CHAPTER 6

MAINTENANCE

WARNING

Dangerous voltages exist in this radio equipment. Before removing any covers, disconnect the primary power.

Section I. INTRODUCTION

6-1. CHAPTER ORGANIZATION. This chapter is divided into five sections. Section I tells how the chapter is organized, describes the on-equipment maintenance philosophy, and introduces you to the concept of BIT (Built-In Test). Section II is a detailed presentation of how to use BIT to troubleshoot and repair the Remote Control Unit. Section III consists of removal and replacement procedures for the faulty modules identified by BIT. Section IV is dedicated to Periodic Maintenance Procedures. Section V contains alignment procedures for the replaceable modules.

6-2. ON-EQUIPMENT MAINTENANCE PHILOSOPHY. The Remote Control Unit is designed so that you can make most repairs without removing the equipment from its location. The procedures in this chapter should enable you to identify and correct most equipment malfunctions within 15 minutes.

NOTE

Field and Organizational Maintenance of the modules and circucit card assemblies is limited to removal, replacement, and alignments listed in Chapter 6.

Tool List

Screwdrivers:
- 3/16-inch flat blade (4 inches long)
- No. 1 Phillips
- No. 2 Phillips
- Phillips, right-angle, ratchet (optional)

Wrenches:
- 6-inch adjustable
- 0.050-inch Allen
- Nut Drivers: 3/16, 9/16, 1/4, 5/16 (optional)
- Needle Nose Pliers (optional)

Alignment Tool Kit

6-3. BIT (BUILT-IN TEST). The key to servicing the Remote Control Unit is a feature called BIT. BIT, which is an acronym for Built-In Test, consists of several systems, some manual and some automatic. These systems are the front panel controls and displays (including a multi-function meter), an automatic hardware monitor, a manual diagnostic BIT routine, and an automatic diagnostic BIT routine. When used in conjunction with this manual, these systems allow rapid and accurate fault diagnosis.

Section II. PERFORMANCE TESTING AND TROUBLE ANALYSIS USING BIT

6-4. FRONT PANEL CONTROLS AND DISPLAYS. The front panel controls and displays are utilized to control and monitor equipment operation during fault diagnosis. The displays provide an indication of equipment status, and a built-in meter allows analog monitoring of the parameters listed in Table 6-1. See Chapter 4 in this manual for a detailed discussion of all the controls and indicators.

6-5. AUTOMATIC HARDWARE MONITOR. The automatic hardware monitor continuously checks the operation of the microprocessor. If a malfunction occurs, the monitor resets and restarts the microprocessor.

6-6. MANUAL DIAGNOSTIC BIT ROUTINE. A manual BIT routine is included in this section to assist in fault diagnosis. Figure 6-1, which is a flowchart of the steps in this routine, provides a sequence of observations which can be used to supplement the automatic BIT routine described in the following paragraph.

6-7. AUTOMATIC DIAGNOSTIC BIT ROUTINE. The automatic BIT routine is used to test the operation of the Remote Control Unit. This BIT routine operates in the same manner as a skilled technician, signal-tracing the main receive and transmit signal paths from input to output. Upon detection of a fault, the process stops and the corresponding fault code is displayed. The Appendix at the end of this chapter indicates the sequence of events that occurs during the automatic BIT routine. Successful completion of this routine assures you that the Remote Control Unit is operationally ready for use. Running the automatic diagnostic BIT routine for performance testing and verification is therefore another major use of this feature.

6-8. TROUBLESHOOTING WITH BIT. The first stage in the troubleshooting process is becoming aware that a fault condition exists. This usually happens as the result of an observation (for example, you notice that the FAULT light is on) or as the result of a deterioration in the equipment's performance (for example, the person you're communicating with informs you that your signal is very weak). In any case, it's always a good idea to make a note whenever you notice anything unusual. This will come in handy if you have to do any troubleshooting. The nature of the fault determines whether you should use the manual BIT routine or the automatic BIT routine.

a. General Troubleshooting Procedure. The first thing to check for when troubleshooting the Remote Control Unit is whether the communications link to the 100 Watt Transceiver has been established. If the link has not been established, the message "LCU OFF" will appear on the Remote Control Unit's display, and the message "rcu OFF" will appear on the transceiver's display. If these messages appear, do the following:

(1) Check the connecting cable between the Remote Control Unit and the 100 Watt Transceiver, including the connections at the rear panels of both equipments.

(2) Verify that the baud rate, data mode, and audio interface selections in both equipments are identical (see paragraphs 6-10c and 6-12c for information on setting the selector switches).

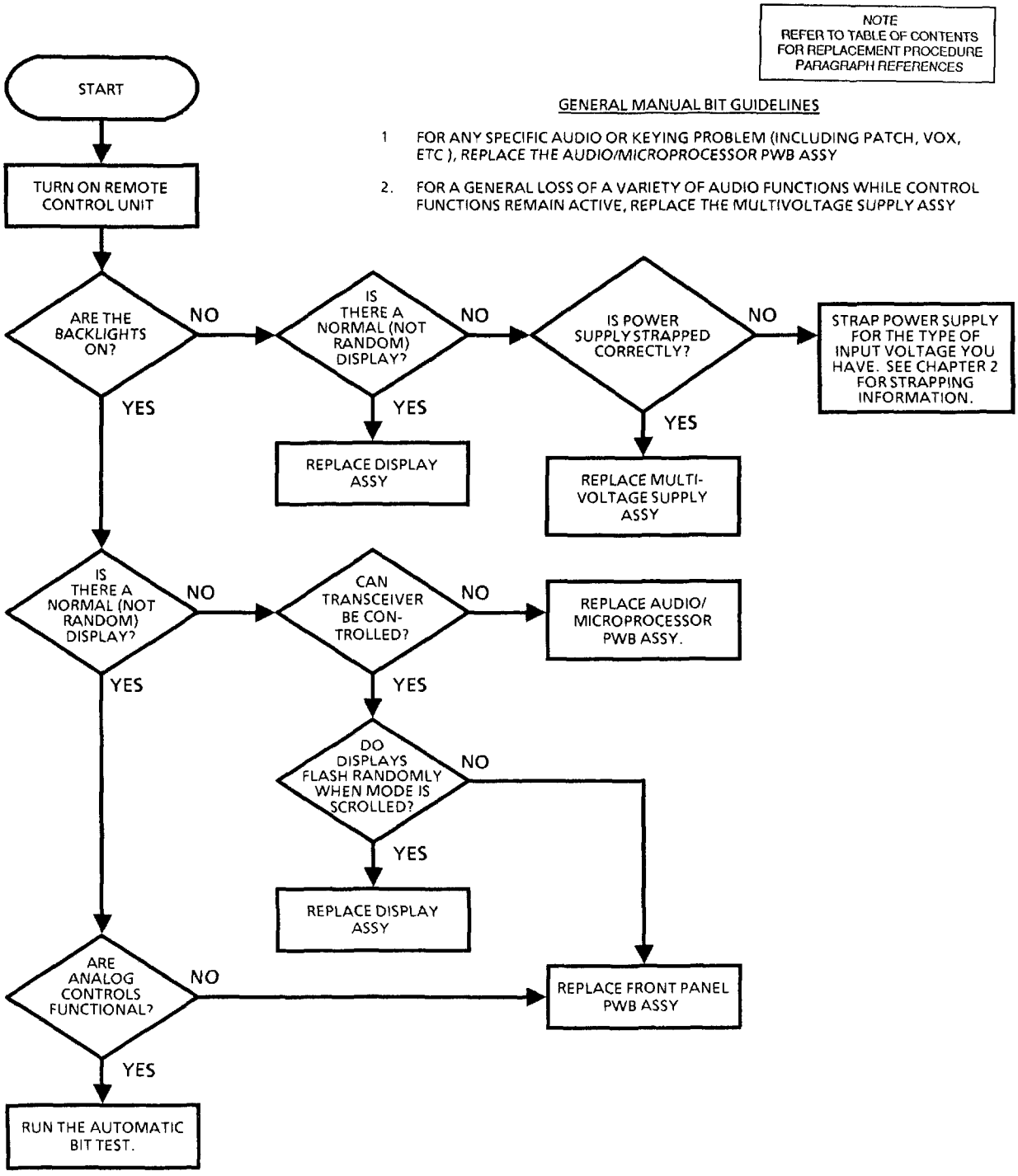
If the link has not been established by these actions, then:

(3) Replace the Audio/Microprocessor PWB Assy in the Remote Control Unit (see Section III of this chapter for instructions on how to do this).

(4) Replace the Remote Interface PWB Assy in the 100 Watt Transceiver (see chapter 6, Section III, in the transceiver technical manual for instructions on how to do this).

It is possible for the audio link to be faulty even though neither of the above messages is displayed. For example, transmit audio may not be present at the transceiver or receive audio may not be present at the Remote Control Unit, even though LINE audio output

MANUAL BIT FAULT ISOLATION CHART



*352-023

Figure 6-1. Manual BIT Fault Isolation Chart

is indicated on both equipment meters. If this is the case, do the following:

(1) Verify the integrity of the audio link between the Remote Control Unit and the 100 Watt Transceiver, including the connections at the rear panels of both equipments.

(2) Verify that the audio interface selection is the same for both equipments (see paragraph 6-12c for information on audio mode selection).

