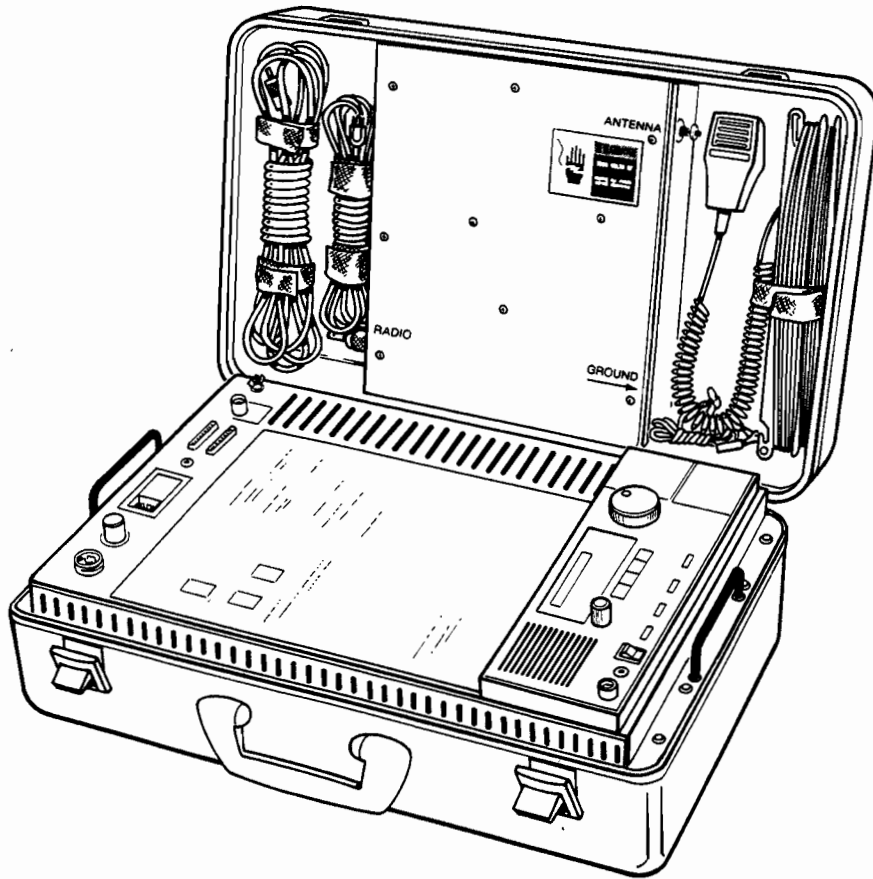


RF-3200T

HF-SSB TRANSPORTABLE COMMUNICATIONS SYSTEM



SERVICE MANUAL SUPPLEMENT

RF-3200T

***HF-SSB TRANSPORTABLE
COMMUNICATIONS SYSTEM***

SERVICE MANUAL SUPPLEMENT

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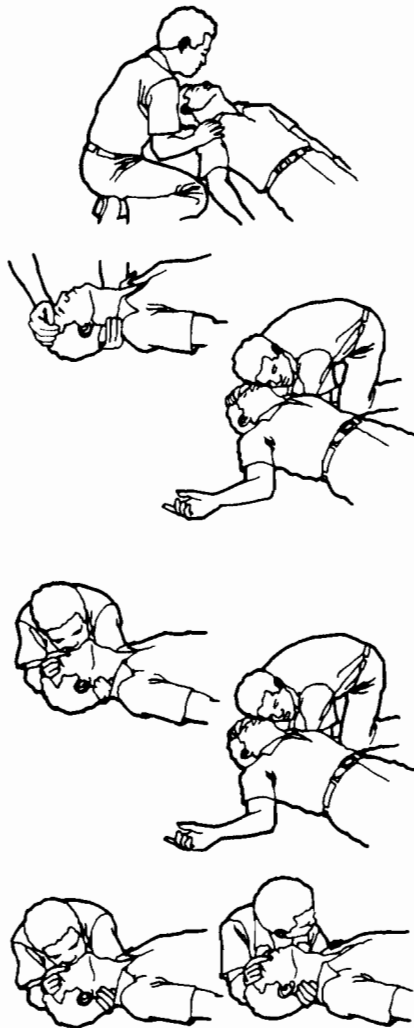


Equipment manufactured by Harris Corporation, RF Communications Group meets stringent quality and safety standards. However, high voltages are present in many radio products, and only a skilled technician should attempt to remove outer covers and make adjustments or repairs. All personnel who operate 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

GENERAL SPECIFICATIONS

Operating Levels:	Programmable: full frequency access, receive-only frequency access, or channelized
Frequency Range:	Transmit: 1.6 to 30 MHz Receive: 0.5 to 30 MHz
Frequency Resolution:	10 Hz steps, digitally synthesized
Number of Channels:	200 programmed (factory set) 121 user-programmable all channels are simplex or half-duplex; non-volatile memory (battery backup)
Automatic Channel Scan:	9 user-programmable groups
Channel Programming:	Front-panel programmable Protection against unauthorized frequency change is provided by a Security Access Code (standard) and by the removal of the internal coding device
Frequency Stability:	± 5 parts in 10^7 (± 15 Hz)
Emission Modes:	J3E-Suppressed Carrier (USB/LSB) H3E-Full Carrier (AME) R3E-Reduced Carrier (SSB) J2A-CW (optional narrow band filter available) F2B-FSK/TTY (optional filter available)
Display:	8-digit Vacuum Fluorescent Display (VFD) LED status indicator
Power Input:	115/230 Vac $\pm 15\%$, 50/60 Hz Receive: 13.6 Vdc + 20%, 2.5 Amps Transmit (single tone): 13.6 Vdc + 20%, 25 Amps
Meter:	Front Panel: TX (in Watts), Reflected Power (in Watts), RX (in "S" units)
Diagnostic Fault Detection:	Monitors and indicates Transmit Forward and Reflected Power, VSWR, Temperature, and Antenna Coupler fault conditions
Programming:	Front Panel: hardware and software security
Size:	8.0 H x 21 L x 13 W inches (19.8 H x 53.3 L x 33.0 W cm)
Weight:	47 pounds (21.3 kg) complete package

SPECIFICATIONS (Cont.)

TRANSMITTER

Power Output:	SSB: 125 Watts PEP/Average from 13.6 Vdc
Overload Protection:	The power amplifier is fully protected from mismatch, including open or shorted antenna and thermal overload
Carrier Suppression:	55 dB below PEP
Intermodulation Distortion:	32 dB below PEP
Undesired Sideband Suppression:	55 dB at 1kHz
Harmonic Suppression:	65 dB below PEP
Spurious Suppression:	65 dB below PEP
Audio Input:	Dynamic Microphone 600 Ohm Auxiliary Input
Residual Noise Level:	50 dB below PEP
Audio Bandwidth:	2.4 kHz (standard) Other bandwidth options available
Speech Processing:	Automatic Level Control with Companded Voice Processing

RECEIVER

Sensitivity:	AM: 3 microvolts for 10 dB SINAD SSB: 0.5 microvolts for 10 dB SINAD
Audio Output:	5 Watts with less than 5% distortion 600 Ohm Auxiliary Output
AGC Characteristics:	The audio output varies less than 2 dB for signals in the range from 10 microvolts to 1 volt. Automatically selected dual time-constant AGC for voice or FSK/CW operation (standard)
Selectivity:	AM: 6 kHz at 6 dB (standard) SSB: 300 Hz to 2700 Hz at 6 dB (standard) Other selectivity options available
Image Rejection:	-70 dB
IF Rejection:	-80 dB
Intermodulation Distortion:	-80 dB
Desensitization:	-100 dB (100 kHz separation)

SPECIFICATIONS (Cont.)

RECEIVER (Cont.)	
Spurious Response:	-70 dB
Squelch:	Voice-controlled Syllabic, with Noise Immunity
Clarifier:	Digital \pm 250 Hz in 10 Hz steps
Overload Protection:	30 Volts RMS
Noise Blanker:	Impulse Noise Rejection (optional)
ANTENNA COUPLER	
Frequency Range:	1.6 MHz to 30 MHz
Tuning Capability:	1.6 MHz to 30 MHz: longwire, dipole, and 24-foot and 35-foot whip antennas 2.0 MHz to 30 MHz: 16-foot whip antennas 4.0 MHz to 30 MHz: 9-foot whip antennas
RF Input Power:	125 Watts PEP (30 Watts Average)
Input Impedance:	50 Ohms
Tuning Accuracy:	VSWR of less than 1.2:1 VSWR of 1.5:1 maximum
Tuning Mode:	Fully Automatic
Tuning Time:	30 milliseconds tune time from memory 1 second typical in Learn Mode
Tune Memory:	321 channels, half-duplex or simplex 16 random tune channels (Group F)
RF Tuner Power:	10 Watts to 20 Watts forward throughout the tune cycle
Diagnostics/Protection:	Automatic Cutback or Bypass Overtemperature Protection Overvoltage Protection Excessive VSWR Protection
Coupler Control:	All control and dc power is multiplexed on the coaxial cable
Remote Capability:	30 feet of RG-58 coaxial cable is provided Up to 150 feet separation between transceiver and coupler is possible when RG- 213/U coaxial cable is used

SPECIFICATIONS (Cont.)

ANTENNA COUPLER (Cont.)

Primary Power Requirements: 13.6 Vdc \pm 20%; power is supplied by the transceiver

Connections: Transceiver Input: Type N; watertight; surge protected
Antenna Output: Ceramic high voltage insulator; surge protected
Ground: Ground lug

ENVIRONMENTAL

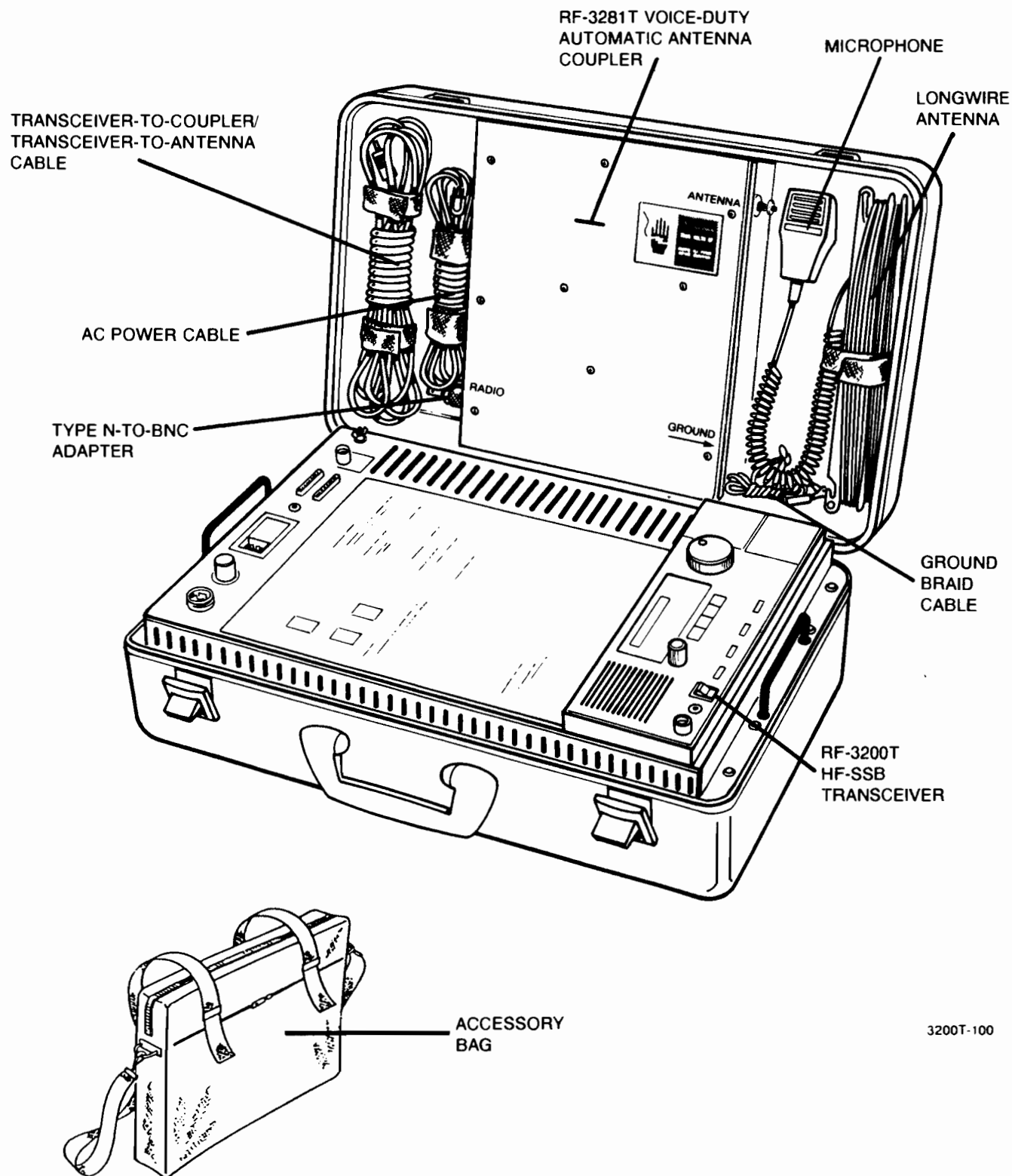
Temperature: -30°C to + 60°C

Vibration Shock: MIL-STD-810D

Humidity: MIL-STD-810D

RF-3200T
***HF-SSB TRANSPORTABLE
COMMUNICATIONS SYSTEM***

SERVICE MANUAL SUPPLEMENT



3200T-100

RF-3200T HF-SSB Transportable Communications System

SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

The RF-3200T HF-SSB (High Frequency Single Sideband) Transportable Communications System includes an RF-3200T 125 W HF-SSB Transceiver, RF-3281T Voice Duty Automatic Antenna Coupler, and other components integrated into a suitcase-style system package. The system includes everything needed to setup and operate a high quality, reliable 125 W HF communications station. The system weighs 47 pounds (21.3 kg) and operates in USB, LSB, compatible AM (AME), CW, and Data modes. Refer to the specifications in the front of this manual for a complete listing of all specifications.

1.2 SCOPE

This publication is a supplement to the RF-3200 HF-SSB Transceiver Service Manual, Publication Number 10212-0300, and the RF- 3281 Voice-Duty Digital Antenna Coupler Servicing Manual, Publication Number 10228-0300. This supplement provides service information for the RF-3200T HF-SSB (High Frequency Single Sideband) Transportable Communications System (hereafter referred to as the RF-3200T System).

