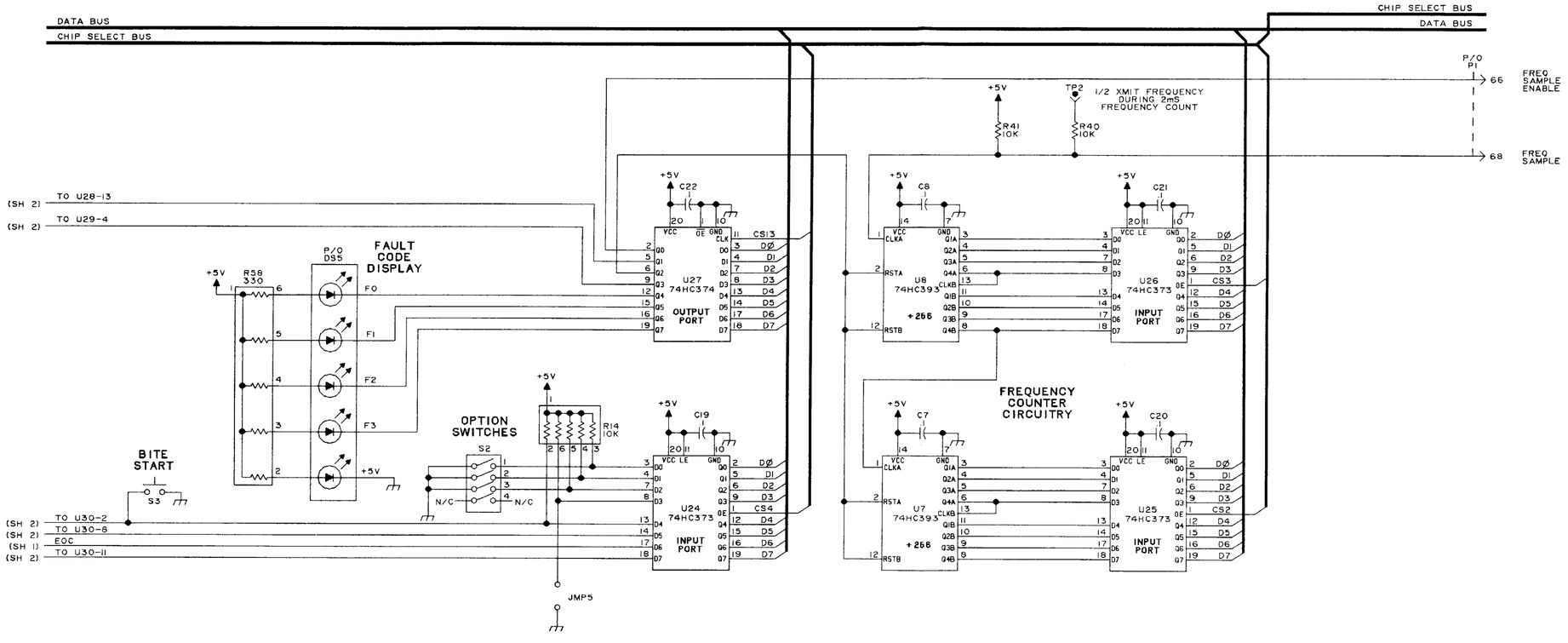

Figure 2. A3 Control PWB Assembly Schematic Diagram (10208-1301, Rev. B) (Sheet 4 of 5)

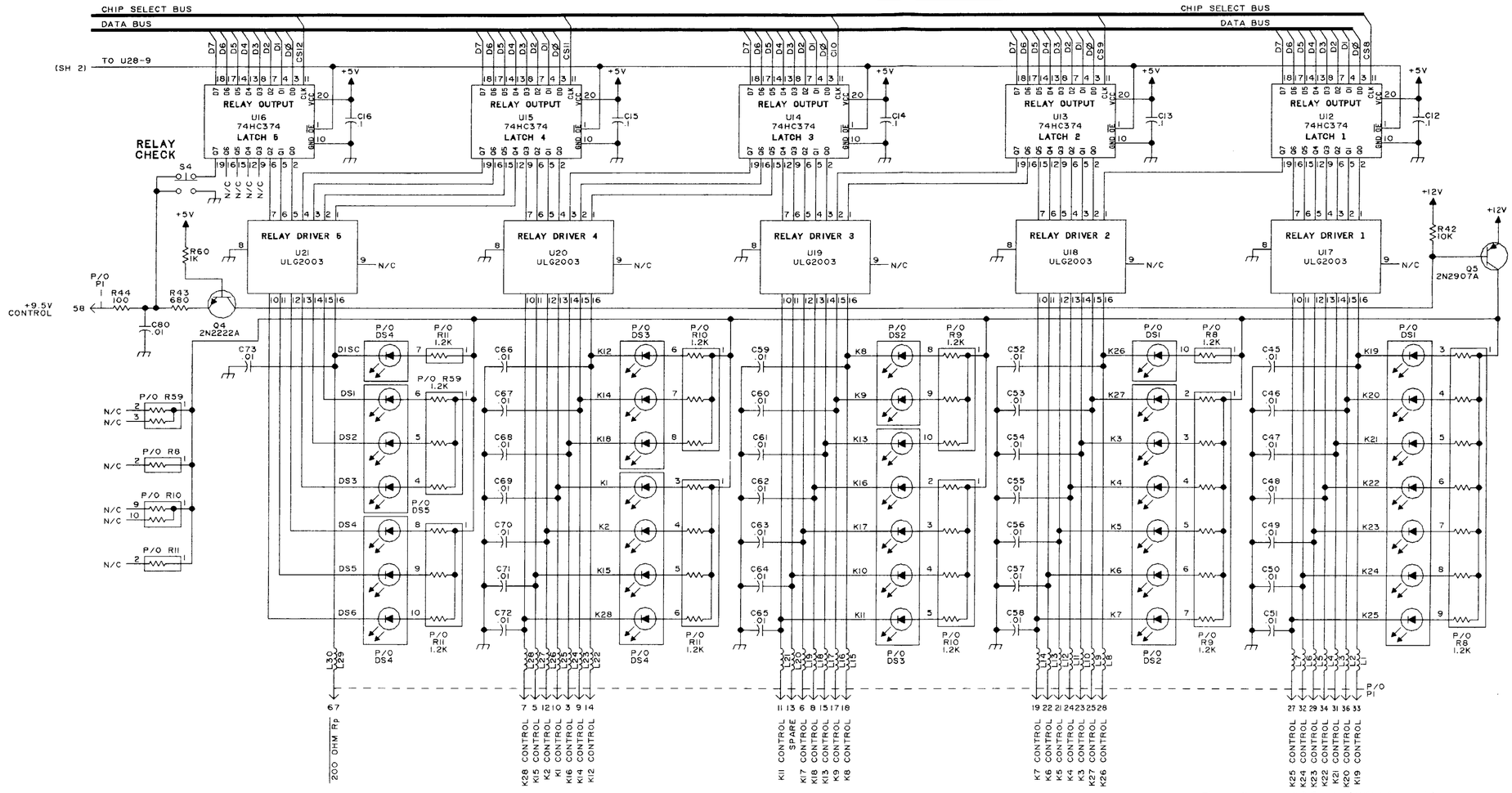

Figure 2. A3 Control PWB Assembly Schematic Diagram (10208-1301, Rev. B) (Sheet 5 of 5)

A4
RF PWB ASSEMBLY

A9
COIL PACK ASSEMBLY

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LIST OF FIGURES

LIST OF TABLES

A4 RF PWB ASSEMBLY/A9 COIL PACK ASSEMBLY

1. GENERAL INFORMATION

This tab section contains parts lists, component location drawings, and schematic diagram for the A4 RF PWB Assembly, A9 Coil Pack Assembly, and A9A1 RF Interface PWB Assembly.

2. CIRCUIT DESCRIPTION

Refer to paragraphs 4.3.3 through 4.3.3.6 for a circuit description of the A4 RF PWB and the A9 Coil Pack.

3. MAINTENANCE INFORMATION

Refer to paragraphs 5.5.4 through 5.5.4.2 for adjustment procedures. Test point voltages are shown on the A4 schematic diagram.

4. PARTS LIST, COMPONENT LOCATIONS, AND SCHEMATIC

Tables 1 through 3 are the parts lists for the A4 RF PWB, A9 Coil Pack Assembly, and A9A1 RF Interface PWB. Component locations for the A4 RF PWB are shown in figure 1. Component locations for the A9 Coil Pack and A9A1 RF Interface PWB are shown in figures 2 and 3. Figure 4 is the schematic diagram for the A4 RF PWB, A9 Coil Pack, and A9A1 RF Interface PWB.

Table 1. A4 RF PWB Assembly Parts List (10208-5400, Rev. D)

Ref. Desig.	Part Number	Description
C1	C11-0035-470	CAP,47PF,5%,6KV,CER
C2	C11-0035-470	CAP,47PF,5%,6KV,CER
C3	C11-0035-470	CAP,47PF,5%,6KV,CER
C4	C11-0035-470	CAP,47PF,5%,6KV,CER
C5	C11-0035-330	CAP,33PF,5%,6KV,CER
C6	C11-0035-330	CAP,33PF,5%,6KV,CER
C9	C11-0035-330	CAP,33PF,5%,6KV,CER
C10	C11-0035-330	CAP,33PF,5%,6KV,CER
C11	C11-0035-330	CAP,33PF,5%,6KV,CER
C12	C11-0035-330	CAP,33PF,5%,6KV,CER
C13	C11-0035-330	CAP,33PF,5%,6KV,CER
C14	C11-0035-330	CAP,33PF,5%,6KV,CER
C15	C11-0035-100	CAP,10PF,5%,6KV,CER
C16	C11-0035-100	CAP,10PF,5%,6KV,CER
C17	C11-0035-100	CAP,10PF,5%,6KV,CER
C18	C11-0035-470	CAP,47PF,5%,6KV,CER
C19	C11-0035-470	CAP,47PF,5%,6KV,CER
C20	C11-0035-330	CAP,33PF,5%,6KV,CER
C21	C11-0004-032	CAP 160MMF 5%
C22	C11-0004-022	CAP, 330PF
C23	C11-0004-022	CAP, 330PF
C24	C11-0004-022	CAP, 330PF
C25	C11-0004-011	CAP,FXD,CER,680 PF
C26	C11-0004-011	CAP,FXD,CER,680 PF
C27	C11-0004-132	CAP, 1300PF
C28	C11-0004-132	CAP, 1300PF

Table 1. A4 RF PWB Assembly Parts List (10208-5400, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
C53	M39014/02-1310	CAP .1 UF
C54	C11-0035-100	CAP, 10PF, 5%, 6KV, CER
C55	CM05FD221G03	CAP 220PF 2% 500V MICA
C56	C26-0010-100	CAP, 10MFD 10V TANT
C57	CM05CD100G03	CAP 10PF 2% 500V MICA
C58	CM05FD201G03	CAP 200PF 2% 500V MICA
C61	M39014/02-1310	CAP .1 UF
C62	M39014/02-1310	CAP .1 UF
C65	C11-0035-100	CAP, 10PF, 5%, 6KV, CER
C66	CM05FD151G03	CAP 150PF 2% 500V MICA
C67	CM05CD100G03	CAP 10PF 2% 500V MICA
C68	CM05FD201G03	CAP 200PF 2% 500V MICA
C69	C26-0010-100	CAP, 10MFD 10V TANT
C70	M39014/02-1310	CAP .1 UF
C71	M39014/02-1310	CAP .1 UF
C72	M39014/02-1310	CAP .1 UF
C73	C26-0010-221	CAP 220MFD 10V TANT
C74	M39014/02-1298	CAP .01UF
CR1	1N4004	DIODE, RECT. 400V 1A
CR2	1N4004	DIODE, RECT. 400V 1A
CR3	1N4004	DIODE, RECT. 400V 1A
CR4	1N4004	DIODE, RECT. 400V 1A
CR5	1N4004	DIODE, RECT. 400V 1A
CR6	1N4004	DIODE, RECT. 400V 1A
CR7	1N4004	DIODE, RECT. 400V 1A
CR8	1N4004	DIODE, RECT. 400V 1A
CR11	1N4004	DIODE, RECT. 400V 1A
CR12	1N4004	DIODE, RECT. 400V 1A
CR15	1N4004	DIODE, RECT. 400V 1A
CR19	1N4004	DIODE, RECT. 400V 1A
CR20	1N4004	DIODE, RECT. 400V 1A
CR21	1N4004	DIODE, RECT. 400V 1A
CR22	1N4004	DIODE, RECT. 400V 1A
CR23	1N4004	DIODE, RECT. 400V 1A
CR24	1N4004	DIODE, RECT. 400V 1A
CR25	1N4004	DIODE, RECT. 400V 1A
CR26	1N4004	DIODE, RECT. 400V 1A
CR27	1N4004	DIODE, RECT. 400V 1A
CR28	1N4004	DIODE, RECT. 400V 1A
CR29	1N6263	DIODE,HOT CARRIER
CR30	1N6263	DIODE,HOT CARRIER
CR31	1N6263	DIODE,HOT CARRIER
CR32	1N6263	DIODE,HOT CARRIER
CR34	1N6263	DIODE,HOT CARRIER
E1	10208-1408	FEMALE CONN
E2	10208-1408	FEMALE CONN
E3	10208-1408	FEMALE CONN
E4	10208-1408	FEMALE CONN
E5	10208-1408	FEMALE CONN
E6	10208-1408	FEMALE CONN
E7	10208-1408	FEMALE CONN
E8	NOT USED	

