



RadiuTM

VHF

25/40 Watt Two-Way FM Radio

UHF

25/35 Watt Two-Way FM Radio

800 MHz

15 Watt Two-Way FM Radio



Note: The following manual revisions are in separate files:

- MMR005, 6/1/88
- MMR009, 10/7/88
- MMR012, 12/05/88
- MMR013, 2/3/89
- MMR016, 5/01/89
- MMR023, 8/1/89
- MMR028, 12/11/89
- MMR030, 10/1/89
- MMR048, 10/3/91

**THIS MANUAL HAS BEEN
DISCONTINUED**

Service Manual

6880101W58-A

Contents

Model Charts	ii
Recommended Antennas and Available Accessories	vii
FCC Information	vii
Performance Specifications	viii
Disassembly and Assembly	1
Alignment, Programming, Maintenance & Troubleshooting	4

Diagrams

Troubleshooting Diagrams	7
Functional Block Diagrams	11
Circuit Board Diagrams, and Schematic for Logic Board	13
Circuit Board Diagrams, and Schematic for VHF RF Board	16
Circuit Board Diagrams, and Schematic for UHF RF Board	18
Circuit Board Diagrams, and Schematic for 800 MHz RF Board	20
Circuit Board Diagrams, and Schematic for VHF 25 Watt Power Amplifier	22
Circuit Board Diagrams, and Schematic for VHF 40 Watt Power Amplifier	23
Circuit Board Diagrams, and Schematic for UHF 25 Watt Power Amplifier	24
Circuit Board Diagrams, and Schematic for UHF 35 Watt Power Amplifier	25
Circuit Board Diagrams, and Schematic for 800 MHz 15 Watt Power Amplifier	26
Circuit Board Diagrams, Schematic and Parts List for Front Panel 2 Freq. Display Board Radius M100 Radio	27
Circuit Board Diagrams, Schematic and Parts List for Front Panel 6/14 Freq. Display Board Radius M200-Series Radios	28
Circuit Board Diagrams, Schematic and Parts List for Front Panel Switch Board	29
Exploded View and Mechanical Parts List for Radius M100 Radio	30
Exploded View and Mechanical Parts List for Radius M200-Series Radios	31
Optional Accessories	32
Parts List for Logic, VHF RF, UHF RF, 800 MHz RF, and Power Amplifier Boards	37

		MODEL	FREQ.	VERSION
		D33LRA73A5AK	2	Radius M100 25 Watt
		D33LRA77A5AK	6	Radius M206 25 Watt
		D33LRA7PA5AK	14	Radius M214 25 Watt

VHF Radius Mobile Radio

25 Watt RF Power

136-162 MHz

146-174 MHz

* = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY.
X = ONE ITEM SUPPLIED.

ITEM	DESCRIPTION	ITEM	DESCRIPTION
	HUD1705A UNIFIED CHASSIS KIT 136-172 MHz	HLD4321A	RF BOARD 136-162 MHz
	HUD1706A UNIFIED CHASSIS KIT 146-174 MHz	HLD4322A	RF BOARD 146-174 MHz
	HLD1615A PA KIT 25 WATT 136-162 MHz (Note 1)	HLN5173A	LOGIC BOARD
	HLD3009A PA KIT 25 WATT 146-174 MHz (Note 2)	HLN5174A	DISPLAY BOARD 2 FREQ.
X	HCN3032A FRONT PANEL 2 FREQ.	HLN5175A	DISPLAY BOARD 6/14 FREQ.
X	HCN3033A FRONT PANEL 6 FREQ.	HLN9141A	FRONT PANEL HDWR 2 FREQ.
X	HCN3034A FRONT PANEL 14 FREQ.	HLN9142A	FRONT PANEL HDWR 6 FREQ.
X X X	HLN9180A NAMEPLATE	HLN9143A	FRONT PANEL HDWR 14 FREQ.
X X X	HHN4029A HOUSING KIT	HLN5184A	FRONT PANEL SWITCH BOARD
X X X	HMN1056A MICROPHONE KIT	HLN5188A	CHASSIS HDWR
X X X	HLN4433A MICROPHONE HANGUP CLIP	HLD4323A	25W PA BOARD 136-162 MHz
X X X	HKN4137A POWER CABLE KIT	HLD4324A	25W PA BOARD 146-174 MHz
X X X	HLN5189A INSTALLATION HDWR KIT	HLN5183A	25W HEATSINK HDWR
X X X	HBN4040A PACKING KIT	HLN1245A	MICROPHONE
		HLN5301A	COILED CORD

NOTE: 1. HLD1615A IS PART OF HUD1705A.
2. HLD3009A IS PART OF HUD1706A.

MODEL	FREQ.	VERSION			
D43LRA73A5AK	2	Radius M100 40 Watt			
D43LRA77A5AK	6	Radius M206 40 Watt			
D43LRA7PA5AK	14	Radius M214 40 Watt			
VHF Radius Mobile Radio 40 Watt RF Power 146-174 MHz					
X=ONE ITEM SUPPLIED.					
ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
X X X	HUD1710A	HLD4322A	UNIFIED CHASSIS KIT 146-174 MHz	HLD4322A	RF BOARD 146-174 MHz
X X X	HLD3010A	HLN5173A	PA KIT 40 WATT 146-174 MHz (See Note)	HLN5173A	LOGIC BOARD
X	HCN3032A	HLN5174A	FRONT PANEL 2 FREQ.	HLN5174A	DISPLAY BOARD 2 FREQ.
X	HCN3033A	HLN5175A	FRONT PANEL 6 FREQ.	HLN5175A	DISPLAY BOARD 6/14 FREQ.
X	HCN3034A	HLN9141A	FRONT PANEL 14 FREQ.	HLN9141A	FRONT PANEL HDWR 2 FREQ.
X X X	HLN9180A	HLN9142A	NAMEPLATE	HLN9142A	FRONT PANEL HDWR 6 FREQ.
X X X	HHN4029A	HLN9143A	HOUSING KIT	HLN9143A	FRONT PANEL HDWR 14 FREQ.
X X X	HMN1056A	HLN5184A	MICROPHONE KIT	HLN5184A	FRONT PANEL SWITCH BOARD
X X X	HLN4433A	HLN5188A	MICROPHONE HANGUP CLIP	HLN5188A	CHASSIS HDWR
X X X	HKN4137A	HLD4326A	POWER CABLE KIT	HLD4326A	40W PA BOARD 146-174 MHz
X X X	HLN5189A	HLN9071A	INSTALLATION HDWR KIT	HLN9071A	40W HEATSINK HDWR
X X X	HBN4040A	HLN1245A	PACKING KIT	HLN1245A	MICROPHONE
		HLN5301A		HLN5301A	COILED CORD

NOTE: HLD3010A IS PART OF HUD1710A.

UHF Radius Mobile Radio 25 Watt RF Power 449-470 MHz

X = ONE ITEM SUPPLIED.

MODEL	FREQ.	VERSION			DESCRIPTION
D34LRA73A5AK	2	Radius M100 25 Watt			RF BOARD 449-470 MHz
D34LRA77A5AK	6	Radius M206 25 Watt			LOGIC BOARD
D34LRA79A5AK	14	Radius M214 25 Watt			DISPLAY BOARD 2 FREQ.
					DISPLAY BOARD 6/14 FREQ.
					FRONT PANEL HDWR 2 FREQ.
					FRONT PANEL HDWR 6 FREQ.
					FRONT PANEL HDWR 14 FREQ.
					FRONT PANEL SWITCH BOARD
					CHASSIS HDWR
					25W PA BOARD 449-470 MHz
					MICROPHONE
					COILED CORD
ITEM			DESCRIPTION		
X X X	HUE2060A		UNIFIED CHASSIS KIT 449-470 MHz	X	X
X X X	HLE1687A		PA KIT 25 WATT 449-470 MHz (See Note)		
X	HCN3032A		FRONT PANEL 2 FREQ.		
	X	HCN3033A	FRONT PANEL 6 FREQ.		
		X	HCN3034A		
X X X	HLN9180A		NAMEPLATE		
X X X	HHN4029A		HOUSING KIT		
X X X	HMN1056A		MICROPHONE KIT		
X X X	HLN4433A		MICROPHONE HANGUP CLIP		
X X X	HKN4137A		POWER CABLE KIT		
X X X	HLN5189A		INSTALLATION HDWR KIT		
X X X	HBN4040A		PACKING KIT		

NOTE: HLE1687A IS PART OF HUE2060A.

**UHF Radius Mobile Radio
35 Watt RF Power
449-470 MHz**

X = ONE ITEM SUPPLIED.