(3) Replace the Audio Interface PWB Assy in the Remote Control Unit or in the 100 Watt Transceiver (the same assembly is used in both equipments--see Section III in chapter 6 of both equipment manuals for instructions on how to do this).

b. Using the Manual BIT Flowchart. If an "LCU OFF" message is not present on the Remote Control Unit's display, the manual BIT flowchart, Figure 6-1, may be used when the Remote Control Unit is powered up and there is another obvious problem or symptom observed. It suggests preliminary observations and actions that you should perform before you initiate the automatic BIT routine. Sometimes, when there is a problem with the display or the keypad is inoperative, you cannot use the automatic BIT routine at all. In these cases, you must rely entirely on the manual BIT flowchart.

c. Using the Automatic BIT Routine. When you initiate the automatic BIT routine, you must use Table 6-2 to interpret the results. This table has the fault code for the Remote Control Unit (code 4-01). Fault codes for the 100 Watt Transceiver (codes 1A1A1-0 through 1A1A19-2), the 500 Watt and 1 KW Linear Power Amplifier (codes 2-01 through 2-22), and the 100/500 Watt Antenna Coupler (codes 3-01 and 3-02) are listed in Chapter 6 of the technical manuals for those components. The table tells you what to do to fix the problem, which in the case of the Remote Control Unit consists of simply replacing the Audio/Microprocessor Board. Instructions for removing and replacing this and other modules can be found in Section III of this chapter, "Removal/Replacement Procedures."

NOTES

The automatic BIT routine transmits full power into the antenna system at the selected frequency. The consequences of this transmission should be considered before exercising BIT into an antenna. Another important consideration when using the automatic BIT routine is that this routine tests the system only at the frequency currently selected by the Remote Control Unit.

Table 6-1. Meter Functions

Function	Parameter	Range/Units
AUDIO	Transmit audio on Audio/Microprocessor PWB Assy	-20 to +10 dB
LINE	Receive audio at input of Audio/Microprocessor PWB Assy	-20 to +10 dBm
	If KEYED, transmit audio at output of Audio/Microprocessor PWB Assy	
PATCH	If KEYED, transmit audio input to Audio/Microprocessor PWB Assy	-20 to +10 dBm
	If UNKEYED, receive audio output from Audio/Microprocessor PWB Assy	
FWD	If KEYED, forward RF output from Transceiver	0 to 150 Watts
	If UNKEYED, relative receive signal strength (AGC voltage) at Transceiver	0 to S9+60 dB
REF	If KEYED, reflected RF power at Transceiver	0 to 150 Watts
	If UNKEYED, relative receive signal strength (AGC voltage) at Transceiver	0 to S9+60 dB
VSWR	If KEYED, VSWR computed from FWD and REF measurements	1 to 4
	If UNKEYED, relative receive signal strength (AGC voltage) at Transceiver	0 to S9+60 dB

Table 6-2. Fault Code Chart

NOTE

This table lists only the fault code for the Remote Control Unit (code 4- 01). For an explanation of the fault codes for the 100 Watt Transceiver (codes 1A1A1-0 through 1A1A19-2), the LPA (codes 2-01 through 2-22), and the 100/500 Watt Antenna Coupler (codes 3-01 and 3-02), refer to Chapter 6 of the technical manuals for those equipments.

Code	Explanation	Procedure
4-01*	AUDIO LOOPBACK FAULT	Replace Audio/Microprocessor PWB Assy.

* This Fault Code may be caused by the PATCH RCV MIC, or LINE potentiometers on the remote control panel being set too low.
Before replacing the Audio/Microprocessor PWB Assy, try turning the potentiometer clockwise, then run the BIT test again to see if this corrects the problem.

Section III. REMOVAL/REPLACEMENT PROCEDURES

WARNING

Dangerous voltages exist in this radio equipment. Before removing any covers, disconnect the primary power.

CAUTION

Use care when disconnecting ribbon cables, coaxial cables, etc.

NOTE

Refer to drawing FO-5 while doing the following procedures. This drawing has an apron which allows you to look at it while reading the procedures. The numbers in parentheses in the procedural steps correspond to the numbered items on the drawing. For example, "B4" refers to item 4 on view B.

6-9. FRONT PANEL PWB ASSY/DISPLAY ASSY.

a. Removal.

(1) Disconnect the input power from the Remote Control Unit.

(2) On the front panel, remove the AUDIO (A13), RF GAIN (A14), and SQUELCH (A15) knobs. Each knob is held in position by a pair of setscrews.

(3) Loosen the four captive Phillips screws (A16) on the front panel.

(4) Pull the front panel straight out, and swing it down into its horizontal position (view B).

(5) Remove the eight standoffs and one Phillips screw (B1) holding the Front Panel Assy (B2) to the front panel.

NOTE

The Front Panel Assy consists of the Front Panel PWB Assy (B2) and the Display Assy (B3), which is mounted to the Front Panel PWB Assy. Make a note of the positions of the cables before disconnecting them.

(6) Disconnect all the cables from the Front Panel PWB Assy, except for the W1 cable. Disconnect this cable at J2 on the Audio/Microprocessor PWB Assy (B4).

(7) Remove the Front Panel PWB Assy from the front panel.

(8) Remove the six Phillips screws holding the Display Assy to the Front Panel PWB Assy.

b. Replacement.

(1) Using the six Phillips screws, mount the existing Display Assy (B3) to the new Front Panel PWB Assy (B2), or mount the new Display Assy to the existing Front Panel PWB Assy.

(2) Reverse the steps of the removal procedure, beginning with step 7.

6-10. AUDIO/MICROPROCESSOR PWB ASSY.

a. Removal.

(1) Disconnect the input power from the Remote Control Unit.

(2) Disconnect the TRANSCEIVER CONTROL cable (and the AUDIO 2 cable, if installed) from the back of the Remote Control Unit.

(3) Loosen the two 1/4-turn fasteners (B5), and remove the top cover (B6).

(4) On the Audio/Microprocessor PWB Assy (B4), disconnect the cables at J2, J3, J4, J5, J8, and J9.

NOTE

The Audio/Microprocessor PWB Assy consists of the Audio/Microprocessor PWB Assy (B4) and its mounting bracket (B7). The board is riveted to the mounting bracket and cannot be removed from it.

(5) Loosen the four 1/4-turn fasteners that hold the Audio/Microprocessor PWB Assy to the chassis.

(6) Lift the Audio/Microprocessor PWB Assy out of the chassis, and disconnect the remaining ribbon cables at J1 and J2 on the Audio Interface PWB Assy (B8).

(7) Remove the cables from their retainer clips, and remove the Audio/Microprocessor PWB Assy from the Remote Control Unit.

b. Replacement.

Reverse the order of the above steps.

c. Switch Settings.

NOTE

The switch settings on the Audio-/Microprocessor PWB Assy must match the settings for the corresponding switches on the Remote Control Interface PWB Assy in the 100 Watt Transceiver.

(1) Baud Rate Select Switch, S3

This switch has 10 positions:

0 = 300 baud

1 = 600 baud

2 = 1200 baud

3 = 2400 baud

4 = 4800 baud

5 = 9600 baud

6 = not used

7 = factory test

8 = not used

9 = not used

9600 baud is the recommended setting, except when using FSK modem. In this case, set the switch for 300 baud.

(2) Interface Select Switch, S4

This switch has 10 positions:

0 = Mil. Std. 188 (not used)

1 = RS-232C (up to 100 ft.)

2 = RS-422 (up to 1 mile)

3 = FSK modem (length of phone lines)

4 = loopback UART (factory test)

5 - 9 = not used

Set this switch according to the type of interface used, which is determined by the distance between the Remote Control Unit and the 100 Watt Transceiver. Maximum distance for each interface is given in parentheses.

(3) FSK Modem Hookup Select Switch, S5

This slide switch selects either two-wire or four-wire hookup for FSK modem. Set this switch for the type of hookup you have.

6-11. MULTIVOLTAGE SUPPLY ASSY.

a. Removal.

(1) Disconnect the input power from the Remote Control Unit.

(2) Loosen the four captive Phillips screws (A16) on the front panel (A11).

(3) Pull the front panel straight out, and swing it down into its horizontal position (view B).

(4) Disconnect the Multivoltage Supply Assy cable on the top of the Multivoltage Supply Assy (B9).

(5) Loosen the two slotted captive screws (B10) holding the Multivoltage Supply Assy to its mounting brackets.

(6) As necessary, remove any ribbon cables from their retainer clips, and move them out of the way.

(7) Pull the Multivoltage Supply Assy out of the Remote Control Unit.

b. Replacement.

Reverse the order of the above steps.

6-12. AUDIO INTERFACE PWB ASSY.

a. Removal.

(1) Disconnect the input power from the Remote Control Unit.

(2) Disconnect the wires from TB1 at the rear of the Remote Control Unit.

(3) Loosen the two large captive Phillips screws holding the Audio Interface PWB Assy (B8) to the rear of the Remote Control Unit

(4) Pull out the Audio Interface PWB Assy, and disconnect the two ribbon cables.

(5) Remove the Audio Interface PWB Assy from the Remote Control Unit.

b. Replacement.

Reverse the order of the above steps.

c. Switch Settings.

NOTE

The switch settings on the Audio Interface PWB Assy in the Remote Control Unit must match the switch settings on the Audio Interface PWB Assy in the 100 Watt Transceiver.

(1) 2-Wire/4-Wire PATCH Select Switch, S1

Set this switch to the 2-wire (2W) or 4-wire (4W) position according to the number of wires connected to the PATCH terminals at the terminal strip (TB1) on the Audio Interface PWB Assy.