Table 1. A4 RF PWB Assembly Parts List (10208-5400, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
E9	10208-1408	FEMALE CONN
E10	NOT USED	
E11	NOT USED	
E12	10208-1408	FEMALE CONN
E13	10208-1408	FEMALE CONN
E14	10208-1413	PIN, RF INPUT
K1	10208-1404	RELAY,SPDT,12VDC,MOD.
K2	10208-1404	RELAY,SPDT,12VDC,MOD.
K3	10208-1404	RELAY,SPDT,12VDC,MOD.
K4	10208-1404	RELAY,SPDT,12VDC,MOD.
K5	10208-1404	RELAY,SPDT,12VDC,MOD.
K6	10208-1404	RELAY,SPDT,12VDC,MOD.
K7	10208-1404	RELAY,SPDT,12VDC,MOD.
K8	10208-1403	RELAY,DPST,12VDC,MOD.
K11	10208-1403	RELAY,DPST,12VDC,MOD.
K12	10208-1403	RELAY,DPST,12VDC,MOD.
K15	10208-1403	RELAY,DPST,12VDC,MOD.
K19	10208-1404	RELAY,SPDT,12VDC,MOD.
K20	10208-1404	RELAY,SPDT,12VDC,MOD.
K21	10208-1404	RELAY,SPDT,12VDC,MOD.
K22	10208-1404	RELAY,SPDT,12VDC,MOD.
K23	10208-1404	RELAY,SPDT,12VDC,MOD.
K24	10208-1404	RELAY,SPDT,12VDC,MOD.
K25	10208-1404	RELAY,SPDT,12VDC,MOD.
K26	10208-1404	RELAY,SPDT,12VDC,MOD.
K27	10208-1404	RELAY,SPDT,12VDC,MOD.
K28	10208-1403	RELAY,DPST,12VDC,MOD.
L1	MS75084-16	COIL, RF 22 UH 10%
L3	MS75084-16	COIL, RF 22 UH 10%
L4	MS75084-16	COIL, RF 22 UH 10%
P1	J46-0040-124	CONNECTOR,FEMALE
P2	J46-0040-124	CONNECTOR,FEMALE
R1	NOT USED	
R2	R15-0005-205	RES,2MEG. 1.25W,2000V,10%
R3	NOT USED	
R4	R30-0008-502	RES,VAR,PCB 5K 1/2W 10%
R5	R65-0003-123	RES,12K 5% 1/4W CAR FILM
R6	R65-0003-822	RES,8.2K 5% 1/4W CAR FILM
R7	NOT USED	
R8	R65-0003-123	RES,12K 5% 1/4W CAR FILM
R9	R65-0003-752	RES,7.5K 5% 1/4W CAR FILM
R10	R30-0008-502	RES,VAR,PCB 5K 1/2W 10%
R11	R80-0001-330	RES,MET.FLM,33 ,5%,5W.
R12	RN55D1501F	RES,1500 1% 1/8W MET FLM
R13	RN55D5111F	RES,5110 1% 1/8W MET FLM
R14	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
T1	10208-1420	TRANSFORMER ASSY 50-200 O
T2	10208-5420	TRANSFORMER I SAMP
VR1	1N4728A	DIODE 3.3V 5% 1W ZENER
VR2	1N4728A	DIODE 3.3V 5% 1W ZENER
VR3	1N4728A	DIODE 3.3V 5% 1W ZENER
VR4	1N4728A	DIODE 3.3V 5% 1W ZENER
VR5	1N4728A	DIODE 3.3V 5% 1W ZENER

Table 2. A9 Coil Pack Assembly Parts List (10208-5250, Rev. B)

Ref. Desig.	Part Number	Description
C7	C15-0003-002	CAP 50 PF
C8	C15-0003-002	CAP 50 PF
E1	10208-1207	PIN, CONNECTOR
E2	10208-1207	PIN, CONNECTOR
E3	10208-1207	PIN, CONNECTOR
E4	10208-1207	PIN, CONNECTOR
E5	10208-1207	PIN, CONNECTOR
E6	10208-1207	PIN, CONNECTOR
E7	10208-1207	PIN, CONNECTOR
E9	10208-1207	PIN, CONNECTOR
E12	10208-1207	PIN, CONNECTOR
E13	10208-1207	PIN, CONNECTOR
L1	10208-5600	COIL ASSY, 4/.6/.3
L2	10208-1700	COIL ASSY, .1UH
L3	10208-1750	COIL ASSY, .17UH
L4	10208-1800	COIL ASSY
L5	10208-1710	COIL ASSY
L6	10208-5000	COIL ASSY, 8UH
L7	10208-5100	COIL ASSY, 16UH
L8	10208-2200	COIL ASSY, 32UH

Table 3. A9A1 RF Interface PWB Assembly Parts List (10208-5260, Rev. E)

Ref. Desig.	Part Number	Description
C7	NOT USED	
C8	NOT USED	
C63	C11-0035-100	CAP,10PF,5%,6KV,CER
C64	C11-0035-100	CAP,10PF,5%,6KV,CER
CR9	1N4004	DIODE, RECT. 400V 1A
CR13	1N4004	DIODE, RECT. 400V 1A
CR14	1N4004	DIODE, RECT. 400V 1A
CR16	1N4004	DIODE, RECT. 400V 1A
CR17	1N4004	DIODE, RECT. 400V 1A
CR18	1N4004	DIODE, RECT. 400V 1A
E23	H32-0023-608	STANDOFF, INS, #6
E24	H32-0023-608	STANDOFF, INS, #6
E25	H32-0023-608	STANDOFF, INS, #6
J1	J46-0084-124	PINS,MALE
J2	J46-0084-124	PINS,MALE
K9	K70-0011-001	RELAY, CER, VAC, SPST, NC
K13	K70-0011-001	RELAY, CER, VAC, SPST, NC
K14	K70-0012-001	RELAY, CER, VAC, SPST, NO
K16	K70-0011-001	RELAY, CER, VAC, SPST, NC
K17	K70-0011-001	RELAY, CER, VAC, SPST, NC
K18	K70-0012-001	RELAY, CER, VAC, SPST, NO
P3	J46-0056-050	RECEPTACLE 50 PIN

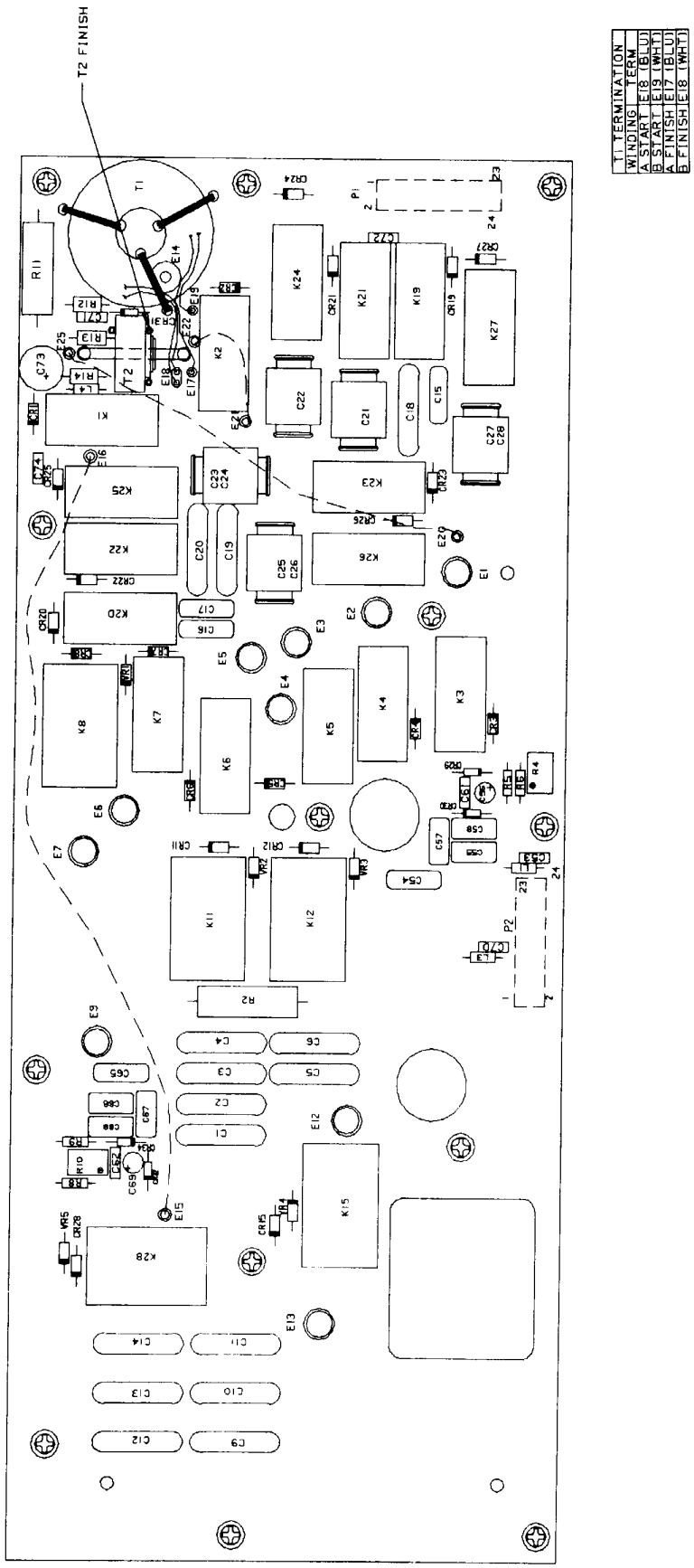
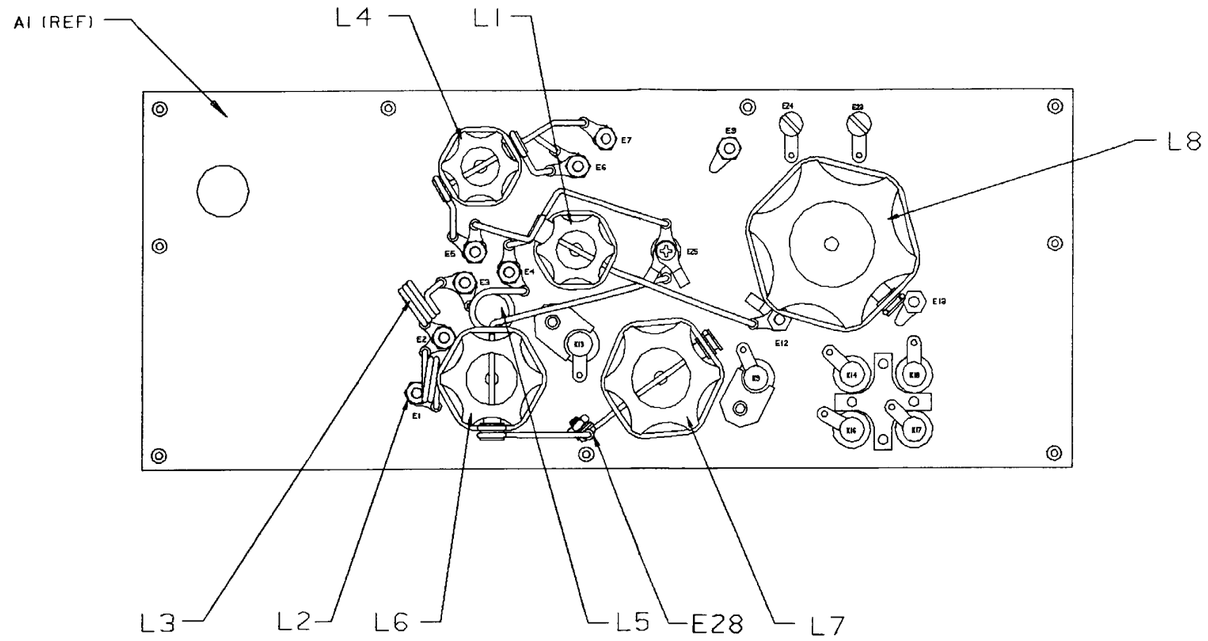
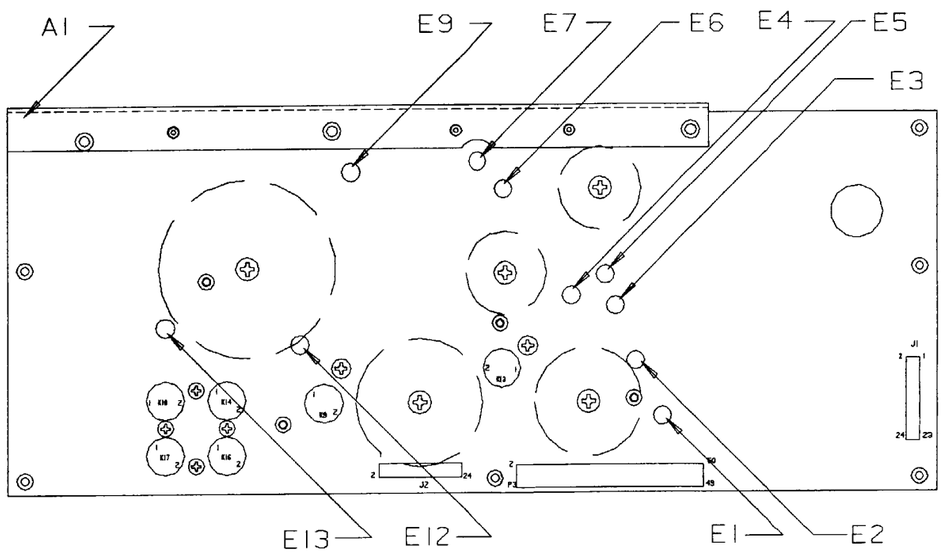