For detailed operation information, refer to the RF-3200 User's Guide, Publication Number 102132-0050, with the RF-3200T User's Guide Supplement, Publication Number 10262-0050 (supplied). The user's guide provides complete operating information for the RF-3200T HF-SSB Transceiver, which is functionally the same as the RF-3200 HF-SSB Transceiver.

For detailed maintenance information for the transceiver and antenna coupler, refer to the service manuals (previously identified) and this supplement. (This supplement references information in the basic service manuals, where applicable. The information is not repeated herein.) Complete service information for the power supply and other RF-3200T System-specific components is contained in this supplement.

1.3 ITEMS SUPPLIED

Table 1-1 lists the contents of the Accessory Bag (strapped carry case) supplied with the system. The bag and its contents are part of the system's Ancillary Kit (PN 10262-0500). Table 1-2 lists the additional items supplied with the system. These items are also part of the system's ancillary kit.

Table 1-1. Accessory Bag Contents

Qty.	Part Number	Description
1	J-0060	Ac Plug 3-to-2 Prong Connector Adapter
1	10262-0600	Auxiliary Dc Power Cable
1	P/O 10262-0700	Longwire Antenna*
1	P/O 10262-0700	Dipole Antenna Adapter
2	F-0016	Fuse, 6 A, QA, 250 V, Type 3AG
4	F-0013	Fuse, 3 A, QA, 250 V, Type 3AG
2	F-0105	Fuse, 30 A, QA, 32 V, Type 5AG

*An additional Longwire Antenna is stowed in the unit's cover.

Table 1-1. Accessory Bag Contents (Cont.)

Qty.	Part Number	Description
2	F-0017	Fuse, 8 A, QA, 125 V, Type 3AG
2	F15-0001-010	Fuse, 2.5 A, QA, 125 V, Type PIC
1	SK-0423	Flat Blade Screwdriver, 4-1/2 Inch
1	J-0002	UHF Cable Plug Connector
1	J22-0070-115	15-Pin D Plug Connector
1	J22-0070-514	15-Pin Connector Metal/Plastic Hood
1	UG-21D/U	Type N Coax Connector
1	Z52-0003-000	Foreign Power Adapter Plug Kit
1	10212-0050	RF-3200 User's Guide
1	10262-0050	RF-3200T User's Guide Supplement
1	10212-0051	RF-3200 Operator's Card

Table 1-2. Additional Items Supplied with the System

Qty.	Part Number	Description
1	W-0023	6-foot Line Cord
1	P/O 10262-0700	Longwire Antenna*
1	10262-0650	Ground Strap Cable Assembly
1	10212-0200	Handheld Microphone
1	10262-6220	Carry Case (Accessory Case)
30 ft.	P/O 10262-0700	Coaxial Cable, UHF to BNC
1	UG-201A/U	BNC-to-N Adapter (installed on coupler)

*An additional Longwire Antenna is stowed in the unit's Accessory Bag.

1.4 POWER SOURCE INFORMATION

The RF-3200T System is capable of operating from either an ac or dc power source. Power source interconnection procedures are included in the RF-3200T User's Guide supplement.

1.5 SYSTEM FUNCTIONAL BLOCK DIAGRAMS

Figures 1-1, 1-2, and 1-3 are simplified functional block diagrams for the RF-3200T System. Study these illustrations to become familiar with the main functional circuit groups of the unit.

Figure 1-1 is a simplified functional block diagram of the RF-3200T HF-SSB Transceiver.

Figure 1-2 shows a simplified functional block diagram of the special Coupler Interface PWB Assembly.

Figure 1-3 is a simplified functional block diagram of the RF-3281T Voice Duty Digital Antenna Coupler's PWB Assembly.

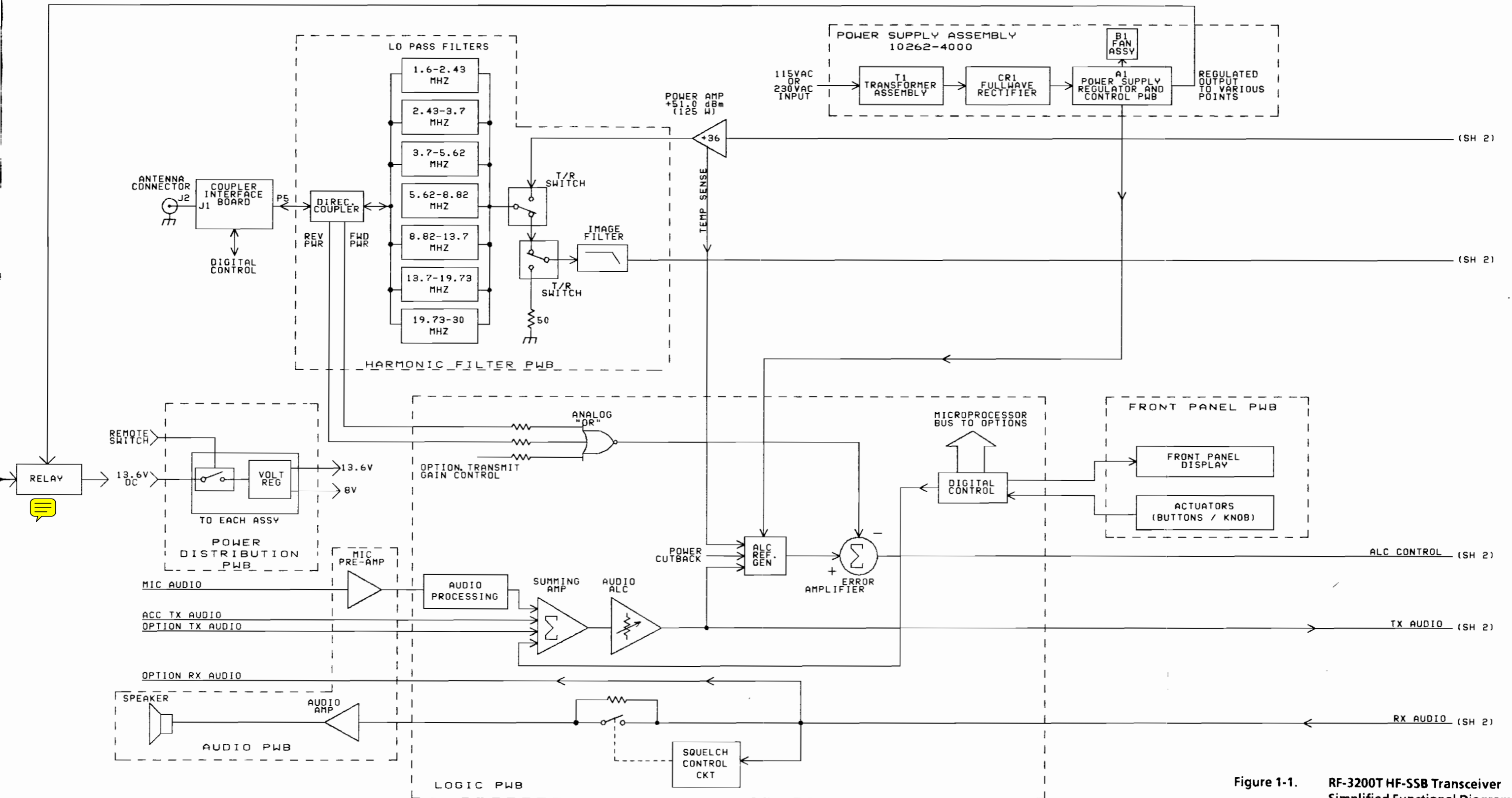


Figure 1-1. RF-3200T HF-SSB Transceiver Simplified Functional Diagram (10262-0001) (Sheet 1 of 2)

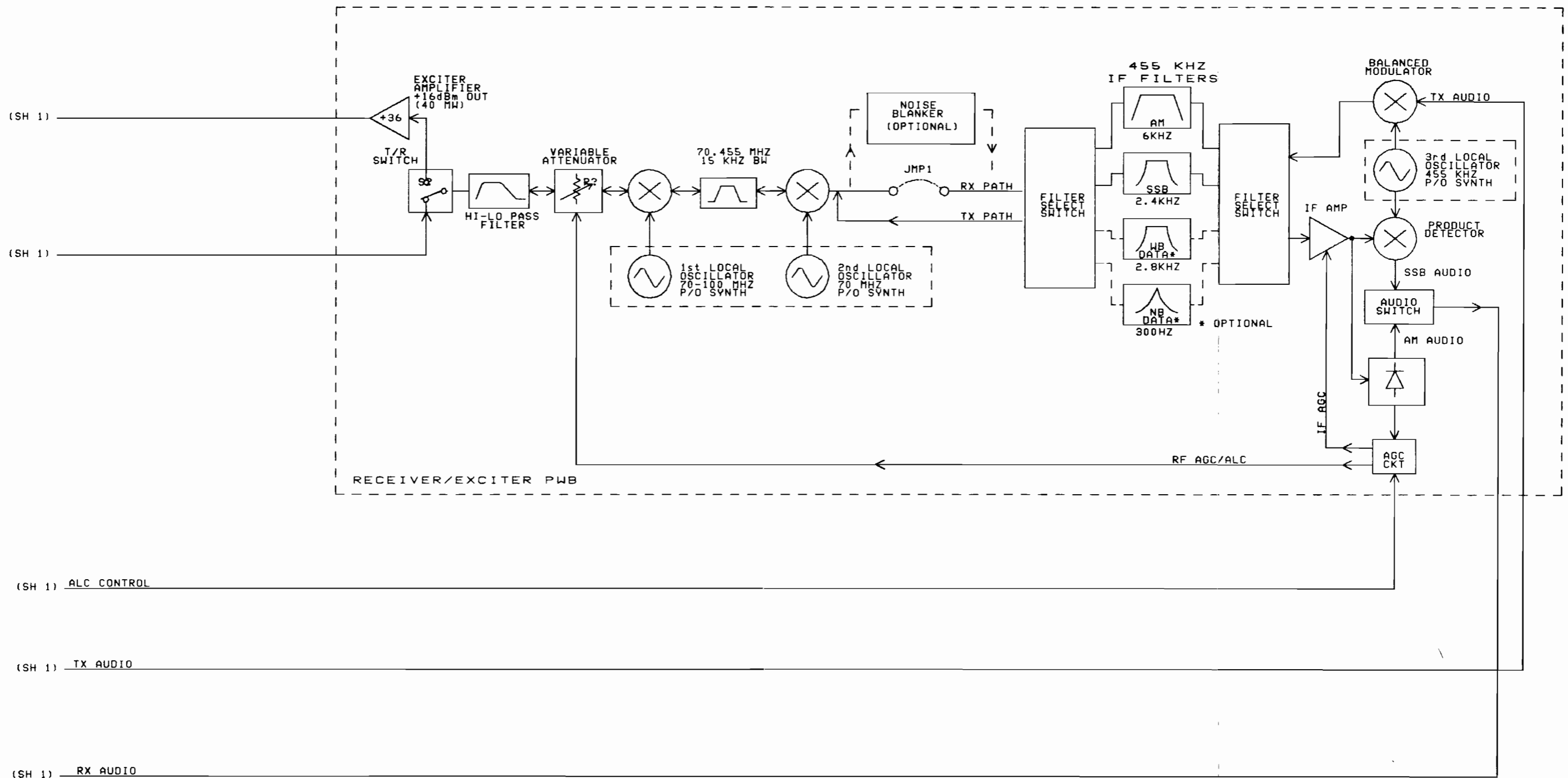


Figure 1-1. RF-3200T HF-SSB Transceiver Simplified Functional Diagram (10262-0001) (Sheet 2 of 2)