MODEL	FREQ.	VERSION			ITEM	DESCRIPTION
D44LRA73A5AK	2	Radius M100 35 Watt			HLE4425A	RF BOARD 449-470 MHz
D44LRA77A5AK	6	Radius M206 35 Watt			HLN5173A	LOGIC BOARD
D44LRA79A5AK	14	Radius M214 35 Watt			HLN5174A	DISPLAY BOARD 2 FREQ.
					HLN5175A	DISPLAY BOARD 6/14 FREQ.
					HLN9141A	FRONT PANEL HDWR 2 FREQ.
					HLN9142A	FRONT PANEL HDWR 6 FREQ.
					HLN9143A	FRONT PANEL HDWR 14 FREQ.
					HLN5184A	FRONT PANEL SWITCH BOARD
					HLN5188A	CHASSIS HDWR
					HLE4432A	35W PA BOARD 449-470 MHz
					HLN5274A	35W HEATSINK HDWR
					HLN1245A	MICROPHONE
					HLN5301A	COILED CORD
ITEM			DESCRIPTION			
X X X	HUE2064A	UNIFIED CHASSIS KIT 449-470 MHz		X	X	
X X X	HLE3011A	PA KIT 35 WATT 449-470 MHz (See Note)				
X	HCN3032A	FRONT PANEL 2 FREQ.			X	
	X	HCN3033A	FRONT PANEL 6 FREQ.		X	X
	X	HCN3034A	FRONT PANEL 14 FREQ.		X	X
X X X	HLN9180A	NAMEPLATE				
X X X	HHN4029A	HOUSING KIT				
X X X	HMN1056A	MICROPHONE KIT				
X X X	HLN4433A	MICROPHONE HANGUP CLIP				X X
X X X	HKN4137A	POWER CABLE KIT				
X X X	HLN5189A	INSTALLATION HDWR KIT				
X X X	HBN4040A	PACKING KIT				

NOTE: HLE3011A IS PART OF HUE2064A.

800 MHz Radius Mobile Radio 15 Watt RF Power

X= ONE ITEM SUPPLIED.

MODEL		FREQ.	VERSION
D35LRA73A5AK		2	Radius M100 15 Watt
D35LRA77A5AK		6	Radius M206 15 Watt
D35LRA7PA5AK		14	Radius M214 15 Watt

ITEM	DESCRIPTION	ITEM	DESCRIPTION
X X X	HUF1033A	HLF4095A	RF BOARD 800 MHz
X X X	HLF1038A	HLN5173A	LOGIC BOARD
X	HCN3032A	HLN5174A	DISPLAY BOARD 2 FREQ.
X	HCN3033A	HLN5175A	DISPLAY BOARD 6/14 FREQ.
	HCN3034A	HLN9141A	FRONT PANEL HDWR 2 FREQ.
X X X	HLN9180A	HLN9142A	FRONT PANEL HDWR 6 FREQ.
X X X	HHN4029A	HLN9143A	FRONT PANEL HDWR 14 FREQ.
X X X	HMN1056A	HLN5184A	FRONT PANEL SWITCH BOARD
X X X	HLN4433A	HLN5188A	CHASSIS HDWR
X X X	HKN4137A	HLF4097A	15W PA BOARD 800 MHz
X X X	HLN5189A	HLN5293A	15W HEATSINK HDWR
X X X	HBN4040A	HLN1245A	MICROPHONE
		HLN5301A	COILED CORD

NOTE: HLF1038A IS PART OF HUF1033A.

RECOMMENDED ANTENNAS

The following antennas are available for use with your Radius mobile radio. Each of these antennas is furnished with a mini-UHF connector which mates with the antenna connector on the Radius radio.

HAD4006	VHF 136-144MHZ 1/4 WAVE ROOF MT
HAD4007	VHF 144-150.8MHZ 1/4 WAVE ROOF MT
HAD4008	VHF 150.8-162MHZ 1/4 WAVE ROOF MT
HAD4009	VHF 162-174 MHZ 1/4 WAVE ROOF MT
HAD4010	VHF 136-144MHZ 1/4 WAVE TRUNK LIP
HAD4011	VHF 144-150.8MHZ 1/4 WAVE TRUNK LIP
HAD4012	VHF 150.8-162MHZ 1/4 WAVE TRUNK LIP
HAD4013	VHF 162-174MHZ 1/4 WAVE TRUNK LIP
HAD4014	VHF 3DB GAIN ROOF MT
HAD4015	VHF 3DB GAIN TRUNK LIP MT
HAE4003	UHF 1/4 WAVE ROOF MT
HAE4007	UHF 1/4 WAVE TRUNK LIP MT
HAE4011	UHF 3.5DB GAIN ROOF MT W/SPRING
HAE4015	UHF 3.5DB GAIN TRUNK LIP MT W/SPRING
HAE4019	UHF 5DB GAIN ROOF MT
HAE4023	UHF 5DB GAIN TRUNK LIP MT
HAF4002	800 MHZ 1/4 WAVE ROOF MT
HAF4003	800 MHZ 1/4 WAVE TRUNK LIP MT
HAF9067	800 MHZ 3DB GAIN ROOF MT
HAF9085	800 MHZ 3DB GAIN ROOF W/TEFLON CABLE
HAF9084	800 MHZ 3DB GAIN TRUNK LIP MT

AVAILABLE ACCESSORIES

Your radio may be customized to your needs by any of the Radius mobile accessories available.

Side Mount battery cable adaptor—recommended for General Motors manufactured vehicles with side mount batteries for easier installation of battery cable.....HLN5290A

Mini-UHF connector—to be added to end of cable, requires crimping tool .HLN5282A

Crimping tool—For self installation requiring crimping of mini-UHF connector.....66-80388A26

External Speaker—5 watt for high noise environmentsHSN4019A

Key Lock Mount—for added securityHLN4426A

Extra Stability Mount—for high noise environmentsHLN5226A

Non-locking trunionHLN5189A

Power CableHKN4137A

Ignition Switch CableHKN4284A

Compact Palm MicrophoneHMN1056A

Heavy Duty Palm MicrophoneHMN1035A

DTMF Touch Code MicrophoneHMN1037A

Heavy Duty Microphone

Hang-Up Clip.....HLN4606A

Power Supply for 15 and 25 watt radios.....HPN1007A

Power Supply for 35 and 40 watt radios.....HPN1008A

Desk Microphone for Control StationHMN1038A

Power Cable for Control Station ...HKN4139A

Base Tray for Control StationHLN5292A

Mini-UHF to UHF Antenna Adapter—for use with existing antennas having UHF connectors.....HLN5291A

FCC INFORMATION

Applicable Part of Rules22, 74, 90, 95A

Authorized Emission15F2, 16F3, 16F1

Model Series	Transmitter Power Output	Type Acceptance Number
D43LRA	40 Watts	ABZ89FT3730
D44LRA	35 Watts	ABZ89FT4725
D33LRA	25 Watts	ABZ89FT3712
D34LRA	25 Watts	ABZ89FT4713
D35LRA	15 Watts	ABZ89FT5672

Performance Specifications Radius M100/M206/M214 Mobile Radios

General

Band:	VHF		UHF		800 MHz
Model Series:	D33LRA	D43LRA	D34LRA	D44LRA	D35LRA
Typical RF Output:	25W	40W	25W	35W	15W
Frequency:	136-162 MHz 146-174 MHz	146-174 MHz	449-470 MHz		TX-806-825 MHz RX-851-870 MHz
Dimensions (H x W x L):	2" x 7" x 7 $\frac{3}{4}$ " (50.8 x 178 x 198mm)				
Primary Voltage Input:	13.8 VDC				
Weight:	61 oz. (1.73 kg)				
Typical Current Drain Receive (5W):	1.5A				
Transmit:	7.0A	11.0A	7.5A	10.0A	6.0A
Standby:	400mA				
Channel Capability:	Radius M100: 2 channels; Radius M206: 6 channels; Radius M214: 14 channels				
Squelch Capability:	Private-Line, Digital Private-Line coded squelch and/or carrier squelch				

Transmitter

Spurious & Harmonic Emissions:	-57 dB (25W) -60 dB (40W)	-57 dB (25W) -60 dB (35W)	-55 dB
Frequency Stability: (-30°C to +60°C, 25°C ref.)	±0.0005%	±0.0005%	±0.00025%
Modulation:	16F1, 16F3, 15F2		
Maximum Frequency Separation (MHz):	12 MHz	10 MHz	19 MHz
Audio Distortion:	5% measured per EIA		
Output Impedance:	50 Ohms		
Modulation Sensitivity:	80 mV rms for 60% maximum deviation at 1000 Hz		

Receiver

Channel Spacing:	30 kHz	25 kHz	25 kHz
Sensitivity 12 dB SINAD:	0.30 μV	0.30 μV	0.40 μV
Intermodulation EIA SINAD:	75 dB	70 dB	70 dB
Spurious & Image Rejection:	75 dB	70 dB	70 dB
Selectivity EIA SINAD:	75 dB	70 dB	70 dB
Audio Output:	3W (5W with optional external speaker) @ less than 5% distortion		
Frequency Stability (-30°C to 60°C, 25°C ref.)	± 0.0005%	± 0.0005%	±0.00025%
Maximum Frequency Separation (MHz):	12 MHz	10 MHz	19 MHz
Input Impedance:	50 Ohms		

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Radius VHF, UHF and 800 MHz Radio

1. Radio Disassembly and Assembly

1.1 TO REMOVE CONTROL HEAD AND CHASSIS COVERS

(1) Remove control head mounting screws (Figure 1). Pull control head off and away from the radio.

(2) Remove the two chassis cover screws from each side (Figure 1). Remove top and bottom covers from chassis.