Figure 1. A4 RF PWB Assembly (10208-5400) Component Locations



LEFT SIDE VIEW



RIGHT SIDE VIEW

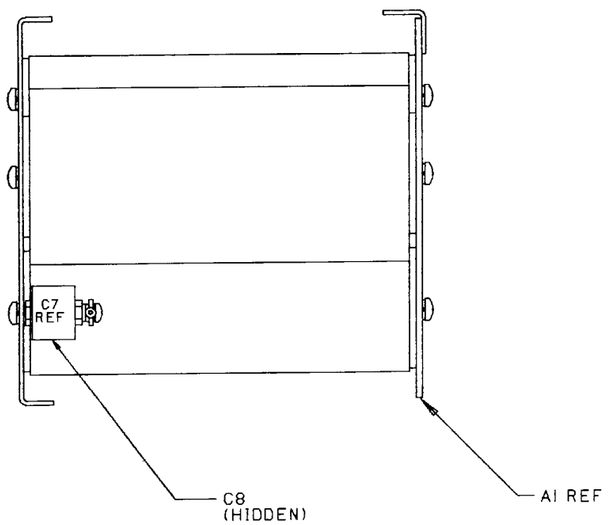
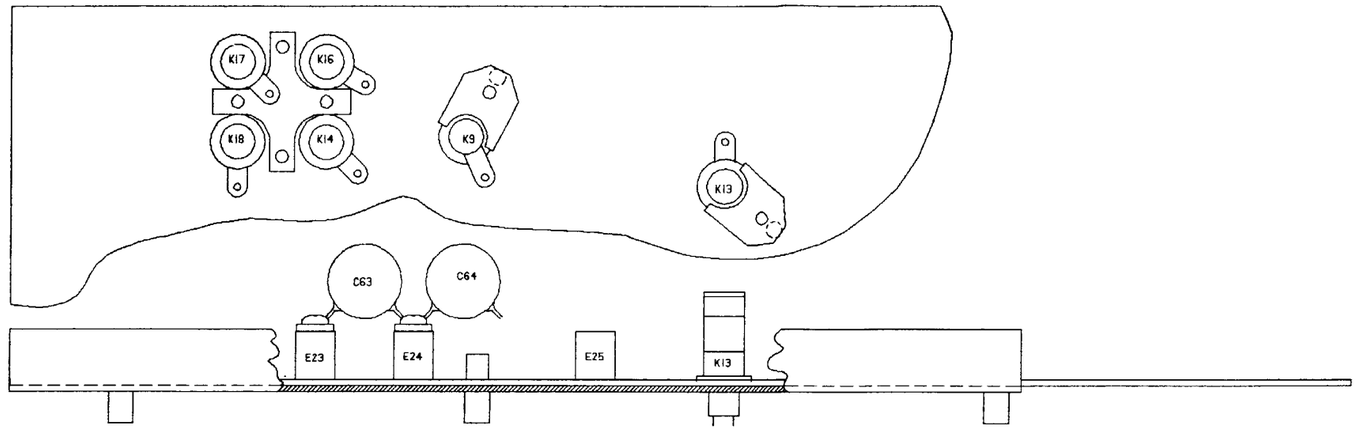


Figure 2. Coil Pack Assembly A9 (10208-5250)



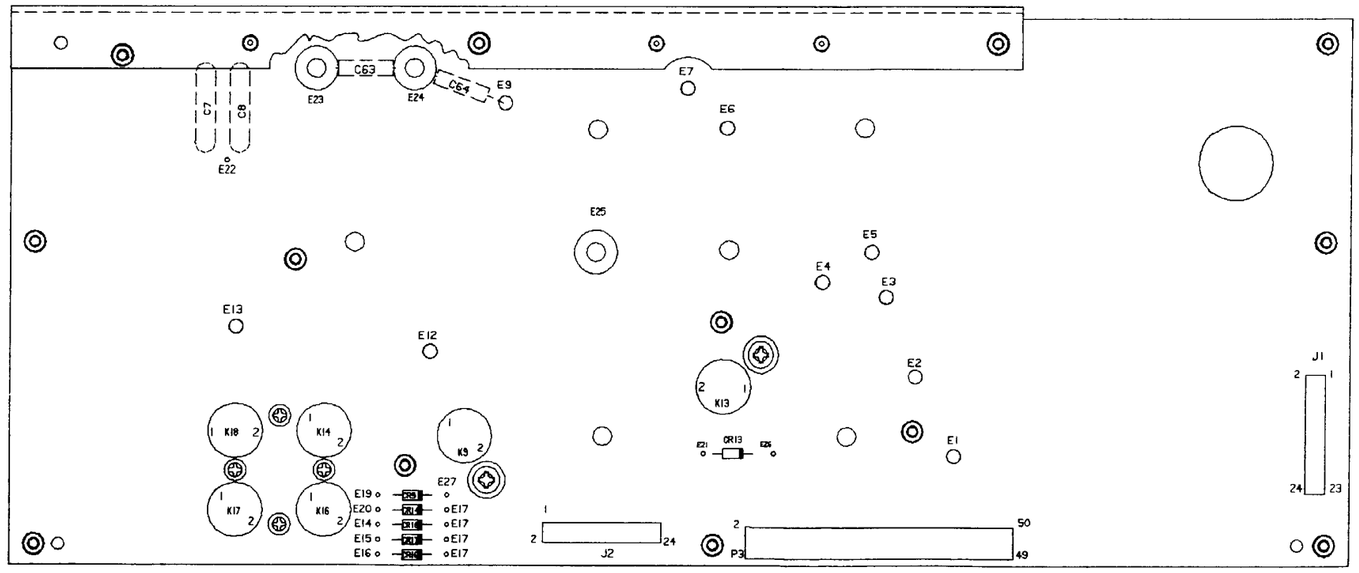


Figure 3. A9A1 RF Interface PWB Assembly (10208-5260) Component Locations

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
5. ALL DIODE PART NUMBERS ARE IN4004.

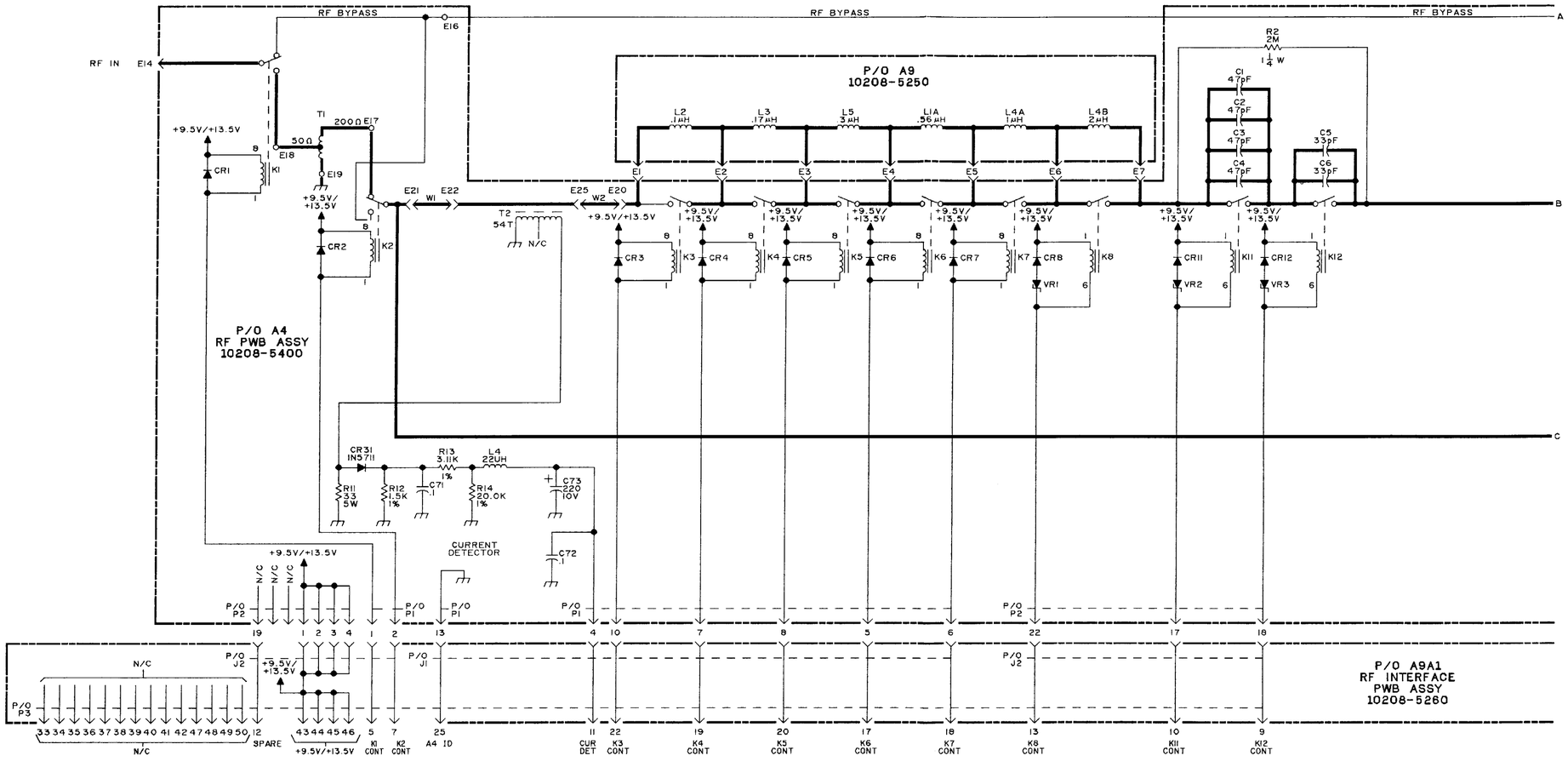


Figure 4. A4 RF PWB Assembly (10208-5400)/ A9 Coil Pack Assembly (10208-5250) Schematic Diagram (10208-5251, Rev. C) (Sheet 1 of 2)