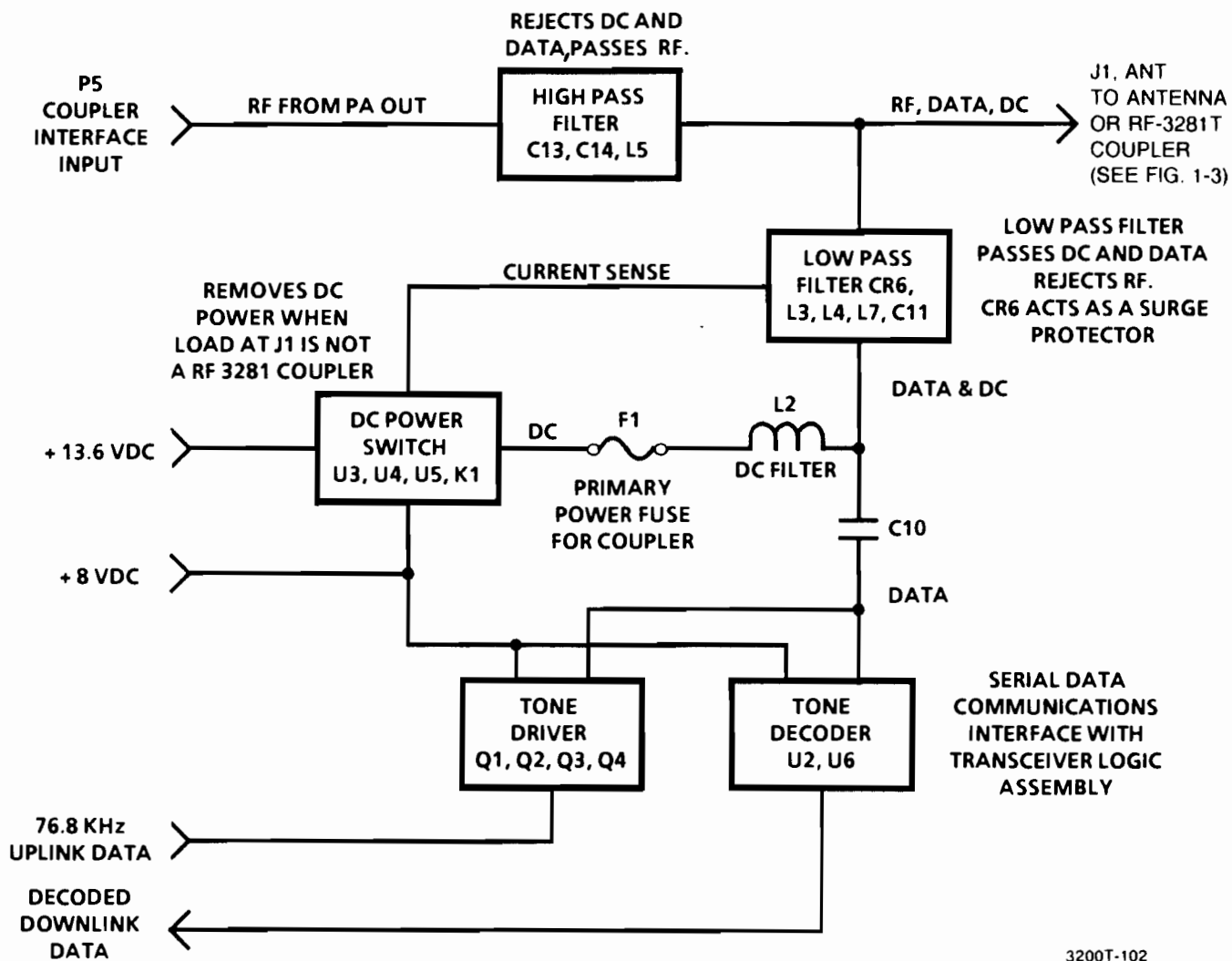


Figure 1-2. Coupler Interface PWB, P/N 10228-2110, Simplified Functional Diagram

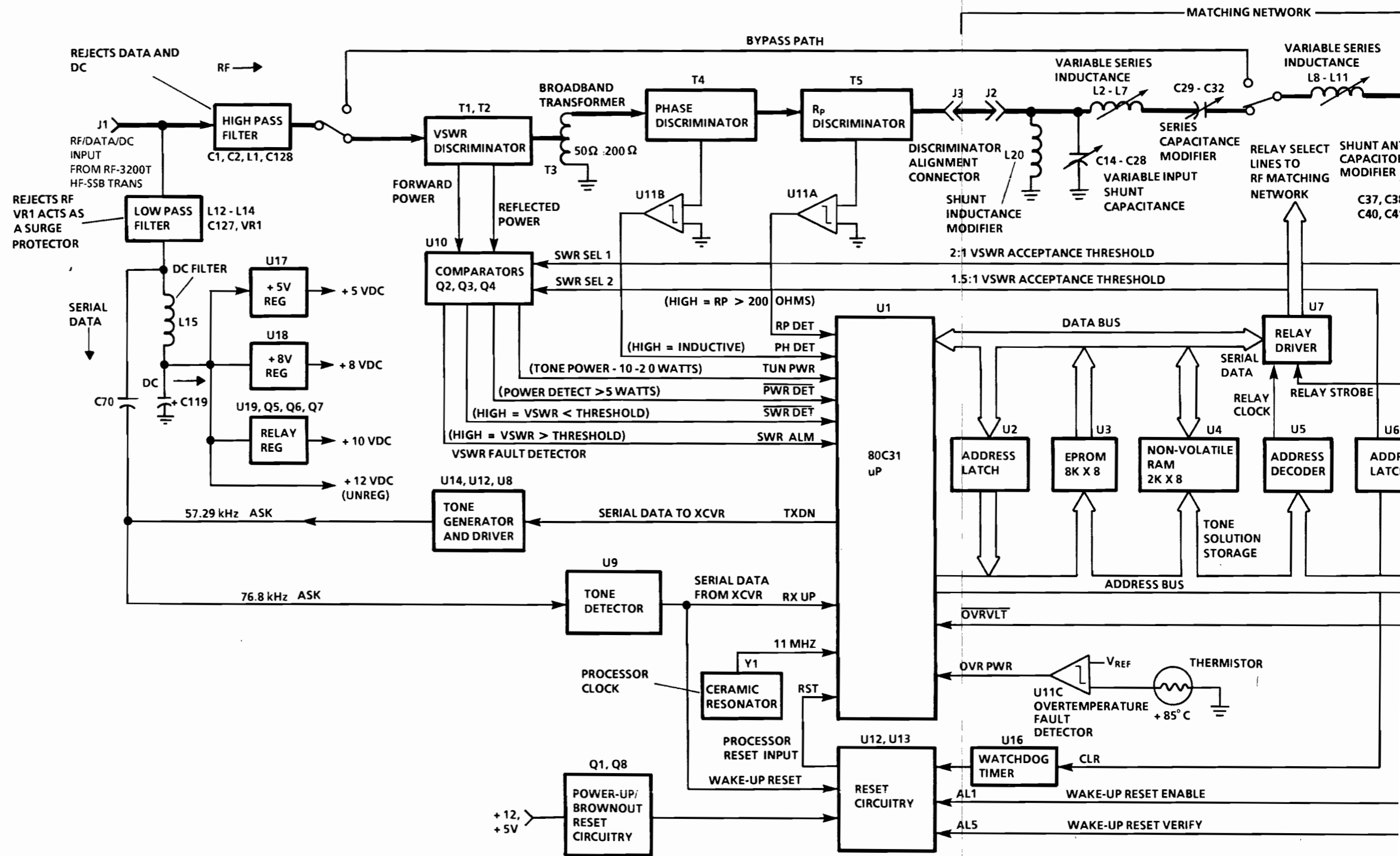
1.6 CONFIGURATION DIFFERENCES - RF-3200 HF-SSB TRANSCEIVER AND RF-3200T HF-SSB TRANSPORTABLE COMMUNICATIONS SYSTEM

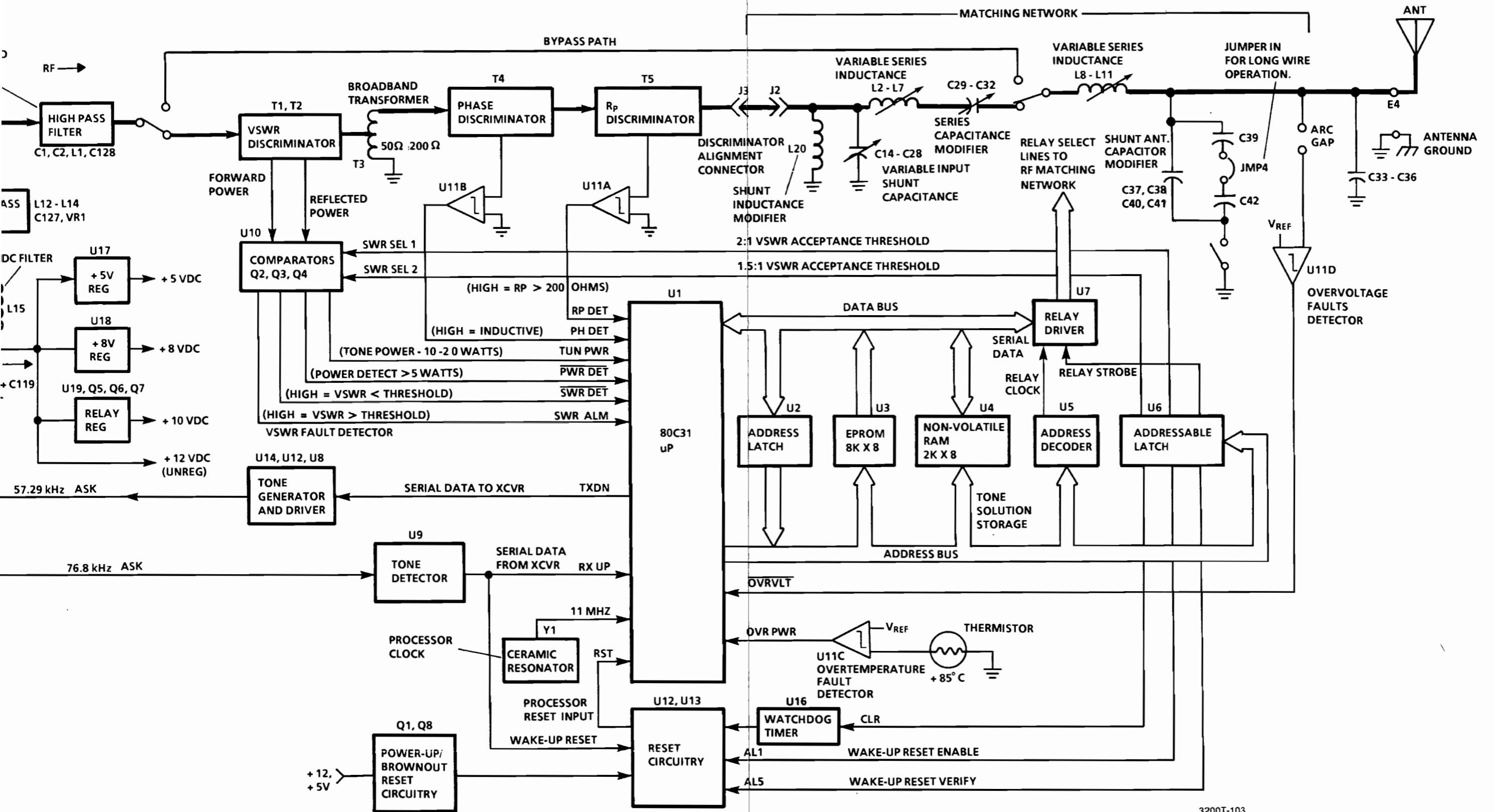
The RF-3200T System differs from the RF-3200 HF-SSB Transceiver as follows:

- The RF-3281T Voice-Duty Antenna Coupler is an integral part of the RF-3200T System. Use of a coupler is optional with the RF-3200 HF-SSB Transceiver.
- The RF-3200T System uses an integrated ac power supply. The RF-3200 HF-SSB Transceiver uses an external 13.6 Vdc. (This supplement includes complete technical information on the power supply.)
- A Coupler Interface PWB Assembly, which multiplexes coupler control data, dc power, and RF power to the antenna coupler over an interconnect coaxial cable, is an integral part of the RF-3200T System. It is an option with the RF-3200 HF-SSB Transceiver.
- The RF-3281T Voice-Duty Digital Antenna Coupler's main PWB assembly (PN 10262-6110) has four components that are physically different but functionally the same as those of the standard RF-3281 Antenna Coupler's main PWB assembly (PN 10228-1110) and its assembled unit. These components are air coil L11 (PN 10262-6115) and coaxial cable jumper assembly (PN 10262-6117). Series Pass Cable Assembly (PN 10262-6130) replaced cable assembly PN 10228-1290. Coupler Input Cable Assembly (PN 10262-6140) replaced cable assembly PN 10228-1250. Antenna Feed Cable Assembly (PN 10262-6120) replaced cable assembly PN 10228-1280. Pass transistor Q5, PN Q-0044 (type TIP-42) replaced pass transistor Q5, type 2N6318. These components were changed to facilitate space requirements.
- Longwire and dipole antenna components are supplied with the RF-3200T System. These components are options with the RF-3200 HF-SSB Transceiver.
- In general, many of the cable assemblies used in the RF-3200T System are extended-sized versions of those used in the RF-3200 HF-SSB Transceiver.

1.7 CONFIGURATION INSTRUCTIONS

Configuration instructions for the RF-3200T System are the same as for the RF-3200 HF-SSB Transceiver. Refer to Section 2 of the RF-3200 Service Manual and RF-3200 Configuration Manual for detailed instructions.





3200T-103

Figure 1-3. RF-3281T Antenna Coupler PWB Assembly Simplified Diagram

SECTION 2

MAJOR ASSEMBLY LOCATION, ACCESS DISASSEMBLY INSTRUCTIONS, AND INTERCONNECTION

2.1 CHASSIS-LEVEL ASSEMBLIES

The RF-3200T HF-SSB Transceiver Radio Chassis in the lower case assembly contains ten major assemblies interconnected by various cables. These assemblies are:

- Front Panel Assembly A1, PN 10262-2000
- Audio PWB Assembly A2, PN 10262-2210
- Receiver/Exciter (RX/EX) PWB Assembly A3, PN 10212-1410
- Harmonic Filter (HF) PWB Assembly A4, PN 10212-1510
- Heatsink Assembly A5, PN 10262-1100
- Fan Assembly A6, PN 10212-2015
- Logic PWB Assembly A7, PN 10212-1210
- Synthesizer PWB Assembly A8, PN 10212-1310
- Antenna Coupler Interface PWB Assembly A9, PN 10228-2110

NOTE

Though located in the radio chassis, technical information for this PWB is included in the RF-3281 Voice-Duty Digital Antenna Coupler Service Manual.

- Oven-controlled Reference Oscillator PWB Assembly A10, PN 10212-3010 (Option - if installed)
- Power Supply, PN 10262-4000

The upper case assembly contains the RF-3281T Voice-Duty Digital Antenna Coupler. Figure 2-1 is the interconnecting diagram for the RF-3200T System.

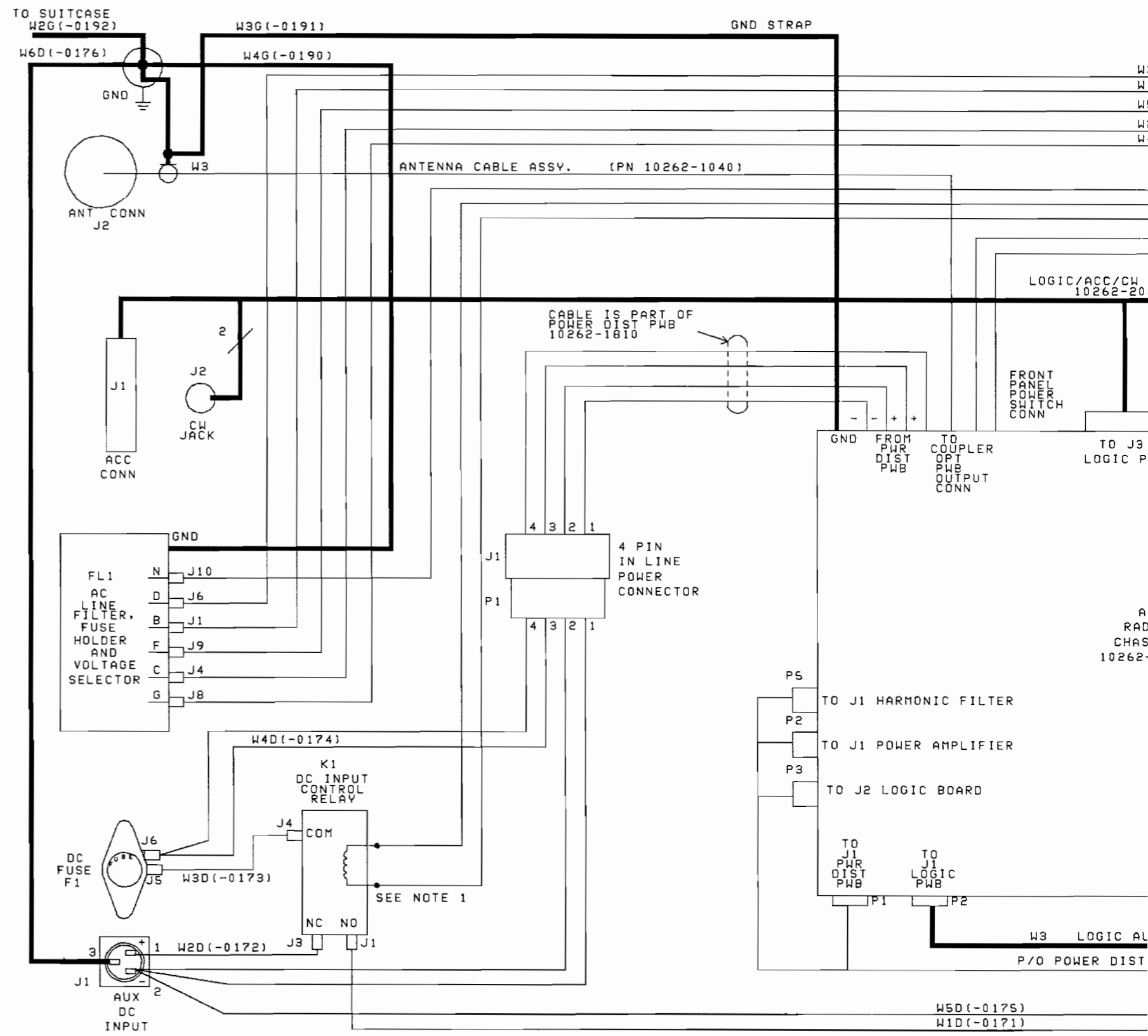
2.2 ACCESS DISASSEMBLY

Figures 2-2 through 2-8 show and describe how to disassemble the RF-3200T System down to the major assembly level. Examine these data very carefully prior to attempting disassembly.