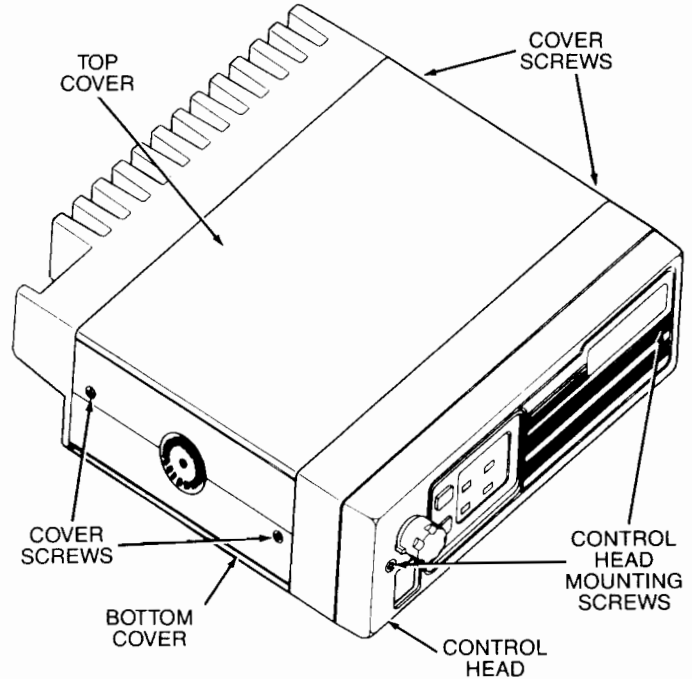


Figure 1

1.2 TO REMOVE RF CHASSIS SHIELD

Remove RF chassis shield by prying each of the four corners at the indentation provided (Figure 2). Be careful not to overbend any one corner.

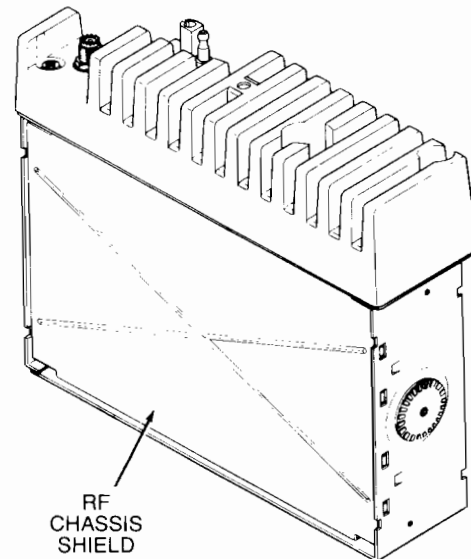


Figure 2

1.3 TO REMOVE THE POWER AMPLIFIER HEAT SINK

- (1) Disconnect the transmit and receive coax cables from the RF board (Figure 3).
- (2) Disconnect the 5-pin connector from the logic board (Figure 4).
- (3) Remove the heat sink mounting screws (Figure 4). Pull heat sink off of chassis while carefully feeding the transmit and receive coax cables through their respective holes in the chassis.

1.4 TO REMOVE THE RF CIRCUIT BOARDS

- (1) After the P.A. heat sink has been removed, pry off the RF shield (Figure 5). Be careful not to over-bend any one corner or side.
- (2) After removing the RF shield, then remove all the RF board mounting screws and take out the RF board (Figure 5).

1.5 TO REMOVE THE LOGIC CIRCUIT BOARD

- (1) After the RF board has been removed, turn the radio over and pry off the logic shield (Figure 6), again being careful not to bend any one corner or side.
- (2) Remove all logic board mounting screws (Figure 6).
- (3) Now remove the two regulator heat sink mounting screws from the side of the chassis (Figure 6). The logic board can now be lifted out of the chassis.

1.6 TO REMOVE THE POWER AMPLIFIER CIRCUIT BOARD

- (1) Remove the power amplifier shield by carefully prying each corner and side until you can slide the shield off easily (Figure 7). Remove the shield completely by guiding the coaxial cables out.
- (2) Unsolder the A+ power connector feed-through leads and the antenna connector lead (Figure 8).
- (3) (UHF only). Remove the stud mount transistor mounting nut from the back of the heat sink (Figure 10).
- (4) Remove two power device mounting screws and all P.A. board mounting screws (Figure 8 & 9), and then take out the P.A. board.

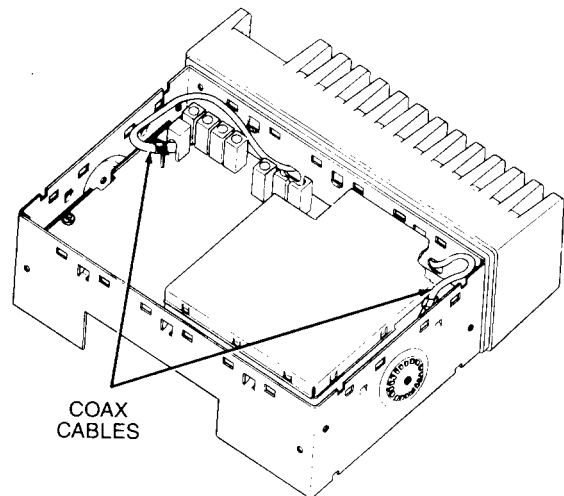


Figure 3

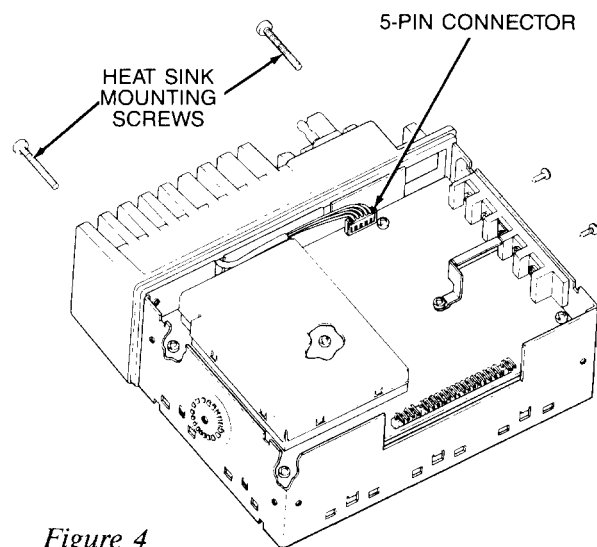


Figure 4

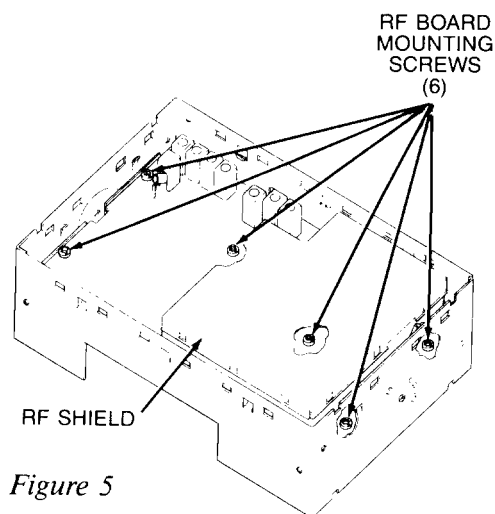


Figure 5

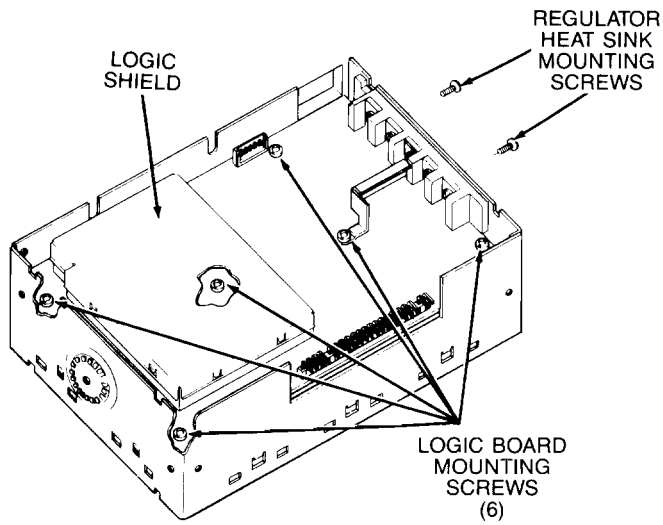


Figure 6

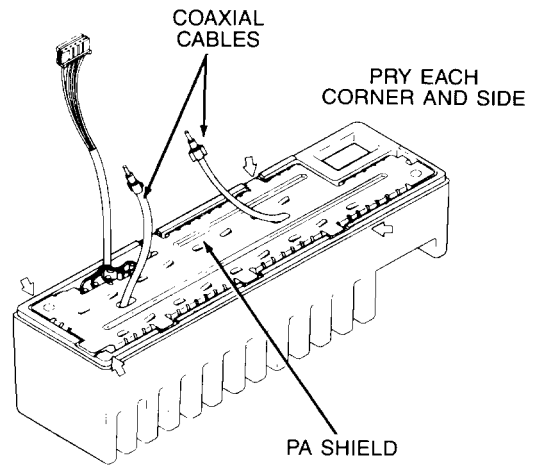
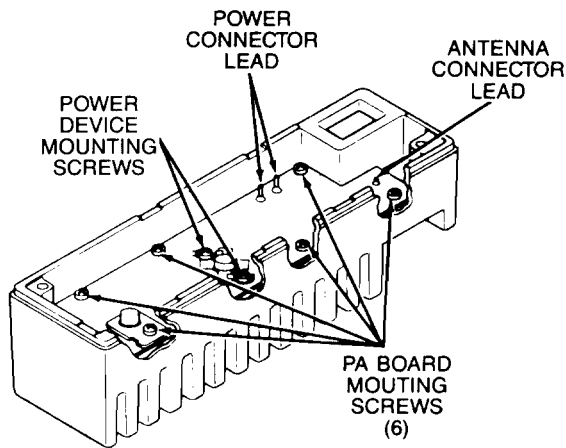
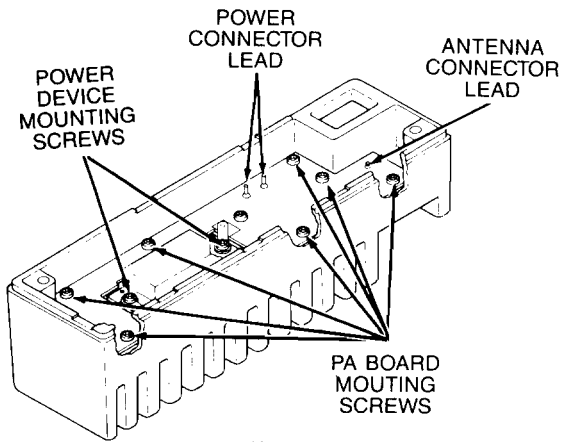