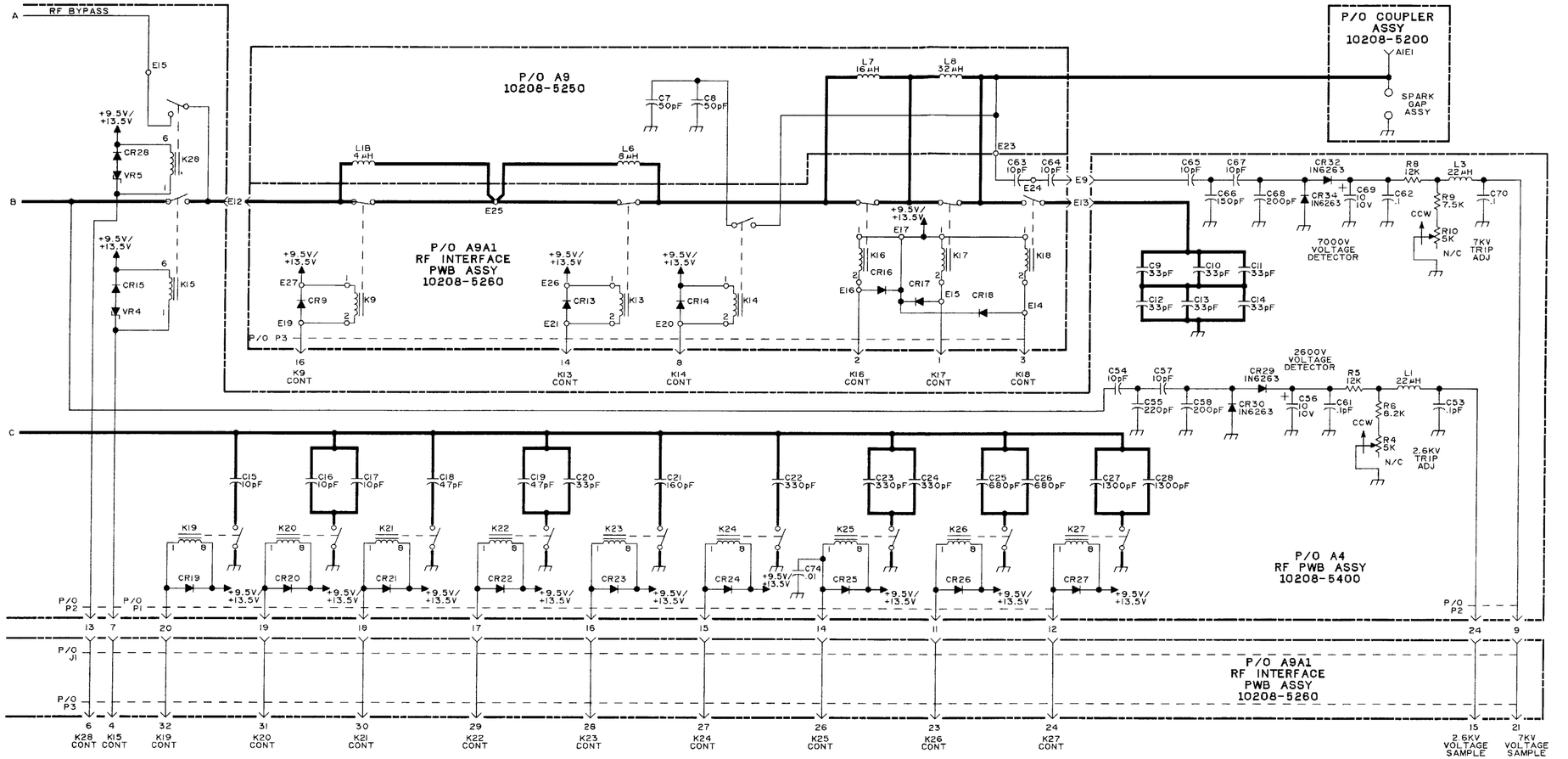


Figure 4. A4 RF PWB Assembly (10208-5400)/ A9 Coil Pack Assembly (10208-5250) Schematic Diagram (10208-5251, Rev. C) (Sheet 2 of 2)

A5
DISCRIMINATOR PWB ASSEMBLY

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A5 DISCRIMINATOR PWB ASSEMBLY

1. GENERAL INFORMATION

This tab section contains the parts list, component location drawing, and schematic diagram for the A5 Discriminator PWB Assembly.

2. CIRCUIT DESCRIPTION

Refer to paragraphs 4.3.2 through 4.3.2.6 for a circuit description of the A5 Discriminator PWB.

3. MAINTENANCE INFORMATION

Refer to paragraph 5.5.3 for adjustment procedures. Test point voltages are shown on the A5 schematic diagram.

4. PARTS LIST, COMPONENT LOCATIONS, AND SCHEMATIC

Table 1 is the parts list for the A5 Discriminator PWB. Component locations are shown in figure 1. Figure 2 is the schematic diagram for the A5 Discriminator PWB.

Table 1. A5 Discriminator PWB Assembly Parts List (10208-1500, Rev. F)

Ref. Desig.	Part Number	Description
C1	M39014/01-1317	CAP,CER,1000PF
C2	M39014/01-1317	CAP,CER,1000PF
C3	M39014/02-1298	CAP 01UF
C4	M39014/02-1298	CAP 01UF
C5	M39014/02-1310	CAP .1 UF
C6	M39014/02-1310	CAP .1 UF
C7	M39014/02-1310	CAP .1 UF
C8	C-6614	CAP. CER. 5.1PF
C9	C-6614	CAP. CER. 5.1PF
C10	CM06FD681J03	CAP 680PF 5% 500V MICA
C11	CM05ED820G03	CAP 82PF 2% 500V MICA
C12	CM05ED121G03	CAP 120PF 2% 500V MICA
C13	CM05ED121G03	CAP 120PF 2% 500V MICA
C14	M39014/02-1310	CAP .1 UF
C15	M39014/02-1298	CAP 01UF
C16	M39014/02-1298	CAP 01UF
C17	M39014/02-1298	CAP 01UF
C18	M39014/02-1310	CAP .1 UF
C19	M39014/02-1310	CAP .1 UF
C20	M39014/01-1268	CAP 330PF
C21	M39014/02-1310	CAP .1 UF
C22	M39014/02-1317	CAP 1000PF
C23	M39014/02-1310	CAP .1 UF
C24	M39014/02-1310	CAP .1 UF
C25	M39014/02-1310	CAP .1 UF
C26	M39014/02-1310	CAP .1 UF
C27	M39014/02-1310	CAP .1 UF
C28	M39014/02-1298	CAP 01UF

Table 1. A5 Discriminator PWB Assembly Parts List (10208-1500, Rev. F) (Cont.)

Ref. Desig.	Part Number	Description
C29	M39014/02-1310	CAP .1 UF
C31	M39014/02-1298	CAP 01UF
C32	M39014/02-1310	CAP .1 UF
C33	M39014/02-1298	CAP 01UF
C34	M39014/01-1268	CAP 330 PF
CR1	1N5711	DIODE,HOT CARRIER
CR2	1N5711	DIODE,HOT CARRIER
CR3	1N5711	DIODE,HOT CARRIER
CR4	D02-0003-001	DIODE,RECT,RF
CR5	D02-0003-001	DIODE,RECT,RF
CR6	1N5711	DIODE,HOT CARRIER
CR7	1N5711	DIODE,HOT CARRIER
CR8	1N3064	DIODE
CR9	1N6263	DIODE,HOT CARRIER
CR10	1N4004	DIODE, RECT. 400V 1A
CR11	NOT USED	
CR12	NOT USED	
J2	M39012/21-0001	CONNECTOR
J3	10012-4608	CONTACT, PLUNGER
JMP1	MP-1142	CIRCUIT JUMPER
JMP2	MP-1142	CIRCUIT JUMPER
K1	K10-0004-001	RLY, 12VDC,DPDT,MOLD,PC M
L1	MS90539-11	COIL, RF 680 UH 5%
L2	MS90539-11	COIL, RF 680 UH 5%
L3	MS18130-7	COIL, RF 0.82 UH 10%
L4	L-0630	RF COIL, MOLDED, 15 UH
L5	MS75085-02	COIL, 39 UH
P1	J46-0056-020	RECEPTACLE,20-PIN
Q1	Q35-0003-000	XSTR, SS/RF
Q2	JAN2N2857	XSTR, SS/RF
R1	RN55D1000F	RES,100.0 1% 1/8W MET FLM
R2	RN55D1000F	RES,100.0 1% 1/8W MET FLM
R3	RN55D3321F	RES,3320 1% 1/8W MET FLM
R4	RN55D1621F	RES,1620 1% 1/8W MET FLM
R5	R65-0003-221	RES,220 5% 1/4W CAR FILM
R6	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R7	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R8	RN55D1003F	RES,100K 1% 1/8W MET FLM
R9	RN55D1003F	RES,100K 1% 1/8W MET FLM
R10	R65-0003-104	RES,100K 5% 1/4W CAR FILM
R11	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R12	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R13	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R14	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R15	R65-0003-511	RES,510 5% 1/4W CAR FILM
R16	R30-0008-201	RES,VAR,200 3/4W
R17	R30-0008-201	RES,VAR,200 3/4W
R18	RN65D1000F	RES,100.0 1% 1/2W MET FLM
R19	RN55D6811F	RES,6810 1% 1/8W MET FLM
R20	RN65D1000F	RES,100.0 1% 1/2W MET FLM
R21	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R22	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM

Table 1. A5 Discriminator PWB Assembly Parts List (10208-1500, Rev. F) (Cont.)

Ref. Desig.	Part Number	Description
R23	RN55D2491F	RES,2490 1% 1/8W MET FLM
R24	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
R25	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
R26	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R27	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R28	RN55D1000F	RES,100.0 1% 1/8W MET FLM
R29	RN55D1000F	RES,100.0 1% 1/8W MET FLM
R30	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
R31	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R32	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
R33	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R34	R65-0003-273	RES,27K 5% 1/4W CAR FILM
R35	NOT USED	
R36	R65-0003-334	RES,330K 5% 1/4W CAR FILM
R37	NOT USED	
R38	R65-0003-101	RES,100 5% 1/4W CAR FILM
R39	NOT USED	
R40	R65-0003-561	RES,560 5% 1/4W CAR FILM
R41	NOT USED	
R42	R65-0003-102	RES 1.0K 5% 1/4W CAR FILM
R43	R65-0003-102	RES 1.0K 5% 1/4W CAR FILM
R44	R65-0003-102	RES 1.0K 5% 1/4W CAR FILM
R45	RN55D3011F	RES, 3.01K 1% 1/8W MET FLM
R46	RN55D5111F	RES, 5.11K 1% 1/8W MET FLM
T1	10208-1440	TRANSFORMER ASSY,VOLTAGE
T2	10208-1430	DISC. CURRECT XFMR ASSY
T3	1960-4013	TRANSFORMER RF
TP1	J65-0009-001	TEST POINT
TP2	J65-0009-001	TEST POINT
TP3	J65-0009-001	TEST POINT
TP4	J65-0009-001	TEST POINT
TP5	J65-0009-001	TEST POINT
TP6	J65-0009-001	TEST POINT
TP7	J65-0009-001	TEST POINT
TP8	J65-0009-001	TEST POINT
TP9	J65-0009-001	TEST POINT
TP10	J65-0009-001	TEST POINT
TP11	J65-0009-001	TEST POINT
TP12	J65-0009-001	TEST POINT
TP13	J65-0009-001	TEST POINT
TP14	J65-0009-001	TEST POINT
U1	I30-0020-004	IC 2904 OP AMP DIP(PLASTC
U2	I30-0020-004	IC 2904 OP AMP DIP(PLASTC
U3	I30-0020-004	IC 2904 OP AMP DIP(PLASTC
U4	I85-0000-074	54F74
VR1	I11-0006-005	IC VR 7805 +5V 0.5A 4%

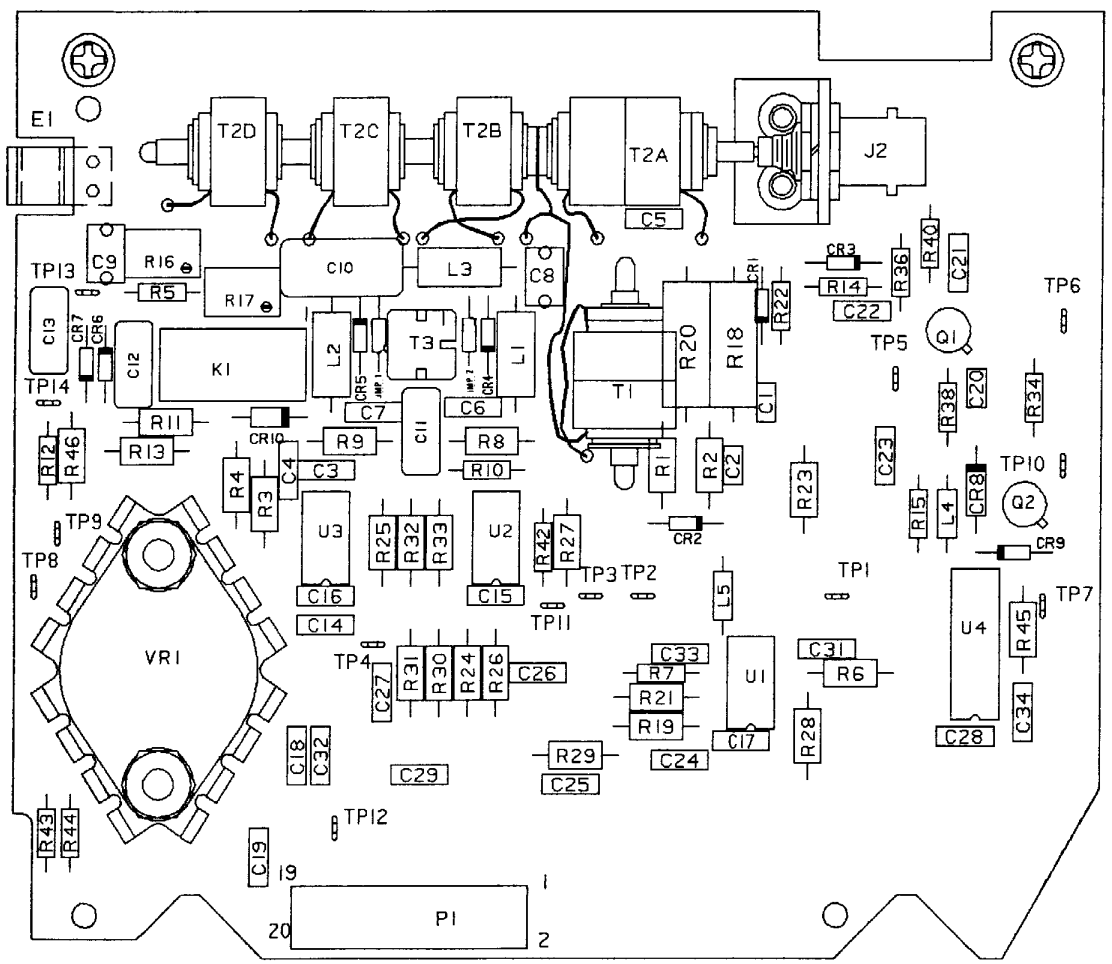

Figure 1. A5 Discriminator PWB Assembly (10208-1500) Component Locations

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.