Access to the bottom of the radio chassis is as shown in figure 3-5 of the RF-3200 HF-SSB Transceiver Service manual.

The location of PWB assemblies A3 through A9 are as shown in figures 3-3 and 3-6 of the RF-3200 HF-SSB Transceiver Service Manual.

1. VOLTAGE ON THIS WINDING IS ALWAYS 115VAC REGARDLESS OF APPLIED INPUT VOLTAGE AT INPUT OF AC LINE FILTER, FL1.



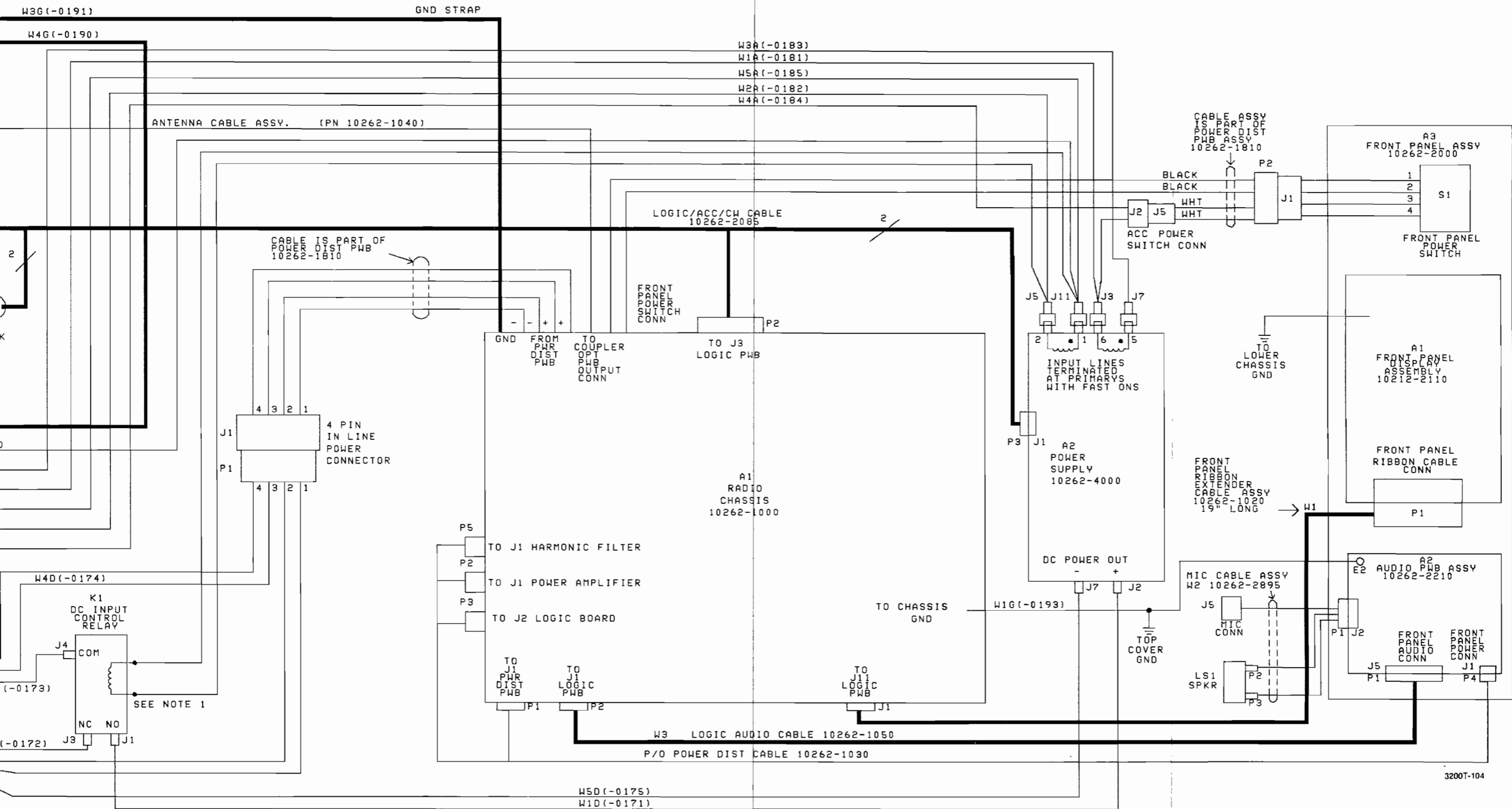
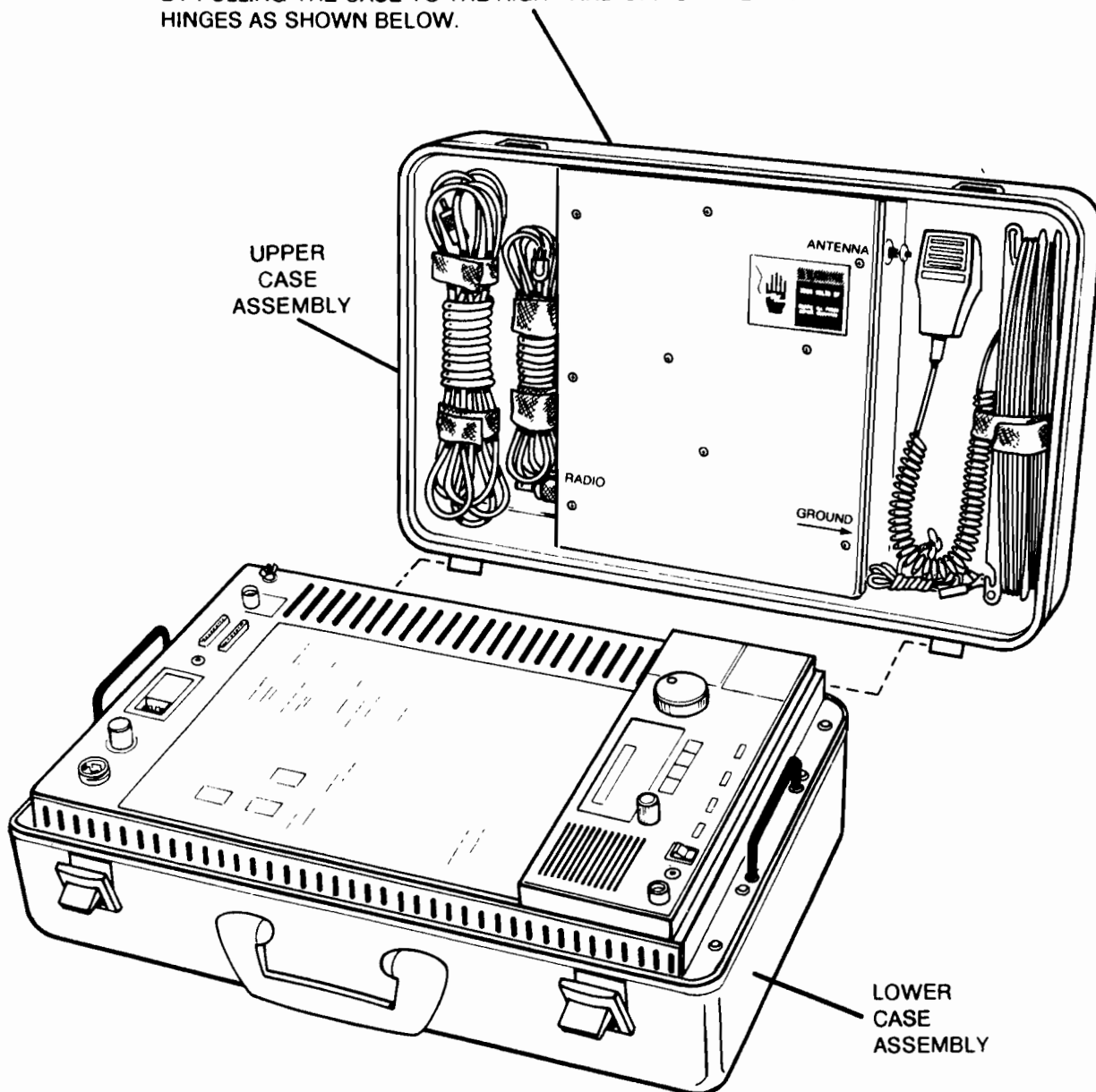


Figure 2-1. RF-3200T System Interconnecting Wiring Diagram

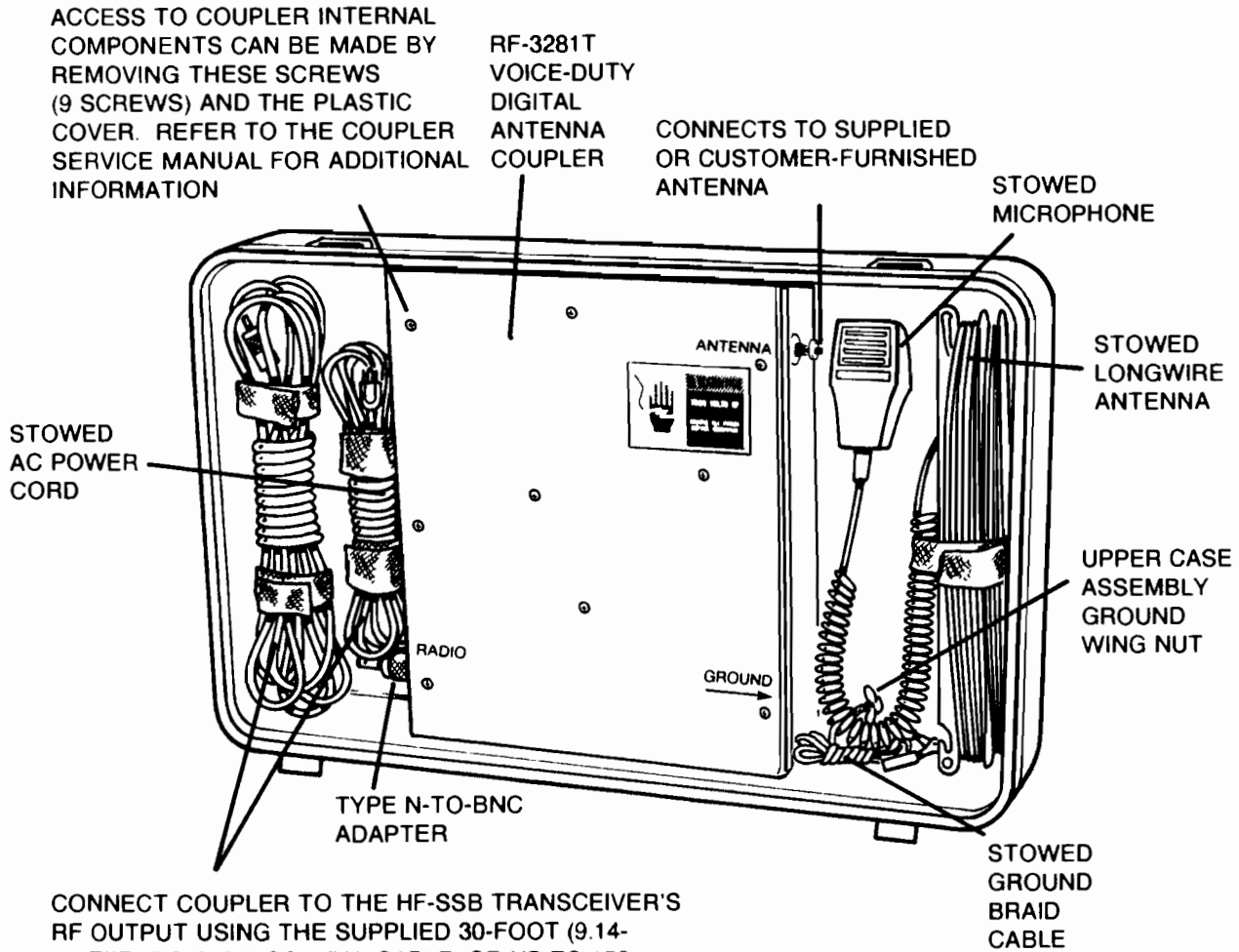
DISASSEMBLY PROCEDURE

SEPARATE UPPER CASE ASSEMBLY AND LOWER CASE ASSEMBLY BY PULLING THE CASE TO THE RIGHT AND OFF OF THE PIN HINGES AS SHOWN BELOW.



3200T-105

Figure 2-2. Upper and Lower Case Assembly Separation Procedure



CONNECT COUPLER TO THE HF-SSB TRANSCEIVER'S RF OUTPUT USING THE SUPPLIED 30-FOOT (9.14-METER) RG-213/U COAXIAL CABLE, OR UP TO 150 FEET (47.5 METERS) OF CUSTOMER-FURNISHED RG-213/U COAXIAL CABLE. (AN OPTIONAL BIAS TEE WILL PERMIT EXTENDED RANGE USING DC POWER CABLE.)

3200T-106

Figure 2-3. Upper Case Assembly Separated from Lower Case Assembly - Detail View and Information Sheet

CAUTION

COMPONENT FIT TOLERANCES ARE VERY CLOSE. FAILURE TO REMOVE THE CHASSIS CAREFULLY MAY RESULT IN DAMAGE TO THE EQUIPMENT.