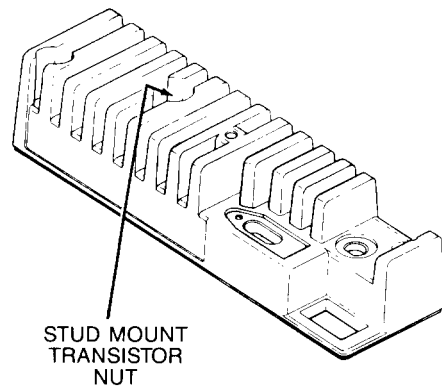
Figure 7



VHF & UHF
Figure 8



800 MHz
Figure 9



UHF ONLY
Figure 10

1.7 TO RE-ASSEMBLE THE RADIO

Reverse the disassembly procedure and tighten all screws to the torques specified in Table 1.

2. Alignment

The advanced design and manufacturing proce-

dures eliminate the need for traditional tuning tasks.

All the circuits in the Radius radio have been aligned at the factory with specialized equipment.

Alignment in the field should not be attempted or necessary.

Table 1. Fasteners, Tools, and Torques

PART NUMBER	DESCRIPTION	LOCATION	QTY.	DRIVER SIZE	INPUT TORQUE	REPAIR TORQUE	ILLUST. REF.
03-10945A11	Plastite M3 x 8 Slit Torx Pan Hd.	Control Head Brds. and Int'l. Spx'r.	9	T10	8 in. lbs.	7 in. lbs.	
03-80270L01	Mach. M4 x .7 x 38 Torx. Cap Scr. Blk.	Control Head Mtg.	2	T15	10 in. lbs.	10 in. lbs.	
03-80271L01	Mach. M4 x .7 x 27 Slit Torx. Pn. Hd. Blk.	Heat Sink Mtg.	2	T15	12-14 in. lbs.	12-14 in. lbs.	H
03-10943M04	Taptite M2.5 x 8 Slit Torx. Pan Hd.	Regulator H.S. Device Mtg.	5	T8	6-8 in. lbs.	4-6 in. lbs.	A
03-10943M09	Taptite M3 x 6 Slit Torx. Pan Hd.	RF/Logic Brd. Mounting	12	T10	8-9 in. lbs.	8-9 in. lbs.	C
03-10943M10	Taptite M3 x 8 Slit Torx. Pan Hd.	P.A. Device/Brd. Mtg.	8	T10	11-13 in. lbs.	8-10 in. lbs.	D
03-10943R04	Tatptite M2.5 x 8 Torx. Flt. Hd.	Regulator H.S. Mounting	2	T8	8-10 in. lbs.	6-8 in. lbs.	B
03-10943R55	Tatptite M3 x 8 Torx. Flt. Hd. Blk.	Chassis Covers	4	T10	10-12 in. lbs.	8-10 in. lbs.	I
03-00136756	Tpg. 10-16 x 5/8 Plain Hex	Ext. Spkr. Mtg. Trunnion	3	5/16" Hex Driver	Field Inst'l.	Field Inst'l.	
03-00140001	Tpg. 8-19 x 7/8 Phl. Pan	Ext. Spkr. Rear Hsg.	4	P-2	6-8 in. lbs.	6-8 in. lbs.	J
09-80131M01	Hex/Tension Nut (Part of Ant. Conn. Assembly)	P.A.-Antenna Conn. Mtg.	1	1/2" Hex Driver	18-20 in. lbs.	18-20 in. lbs.	E
0200007003	Hex Nut 8-32	P.A.-Stud Device Mtg.	1	5/16" Hex Driver	5 in. lbs.	5 in. lbs.	G
38-80041M01	Plug, Button	Heat Sink Plug	1	—	—	—	F
03-84244C03	Screw, Wing	Ext. Spkr. Mtg. Trunnion	2	—	Field Inst'l.	Field Inst'l.	
03-80105F01	Screw, Tee Knob	Radio Mtg. Trunnion	2	—	Field Inst'l.	Field Inst'l.	
03-10943M72	Taptite M5 x 8 Slit Torx. Pn. Hd.	P.A.—High Vib. Mtg. Brkt.	1	T25	32-34 in. lbs.	30-32 in. lbs.	
03-00138021	Tpg. 10-16 x 3/4 Pln. Hex Chs.	Trunnion Mtg.	6	5/16" Hex Driver	Field Inst'l.	Field Inst'l.	
		Locking Trun. Mtg.	6				
0310913A43	Mach. M5 x 8 Slit Torx. Flt. Hd.	Base MK Mtg. Clip	1	T25	12-14 in. lbs.	12-14 in. lbs.	
0310908B08	Mach. M5 x 10 Slit Torx. Pn. Hd.	Locking Trunnion Radio Mtg.	2	T25	Field Inst'l.	Field Inst'l.	
0310943M11	Taptite M3x10 S/L Torx, Pam H6	Power Connector	2	T10	9-11 in. lb.	7-9 in. lb.	D

3. Programming

The Radius radios can be programmed in the field to these parameters:

Receive and Transmit frequencies.
Transmit Frequency Adjustment (warp).
PL or DPL encode and decode Codes.
Transmit Power Output.
Transmit Deviation.
Time Out Timer.
Mode Slaved Scan List

Configuration information for programming these parameters is contained in the Radius RADIO SERVICE SOFTWARE package (HVN9174A for 5.25 inch drives and HVN9173A for 3.5 inch drives).

A personal computer (P.C.) and the appropriate software Diskette will be required in addition to the items listed in Recommended Test Equipment.

We strongly suggest the servicer become familiar with the programming techniques applicable to the Radius Radios.

4. Maintenance and Troubleshooting Procedures

These troubleshooting charts allow you to trace a problem to a specific board in the radio. Each radio has five boards. The control head contains the Front Panel Display Board and Switch Board. The heatsink casting contains the RF Power Amplifier Board. The chassis contains the RF Board and Logic Board. Start troubleshooting with the "Basic Troubleshooting" chart which will refer you to other charts depending on the symptoms observed.

5. Recommended Test Equipment

R2001D Communication Systems Analyzer
or
R2200B Service Monitor
R1011B Power Supply
R1037A Digital Multimeter
or
R1024B Digital Multimeter

6. Board Replacement and Calibration

Replacement of the Logic board, RF board, or Power Amplifier requires that recalibration must be performed with the Motorola Radio Service Software. **The procedures and tasks for calibration are covered in Part 4 in the Radius Radio Service Software Manual.**