1. APPROXIMATELY 2.5VDC WHEN UNKEYED
2 TO 3VDC WHEN TUNED AND KEYED WITH
30 TO 40 WATTS (AM MODE. NO MODULATION).
2. APPROXIMATELY 2.5VDC WHEN UNKEYED
2.2 TO 2.8VDC WHEN TUNED AND KEYED WITH
30 TO 40 WATTS (AM MODE. NO MODULATION).
3. ZERO VDC WHEN UNKEYED
APPROX SQUARE ROOT OF (REFL POWER LEVEL/3.6)
VDC WHEN KEYED.
4. ZERO VDC WHEN UNKEYED
APPROX SQUARE ROOT OF (REFL POWER LEVEL/9.4)
VDC WHEN KEYED.
5. THE OUTPUT WILL BE A SINUSODIAL WAVEFORM WITH A FREQUENCY EQUAL TO THE TRANSMIT FREQUENCY AND AN AMPLITUDE GREATER THAN .5V PEAK TO PEAK. WITH NO RF INPUT THE OUTPUT WILL BE 0 VDC.
6. THE OUTPUT WILL APPROACH A SQUARE-WAVE WITH A FREQUENCY EQUAL TO THE TRANSMIT FREQUENCY AND AN AMPLITUDE THAT TOGGLES BETWEEN 0 AND ABOUT 0.7 VOLTS. WITH NO RF INPUT THE OUTPUT WILL BE ABOUT 0.5 VDC.
7. THE OUTPUT WILL APPROACH A SQUARE-WAVE WITH A FREQUENCY EQUAL TO THE TRANSMIT FREQUENCY AND AN AMPLITUDE THAT TOGGLES BETWEEN 0 AND ABOUT 4 VOLTS. WITH NO RF INPUT THE OUTPUT MAY BE ANYWHERE BETWEEN 0 AND 5 VDC.
8. FOR Rp ADJUSTMENT PROCEDURE, SEE MAINTENANCE SECTION OF THE MANUAL.

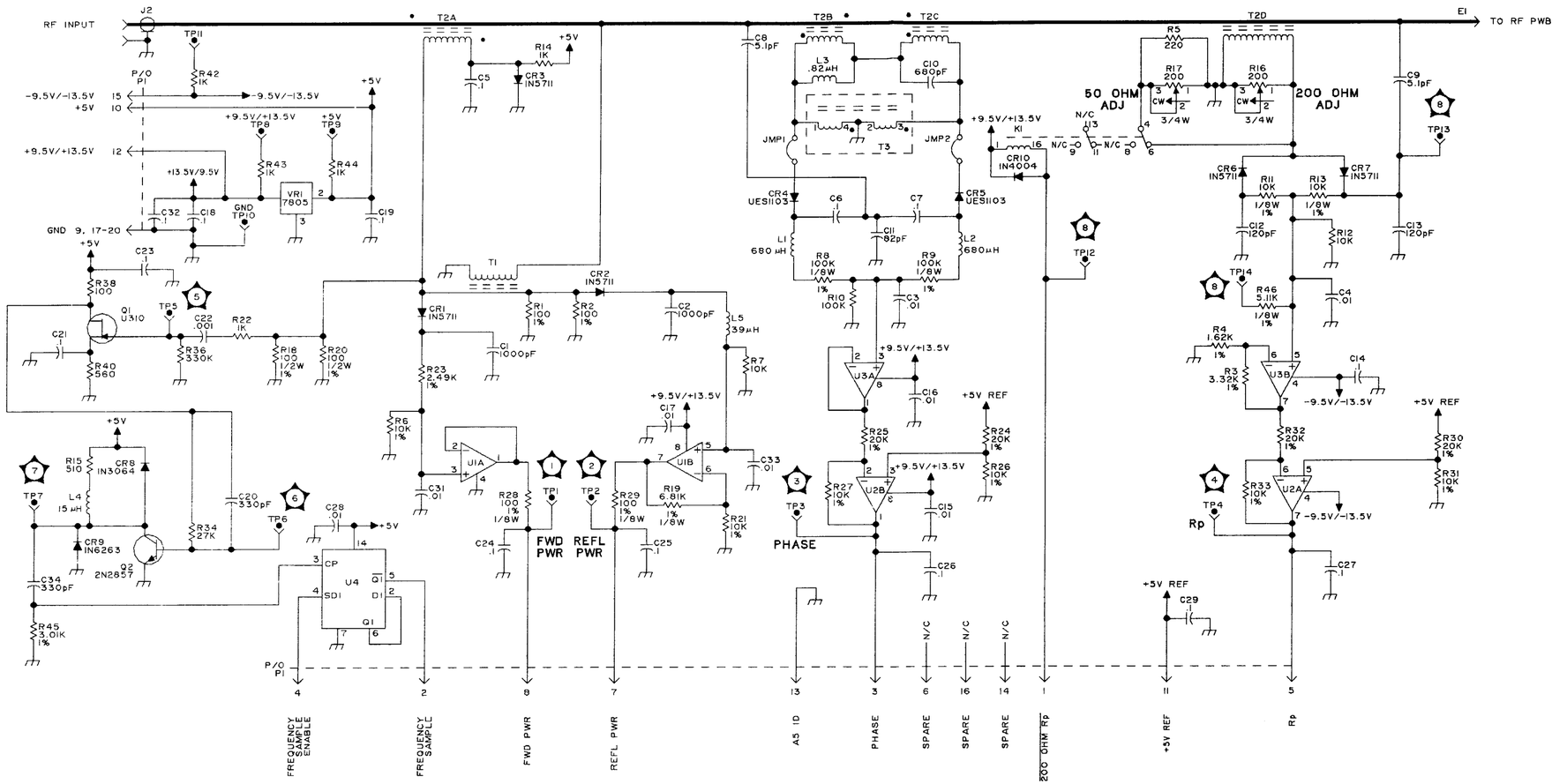

Figure 2. A5 Discriminator PWB Assembly Schematic Diagram (10208-1501, Rev. C)

A6
POWER SUPPLY PWB ASSEMBLY

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A6 POWER SUPPLY ASSEMBLY

1. GENERAL INFORMATION

This tab section contains the parts lists component location drawings, and schematic diagram for the A6 Power Supply Assembly.

2. CIRCUIT DESCRIPTION

Refer to paragraphs 4.3.1 through 4.3.1.6 for a circuit description of the A6 Power Supply.

3. MAINTENANCE INFORMATION

Refer to paragraph 5.5.1.1 for adjustment procedures. Test point voltages are shown on the A6 schematic diagram.

4. PARTS LIST, COMPONENT LOCATION, AND SCHEMATIC

Tables 1 and 2 are the parts lists for the A6 Power Supply. Component locations are shown in figure 1. Figure 2 is the schematic diagram.

Table 1. A6 Power Supply Assembly (10208-3000) Parts List

Ref. Desig.	Part Number	Description
A1	10208-3010	POWER SUPPLY PWB ASSY
A2	10208-3020	EMI FILTER ASSY

NOTE

EMI Filter A6A2 is not a repairable assembly and must be replaced as an assembly.

Table 2. A6A1 Power Supply PWB Assembly Parts List (10208-3010, Rev. F)

Ref. Desig.	Part Number	Description
C1	C78-0050-331	CAP,330UF,50V
C2	C73-0025-680	CAP,FXD,ELCTLT,68 UF,25 V
C3	M39014/02-1304	CAP .039UF 10% 100V,CER
C4	M39014/02-1310	CAP .1 UF
C5	M39014/02-1310	CAP .1 UF
C6	M39014/02-1310	CAP .1 UF
C7	C73-0040-470	CAP,FXD,ELCTLT,47UF
C8	M39014/02-1310	CAP .1 UF
C9	M39014/02-1298	CAP 01UF
C10	M39014/01-1317	CAP,CER,1000PF
C11	M39014/02-1300	CAP, CER 15000PF
C12	M39014/02-1298	CAP 01UF
C13	M39014/02-1320	CAP, CER, ,47UF,
C14	C26-0025-220	CAP TANT 22 UF 25V
C15	C26-0025-339	CAP,FXD,ELCTLT,3.3 UF,25
C16	C28-0050-122	CAP 1200UF 50V
C17	M39014/02-1298	CAP 01UF

Table 2. A6A1 Power Supply PWB Assembly Parts List (10208-3010, Rev. F) (Cont.)

Ref. Desig.	Part Number	Description
C18	M39014/02-1298	CAP 01UF
C19	M39014/02-1310	CAP .1 UF
C20	C78-0050-331	CAP,330UF,50V
C21	M39014/02-1310	CAP .1 UF
C22	M39014/02-1320	CAP, CER, ,47UF,
C23	C26-0025-339	CAP,FXD,ELCTLT,3.3 UF,25
C24	M39014/02-1312	CAP .027UF 10%,100V,CER
C25	M39014/02-1289	CAP 3300PF 10% 200V CER
C26	C26-0025-100	CAP, TANT, 10UF, 25V
C27	C26-0035-159	CAP. TANT 1.5MF 35V
C28	C26-0035-159	CAP. TANT 1.5MF 35V
C29	C28-0025-222	CAP 2200UF 25V
C30	C26-0025-100	CAP, TANT, 10UF, 25V
CR1	1N4004	DIODE, RECT. 400V 1A
CR2	1N4454	DIODE, SS SILICON
CR3	1N4454	DIODE, SS SILICON
CR4	1N4454	DIODE, SS SILICON
CR5	1N4454	DIODE, SS SILICON
CR6	D22-0007-006	RECTIFIER, MR 816
CR7	D22-0007-006	RECTIFIER, MR 816
CR8	JAN1N5417	DIODE,RECT,FR,3A,200V
CR9	JAN1N5417	DIODE,RECT,FR,3A,200V
CR10	D22-0007-002	DIODE, MR811
CR11	D22-0007-002	DIODE, MR811
CR12	D21-0001-004	RECTIFIER,FW
CR13	D22-0007-002	DIODE, MR811
CR14	D22-0007-002	DIODE, MR811
E1	MP-0372	FAST-ON,.125
E2	MP-0372	FAST-ON,.125
E3	MP-0372	FAST-ON,.125
E4	MP-0372	FAST-ON,.125
E5	NOT USED	
E6	MP-0372	FAST-ON,.125
E7	MP-0372	FAST-ON,.125
L1	L13-0001-330	CHOKE,33UH
L2	10085-1268	COIL,FXD,1 MH
L3	10208-3017	TOROID,4.7 MH
L4	10208-3016	TOROID,COMMON MODE
Q1	Q-0055	XSTR SS/GP NPN
Q2	2N2222A	XSTR, SS/GP, NPN
Q3	2N2219A	XSTR, SS/GP, NPN
Q4	2N2219A	XSTR, SS/GP, NPN
Q5	2N2907A	XSTR, SS/GP, PNP
Q6	2N2222A	XSTR, SS/GP, NPN
Q7	2N2222A	XSTR, SS/GP, NPN
Q8	Q20-0007-035	TRANSISTOR,NPN,PWR
Q9	Q20-0007-035	TRANSISTOR,NPN,PWR
Q10	2N2907A	XSTR, SS/GP, PNP
R1	RCR32G102JM	RES,1.0K 5% 1W CAR COMP
R2	RCR42G221JM	RES,220 5% 2W CAR COMP
R3	R65-0004-100	RES,10 5% 1/2W CAR FILM
R4	R-2208	RES,VAR,PCB 2K .5 20%
R5	RN55D1002F	RES,10.0K 1% 1/8W MET FLM

Table 2. A6A1 Power Supply PWB Assembly Parts List (10208-3010, Rev. F) (Cont.)