(2) 2-Wire/4-Wire LINE Select Switch, S2

Set this switch to the 2-wire (2W) or 4-wire (4W) position, according to the number of wires connected to the LINE terminals at the terminal strip (TB1) on the Audio Interface PWB Assy.

Section IV. PERIODIC MAINTENANCE PROCEDURES

6-13. PERIODIC MAINTENANCE. Every 336 days, check the interior of the Remote Control Unit for dust accumulation. Remove any excessive dust accumulation as required.

Section V. ALIGNMENT PROCEDURES

6-14 INTRODUCTION. This section contains instructions for checking and adjusting the replaceable subassemblies in the Remote Control Unit. This section also contains circuit board layouts to help you identify the components that require adjustment. To do the procedures described in this section, you need the test equipment listed in Table 6-3 or equivalent equipment.

Table 6-3. Test Equipment

Generic Name	Military Designation	Manufacturer Model No.	Federal Stock No.	Required Range
Signal Generator (RF)		Hewlett Packard, Model 8640B		-120 to +20 dBm; 440 KHz to 70.5 MHz in 10 Hz increments
Signal Generator (audio)		Hewlett Packard, Model 204D		-70 to +10 dBm; 300 Hz to 3.3 KHz
AC Voltmeter		Hewlett Packard, Model 400F		300 uV to 3 V (audio frequency)
Digital Multimeter		Fluke, Model 8012A		200 mV to 250 Vac; 200 mV to 40 Vdc; 0 to 20 megohms
100 Watt Transceiver	RT-1446/URC	RF Communications, Model RF-350	5820-01-162-3406	

NOTE: Equivalent Items Authorized

6-15. ALIGNMENT PROCEDURES

NOTE

See Fig.1-3 for Subassy Locations

a. FRONT PANEL PWB ASSY. A1A1.

Preset as follows:

- Squelch...fully counterclockwise
- RF gain...fully clockwise
- Audio gain...for comfortable listening level.

b. DISPLAY ASSY. A1 A2.

No adjustments.

c. MULTIVOLTAGE SUPPLY ASSY. A3. Fig. 6-2

(1) R61 (+5 V Adjustment) Adjust R61 for +5 Vdc at E6 (blue wire) on the Multivoltage Supply PWB Assy.

(2) R4 (+15 V Adjustment)

Adjust R4 for +15 Vdc at E3 (orange wire) on the Multivoltage Supply PSB Assy.

d. AUDIO INTERFACE PWB ASSY. A4. Fig. 6-3.

(1) PATCH Nulling Potentiometer R1

NOTE

This adjustment has an effect only when using a 2-wire PATCH hookup. The Remote Control Unit must be connected to and controllinq a 100 Watt Transceiver

(a) Set the PATCH selector switch (S1) on the Audio Interface PWB Assy to the "2"position.

(b) Connect the nominal 600-ohm termination across the "2W" PATCH terminals on TB1 at the rear of the Remote Control Unit.

(c) Connect an RF signal generator to the antenna jack (J 1) at the rear of the transceiver.

(d) Set the signal generator for a carrier frequency of 15 MHz at approximately -20 dBm. Select a modulating frequency of 1 KHz at 50% modulation.

(e) On the Remote Control Unit, select AME at 15 MHz

(f) Select PATCH for the audio source, and select AUDIO for the meter.

(g) Adjust potentiometer R1 (accessible through a hole in the Audio Interface PWB Assy's frame) for a null (minimum reading) on the front panel meter of the Remote Control Unit.

(2) LINE Nulling Potentiometer R5

NOTE

This adjustment only affects a 2-wire LINE hookup (as-when a Remote Control Unit is connected to the 100 Watt Transceiver). For this procedure, the Remote Control Unit must be connected to a 100 Watt Transceiver. The transceiver must be in REMOTE and connected to a dummy load.

(a) On the Remote Control Unit, select USB mode at any frequency.

(b) Select MIC as the AUDIO SOURCE.

(c) Set the LINE selector switch (S2) on the Audio Interface PWB Assy to the "2"position on both the transceiver and the Remote Control Unit

(d) Turn on the internal BIT test tone of the Remote Control Unit by moving the jumper plug (PN65474-001) from between E22 and E23 to between E22 and E21 on the Audio/ Microprocessor PWB Assy.

(e) Key the Remote Control Unit using the 2ND, TX KEY buttons on the front panel.

(f) Turn the volume control to maximum and adjust R5 on the Audio Interface PWB Assy for minimum audio on the speaker.

(g) Turn the volume control to minimum and unkey the Remote Control Unit.

(h) Place the jumper plug on the Audio/Microprocessor PWB Assy to its original position (between E22 and E23).

e. AUDIO/MICROPROCESSOR PWB ASSY, A2, Fig. 6-4.

(1) R244, LINE RX AUDIO Adjustment

(a) Rotate R244 maximum counterclockwise.

(b) With the Remote Control Unit connected to a 100 Watt Transceiver and REMOTE operation selected on the transceiver front panel, enter a frequency of 2.456 MHz on the Remote Control Unit's front panel.

(c) Select USB mode and the LINE meter function.

(d) Activate the BIT Oscillator in the transceiver by moving the jumper from pins 1 and 2 on J7 of the Low Pass Filter PWB Assy to pins 2 and 3 (located in transceiver).

(e) Adjust the transceiver LINE level to -10 dBm, as indicated at the transceiver front panel meter.

(f) On the Remote Control Unit, select MIC as the audio source.

(g) Observe the LINE meter at the Remote Control Unit's front panel. If the meter reads less than -10 dBm, note the level and continue with the next step. If it is -10dBm or more, this alignment is complete (-9 dBm is more than -10 dBm).

(h) Set the meter to PATCH.

(i) Set the PATCH RX potentiometer on the Remote Control Unit's front panel for -10 dBm, as indicated on the PATCH meter.

(j) Adjust R244 to raise the PATCH level by the same amount that the LINE level at the Remote Control Unit was below the LINE level at the transceiver.

(2) R59, AUDIO 2 RX AUDIO Adjustment

Before adjusting R59, check that R244 is adjusted correctly.

(a) With the Remote Control Unit connected to a 100 Watt Transceiver and REMOTE operation selected on the transceiver front panel, enter a frequency of 2.456 MHz on the Remote Control Unit's front panel.

(b) Select USB.

(c) Activate the BIT Oscillator in the transceiver by moving the jumper from pins 1 and 2 on J7 of the Low Pass Filter PWB Assy to pins 2 and 3.

(d) Connect a 600-ohm resistor across pins 2 and 3 of connector J3 on the back of the Remote Control Unit (see figure 2-5).

(e) Connect an audio voltmeter across the resistor, and adjust R59 for +10 dBm on the meter.

(3) R51, AUDIO 2 TX AUDIO Adjustment

(a) Connect an audio signal generator to pins 4 and 5 of the AUDIO 2 connector J3 at the rear of the Remote Control Unit.

(b) On the Remote Control Unit front panel, select AUDIO 2 as the AUDIO SOURCE.

(c) Set the meter to AUDIO.

(d) Adjust the signal generator output to +10 dBm at 1 KHz, and adjust R51 for 0 dBm on the Remote Control Unit's front panel meter.