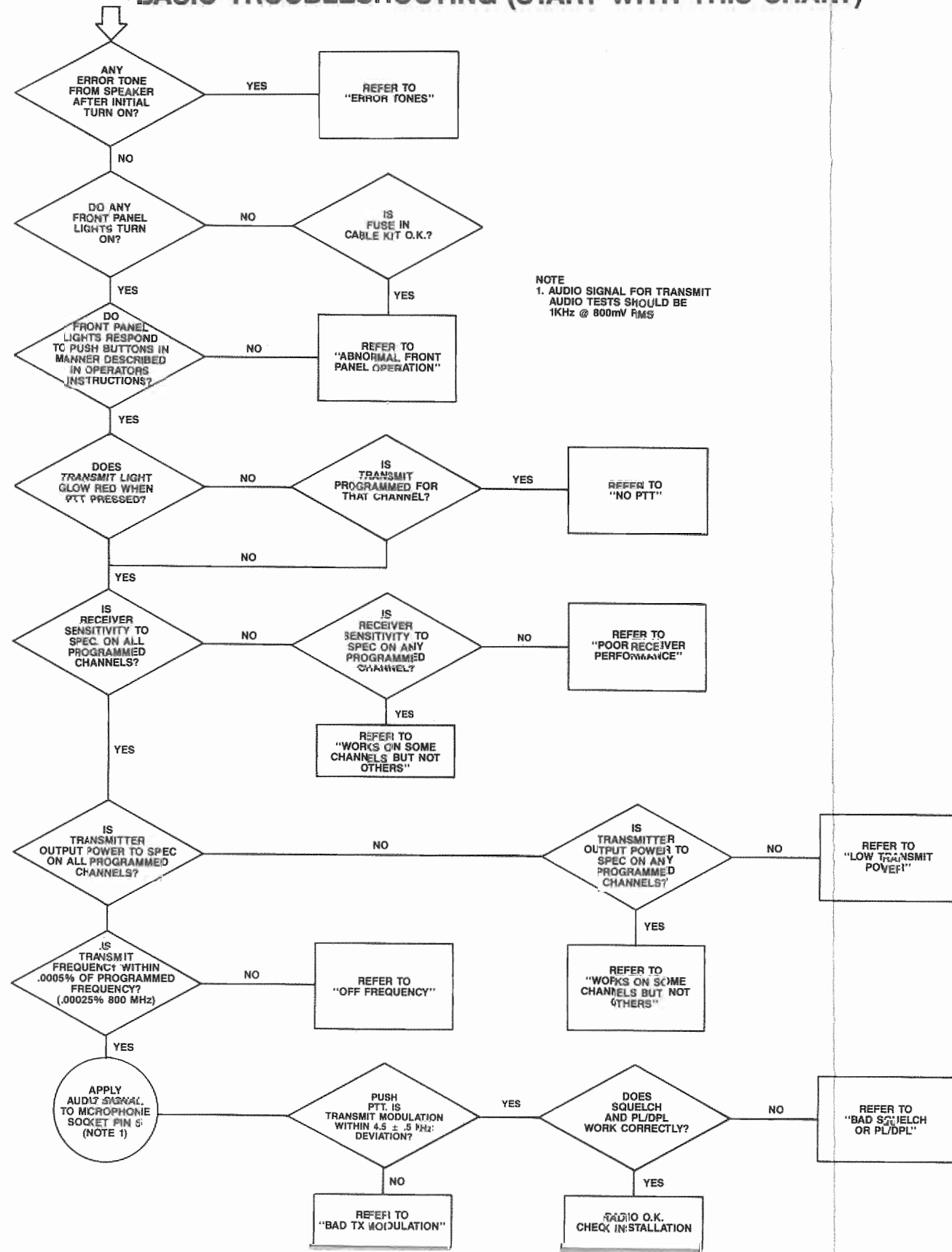
Failure to perform the required calibration procedure will affect the performance of the Reference Oscillator, RF Power Leveling and Protection, and Transmitter Modulation over frequency and temperature. An uncalibrated radio may not comply with FCC rules and may be unreliable at temperature extremes.

The Radius Radio was designed to be serviced at the board level only. There are a number of non-field serviceable parts in the radio. They are identified in the schematic by the shaded areas. Field replacement of these parts will affect the factory calibrated numbers on the Tuning Label. If any of these parts fail, board replacement is the only way to service the radio.

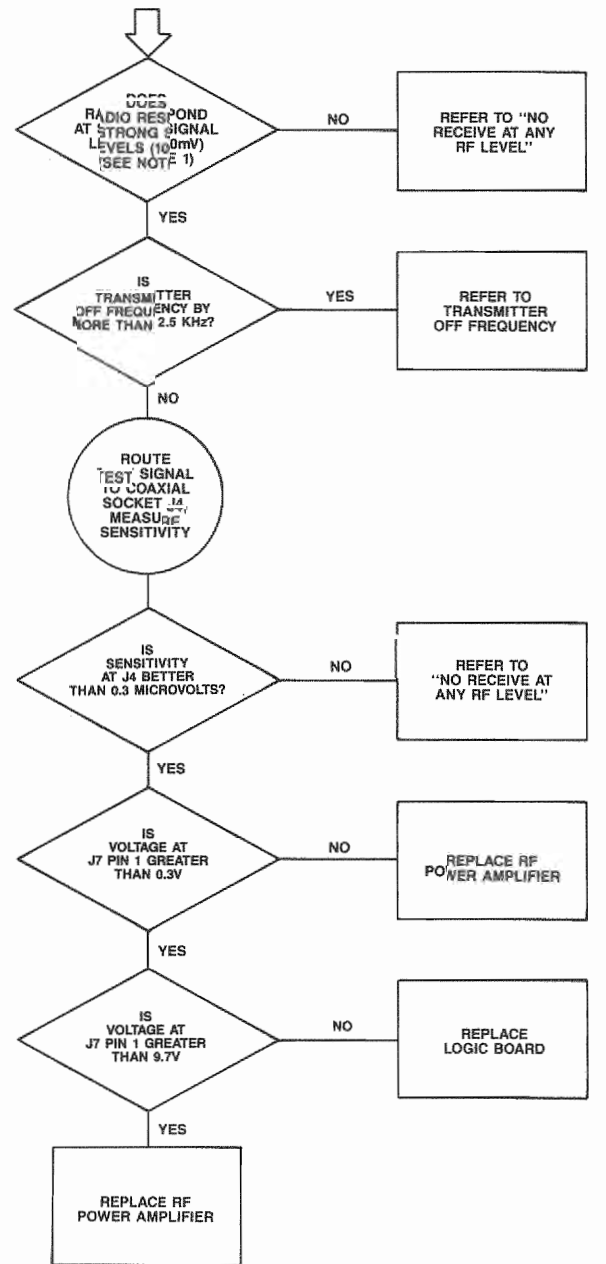
Error Tones

Tone	Problem
High pitch Beep (900Hz 119ms) on initial turn on or when key is pressed.	Normal operation — no error.
Low pitched tone (163Hz) for 5 seconds following turn on.	Code plug error. For all code plug errors try to re-program radio. If this does not clear the fault or if problem recurs, replace the logic board.
Low frequency (163Hz) continuous tone present whenever radio is on.	Logic board failure. Replace logic board.
Low pitch beep (300Hz 200 MS) when a button is pressed.	Button is not allowed in the current operating condition. Change operating condition (select another mode, etc.)
Low frequency (150Hz or 112.5Hz) continuous tone while PTT is held.	Transmit is not allowed. If it was time-out-timer, you may release PTT then continue your call.

BASIC TROUBLESHOOTING (START WITH THIS CHART)



POOR RECEIVER PERFORMANCE



NOTE 1. RF SIGNAL SHOULD BE MODULATED WITH 1 KHz @ ± 3 Hz DEVIATION

IMPORTANT
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 6.