Ref. Desig.	Part Number	Description
R6	RN55D2491F	RES,2490 1% 1/8W MET FLM
R7	R65-0003-182	RES,1.8K 5% 1/4W CAR FILM
R8	R65-0003-182	RES,1.8K 5% 1/4W CAR FILM
R9	R65-0003-471	RES,470 5% 1/4W CAR FILM
R10	R65-0003-471	RES,470 5% 1/4W CAR FILM
R11	R65-0003-220	RES,22 5% 1/4W CAR FILM
R12	R65-0003-220	RES,22 5% 1/4W CAR FILM
R13	R65-0003-689	RES,6.8 5% 1/4W CAR FILM
R14	R65-0003-689	RES,6.8 5% 1/4W CAR FILM
R15	RN55D4991F	RES,4990 1% 1/8W MET FLM
R16	RN55D4991F	RES,4990 1% 1/8W MET FLM
R17	R65-0003-279	RES,2.7 5% 1/4W CAR FILM
R18	R65-0003-279	RES,2.7 5% 1/4W CAR FILM
R19	R65-0003-104	RES,100K 5% 1/4W CAR FILM
R20	R65-0004-100	RES,10 5% 1/2W CAR FILM
R21	R65-0003-333	RES,33K 5% 1/4W CAR FILM
R22	RN55D2211F	RES,2210 1% 1/8W MET FLM
R23	R65-0003-272	RES,2.7K 5% 1/4W CAR FILM
R24	RN55D1002F	RES,10.0K 1% 1/8W MET FLM
R25	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R26	RN55D9531F	RES,9530 1% 1/8W MET FLM
R27	RN55D1003F	RES,100K 1% 1/8W MET FLM
R28	RN55D1912F	RES,19.1K 1% 1/8W MET FLM
R29	RN55D2003F	RES,200K 1% 1/8W MET FLM
R30	R65-0003-104	RES,100K 5% 1/4W CAR FILM
R31	R65-0003-272	RES,2.7K 5% 1/4W CAR FILM
R32	RN55D3321F	RES,3320 1% 1/8W MET FLM
R33	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R34	R65-0003-681	RES,680 5% 1/4W CAR FILM
R35	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R36	R65-0003-471	RES,470 5% 1/4W CAR FILM
R37	R65-0003-100	RES,10 5% 1/4W CAR FILM
R38	RN55D1000F	RES,100.0 1% 1/8W MET FLM
R39	R65-0003-220	RES,22 5% 1/4W CAR FILM
R40	R65-0003-100	RES,10 5% 1/4W CAR FILM
R41	R65-0003-101	RES,100 5% 1/4W CAR FILM
R42	RN60D10R0F	RES, 10 1% 1/4W MET FLM
R43	RN55D2150F	RES,215.0 1% 1/8W MET FLM
R44	RN55D4750F	RES,475.0 1% 1/8W MET FLM
R45	R65-0004-102	RES,1.0K 5% 1/2W CAR FILM
R46	RN60D10R0F	RES, 10 1% 1/4W MET FLM
R47	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R48	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R49	RN55D1912F	RES,19.1K 1% 1/8W MET FLM
R50	RN55D4751F	RES,4750 1% 1/8W MET FLM
R51	RN55D2430F	RES,243.0 1% 1/8W MET FLM
R52	R65-0003-223	RES,22K 5% 1/4W CAR FILM
R53	R65-0003-510	RES,51 5% 1/4W CAR FILM
R54	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R55	RN55D2211F	RES,2210 1% 1/8W MET FLM
R56	RN55D2211F	RES,2210 1% 1/8W MET FLM
R57	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM

Table 2. A6A1 Power Supply PWB Assembly Parts List (10208-3010, Rev. F) Cont.)

Ref. Desig.	Part Number	Description
R58	RN55D1002F	RES,10K 1% 1/8W MET FLM
T1	10085-1224	XFMR,DRIVER
T2	L61-0001-005	XFMR,PULSE,100T CT
T3	10208-3018	XFMR,POWER
U1	I62-0003-000	IC 1524 PULSE WIDTH MON
U2	I21-0002-001	IC NEG 12V SUPPLY
U3	I30-0009-000	IC 1558 OP AMP CERAMIC
VR1	1N4743A	DIODE 13V 5% 1W ZENER
VR2	IC-0358	IC VR 317 ADJ V 1.5A

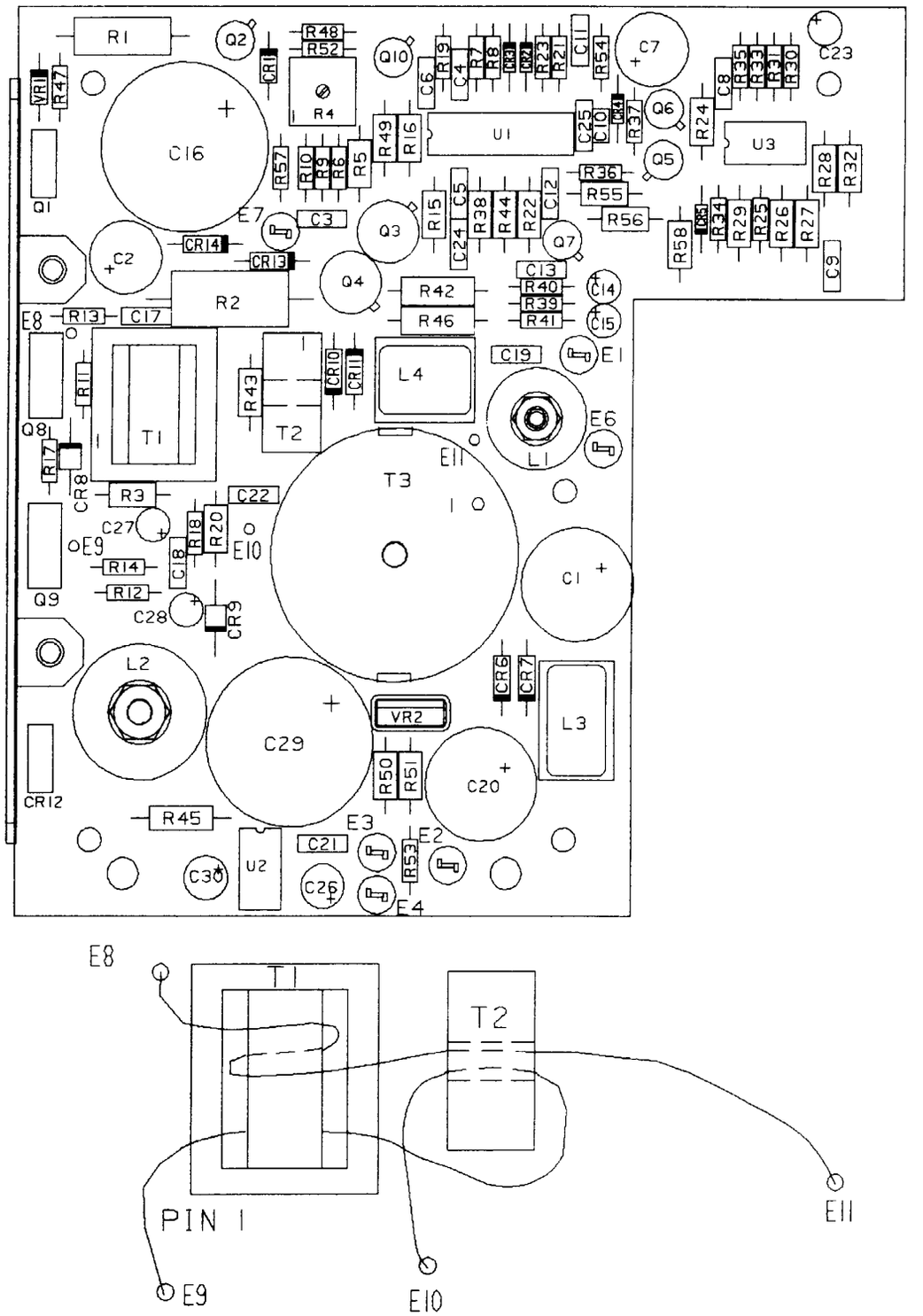

Figure 1. A6A1 Power Supply PWB Assembly (10208-3010) Component Locations

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 (µF).
4. ALL INDUCTANCE VALUES ARE IN MICROHENRIES (µH).
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.

① +13.5VDC ADJUSTMENT MEASURE AT A5TP8

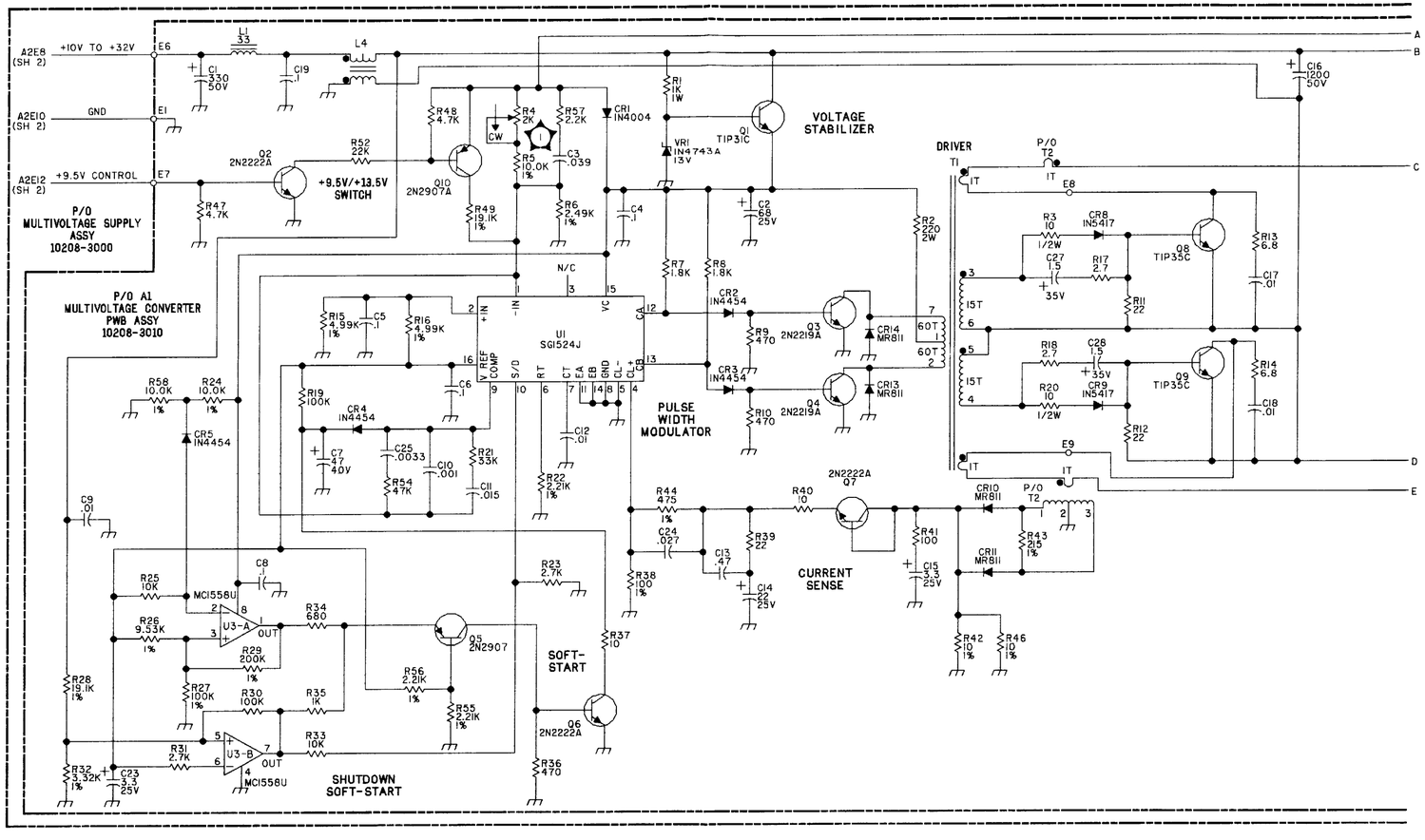

Figure 2. A6 Power Supply Assembly Schematic Diagram (10208-3011, Rev. C) (Sheet 1 of 2)