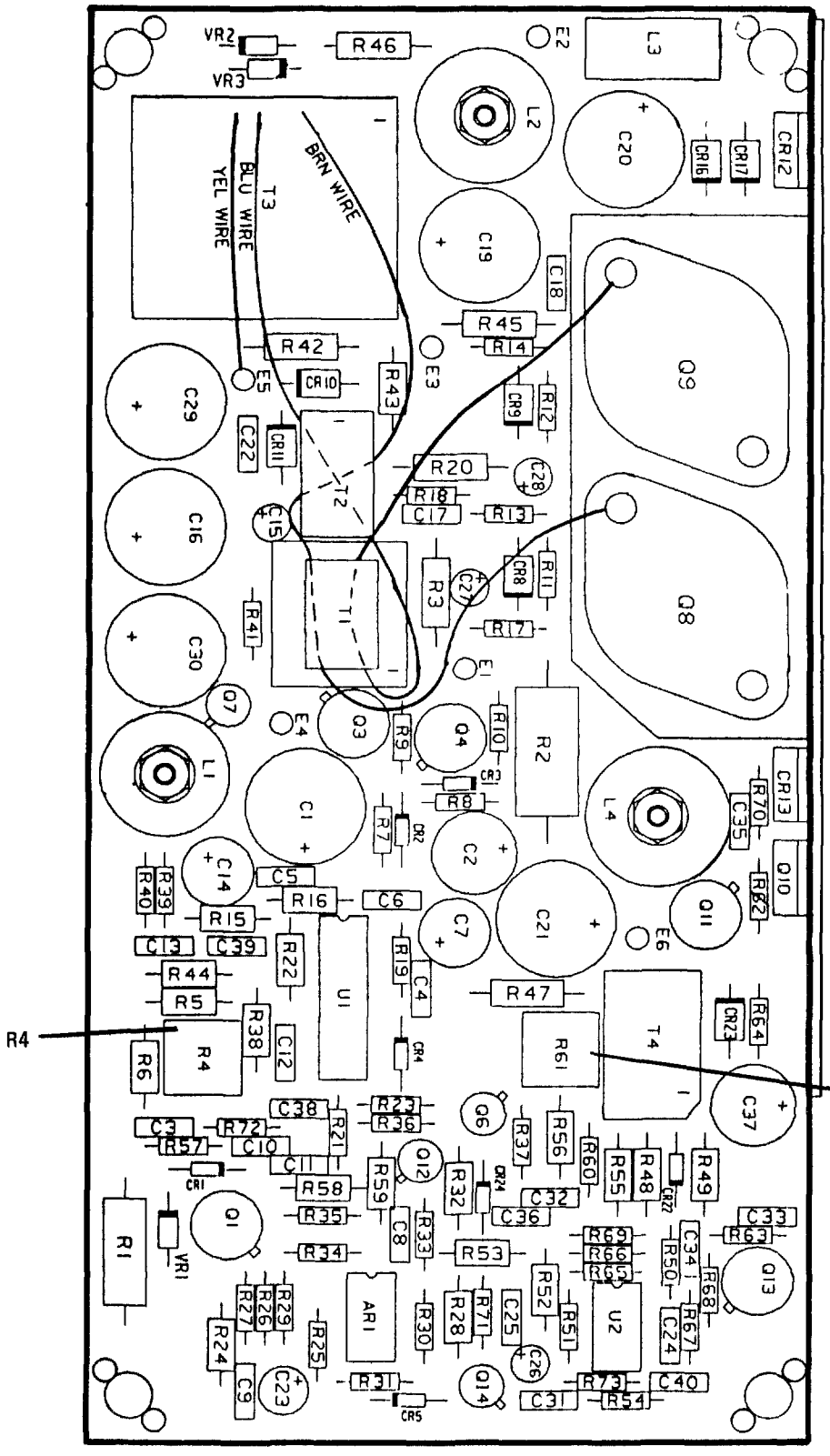


Figure 6-2. Multivoltage Supply Assy

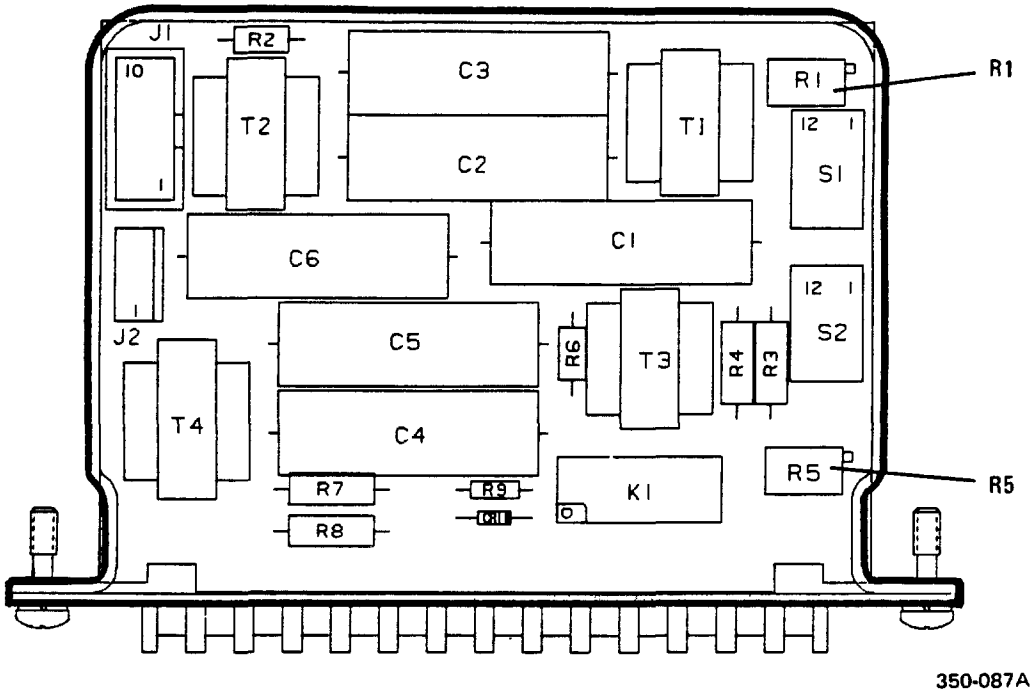


Figure 6-3. Audio Interface PWB Assy

NOTE

This is the correct setting for interfacing with the KY-65 or KY-75 communications secure voice equipment. For interfacing with other equipments, R51 should be set for a 0 dBm AUDIO meter reading with the nominal audio output level of the external equipment applied to J3.

(4) R195, VOX Voice Delay Adjustment

This potentiometer sets the "hang time" for VOX voice keying; that is, it determines the amount of time it takes for the Remote Control Unit to unkey after audio has ceased. This adjustment is preferential, but the normal factory setting is 1/2 to 3/4 second. Using MIC as the AUDIO SOURCE, adjust R195 so that at the end of a test count, the desired time elapses before the unit unkeys.

(5) R240, Sidetone Level Adjustment

(a) Set Remote Control Unit to USB, Meter to Audio, and Audio Source to Patch.

(b) Connect an Audio Signal/Generator to the "2W" Patch Terminals on TB1 at the rear of the Remote Control Unit. Set the Generator to 1 KHz at -10 dBm.

(c) Inject a 40.454 MHz signal into J1 on the transceiver A7 PWB Assy. at -40 dBm.

(d) Connect J1 on the transceiver to a dummy load.

(e) Connect an oscilloscope to the negative lead of C119.

(f) Key the Remote Control Unit, select sidetone (ensure audio meter on remote front panel indicates 0dB. If it does not, adjust Patch Xmit for 0dB).

(g) Adjust R240 so that for a given volume control setting on the Remote Control Unit's front panel, the audio level of the Xmit Sidetone is approximately the same as the Receive Audio level.

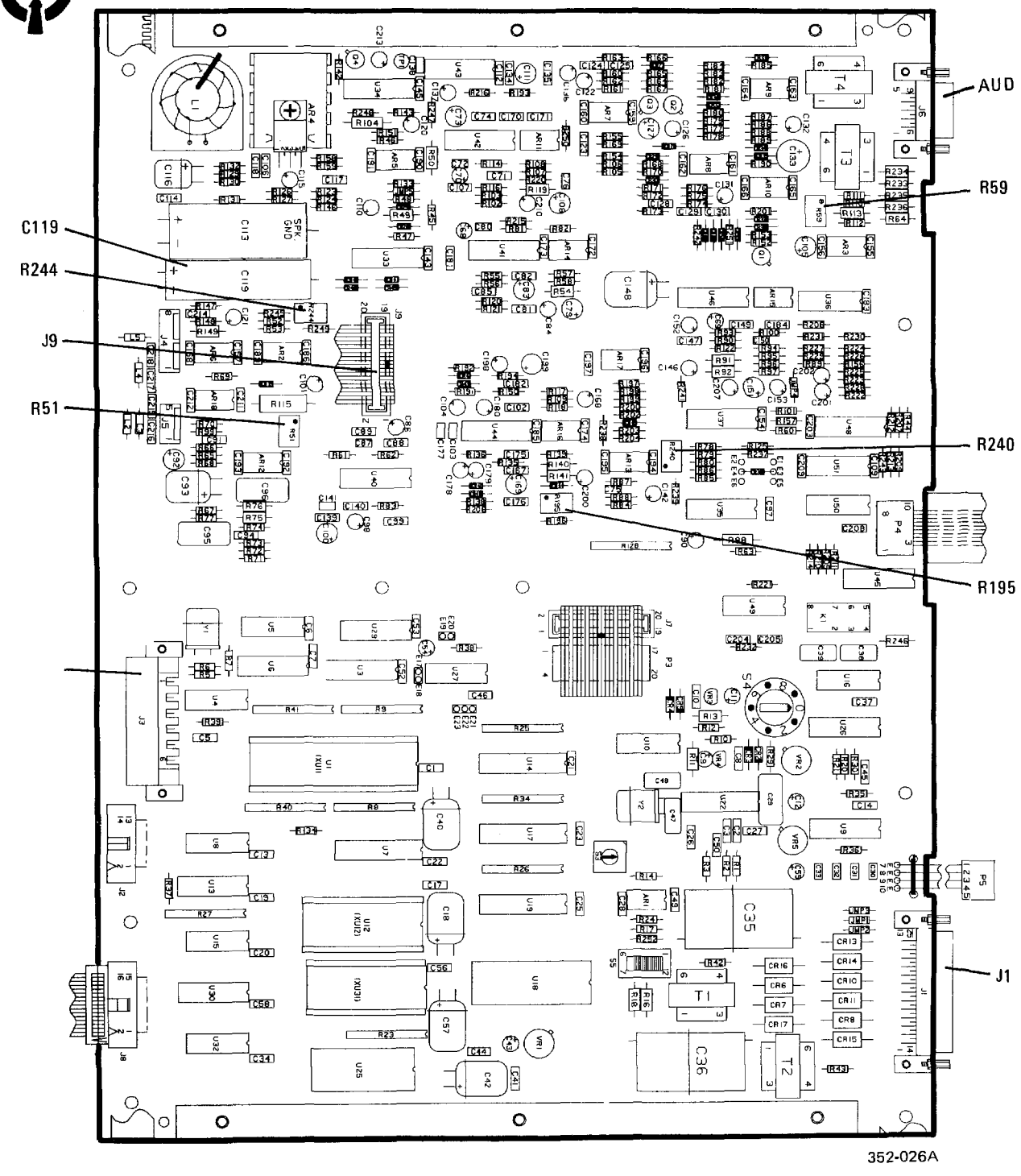


Figure 6-4. Audio/Microprocessor PWB Assy

APPENDIX

CHECKS PERFORMED DURING THE AUTOMATIC BIT ROUTINE FOR THE REMOTE CONTROL UNIT

1. Turns on all front panel indicators for the duration of the test for inspection by the operator.
2. Turns on the BIT Oscillator signal (1200 Hz) and selects audio loop back on the Audio/Microprocessor PWB Assy.
3. Verifies the PATCH RX (receive) output from the Audio/Microprocessor PWB Assy.
4. Commands the rest of the system (the 100 Watt Transceiver and the 500 Watt or 1 KW Linear Power Amplifier) to perform an automatic BIT routine.