STEP TWO

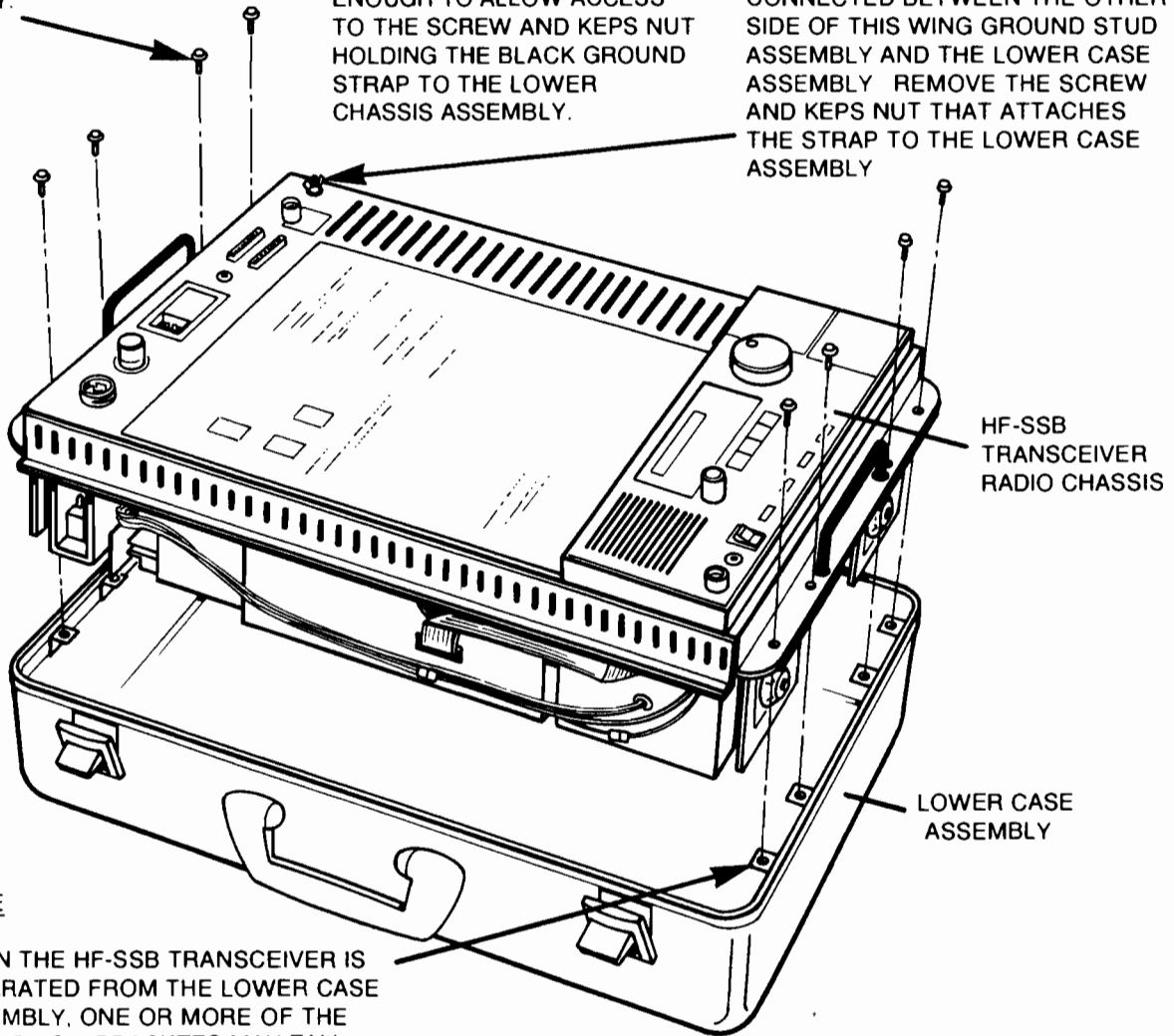
CAREFULLY LIFT HF-SSB TRANSCEIVER RADIO CHASSIS FROM THE LOWER CASE ASSEMBLY BY MOVING THE CHASSIS BACK AND FORTH AND PULLING UPWARDS. ROTATE THE RADIO CHASSIS COUNTERCLOCKWISE JUST ENOUGH TO ALLOW ACCESS TO THE SCREW AND KEPS NUT HOLDING THE BLACK GROUND STRAP TO THE LOWER CHASSIS ASSEMBLY.

STEP THREE

A BLACK GROUND STRAP IS CONNECTED BETWEEN THE OTHER SIDE OF THIS WING GROUND STUD ASSEMBLY AND THE LOWER CASE ASSEMBLY. REMOVE THE SCREW AND KEPS NUT THAT ATTACHES THE STRAP TO THE LOWER CASE ASSEMBLY

STEP ONE

REMOVE THE EIGHT PHILIPS HEAD SCREWS THAT SECURE THE HF-SSB TRANSCEIVER RADIO CHASSIS TO THE LOWER CASE ASSEMBLY.



NOTE

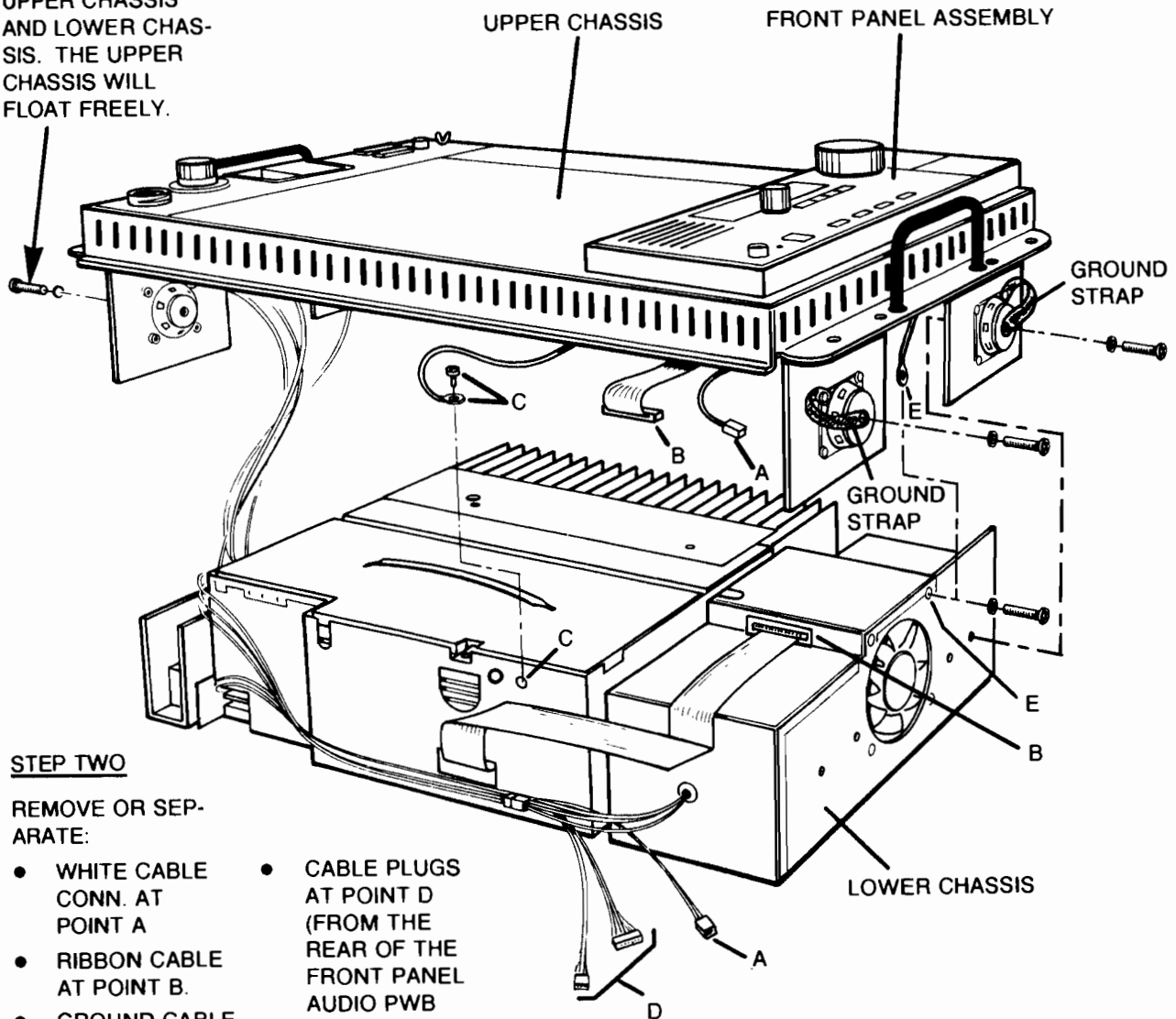
WHEN THE HF-SSB TRANSCEIVER IS SEPARATED FROM THE LOWER CASE ASSEMBLY, ONE OR MORE OF THE MOUNTING L-BRACKETS MAY FALL INTO THE LOWER CASE ASSEMBLY. RETAIN THESE ITEMS FOR FUTURE REASSEMBLY.

3200T-107

Figure 2-4. HF-SSB Transceiver - Lower Case Assembly Separation Procedure

STEP ONE

REMOVE THE FOUR 1/4-20 SCREWS FROM THE SHOCK MOUNTS IN THE UPPER CHASSIS AND LOWER CHASSIS. THE UPPER CHASSIS WILL FLOAT FREELY.



STEP TWO

REMOVE OR SEPARATE:

- WHITE CABLE CONN. AT POINT A
- RIBBON CABLE AT POINT B.
- GROUND CABLE AT POINT C (UNSCREW AS SHOWN)
- CABLE PLUGS AT POINT D (FROM THE REAR OF THE FRONT PANEL AUDIO PWB ASSEMBLY)
- BLACK STRAP AT POINTS E.

3200-108

Figure 2-5. Separation of Upper Chassis and Lower Chassis

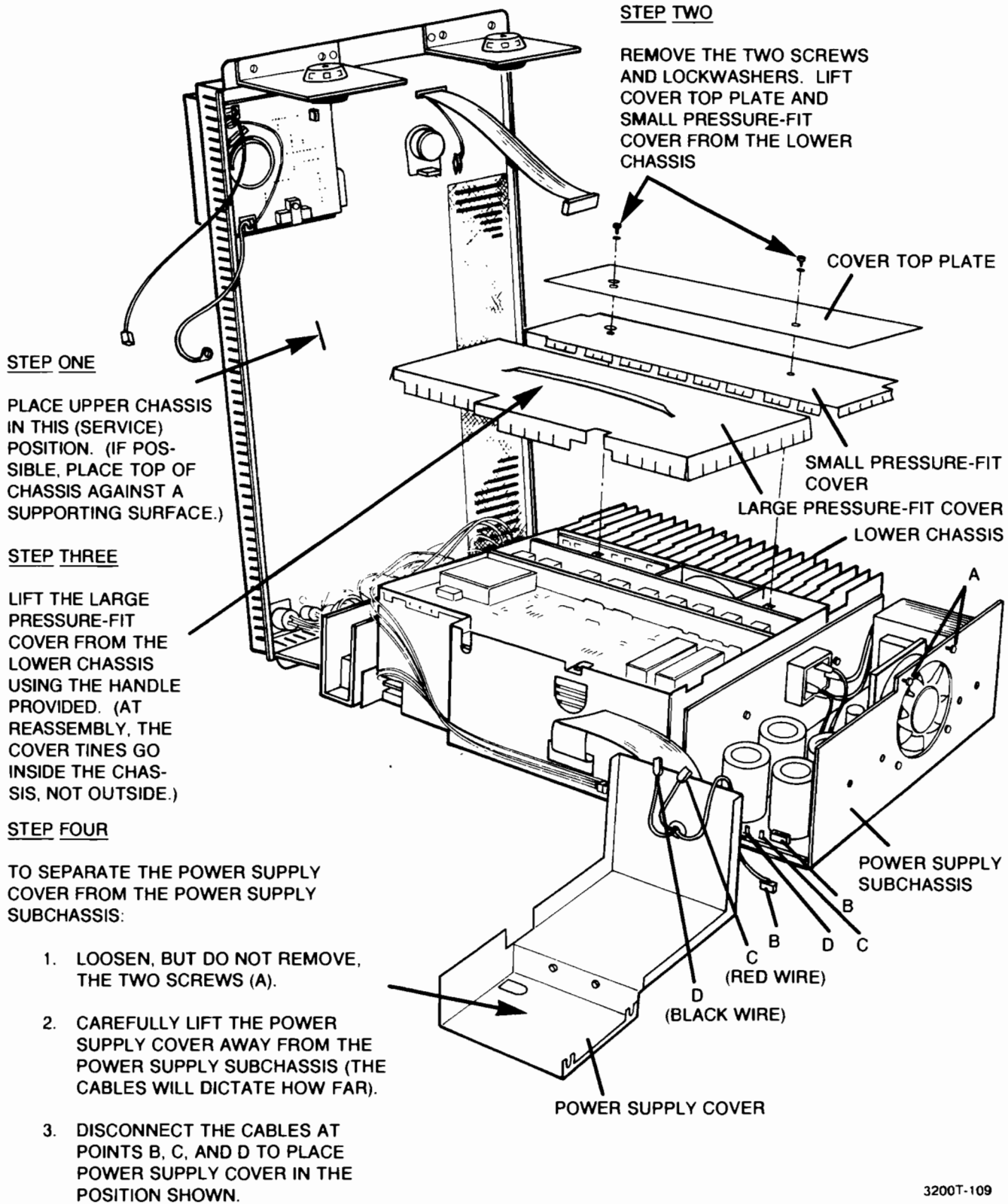
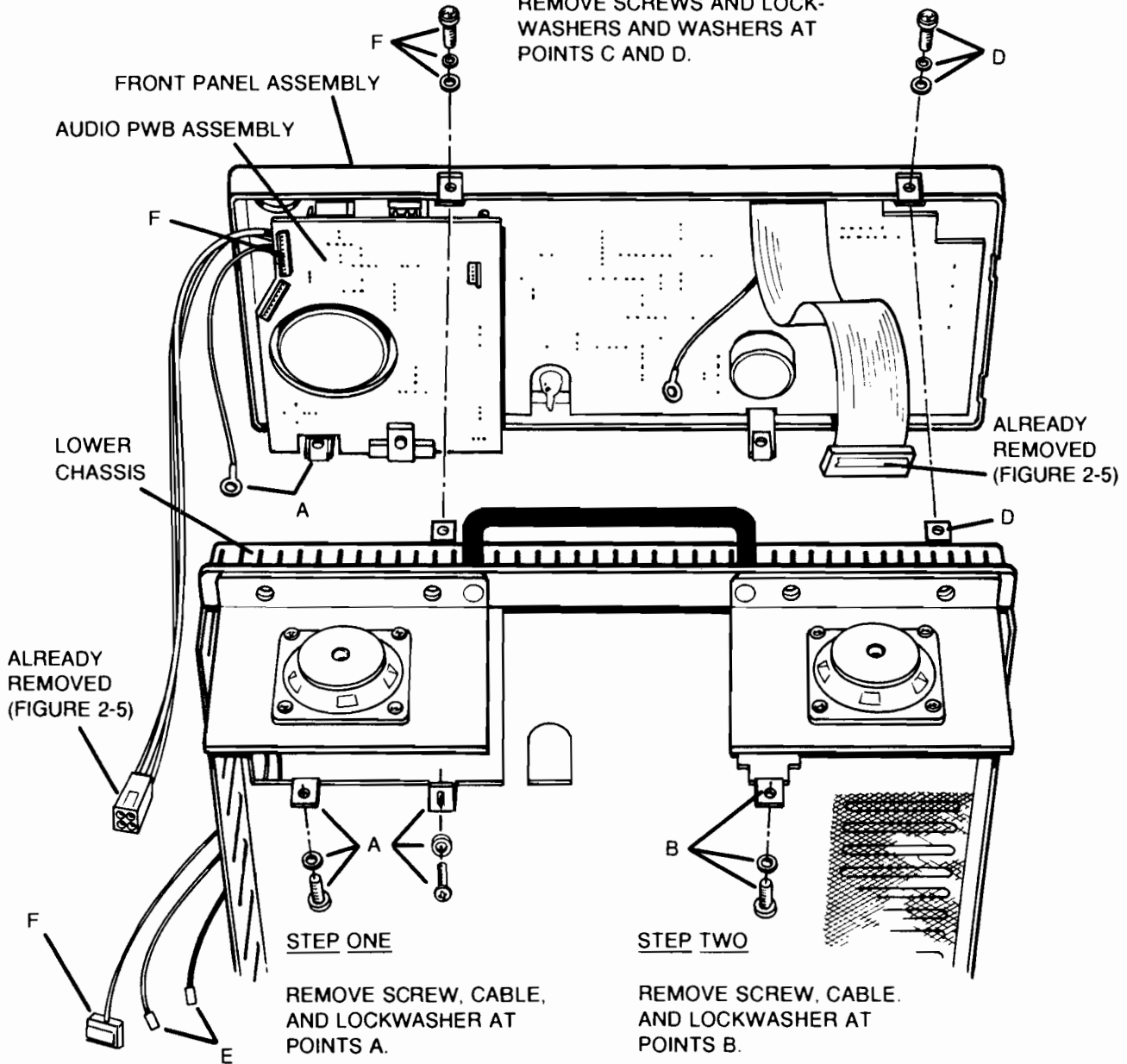