LOW TRANSMITTER POWER

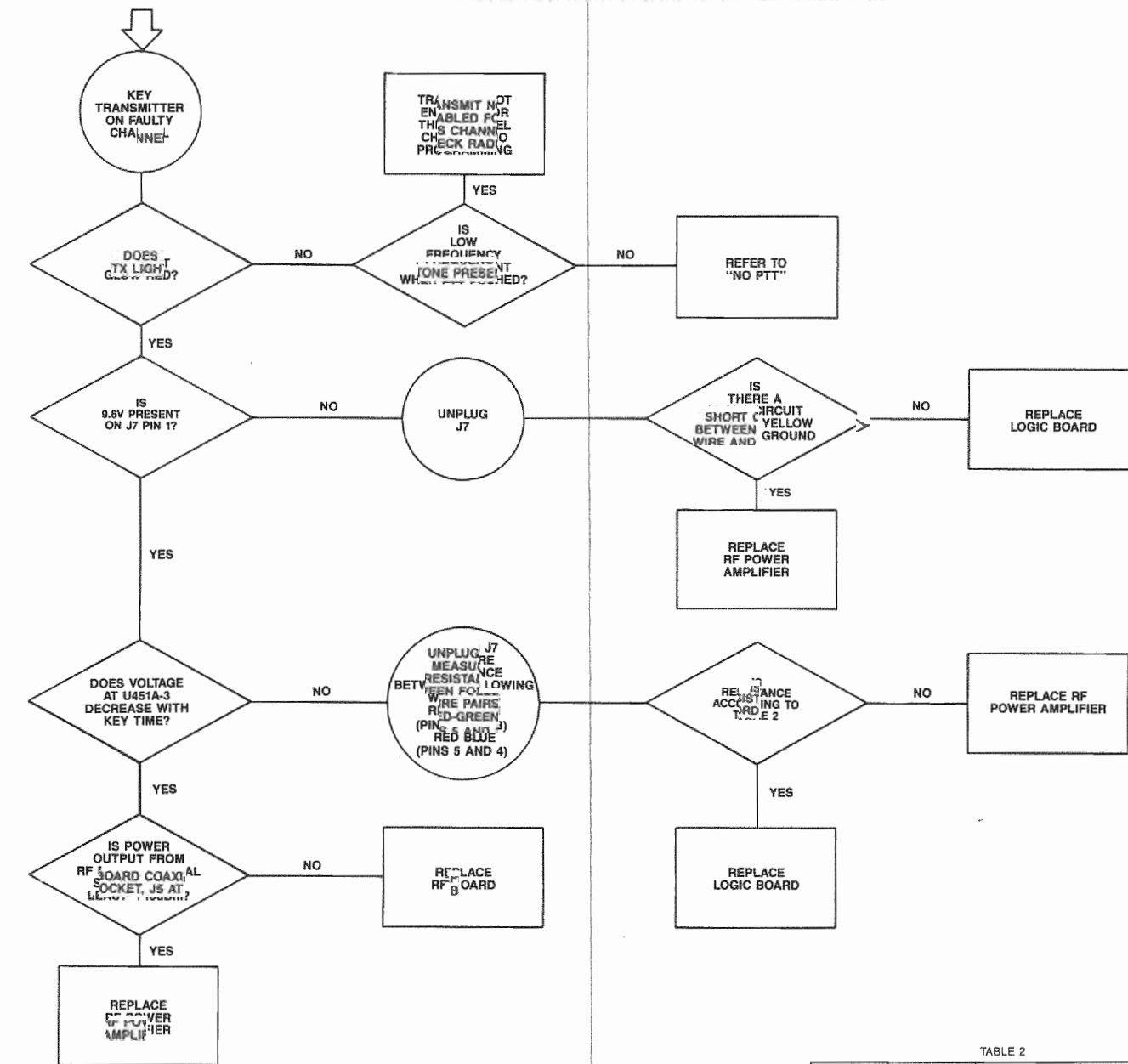
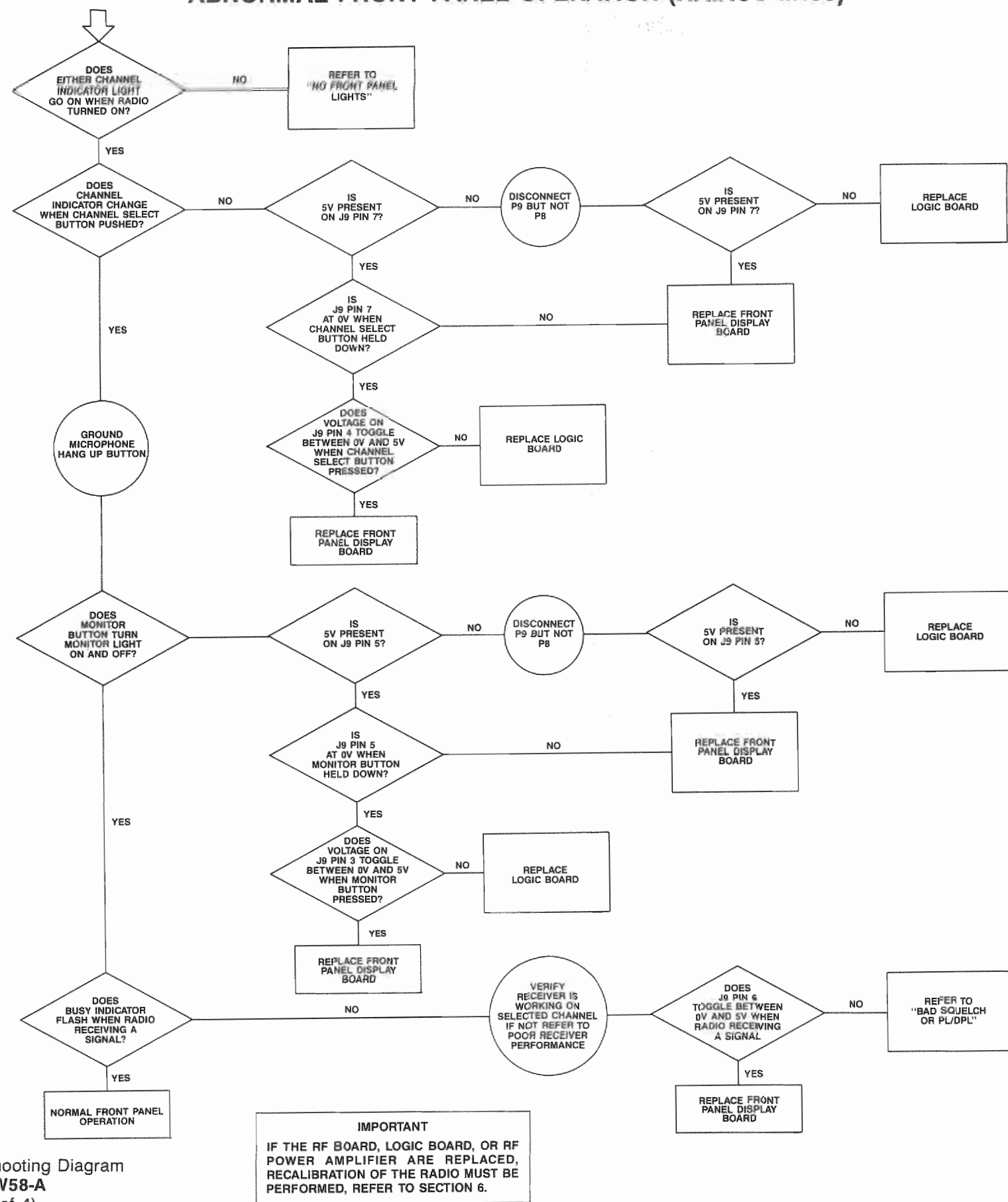


TABLE 2

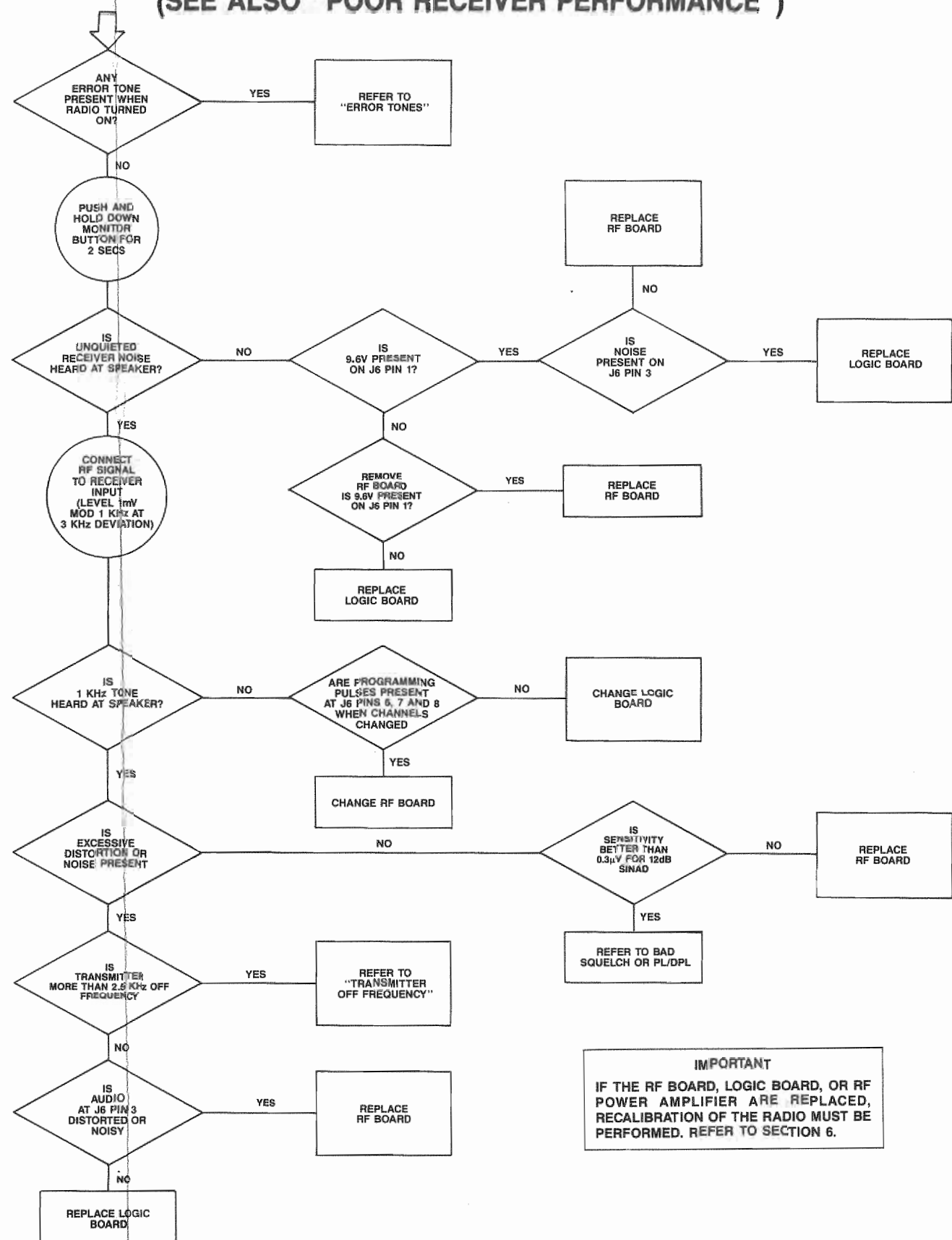
BAND	POWER	WIRE PAIR	RESISTANCE
VHF	25W	RED-GREEN	43 OHMS
VHF	25W	RED-BLUE	0.05 OHMS
VHF	40W	RED-GREEN	15 OHMS
VHF	40W	RED-BLUE	0.01 OHMS
UHF	25W	RED-GREEN	39 OHMS
UHF	25W	RED-BLUE	0.05 OHMS
UHF	35W	RED-GREEN	12 OHMS
UHF	35W	RED-BLUE	0.01 OHMS
800	15W	RED-GREEN	39 OHMS
800	15W	RED-BLUE	0.05 OHMS

IMPORTANT
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 6.