CHAPTER 7

ILLUSTRATED PARTS BREAKDOWN

Section I. INTRODUCTION

7-1. PURPOSE. This chapter lists, illustrates, and describes the assemblies and detail parts for the Remote Control Unit. Its purpose is for the identification, requisitioning, and issuance of parts at the organizational (on-equipment) level.

7-2. SCOPE. Only parts that are coded as replaceable at the organizational level are listed in this chapter. These include the major assemblies and a few detail parts. Mounting hardware is listed only if it is used to attach a replaceable assembly or detail part and only if it is not held captive to the assembly or part. In general, the assemblies and parts installed at the time the Remote Control Unit was manufactured are listed and identified in this chapter. When an assembly or part (including vendor items), which is different from the original, was installed during the manufacture of later items, series, or blocks, all assemblies and parts are listed (and "Usable-On" coded). However, when the original assembly or part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred assembly or part is listed. Also, when an assembly or part was installed during modification, and the original does not have continued application, only the prefered item is listed. Interchangeable and substitute assemblies and parts, subsequently authorized by the Government, are not listed in this chapter; such items are identified by information available through the Interchangeable and Substitute (I & S) Data Systems. Refer to T.O. 00-25-184. When a standard size part can be replaced with an oversize or undersize part, the latter parts, showing sizes, are also listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

7-3. CHAPTER ORGANIZATION. This chapter is divided into two sections. Section I, INTRODUCTION, explains the purpose, scope, and organization of the chapter. Section II, MAINTENANCE PARTS LIST, consists of illustrations, in which the assemblies and detail parts of the Remote Control Unit are identified by numbers (called index numbers), followed by a list which contains parts numbers, descriptions, and other relevant data for the items identified on the illustrations.

7-4. SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES. This chapter contains Air Force Peculiar In-Being Source and Repair Codes only. Definitions of these SMR codes, as well as detailed coding criteria and transposition matrices for each coding method, may be obtained from T.O. 00-25-195. Refer to page 7-3.

7-5. FEDERAL SUPPLY CODES FOR MANUFACTURERS (FSCM). The codes used in this chapter are as follows. The first list is in numerical order by FSCM; the second is in alphabetical order by manufacturer name.

FSCM	NAME AND ADDRESS
00779	Amp Incorporated 2800 Fulling Mill P.O. Box 3508 Harrisburg, Pennsylvania 17105
00853	Sangamo Weston Inc. Sangamo Capacitor Division Subsidiary of Schlumberger Ltd. Sangamo Road P.O. Box 128 Pickens, South Carolina 29671
06540	Mite Corporation Amatom Electronic Hardware Division 446 Blake Street New Haven, Connecticut 06515
09353	C and K Components Incorporated 15 Riverdale Avenue Newton, Massachusetts 02158
14304	Harris Corporation RF Communications Group 1680 University Avenue Rochester, New York 14610
25330	General Connector Corporation Subsidiary of the Union Corporation 80 Bridge Street Newton, Massachusetts 02158
71468	ITT Cannon Electric Division of ITT Corporation 10550 Talbert Avenue P.O. Box 8040 Fountain Valley, California 92708
74199	Quam Nichols Company 218 East Marquette Road Chicago, Illinois 60637
77342	AMF Incorporated Potter and Brumfield Division 200 Richland Creek Drive Princeton, Indiana 47671
81349	Military Specification Code
86797	Rogan Corporation 3455 Woodhead Drive Northbrook, Illinois 60062
86928	Seastrom Mfg. Company Inc. 701 Sonora Avenue Glendale, California 91201
88044	Aeronautical Standards Group Department of the Navy and Air Force
94033	Lapointe Industries Inc. Electronics Products Division 155 West Main Street Rockville, Connecticut 06066
94222	Southco Incorporated 210 North Brinton Lake Road Concordville, Pennsylvania 19331
96906	Military Specification Code

NAME AND ADDRESS	FSCM
AMF Incorporated Potter and Brumfield Division 200 Richland Creek Drive Princeton, Indiana 47671	77342
Amp Incorporated 2800 Fulling Mill P.O. Box 3508 Harrisburg, Pennsylvania 17105	00779
C and K Components Incorporated 15 Riverdale Avenue Newton, Massachusetts 02158	09353
General Connector Corporation Subsidiary of the Union Corporation 80 Bridge Street Newton, Massachusetts 02158	25330
Harris Corporation RF Communications Group 1680 University Avenue Rochester, New York 14610	14304
ITT Cannon Electric Division of ITT Corporation 10550 Talbert Avenue P.O.Box 8040 Fountain Valley, California 92708	71468
Lapointe Industries Inc. Electronics Products Division 155 West Main Street Rockville, Connecticut 06066	94033
Mite Corporation Amatom Electronic Hardware Division 466 Blake Street New Haven, Connecticut 06515	06540
Quam Nichols Company 218 East Marquette Road Chicago, Illinois 60637	74199
Rogan Corporation 3455 Woodhead Drive Northbrook, Illinois 60062	86797
Sangamo Weston Inc. Sangamo Capacitor Division Subsidiary of Schlumberger Ltd. Sangamo Road P.O. Box 128 Pickens, South Carolina 29671	00853
Seastrom Mfg. Company Inc. 701 Sonora Avenue Glendale, California 91201	86928
Southco Incorporated 210 North Brinton Lake Road Concordville, Pennsylvania 19331	94222

Note: Field and organizational maintenance of the modules and circuit card assemblies is limited only to the removals, replacements, and alignments given in chapter 6.

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

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

Section II. MAINTENANCE PARTS LIST

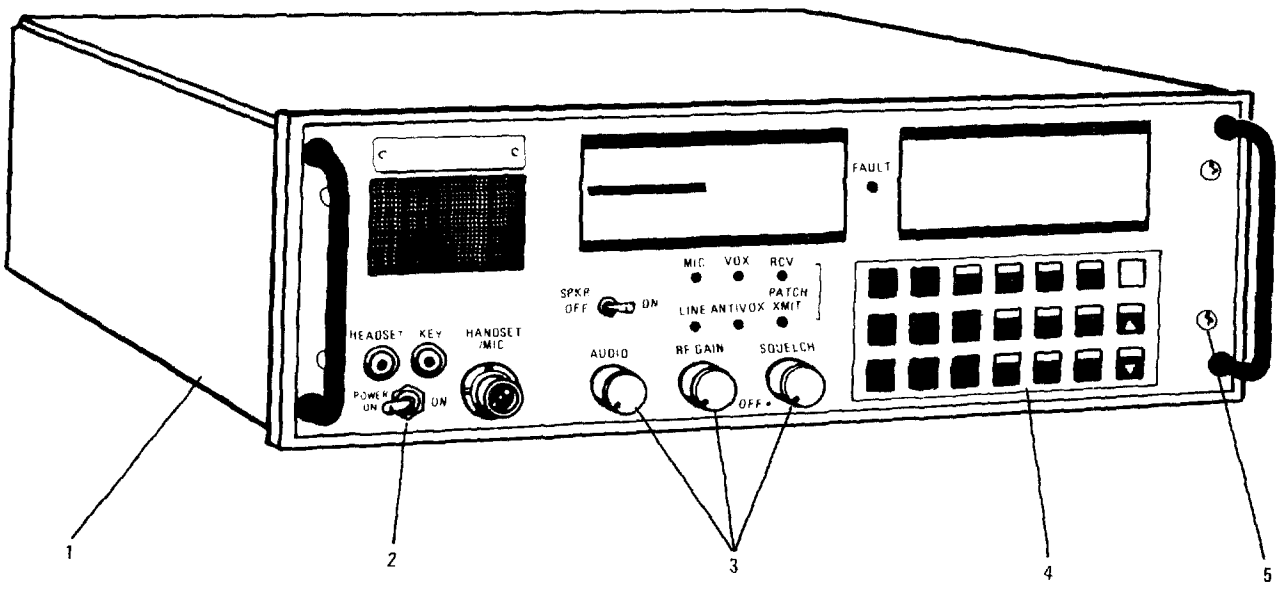


Figure 7-1. Remote Control Unit, C-11329/URC, Front View

ILLUSTRATED PARTS BREAKDOWN

Fig. & Index No.	Part No.	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-1-	10088-0000	14304	Control Unit, Remote*	1		PEODD
1	10088-0100	14304	Remote Control Assy	1		PAODD
2	7401T1ZGE	09353	Switch, Toggle	1		PAOZZ
3	MS-67-1-DC-WD	86797	Knob	3		PAOZZ
	AN565DC6L3	88044	Screw, Set (AP)	6		PAOZZ
4	10085-2007	14304	Keypad	1		PAOZZ
5	10087-2012	14304	Screw, Machine	4		PAOZZ
	10087-2011	14304	Washer, Flat	4		PAOZZ

* Installation Requires Ancillary Kit 10088-0060 (see figure 7-3)