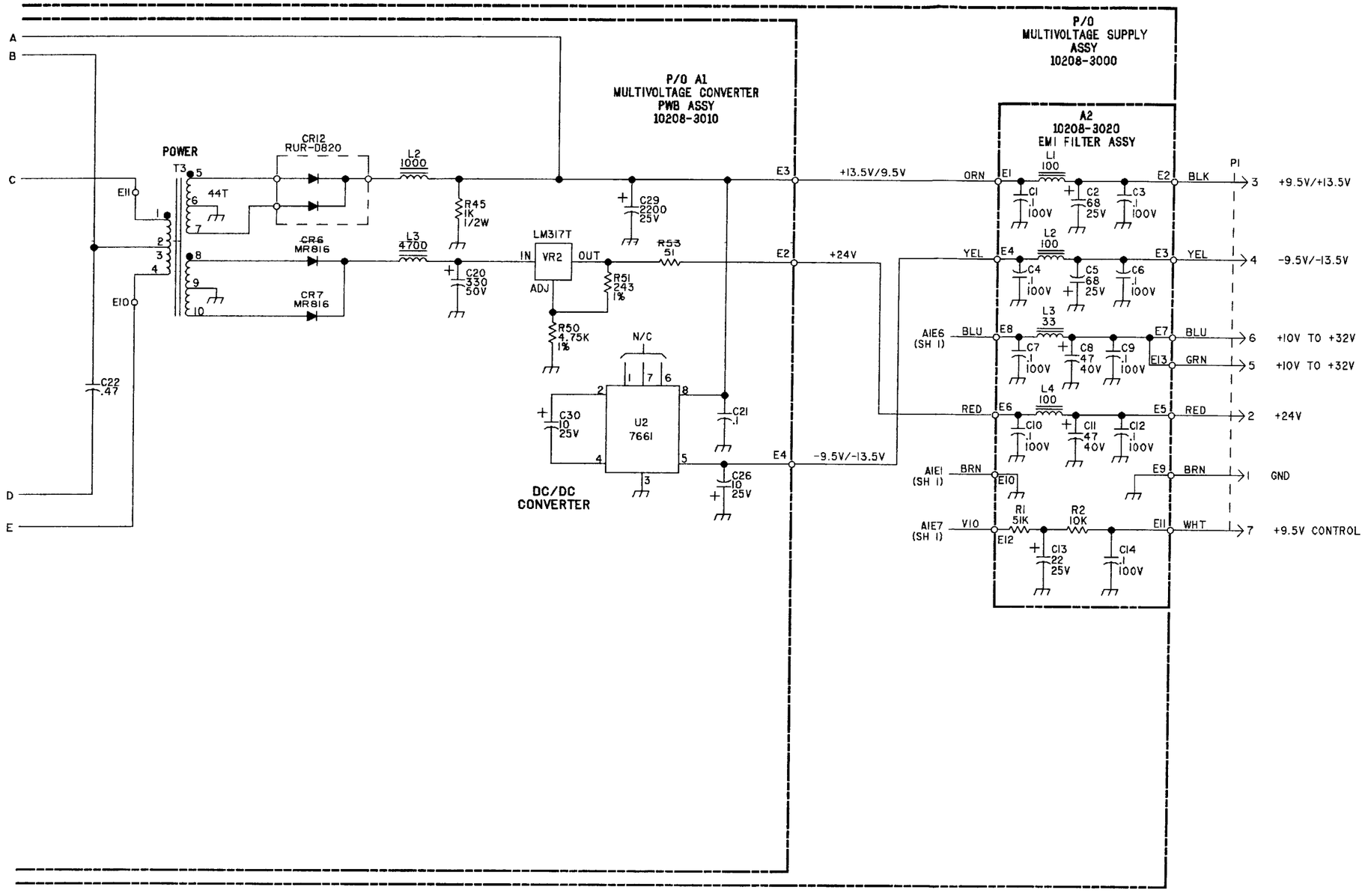

Figure 2. A6 Power Supply Assembly Schematic Diagram (10208-3011, Rev. C) (Sheet 2 of 2)

A7
TRANSCEIVER INTERFACE PWB ASSEMBLY

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LIST OF FIGURES

LIST OF TABLES

A7 TRANSCEIVER INTERFACE PWB ASSEMBLY

1. GENERAL INFORMATION

This tab section contains the parts list, component location drawing, and schematic diagram for the A7 Transceiver Interface PWB Assembly.

2. CIRCUIT DESCRIPTION

Refer to paragraphs 4.3.6 through 4.3.6.13 for a circuit description of the A7 Transceiver Interface PWB.

3. MAINTENANCE INFORMATION

There are no adjustable components on the A7 assembly. Test point voltages are shown on the A7 schematic diagram.

4. PARTS LIST, COMPONENT LOCATION, AND SCHEMATIC

Table 1 is the parts list for the A7 Transceiver Interface PWB. Component locations are shown in figure 1. Figure 2 is the schematic diagram.

Table 1. A7 Transceiver Interface PWB Assembly (10208-3100, Rev. D)

Ref. Desig.	Part Number	Description
C1	M39014/02-1310	CAP .1 UF
C2	M39014/02-1310	CAP .1 UF
C3	M39014/02-1310	CAP .1 UF
C4	M39014/02-1310	CAP .1 UF
C5	M39014/02-1310	CAP .1 UF
C6	M39014/02-1310	CAP .1 UF
C7	M39014/02-1310	CAP .1 UF
C8	M39014/02-1310	CAP .1 UF
C9	M39014/02-1310	CAP .1 UF
C10	M39014/02-1310	CAP .1 UF
C11	M39014/02-1310	CAP .1 UF
C12	C-0065	150V .01UF CER
C13	M39014/02-1310	CAP .1 UF
C14	M39014/02-1310	CAP .1 UF
C15	M39014/02-1310	CAP .1 UF
C16	M39014/02-1310	CAP .1 UF
C17	M39014/02-1310	CAP .1 UF
C18	NOT USED	
C19	M39014/02-1310	CAP .1 UF
C20	M39014/02-1298	CAP 01UF
CR1	1N4004	DIODE, RECT. 400V 1A
CR2	1N4004	DIODE, RECT. 400V 1A
CR3	1N4004	DIODE, RECT. 400V 1A
CR4	1N4004	DIODE, RECT. 400V 1A
CR5	1N4004	DIODE, RECT. 400V 1A
CR6	1N4004	DIODE, RECT. 400V 1A
CR7	1N4004	DIODE, RECT. 400V 1A

Table 1. A7 Transceiver Interface PWB Assembly (10208-3100, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
CR8	1N4004	DIODE, RECT. 400V 1A
CR9	1N4004	DIODE, RECT. 400V 1A
CR10	1N4004	DIODE, RECT. 400V 1A
CR11	1N4004	DIODE, RECT. 400V 1A
CR12	1N4454	DIODE, SS SILICON
CR13	1N4454	DIODE, SS SILICON
CR14	1N4454	DIODE, SS SILICON
CR15	1N4454	DIODE, SS SILICON
CR16	1N4454	DIODE, SS SILICON
CR17	1N5711	DIODE,HOT CARRIER
CR18	1N4454	DIODE, SS SILICON
CR19	D24-0004-006	DIODE,RECT. 200V 6A
CR20	NOT USED	
CR21	NOT USED	
CR22	NOT USED	
CR23	1N4004	DIODE, RECT. 400V 1A
CR24	NOT USED	
CR25	NOT USED	
CR26	NOT USED	
CR27	1N4454	DIODE, SS SILICON
CR28	1N4454	DIODE, SS SILICON
CR29	NOT USED	
CR30	1N6263	DIODE,HOT CARRIER
CR31	1N4454	DIODE, SS SILICON
DS1	N22-0006-002	LED RED T-1 3/4 RTANG
DS2	N22-0006-002	LED RED T-1 3/4 RTANG
DS3	N22-0006-002	LED RED T-1 3/4 RTANG
DS4	N22-0006-002	LED RED T-1 3/4 RTANG
DS5	N22-0006-002	LED RED T-1 3/4 RTANG
DS6	N22-0006-002	LED RED T-1 3/4 RTANG
E1	X-0090	FUSE CLIP, PCB MOUNT
E2	X-0090	FUSE CLIP, PCB MOUNT
F1	F-0016	FUSE 6.0A QA 250V 3AG
J1	J46-0052-060	HEADER,EJECTOR,60 PIN
J2	J46-0083-003	CONNECTOR,3-PIN
J3	J46-0003-010	HEADER,1 X 10,UNSHROUDED
J4	J46-0003-010	HEADER,1 X 10,UNSHROUDED
L1	MS18130-15	COIL, RF 3.9 UH 10%
L2	MS18130-15	COIL, RF 3.9 UH 10%
L3	MS18130-15	COIL, RF 3.9 UH 10%
L4	MS18130-15	COIL, RF 3.9 UH 10%
L5	MS18130-15	COIL, RF 3.9 UH 10%
L6	MS18130-15	COIL, RF 3.9 UH 10%
L7	MS18130-15	COIL, RF 3.9 UH 10%
L8	MS18130-15	COIL, RF 3.9 UH 10%
L9	MS18130-15	COIL, RF 3.9 UH 10%
L10	MS18130-15	COIL, RF 3.9 UH 10%
L11	MS18130-15	COIL, RF 3.9 UH 10%
P1	J65-0006-105	JMPR 5P FEM .10 CNTR
Q1	Q25-0007-000	XSTR
Q2	Q25-0009-000	XSTR
Q3	Q25-0007-000	XSTR

Table 1. A7 Transceiver Interface PWB Assembly (10208-3100, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
Q4	Q25-0007-000	XSTR
Q5	Q25-0009-000	XSTR
Q6	Q25-0007-000	XSTR
Q7	Q25-0007-000	XSTR
Q8	Q25-0007-000	XSTR
Q9	Q25-0007-000	XSTR
Q10	Q25-0007-000	XSTR
Q11	Q25-0007-000	XSTR
Q12	Q25-0007-000	XSTR
R1	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R2	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM
R3	R65-0003-122	RES,1.2K 5% 1/4W CAR FILM
R4	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R5	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R6	R65-0003-681	RES, 680 5% 1/4W CAR FILM
R7	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R8	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R9	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R10	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R11	R65-0003-821	RES,820 5% 1/4W CAR FILM
R12	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R13	R65-0003-202	RES,2.0K 5% 1/4W CAR FILM
R14	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R15	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R16	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R17	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R18	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R19	R65-0003-471	RES,470 5% 1/4W CAR FILM
R20	RN55D3392F	RES,33.9K 1% 1/8W MET FLM
R21	RCR42G561JM	RES,560 5% 2W CAR COMP
R22	RN55D8062F	RES,80.6K 1% 1/8W MET FLM
R23	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R24	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R25	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R26	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R27	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R28	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R29	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R30	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R31	R65-0003-122	RES,1.2K 5% 1/4W CAR FILM
R32	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R33	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R34	R65-0003-272	RES,2.7K 5% 1/4W CAR FILM
R35	R65-0003-202	RES,2.0K 5% 1/4W CAR FILM
R36	R65-0003-271	RES,270 5% 1/4W CAR FILM
R37	R65-0003-511	RES,510 5% 1/4W CAR FILM
R38	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R39	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R40	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R41	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R42	R65-0003-122	RES,1.2K 5% 1/4W CAR FILM
R43	R65-0003-225	RES,2.2M 5% 1/4W CAR FILM

Table 1. A7 Transceiver Interface PWB Assembly (10208-3100, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
R44	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R45	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R46	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R47	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R48	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R49	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
R50	R65-0003-473	RES, 47K 5% 1/4W CAR FILM
S1	S10-0010-911	SW PB SPST NO MO
S2	S10-0010-911	SW PB SPST NO MO
TP1	J65-0009-001	TEST POINT
TP2	J65-0009-001	TEST POINT
TP3	J65-0009-001	TEST POINT
TP4	J65-0009-001	TEST POINT
TP5	J65-0009-001	TEST POINT
TP6	J65-0009-001	TEST POINT
TP7	J65-0009-001	TEST POINT
TP8	J65-0009-001	TEST POINT
TP9	J65-0009-001	TEST POINT
TP10	J65-0009-001	TEST POINT
TP11	J65-0009-001	TEST POINT
TP12	J65-0009-001	TEST POINT
TP13	J65-0009-001	TEST POINT
U1	I15-0000-374	IC 74HC374 PLASTIC CMOS
U2	I15-0000-373	IC 74HC373 PLASTIC CMOS
U3	I90-0006-004	IC 2003 XISTOR ARRAY CER
U4	I01-0000-022	IC 4070B PLASTIC CMOS
U5	I01-0000-024	IC 4072B PLASTIC CMOS
U6	I75-0007-000	MCT6 DUAL OPTO-COUPLER
U7	I75-0007-000	MCT6 DUAL OPTO-COUPLER
U9	I15-0000-008	IC 74HC08 PLASTIC CMOS
VR1	1N4740A	DIODE 10V 5% 1W ZENER
VR2	1N4740A	DIODE 10V 5% 1W ZENER
VR3	1N4740A	DIODE 10V 5% 1W ZENER
VR4	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR5	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR6	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR7	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR8	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR9	1N5223B	DIODE 2.7V 5% 0.5W ZENER
VR10	1N4742A	DIODE,12V 5% 1W
VR11	1N4742A	DIODE,12V 5% 1W
VR12	1N4742A	DIODE,12V 5% 1W
VR13	1N4742A	DIODE,12V 5% 1W
VR14	1N4742A	DIODE,12V 5% 1W
VR15	1N4742A	DIODE,12V 5% 1W
VR16	1N4742A	DIODE,12V 5% 1W
VR17	1N4742A	DIODE,12V 5% 1W
VR18	1N4742A	DIODE,12V 5% 1W
VR19	1N4742A	DIODE,12V 5% 1W
VR20	1N4742A	DIODE,12V 5% 1W
VR21	1N4742A	DIODE,12V 5% 1W
VR22	1N4742A	DIODE,12V 5% 1W

Table 1. A7 Transceiver Interface PWB Assembly (10208-3100, Rev. D) (Cont.)