Figure 2-6. Removal or Separation of Various Chassis Covers

STEP THREE

REMOVE SCREWS AND LOCK-
WASHERS AND WASHERS AT
POINTS C AND D.



STEP FOUR

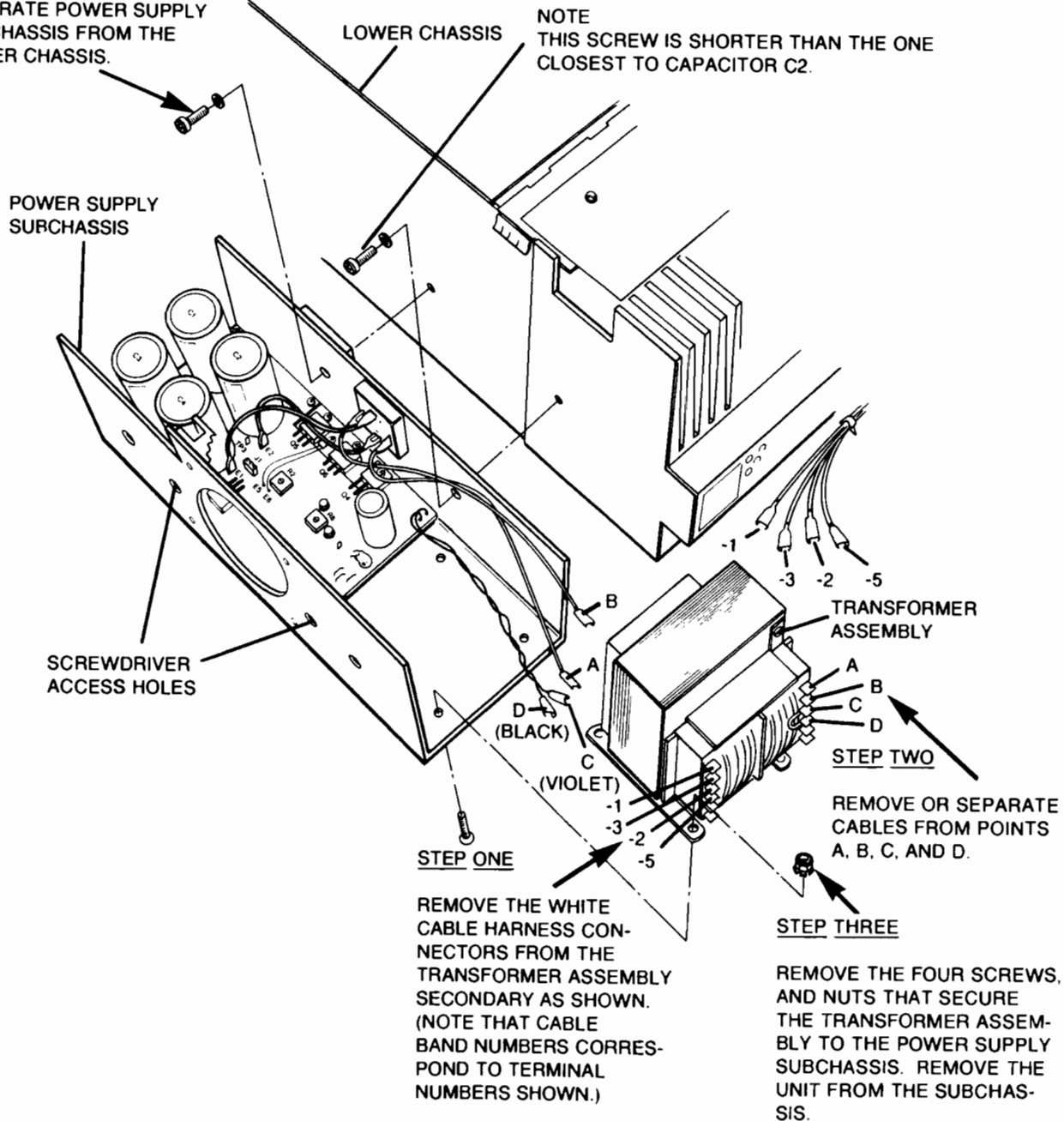
WHILE HOLDING FRONT PANEL
ASSEMBLY, REMOVE THE
SPEAKER WIRES (POINTS E)
AND CONNECTOR (POINTS F)
FROM THE AUDIO PWB ASSEM-
BLY.

3200T-110

Figure 2-7. Removal of Front Panel Assembly from Lower Chassis

STEP FOUR

INSERT A SCREWDRIVER THROUGH THE SCREWDRIVER ACCESS HOLES AND REMOVE THE TWO SCREWS AND LOCKWASHERS. SEPARATE POWER SUPPLY SUBCHASSIS FROM THE LOWER CHASSIS.



3200T-111

Figure 2-8. Separation of the Power Supply Subchassis from the Lower Chassis

Removal of PWB assemblies A3 through A9 is the same as described in Section 3 of the RF-3200 HF-SSB Transceiver Service Manual. For reference, the applicable paragraphs are as follows:

- Receiver/Exciter (RX/EXC) PWB Assembly A3 - paragraph 3.2.6
- Harmonic Filter (HF) PWB Assembly A4 - paragraph 3.2.7
- Heatsink Assembly A5 - paragraph 3.2.13
- Fan Assembly A6 - paragraph 3.2.10
- Logic PWB Assembly A7 - paragraph 3.2.14
- Synthesizer PWB Assembly A8 - paragraph 3.2.15
- Antenna Coupler Interface PWB Assembly A9 - paragraph 3.2.8
- Oven-controlled Reference Oscillator PWB Assembly A10 (Option - if installed) - paragraph 3.2.9

Removal of the Power Supply is described in figure 2-8 of this supplement.

2.3 UNIT REASSEMBLY

Reassembly procedures are essentially the reverse of those shown in figures 2-2 through 2-8. Standard reassembly techniques (such as assembly sequence, hardware accountability, polarity observation, etc.) should be observed.

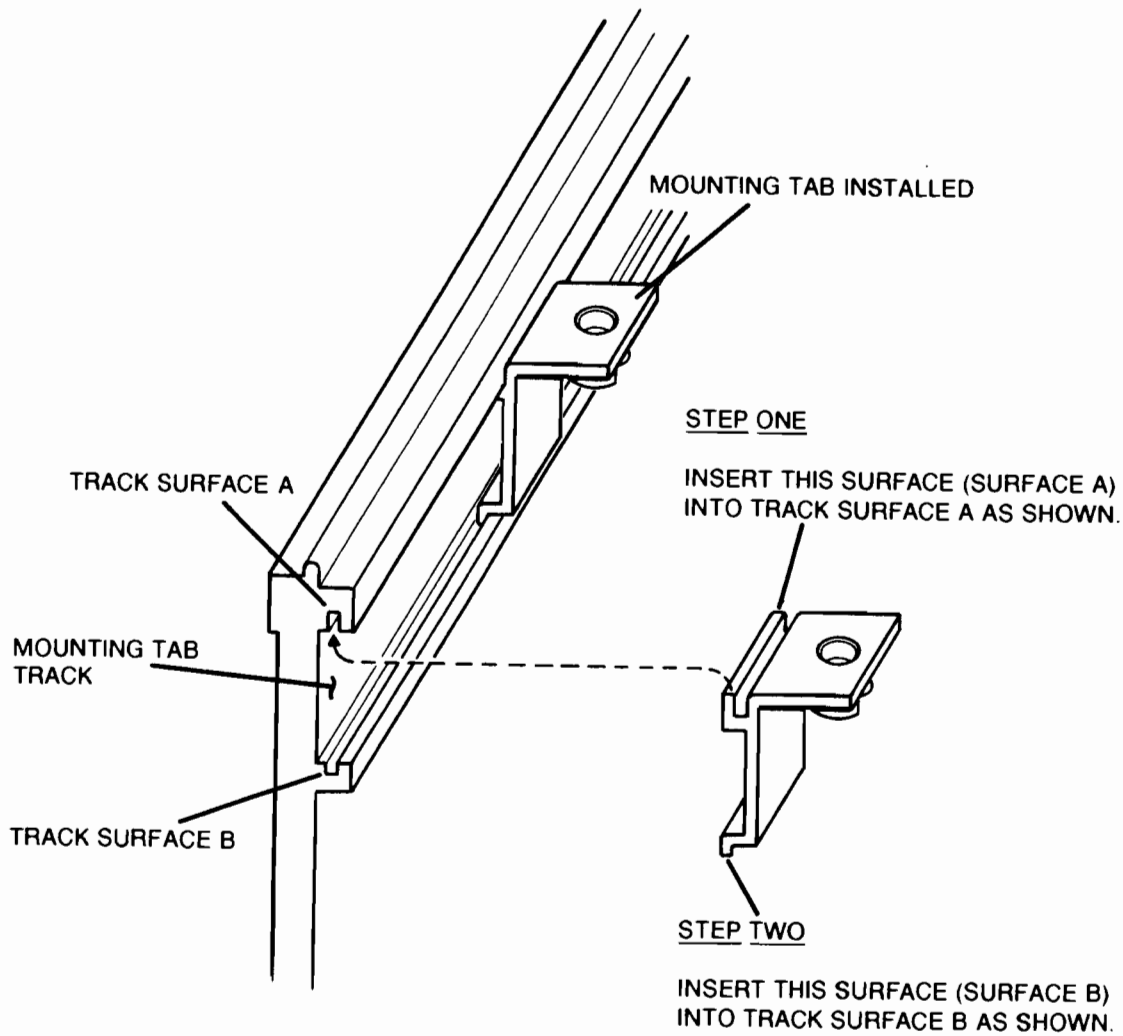
2.3.1 Realignment of HF-SSB Transceiver Radio Chassis and Lower Case Assembly

Refer to figures 2-4 and 2-9 during the following procedure:

- a. Insert the mounting tabs into mounting tab track as shown in figure 2-9.
- b. Align the eight mounting holes in the top of the HF-SSB transceiver radio chassis with the eight mounting tabs in the lower case assembly. (This can be accomplished by using the small screwdriver supplied in the ancillary kit or similar object to align the moveable mounting tabs with the chassis mounting holes.)
- c. Start to rotate the screws. As the screws are turned, the mounting tabs will tighten against the mounting tab track. Tighten the screws.

2.4 CABLE ASSEMBLY IDENTIFICATION

Table 2-1 lists the chassis external and internal cable assemblies applicable to the RF-3200T System.



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Figure 2-9. Mounting Tab Reassembly Detail Procedure and Data

Table 2-1. RF-3200T System Cable Complement List

Ref. Desig.	Part Number	Description
W1	10262-2085	Logic/Accessory/CW Cable Assembly
W2	10262-2095	Microphone Cable Assembly
W3	10262-1050	Logic/Audio Cable Assembly
W4	10212-1070	Logic/Coupler Cable Assembly
W5	10262-1030	Power Distribution Cable Assembly
W6	10212-1055	Power Distribution Cable Assembly
W7	10212-1040	Logic/Synthesizer Cable Assembly
W8	10212-1035	Logic/Receiver Cable Assembly
W9	10212-1045	Logic/Power Amplifier Cable Assembly
W10	10212-1025	Logic/Harmonic Filter Cable Assembly
W11	10212-1021	Power Amplifier/Receiver Coaxial Cable Assembly
W12	10262-1020	Ribbon Extender Cable Assembly
W13	10212-1425	Receiver/Synthesizer Coaxial Cable Assembly
W14	10212-1425	Receiver/Synthesizer Coaxial Cable Assembly
W15	10212-1425	Receiver/Synthesizer Coaxial Cable Assembly
W16	10212-1426	Receiver/Bulkhead Coaxial Cable Assembly
W17	10212-1427	Harmonic Filter/Bulkhead Coaxial Cable Assembly
W18	10262-1040	Antenna Cable Assembly
---	10262-0170	Dc Power Harness Assembly
---	10262-0180	Ac Power Harness Assembly

SECTION 3

TECHNICAL INFORMATION FOR POWER SUPPLY, PART NUMBER 10262-4000

3.1 INTRODUCTION

This section contains or references technical information for the Power Supply, PN 10262-4000. This power supply was specifically designed for use in the RF-3200T System. This section includes schematic diagrams, component location drawings, parts list data, test procedures, and test data for the unit.