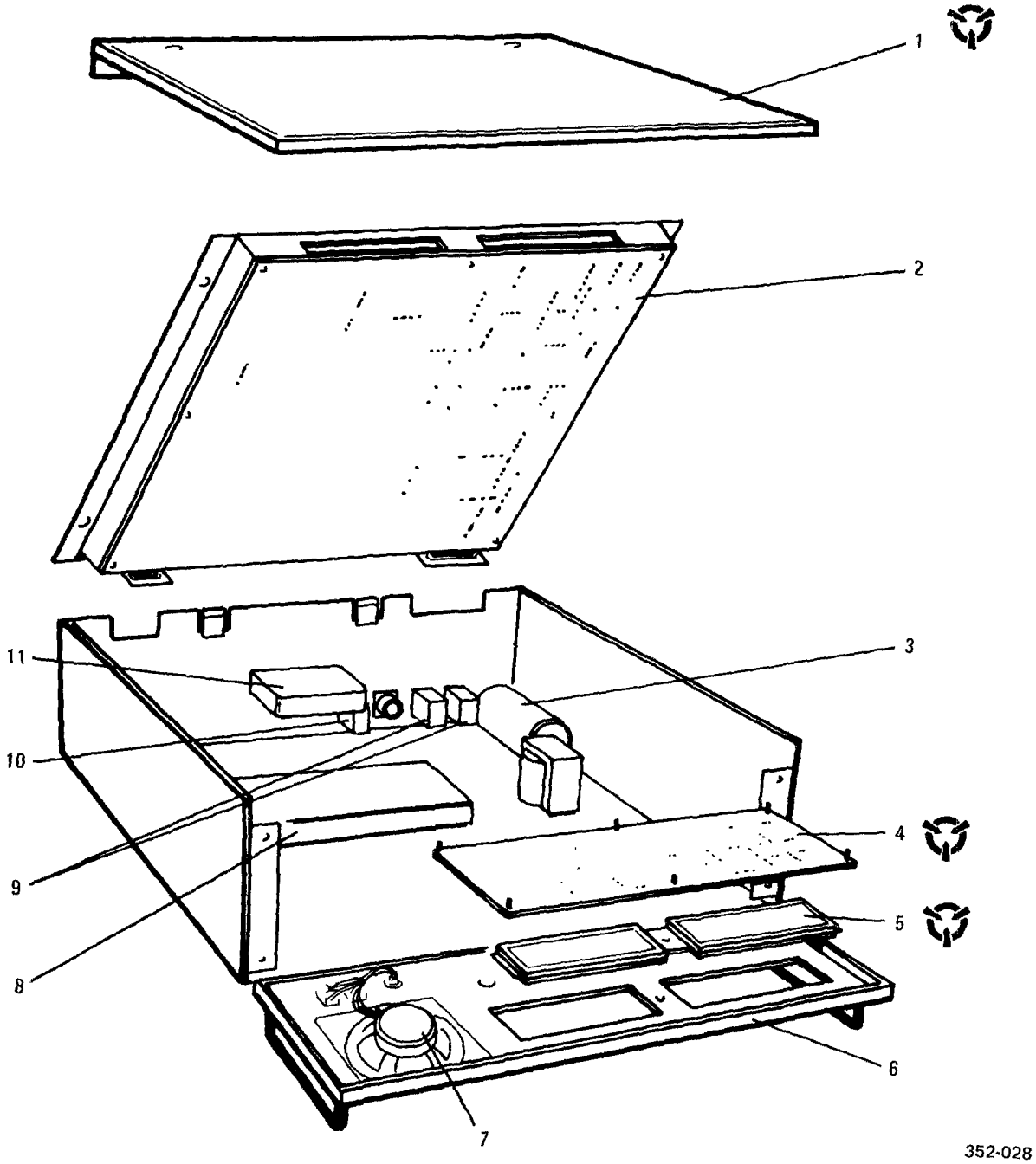


Figure 7-2. Remote Control Unit, C-11329/URC, Exploded View

ILLUSTRATED PARTS BREAKDOWN

Fig. & Index No.	Part No.	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-2- 1	10088-0105	14304	Cover	1		XB
	82-11-100-16	94222	Stud	2		PAOZZ
	82-32-101-20	94222	Retainer	2		PAOZZ
2	10088-5000	14304	Audio/Microprocessor PWB Assy, A2	1		PAODD
3	DCM462T100EC2B	00853	Capacitor, Fxd, Electlt.	1		PAOZZ
	4511-175-87-2N	86928	Retainer, Capacitor	1		XB
	M24243/5-B402	81349	Rivet, Blind	2		PAOZZ
4	10085-2100	14304	Front Panel PWB Assy, A1A1	1		PAODD
	MS24417-1	96906	Switch Guard, (large)	1		PAOZZ
5	10085-2110	14304	Display Assy, A1A2	1		PAOLD
	MS51957-14	96906	Screw, Machine (AP)	6		PAOZZ
	MS35338-135	96906	Washer, Lock (AP)	6		PAOZZ
	MS15795-803	96906	Washer, Flat (AP)	6		PAOZZ
6	10085-2000	14304	Panel Assy, A1	1		PAODD
7	82-8666	74199	Speaker	1		PAOZZ
	MS51957-18	96906	Screw, Machine (AP)	2		PAOZZ
	MS15795-803	96906	Washer, Flat (AP)	2		PAOZZ
	H-6799	14304	Nut, KEPS (AP)	2		PAOZZ
	H-6768	14304	Nut, KEPS (AP)	2		PAOZZ
8	10085-1240	14304	Multivolt Sply Assy, A3	1		PAOLD
9	W58XB1A6A-1	77342	Circuit Breaker	2		PAOZZ
10	W58XB1A6A-5	77342	Circuit Breaker	1		PAOZZ
11	10085-0570	14304	Audio Interface PWB Assy, A4	1		PAODD

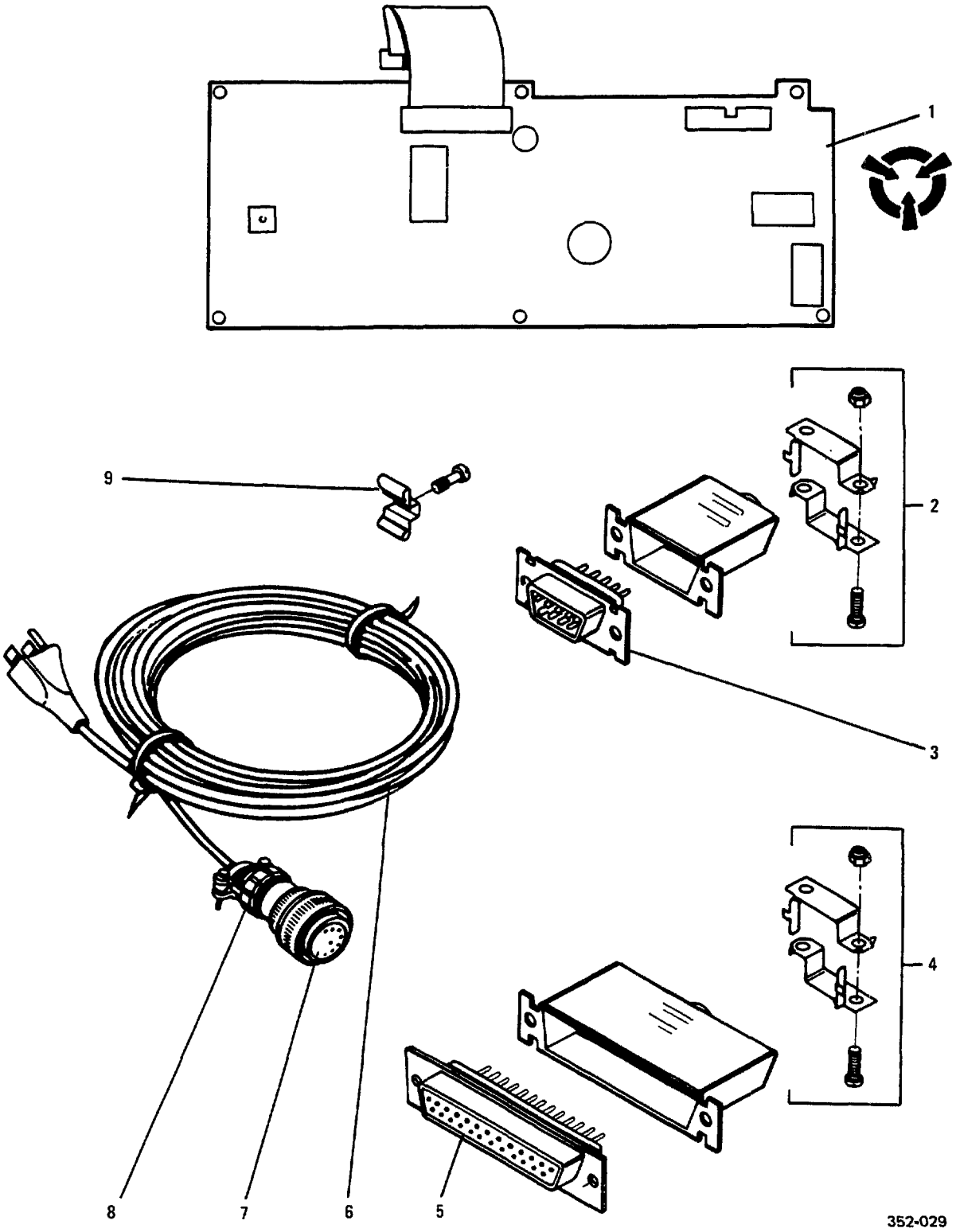


Figure 7-3. Installation Kit for the Remote Control Unit

ILLUSTRATED PARTS BREAKDOWN

Fig. & Index No.	Part No.	FSCM	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SMR Code
7-3-	10088-0060	14304	Installation Kit	1		XB
1	10088-6000	14304	. R.C. Interface PWB Assy	1		PAODD
2	DE24657	71468	. Hood	1		PAOZZ
3	M24308/1-1	81349	. Connector, Rcpt, Elec	1		PAOZZ
4	DB24659-2	71468	. Hood	2		PAOZZ
5	M24308/1-3	81349	. Connector, Rcpt, Elec	2		PAOZZ
6	10085-0065	14304	. Cable Assy	1		XB
7	MS3106A20-8S	96906	. . Connector, Rcpt, Elec	1		PAOZZ
8	M85049/41-12A	81349	. . Clamp, Cable	1		PAOZZ
9	588D205-12	94033	. Screw Lock Assy	6		PAOZZ