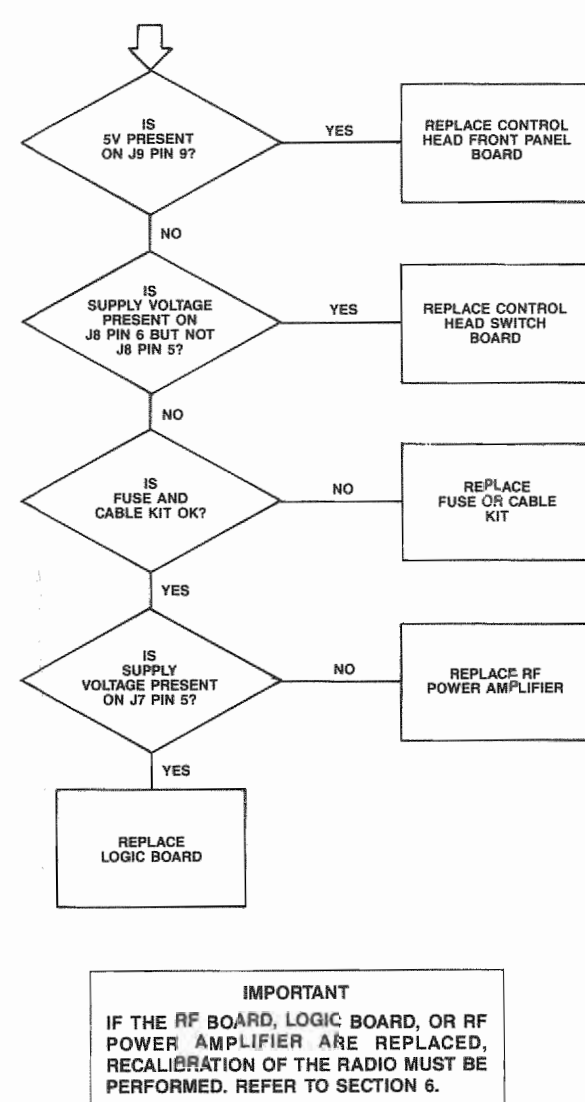
ABNORMAL FRONT PANEL OPERATION (RADIUS M100)



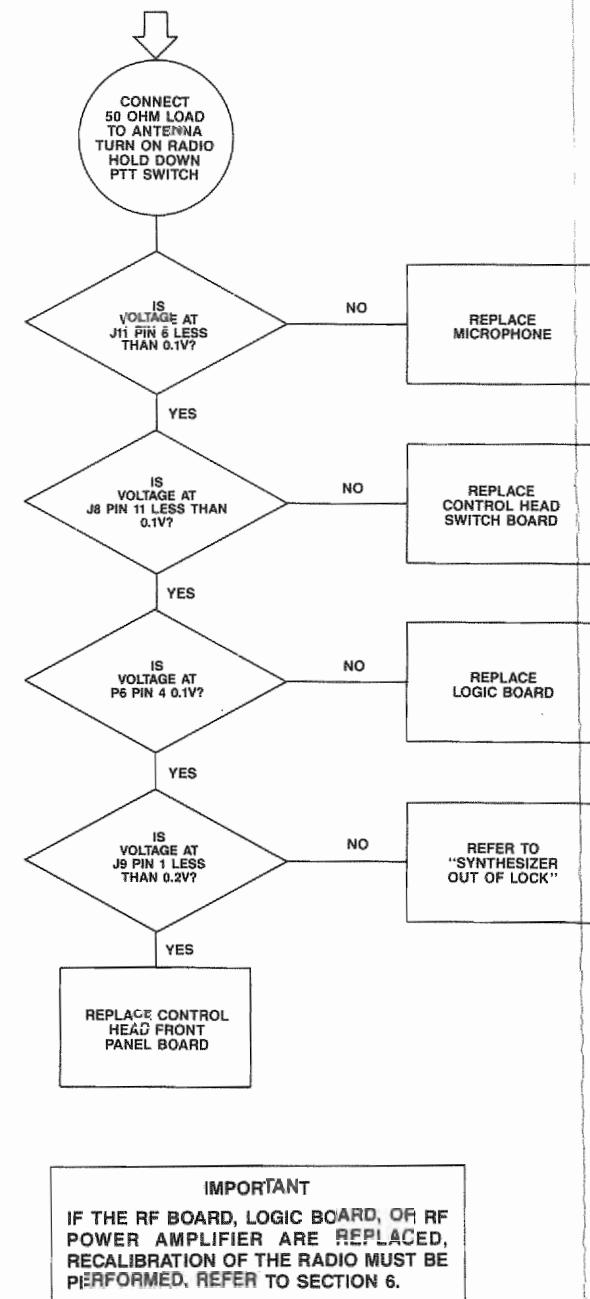
NO RECEIVE AT ANY RF LEVEL (SEE ALSO "POOR RECEIVER PERFORMANCE")



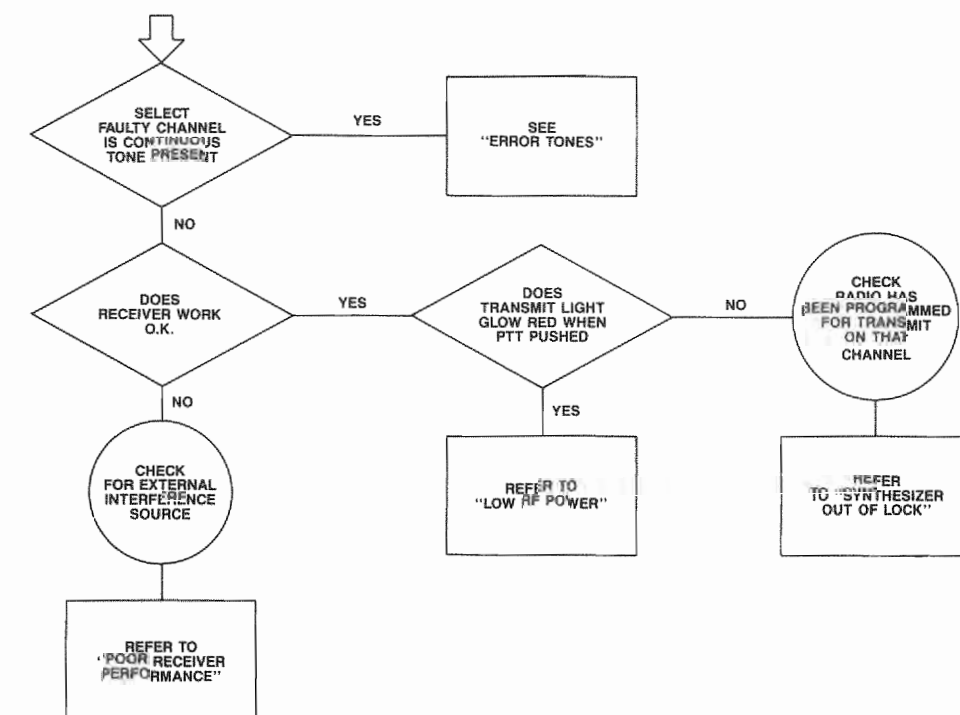
NO FRONT PANEL LIGHTS (RADIUS M100)