3.2 SEPARATION OF THE POWER SUPPLY FROM THE LOWER CHASSIS

Figure 2-8 shows and describes how to separate the power supply from the lower chassis. Perform this procedure if necessary.

3.3 POWER SUPPLY SCHEMATIC, PARTS LIST, AND COMPONENT LOCATION DATA

Figures 3-1 and 3-2 are the applicable schematic diagrams for the power supply.

Tables 3-1 and 3-2 are the applicable parts lists for the power supply.

Figures 3-3 and 3-4 are the applicable component location drawings for the power supply.

3.4 REPLACEMENT OF POWER SUPPLY COMPONENTS

Use the data supplied to identify the location of defective components. Replacement procedures should be in accordance with standard electronic servicing procedures and local directives. No special procedures apply.

3.5 POWER SUPPLY TEST PROCEDURES

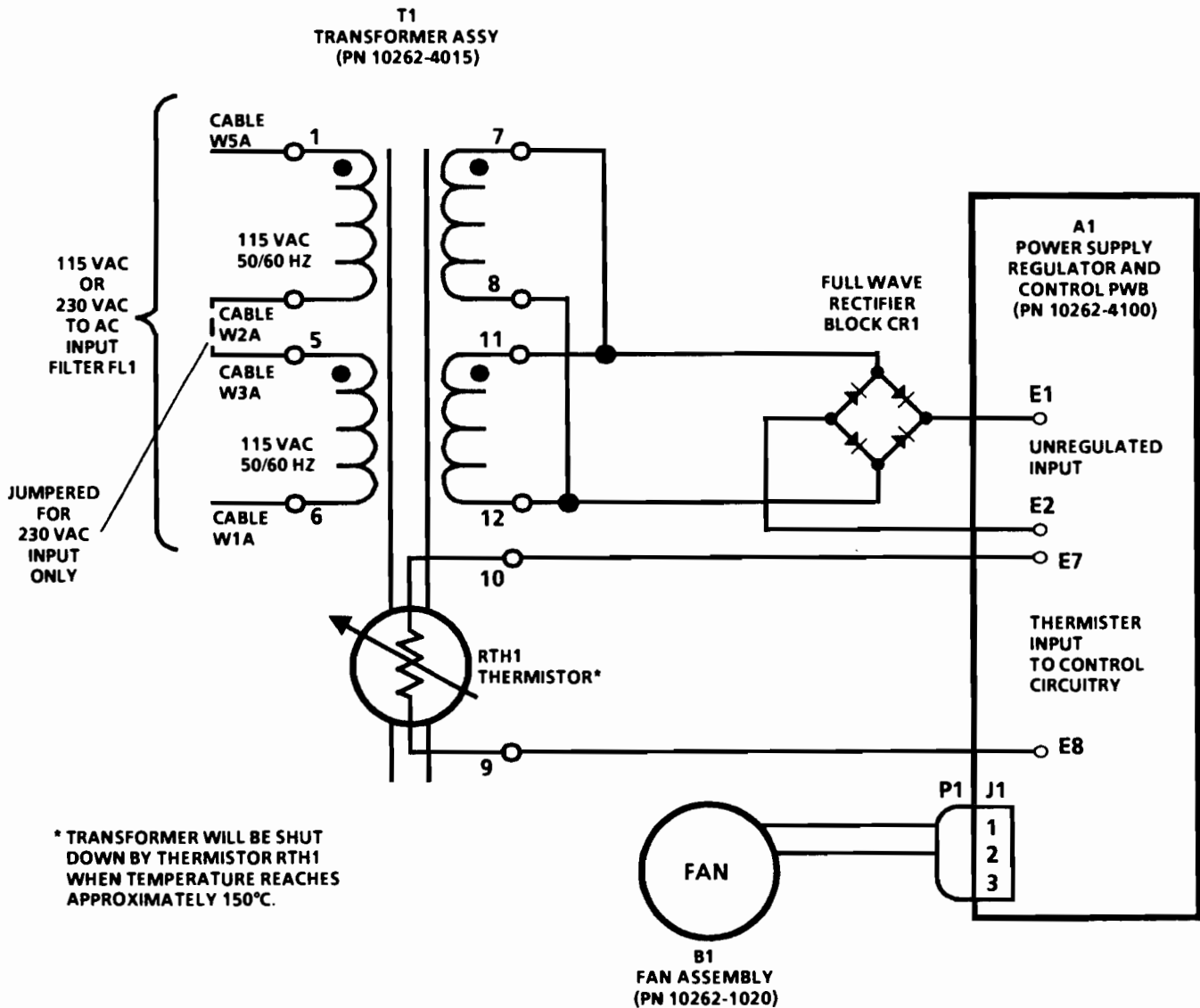
These procedures should only be performed when components have been replaced or as part of a facility-directed maintenance program. Refer to figures 3-1 through 3-4 as necessary during the following procedure.

WARNING

If filter capacitors have been replaced, shield the power supply in a suitable enclosure at initial powerup. This will minimize the effects of incorrectly installed or possibly defective capacitors.

CAUTION

Ensure that the power source is properly fused. The fuse type and value for 115 Vac is a standard blow 6 ampere fuse. The fuse type and value for 230 Vac is a standard blow 3 ampere fuse.



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Figure 3-1. Power Supply Assembly, PN 10262-4000, Schematic Diagram

NOTE: UNLESS OTHERWISE SPECIFIED:

- PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
- ALL RESISTOR VALUES ARE IN OHMS, 1/4W. +/-5%.
- ALL CAPACITOR VALUES ARE IN MICROFARADS.
- VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
- THIS POWER SUPPLY IS NEGATIVE (0ND) REGULATED. CARE SHOULD BE TAKEN NOT TO GROUND THE UNREGULATED NEGATIVE VOLTAGE (TP3).

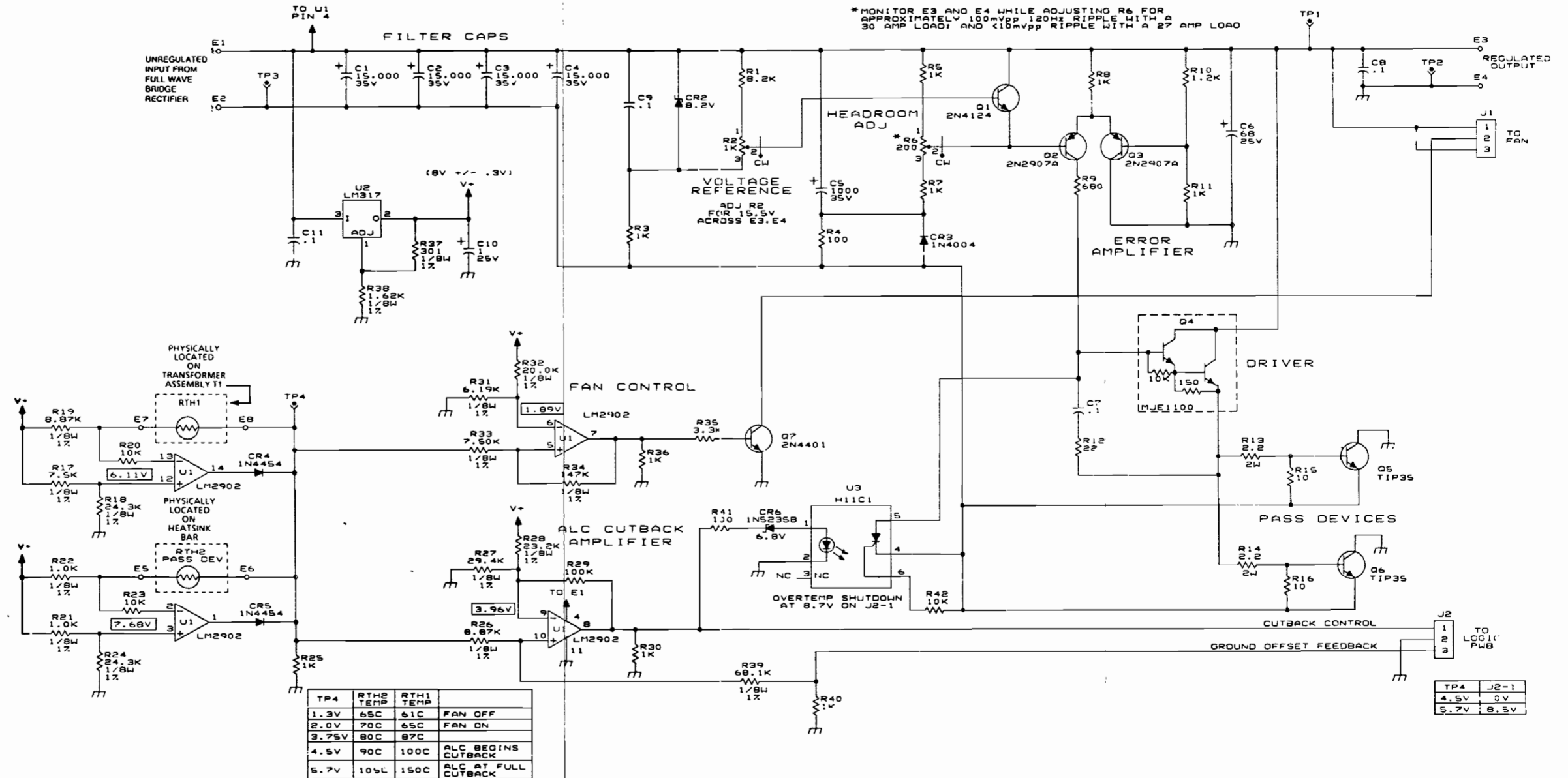


Figure 3-2. Power Supply Regulator and Control PWB Assembly, PN 10262-4100, Schematic Diagram (10262-4101)

Table 3-1. Power Supply Assembly, PN 10262-4000, Parts List

Ref. Desig.	Part Number	Description
A2	10262-4000	Power Supply Assembly
A2A1	10262-4100	Power Supply PWB Assembly (see table 3-2)
B1	10262-4020	Fan Assembly
CR1	D23-0003-002	Diode Rectifier Bridge, 35 A, 100 V
RTH1	D40-0005-107	Thermistor, NTC, 100 K, 10%*
T1	10262-4015	Transformer Assembly

*part of Transformer Assembly T1

Table 3-2. Power Supply PWB Assembly A2A1, PN 10262-4100, Parts List

Ref. Desig.	Part Number	Description
A2A1	10262-4100	Power Supply PWB Assembly
C1-C4	C28-0035-153	Capacitor, Electrolytic, 15000 uF, 35 V
C5	C24-1050-108	Capacitor, Electrolytic, 1000 uF, RDL, 50 V
C6	C26-0025-680	Capacitor, Fixed, Electrolytic, 68 uF, 20%, 25 V
C7 - C9	C11-0009-104	Capacitor, Ceramic, .1 uF, 20%, 50 V
C10	C26-0025-100	Capacitor, Fixed, Tantalum, 10 uF, 20%, 25 V
C11	C11-0009-104	Capacitor, Ceramic, .1 uF, 20%, 50 V
CR1		Not Used
CR2	1N5237B	Diode, Zener, 8.2 V, 5%, .5 W
CR3	1N4004	Diode, Rectifier, 1 A, 400 V
CR4, CR5	1N4454	Diode, SW Silicon, 200 mA, 75 V, 5 W
CR6	1N5235B	Diode, Zener, 6.8 V, 5%, .5 W
J1, J2	J46-0086-003	Header, 3-Pin, 2MM, Shrd, PWB Mtg.
Q1	2N4124	Transistor, SS/GP, NPN, TO-92
Q2, Q3	2N2907A	Transistor, SS/GP, PNP, TO-18
Q4	Q-0142	Transistor, Darlington, NPN, MJE-1100
Q5, Q6	Q-0501	Transistor, Power, TIP-35
Q7	2N4124	Transistor, SS/GP, NPN, TO-92
R1	R65-0003-822	Resistor, Carbon Film, 8.2 K, 5%, 1/4 W
R2	R-2206	Resistor, Variable, PCB, 1 K, 10%, .5 W
R3	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R4	R65-0003-101	Resistor, Carbon Film, 100 ohms, 5%, 1/4 W
R5	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R6	R-2204	Resistor, Variable, PCB, 200 Ohms, 10%, .5 W
R7, R8	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R9	R65-0003-681	Resistor, Carbon Film, 680 ohms, 5%, 1/4 W
R10	R65-0003-122	Resistor, Carbon Film, 1.2 K, 5%, 1/4 W
R11	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R12	R65-0003-220	Resistor, Carbon Film, 22 ohms, 5%, 1/4 W
R13, R14	R72-0003-229	Resistor, Fixed, Wirewound, 2.2 ohms, 10%, 2 W
R15, R16	R65-0003-100	Resistor, Carbon Film, 10 ohms, 5%, 1/4 W
R17	RN55D7501F	Resistor, Metal Film, 7.5 K, 1%, 1/8 W
R18	RN55D2432F	Resistor, Metal Film, 24.3 K, 1%, 1/8 W
R19	RN55D8871F	Resistor, Metal Film, 8.87 K, 1%, 1/8 W