REFERENCE DESIGNATOR INDEX

Reference Designator	Figure & Index No.	Part Number
A1A1	7-2-4	10085-2100
A1A2	7-2-5	10085-2110
A1KP1	7-1-4	10085-2007
A1LS1	7-2-7	82-8666
A1S1	7-1-2	7401T1ZGE
A2	7-2-2	10088-5000
A3	7-2-8	10085-1240
A4	7-2-11	10085-0570
C1	7-2-3	DCM462T100EC2B
CB1, CB2	7-2-9	W58XB1A6A-1
CB3	7-2-10	W58XB1A6A-5

CHAPTER 8

FOLDOUT DRAWINGS

LIST OF REMOTE CONTROL FOLDOUT DRAWINGS

GPO 784-007/85226

NOTES:
1. THE 10088-6000 ASSEMBLY IS INSTALLED IN THE TRANSCEIVER WHEN THE REMOTE CONTROL OPTION IS USED.

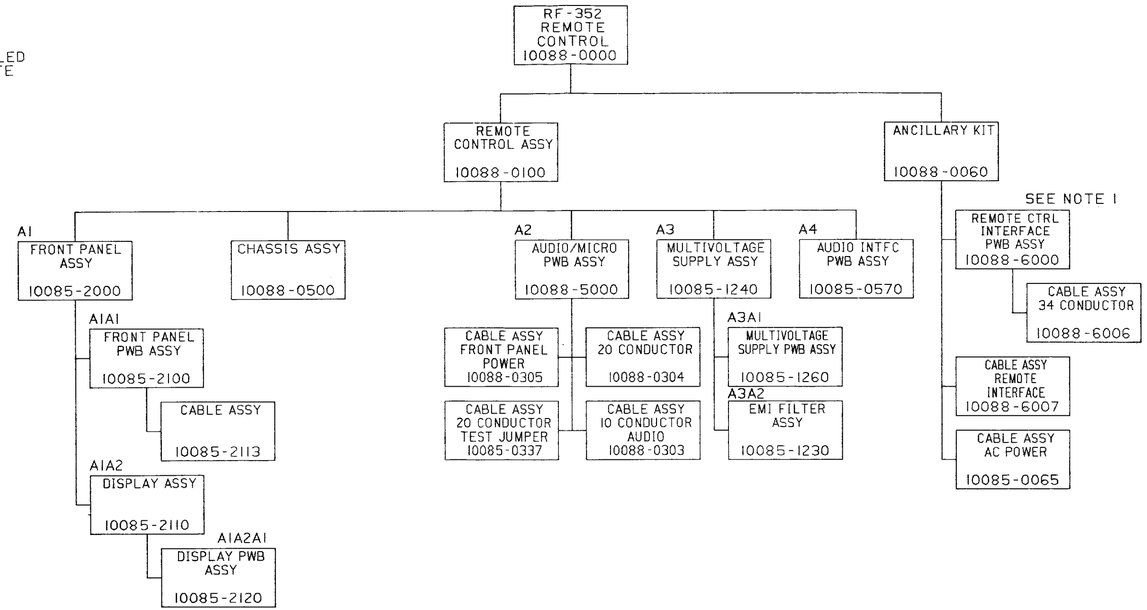


Figure FO-1. Family Tree Remote Control.

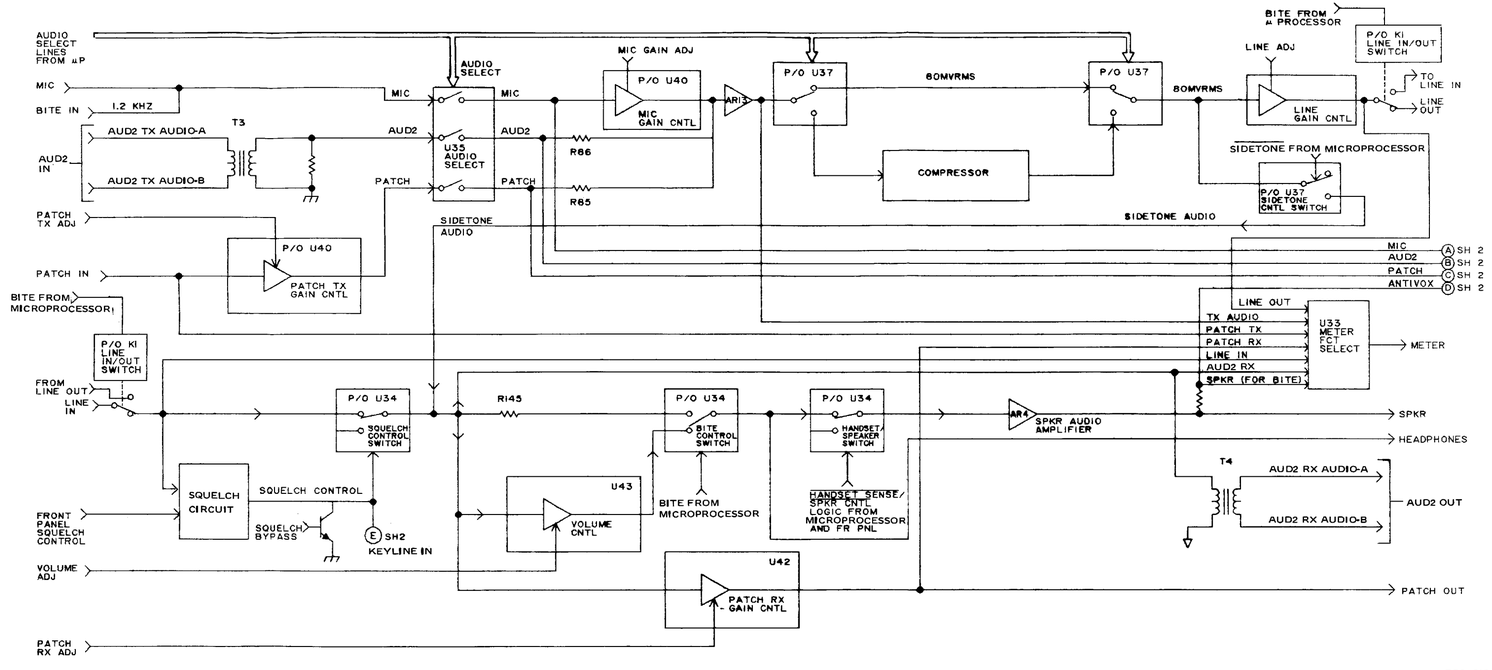


Figure FO-2. Microprocessor Simplified - Audio.