Ref. Desig.	Part Number	Description
VR23	1N4742A	DIODE,12V 5% 1W
VR24	1N4742A	DIODE,12V 5% 1W
VR25	1N4742A	DIODE,12V 5% 1W
VR26	1N4742A	DIODE,12V 5% 1W
VR27	1N4742A	DIODE,12V 5% 1W
VR28	1N4742A	DIODE,12V 5% 1W
VR29	1N4742A	DIODE,12V 5% 1W
VR30	1N4742A	DIODE,12V 5% 1W
VR31	1N4742A	DIODE,12V 5% 1W
VR32	1N4742A	DIODE,12V 5% 1W
VR33	1N4742A	DIODE,12V 5% 1W
VR34	1N4742A	DIODE,12V 5% 1W
VR35	1N4742A	DIODE,12V 5% 1W
VR36	1N4742A	DIODE,12V 5% 1W
VR37	1N4742A	DIODE,12V 5% 1W
VR38	1N4742A	DIODE,12V 5% 1W
VR39	1N4742A	DIODE,12V 5% 1W
VR40	1N4742A	DIODE,12V 5% 1W
VR41	1N4742A	DIODE,12V 5% 1W
VR42	1N4742A	DIODE,12V 5% 1W
Z1	D60-0003-000	VARISTOR, V36ZA80
Z2	D60-0003-000	VARISTOR, V36ZA80
Z3	D60-0003-000	VARISTOR, V36ZA80
Z4	D60-0003-000	VARISTOR, V36ZA80
Z5	D60-0003-000	VARISTOR, V36ZA80
Z6	D60-0003-000	VARISTOR, V36ZA80
Z7	D60-0003-000	VARISTOR, V36ZA80
Z8	D60-0003-000	VARISTOR, V36ZA80
Z9	D60-0003-000	VARISTOR, V36ZA80
Z10	D60-0003-000	VARISTOR, V36ZA80
Z11	D60-0003-000	VARISTOR, V36ZA80
Z12	D60-0003-000	VARISTOR, V36ZA80
Z13	D60-0003-000	VARISTOR, V36ZA80

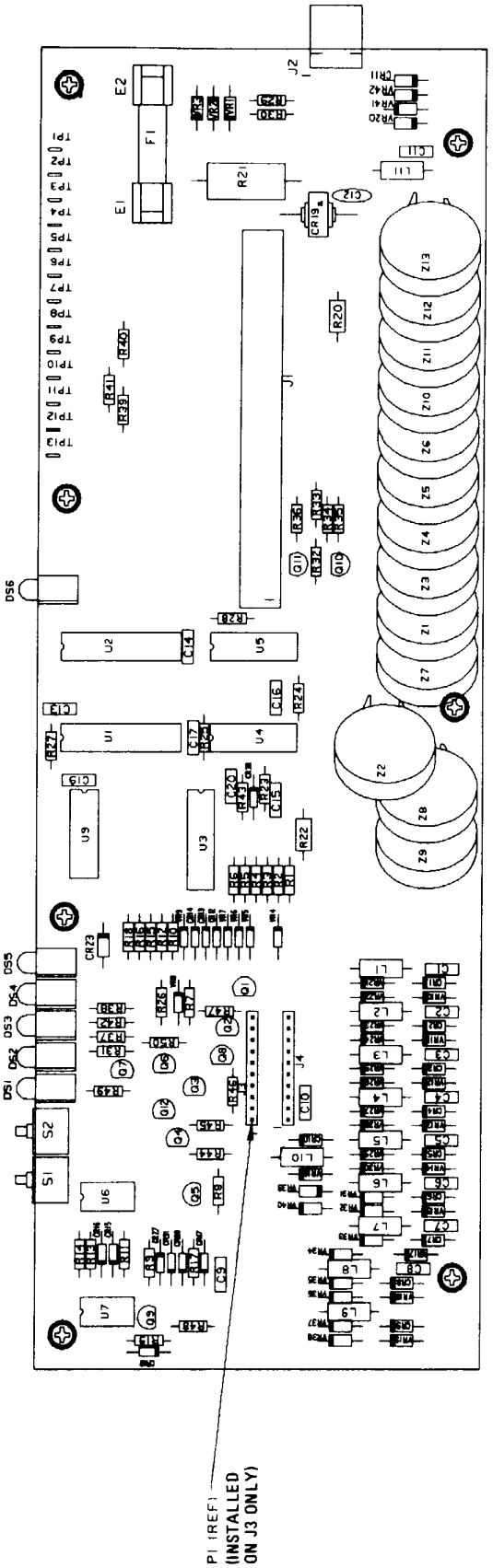

Figure 1. A7 Transceiver Interface PWB (10208-3100) Component Locations

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
5. P1 SHALL BE INSTALLED ON J3 FOR USE WITH THE RF-382-01 AND ON J4 FOR USE WITH THE RF-382-02. (SHOWN IN THE RF-382-02 POSITION).
6. FOR RF-382 COUPLERS W/O VOLTAGE PRE-REGULATOR OPTION 10208-5017, P1 IS CONNECTED TO J2.

   FOR RF-382 COUPLERS WITH VOLTAGE PRE-REGULATOR OPTION 10208-5017, P2 IS CONNECTED TO J2.

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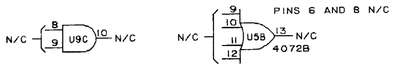

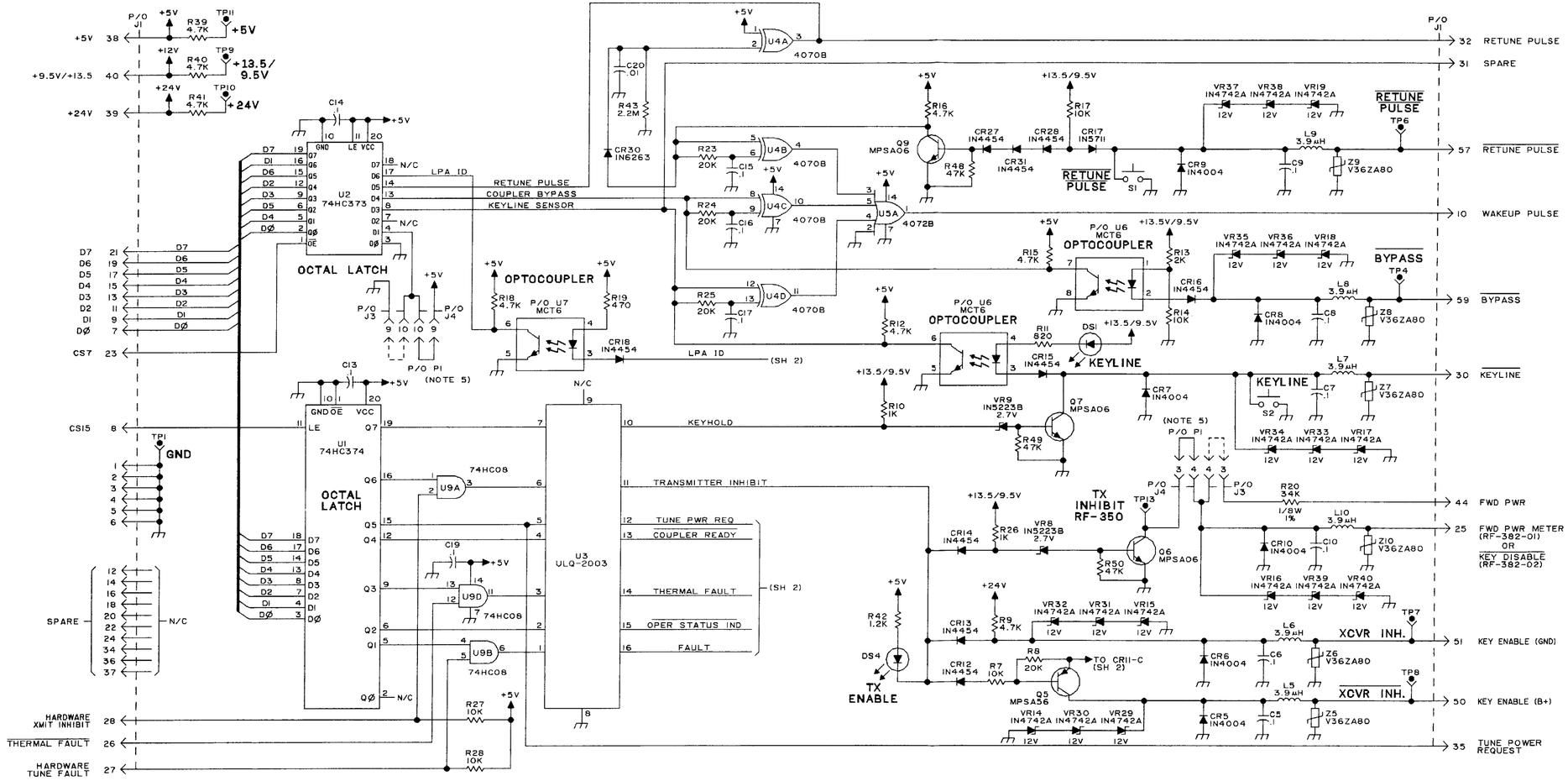

Figure 2. A7 Transceiver Interface PWB Assembly Schematic Diagram (10208-3101, Rev. C) (Sheet 1 of 2)

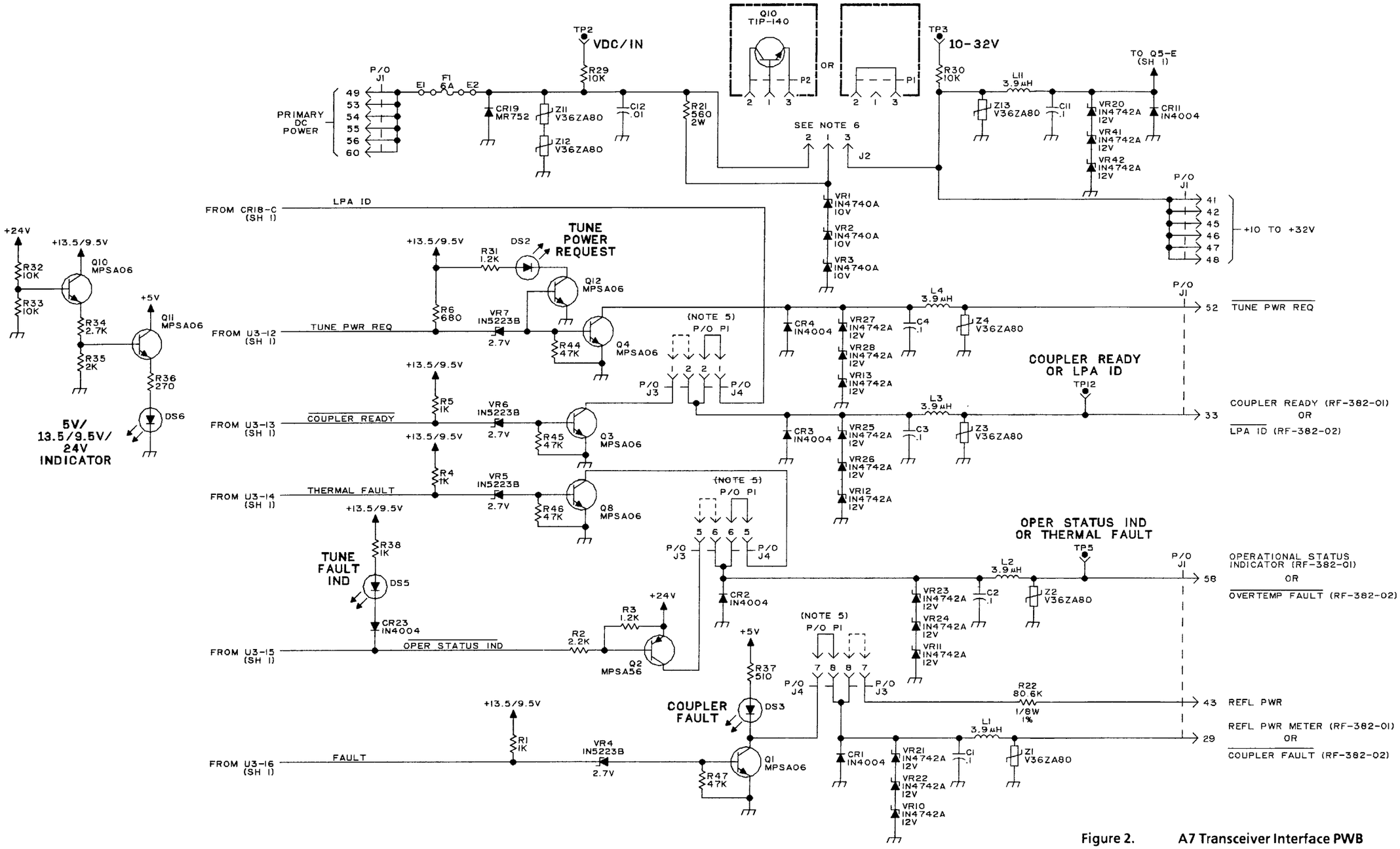

Figure 2. A7 Transceiver Interface PWB Assembly Schematic Diagram (10208-3101, Rev. C) (Sheet 2 of 2)

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