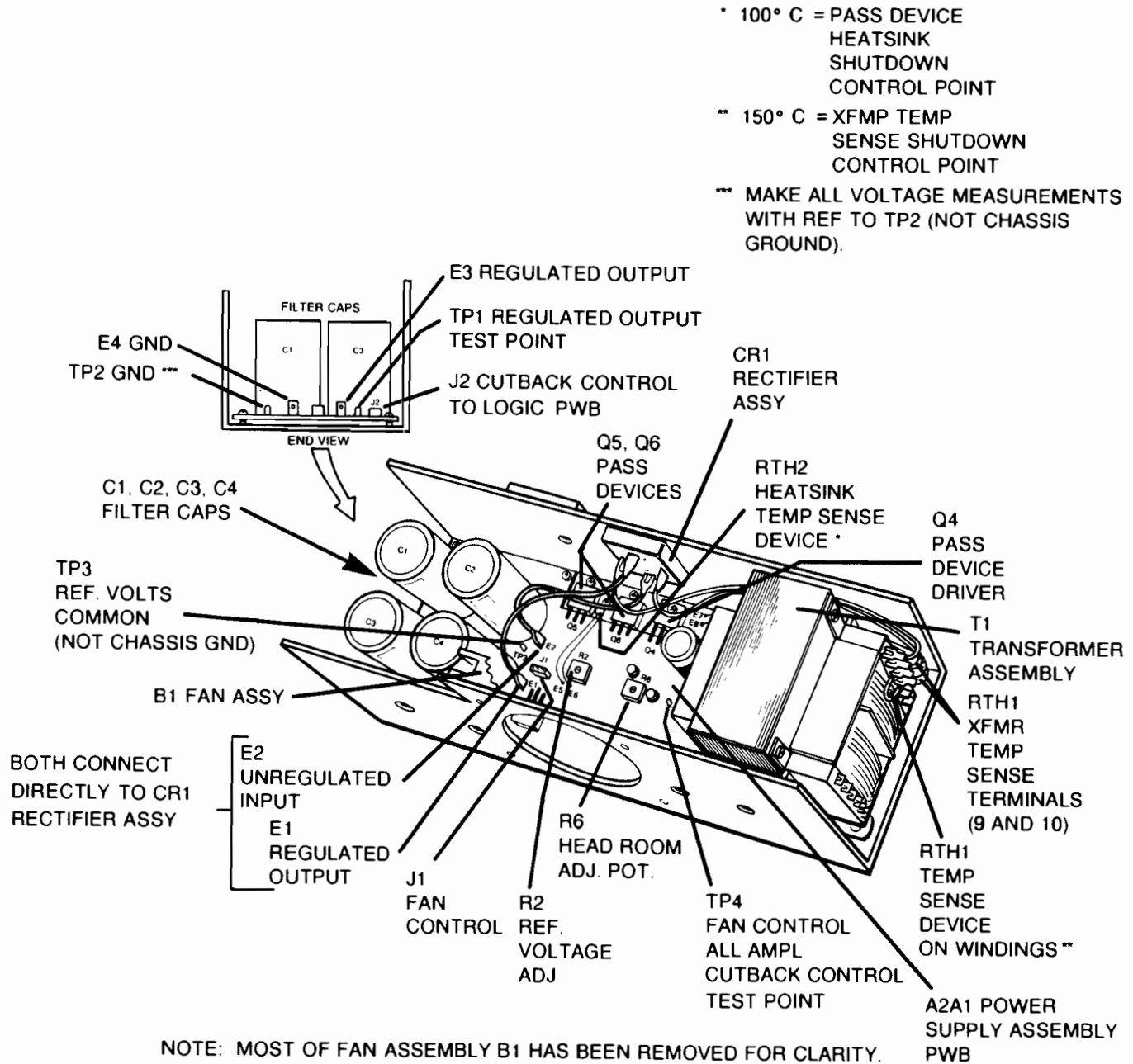
Table 3-2. Power Supply PWB Assembly A2A1, PN 10262-4100, Parts List (Cont.)

Ref. Desig.	Part Number	Description
R20	R65-0003-103	Resistor, Carbon Film, 10 K, 5%, 1/4 W
R21, R22	RN55D1001F	Resistor, Metal Film, 1 K, 1%, 1/8 W
R23	R65-0003-103	Resistor, Carbon Film, 10 K, 5%, 1/4 W
R24	RN55D2432F	Resistor, Metal Film, 24.3 K, 1%, 1/8 W
R25	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R26	RN55D8871F	Resistor, Metal Film, 8.87 K, 1%, 1/8 W
R27	RN55D2942F	Resistor, Metal Film, 29.4 K, 1%, 1/8 W
R28	RN55D2322F	Resistor, Metal Film, 23.2 K, 1%, 1/8 W
R29	RN55D1003F	Resistor, Metal Film, 100 K, 1%, 1/8 W
R30	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R31	RN55D6191F	Resistor, Metal Film, 6.19 K, 1%, 1/8 W
R32	RN55D2002F	Resistor, Metal Film, 20.0 K, 1%, 1/8 W
R33	RN55D7501F	Resistor, Metal Film, 7.5 K, 1%, 1/8 W
R34	RN55D1473F	Resistor, Metal Film, 147 K, 1%, 1/8 W
R35	R65-0003-332	Resistor, Carbon Film, 3.3 K, 5%, 1/4 W
R36	R65-0003-102	Resistor, Carbon Film, 1 K, 5%, 1/4 W
R37	RN55D3010F	Resistor, Metal Film, 301.0 ohms, 1%, 1/8 W
R38	RN55D1621F	Resistor, Metal Film, 1.62 K, 1%, 1/8 W
R39	RN55D6812F	Resistor, Metal Film, 68.1 K, 1%, 1/8 W
R40		Not Used
R41	R65-0003-101	Resistor, Carbon Film, 100 ohms, 5%, 1/4 W
R42	R65-0003-103	Resistor, Carbon Film, 10 K, 5%, 1/4 W
RTH1		Not Used
RTH2	D40-0012-001	Thermistor, NTC, 100 K, 10%
U1	I30-0025-001	IC, Quad Op Amp, LM2902
U2	IC-0358	IC, 1.5 A, Adj. V, VR317
U3	I75-0014-001	Optoisolator, SCR, MOT, H11C1

- a. Connect an active load (Solid State Active Load capable of handling 30 amperes) to regulated output terminals E3 and E4.
- b. Apply ac power to the equipment.
- c. Using a digital multimeter, check the voltages with respect to the regulated ground test point (TP2) and the points specified in the following table:

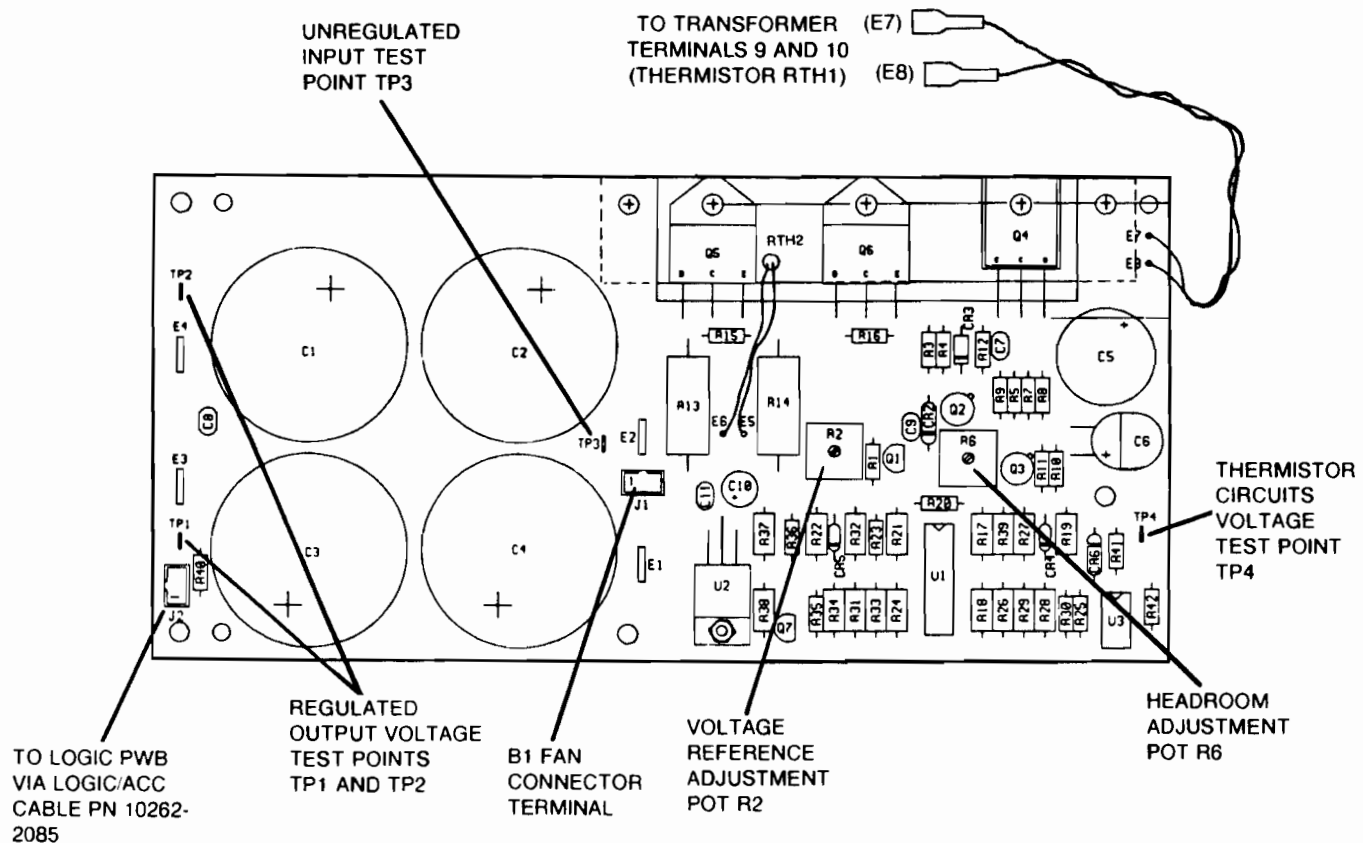
<u>Test Voltage Point</u>	<u>Voltage Should Be</u>
U2-output	8 V \pm 0.3 V
U1-3	7.68 V \pm 0.03 V
U1-6	1.89 V \pm 0.08 V
U1-9	3.96 V \pm 0.15 V
U1-12	6.11 V \pm 0.25 V

- d. Adjust the headroom pot (R6) so that the 120 Hz ripple is 100 mV or greater with a 30 Amp load applied and less than 50 mV with a 27 Amp load applied. (Use a digital multimeter set on the ac scale to obtain these indications.)



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Figure 3-3. Power Supply Component Location and Information Sheet



3200T-115

Figure 3-4. Power Supply Regulator and Control PWB Assembly Component Location and Information Sheet

- e. Using an oscilloscope, monitor the output between test points TP1 and TP3 (the regulated output). Verify that no oscillations appear when no load to full load (30 amps) is applied.
- f. Verify that the full load (30 Amp) output voltage between TP1 and TP2 is greater than 10.5 Vdc.
- g. In the following procedure, use a variable ac power source (for example a Variac) to supply voltage to the power supply. Connect a digital multimeter to test point TP4 (the cutback voltage test point) with respect to TP2.
 1. Increase the ac supply voltage to 140 Vac and load the power supply to 11 amps.
 - Within 1 to 3 minutes, the voltage at TP4 should increase to greater than 2 Vdc.
 - When the voltage at TP4 is between 1.9 to 2.1 Vdc, the fan should turn on.
 2. Remove the load. The fan should turn off when the voltage at TP4 decreases to between 1.2 to 1.4 Vdc.
- h. In the following procedure, use a variable dc power source (0 to 6 Vdc) to supply voltage to test point TP4 (the cutback voltage test point) with respect to TP2. Connect a digital multimeter at J2-1.
 1. Apply 4.0 Vdc to TP4. 0 V should be indicated at J2-1.
 2. Increase the voltage applied at TP4 to 4.5 Vdc. At 4.5 Vdc, the voltage indicated at J2-1 should begin to rise.

CAUTION

During subsequent step 3, it is possible to trip the overtemperature protection circuitry (to be checked in step 4) without observing 8.5 Vdc at J2-1. This could happen very fast. Therefore, make sure that the power supply used is spike free, as just about any spike can trigger U3 (figure 3-1).

3. Increase the voltage applied at TP4 to 5.7 Vdc. The voltage indicated at J2-1 should be 8.5 Vdc.
4. Increase the voltage applied at TP4 to above 8.5 Vdc. The regulated output voltage (as measured at E2 and E3 with a digital multimeter) should be 0 V.

NOTE

Once the regulated output voltage drops to 0 V, the ac power must be removed for at least 5 minutes before the power supply will operate again.

SECTION 4

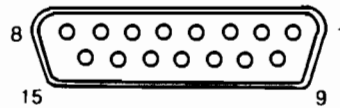
MAINTENANCE AND REPAIR

4.1 INTRODUCTION

Maintenance and repair of the subassemblies of the RF-3200T System are the same as for the RF-3200 HF-SSB Transceiver and RF-3281 Voice-Duty Digital Coupler, with the exception of the power supply (Section 3 of this supplement manual) and minor wiring differences in the microphone, dc power, and accessory connectors.

Figure 4-1 shows the wiring schemes and pin/connector functional correlation for the microphone connector, dc power connector, and accessory connector.

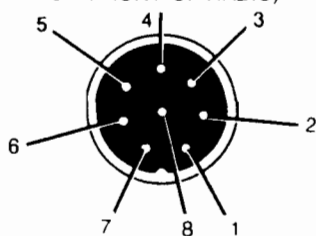
ACCESSORY CONNECTOR PINS
(WHEN VIEWED FROM REAR OF RADIO)



PIN	NAME	I/O	NOTES
1	SPKR +	Output	4 ohm minimum impedance, level-controlled to 11 Vp-p VOLUME knob.
2	SPKR	Output	
3	ACRXOUT	Output	600 ohm source - 0 dBm nominal without optional level adjustment (A7R50).
4	ACCTXIN	Input	600 ohm load - 0 dBm nominal without optional level adjustment (A7R158).
5	ACCKRQ	Input	1.25 V maximum to initiate key or 3.3K maximum pulldown; 2.5 V minimum to release key or open (10K maximum to ground).
6	GNDAUD	Audio Ground	
7	No connection		
8	ACCTR +	I/O	Relay contacts closed for TX, 1 ampere @ +28 Vdc, 0.5 ampere @ 120 Vac (resistive)
9	ACCTR -		
10	RMTSW	Input	Used to remotely switch the transceiver on > 12 Vdc = power off, < 0.3 Vdc (60 mA sink) = power on.
11	PSTAT	Output	Switched A+, internally fused (800 mA maximum)
12	TSTRTS	Test	Factory use only
13	GNDLOG	Logic Ground	Factory use only
14	TSTTXD	Test	Factory use only
15	TSTRXD	Test	Factory use only

DETAIL A

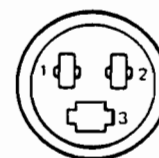
RADIO MIC CONNECTOR PINS
(VIEWED FROM FRONT OF RADIO)



- 1-C MIC + (CARBON MICROPHONE INPUT)
- 2-FIL A + AP (FILTERED SUPPLY VOLTAGE)
- 3-HDST (HANDSET HEADSET ACTIVE LOW)
- 4-EAR + (EARPHONE AUDIO)
- 5-PTT (PUSH-TO-TALK ACTIVE LOW)
- 6-PTT GND (PUSH-TO-TALK GROUND)
- 7-MIC - (MICROPHONE GROUND)
- 8-MIC + (MICROPHONE SIGNAL)

DETAIL B

POWER CONNECTOR PINS
(WHEN VIEWED FROM REAR OF RADIO)



- 1-13.6 VDC
- 2-GROUND
- 3-CHASSIS GROUND

DETAIL C

Figure 4-1. Microphone, Dc Power, and Accessory Connector Data