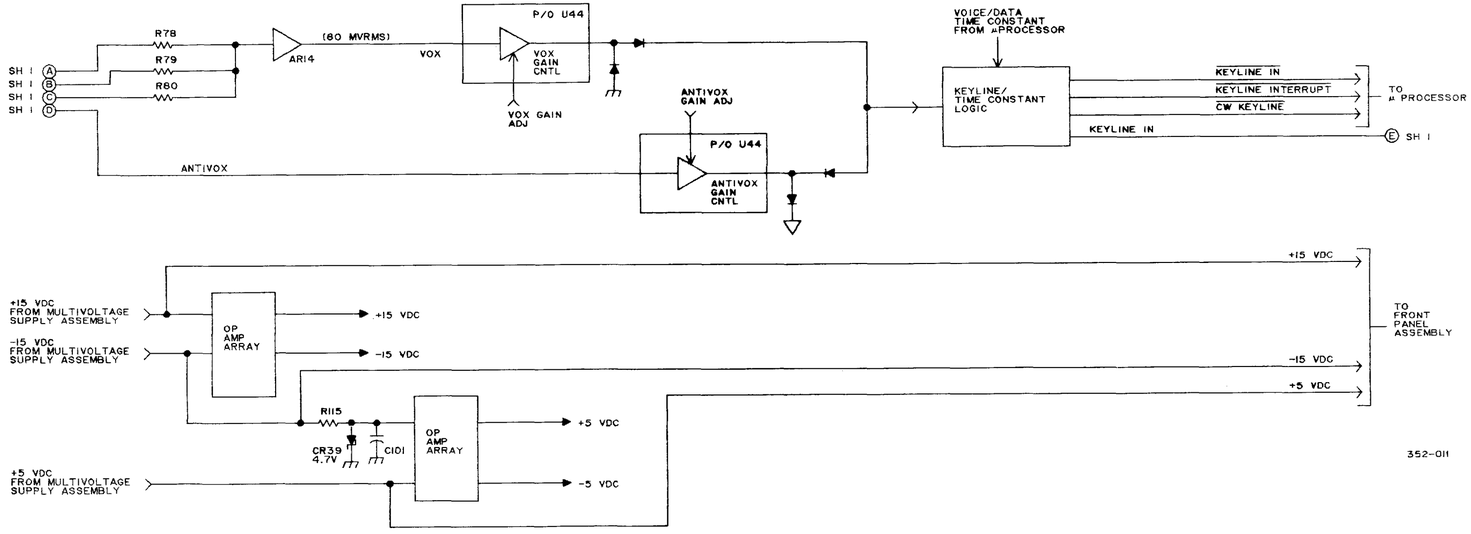


Figure FO-3. Microprocessor Simplified - Control

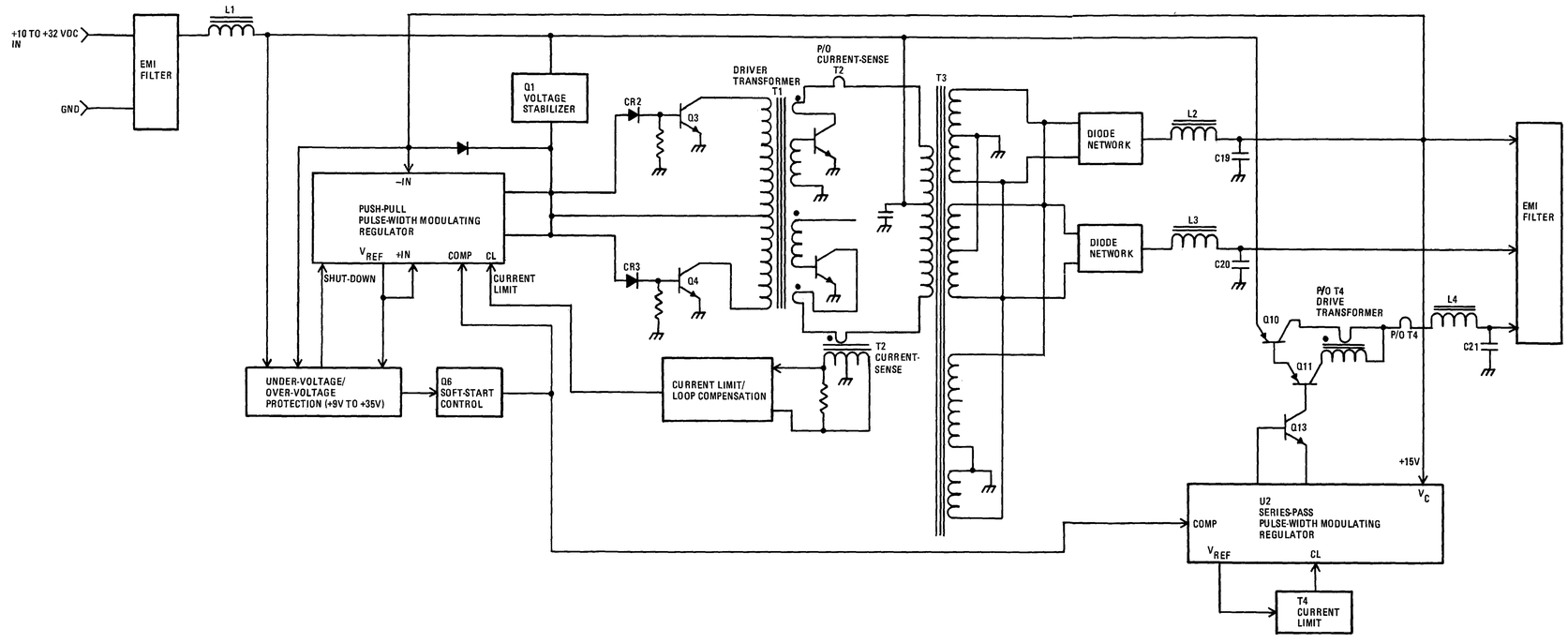
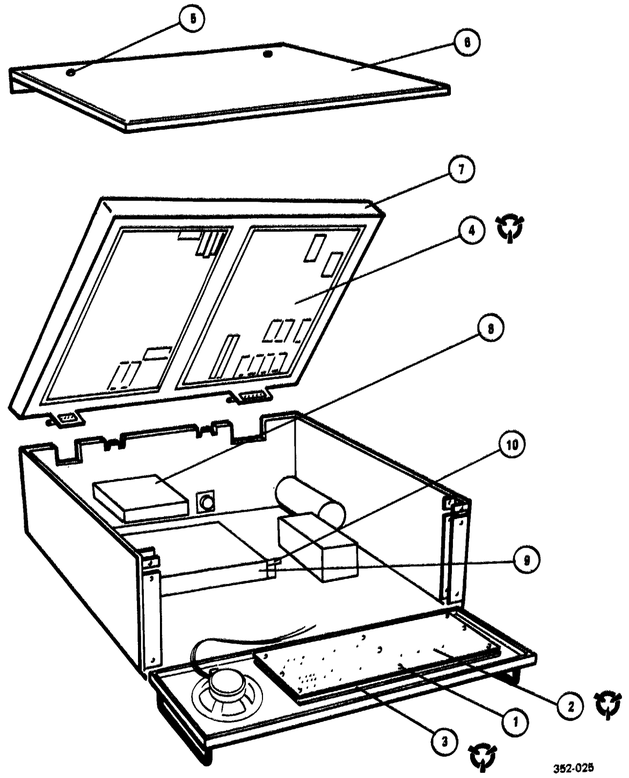


Figure FO-4. DC Voltage Regulator Simplified.

B



A

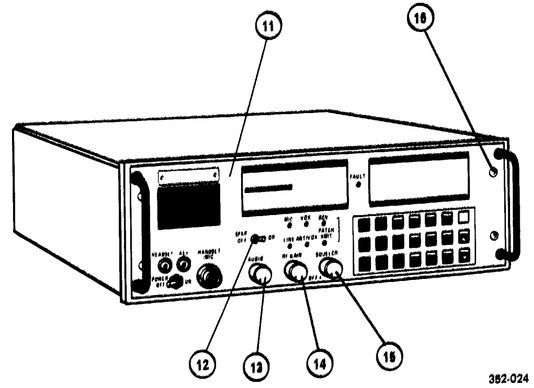


Figure FO-5. Component Location Diagram

NOTE: UNLESS OTHERWISE SPECIFIED:

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

HIGHEST REFERENCE DESIGNATION			
REFERENCE DESIGNATIONS NOT USED			

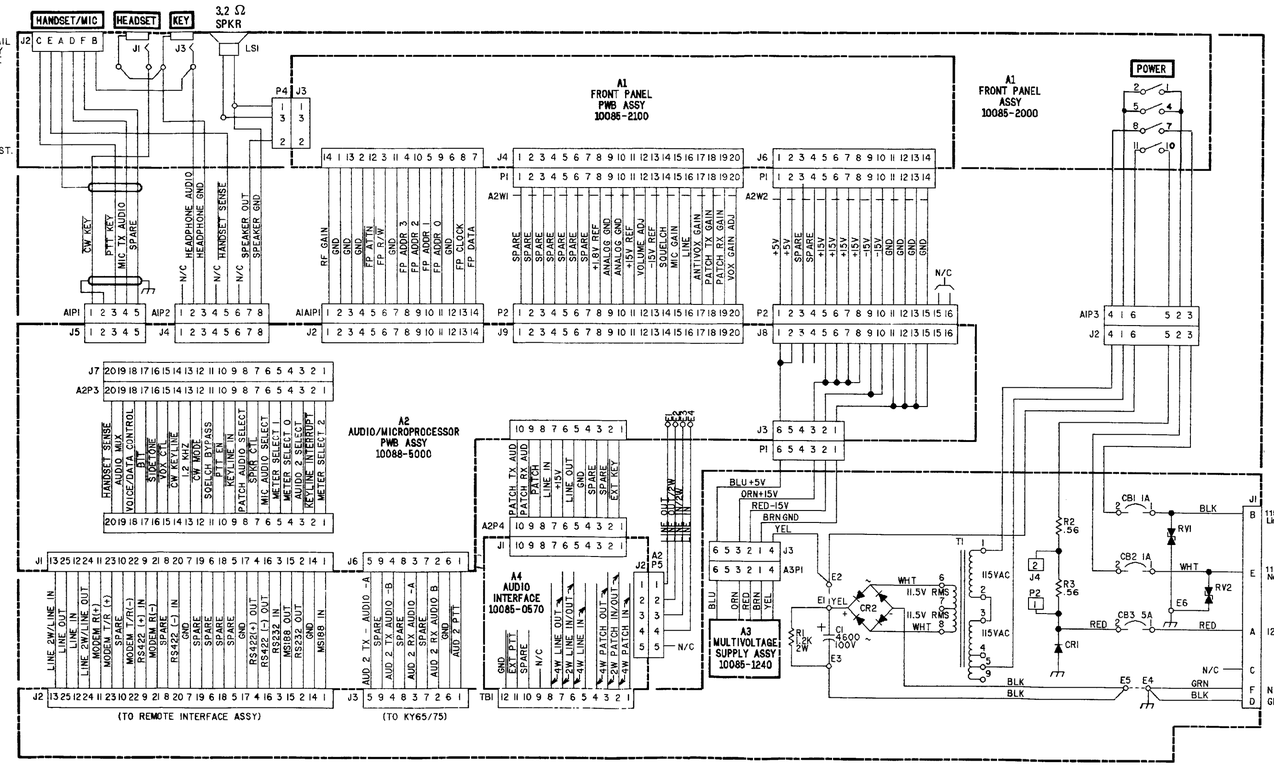


Figure FO-6 Interconnection Diagram