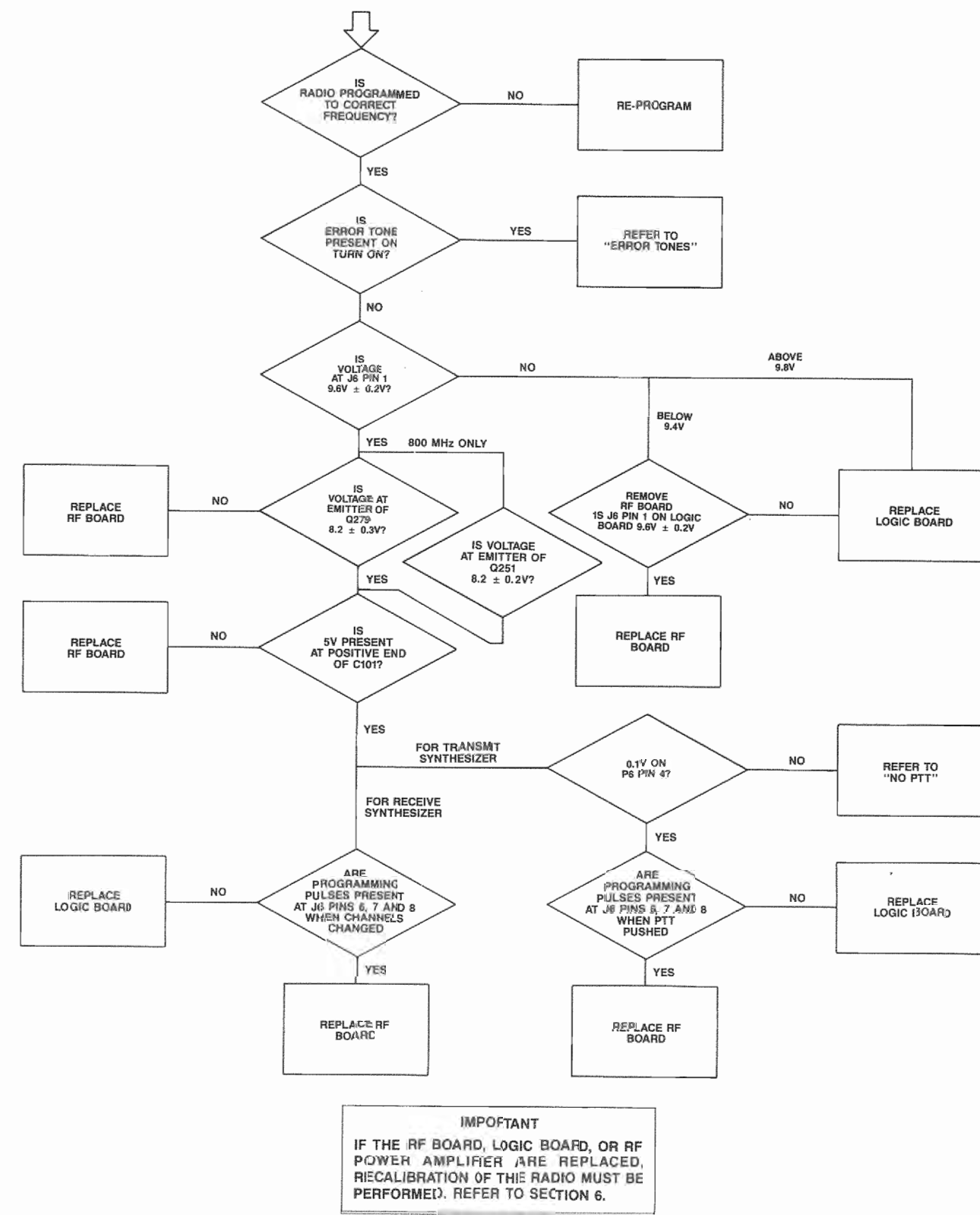
NO PTT



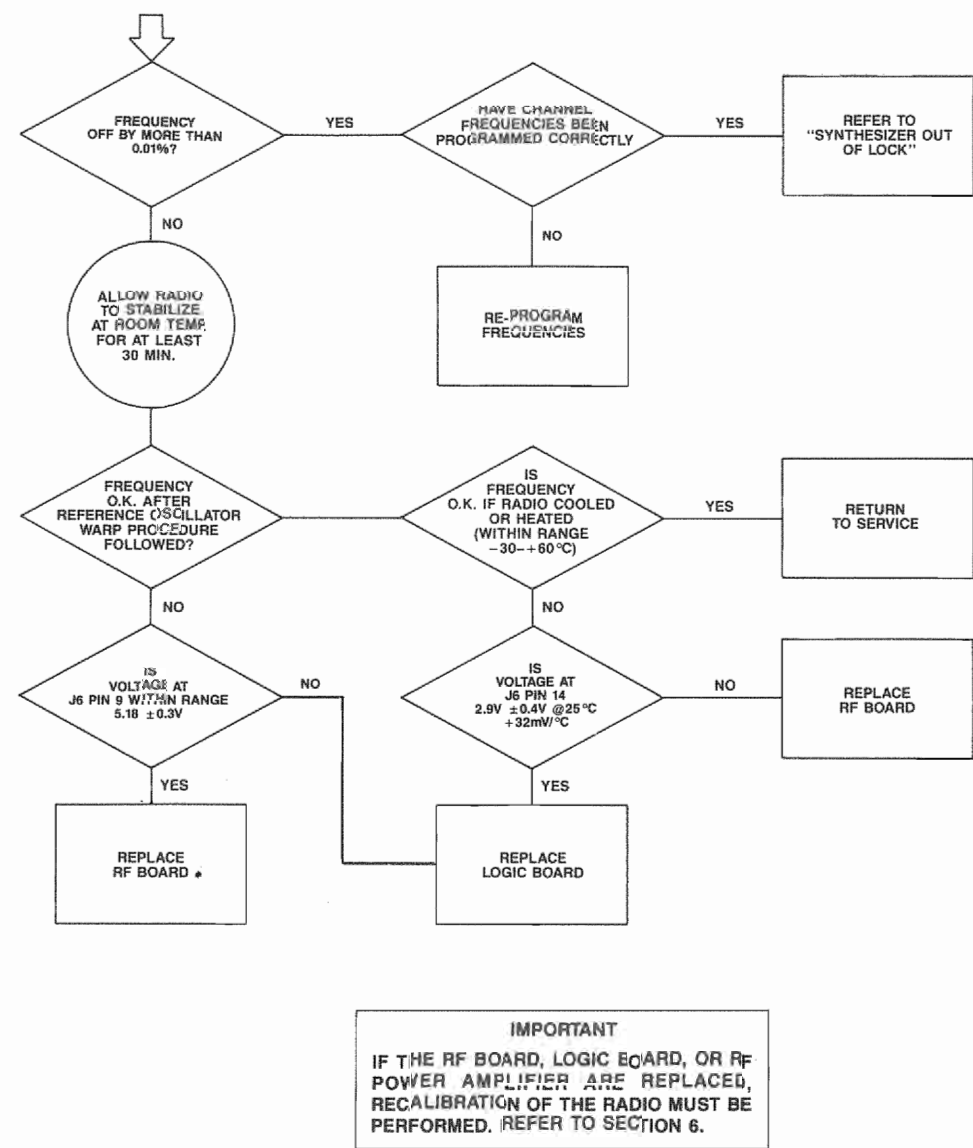
RADIO WORKS ON SOME CHANNELS BUT NOT OTHERS



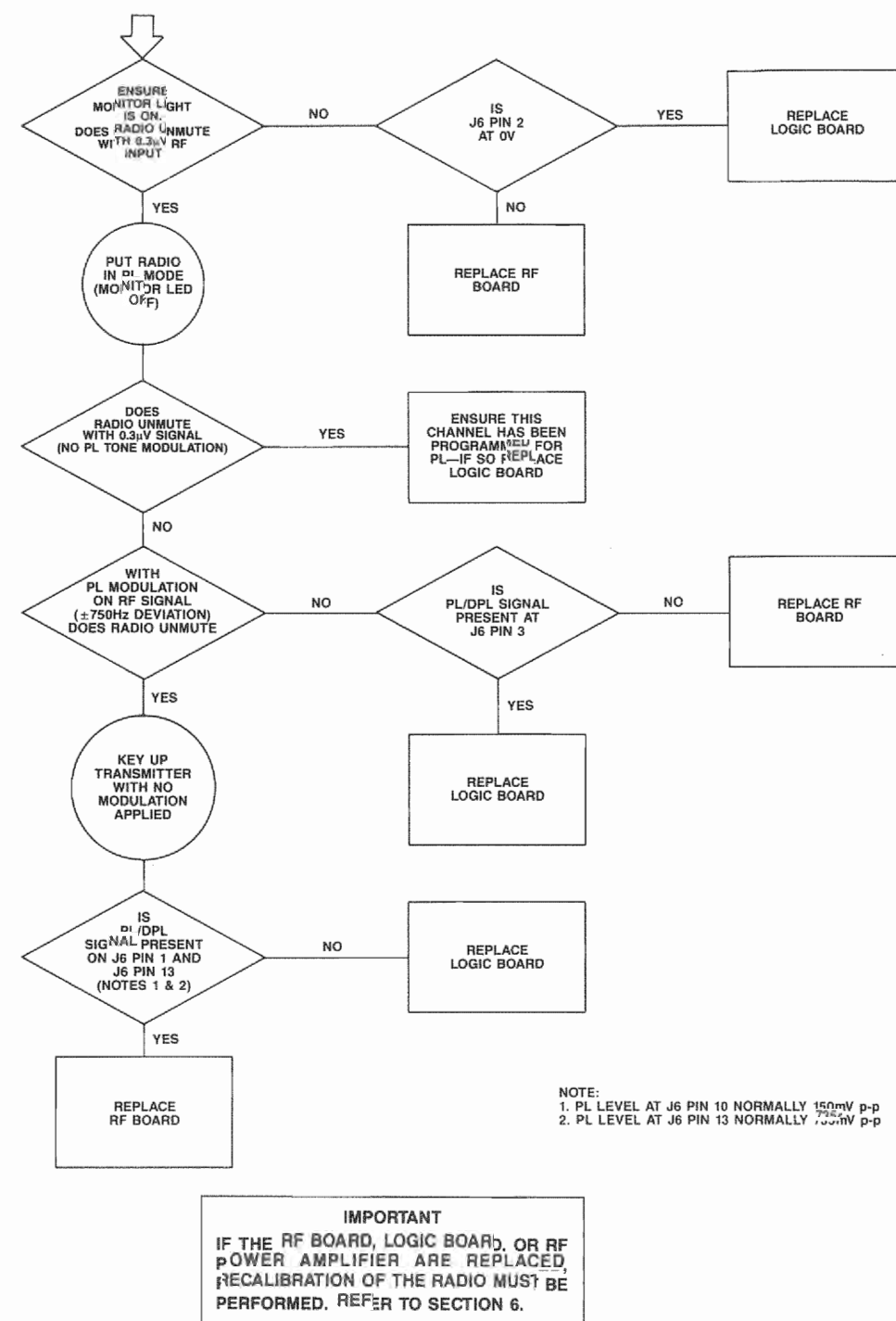
SYNTHESIZER OUT OF LOCK



TRANSMITTER OFF FREQUENCY



BAD SQUELCH OR PL/DPL



BAD TX MODULATION

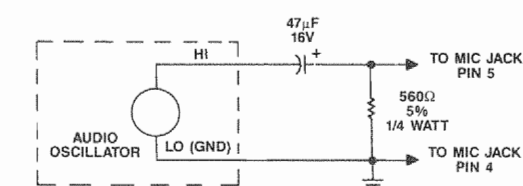
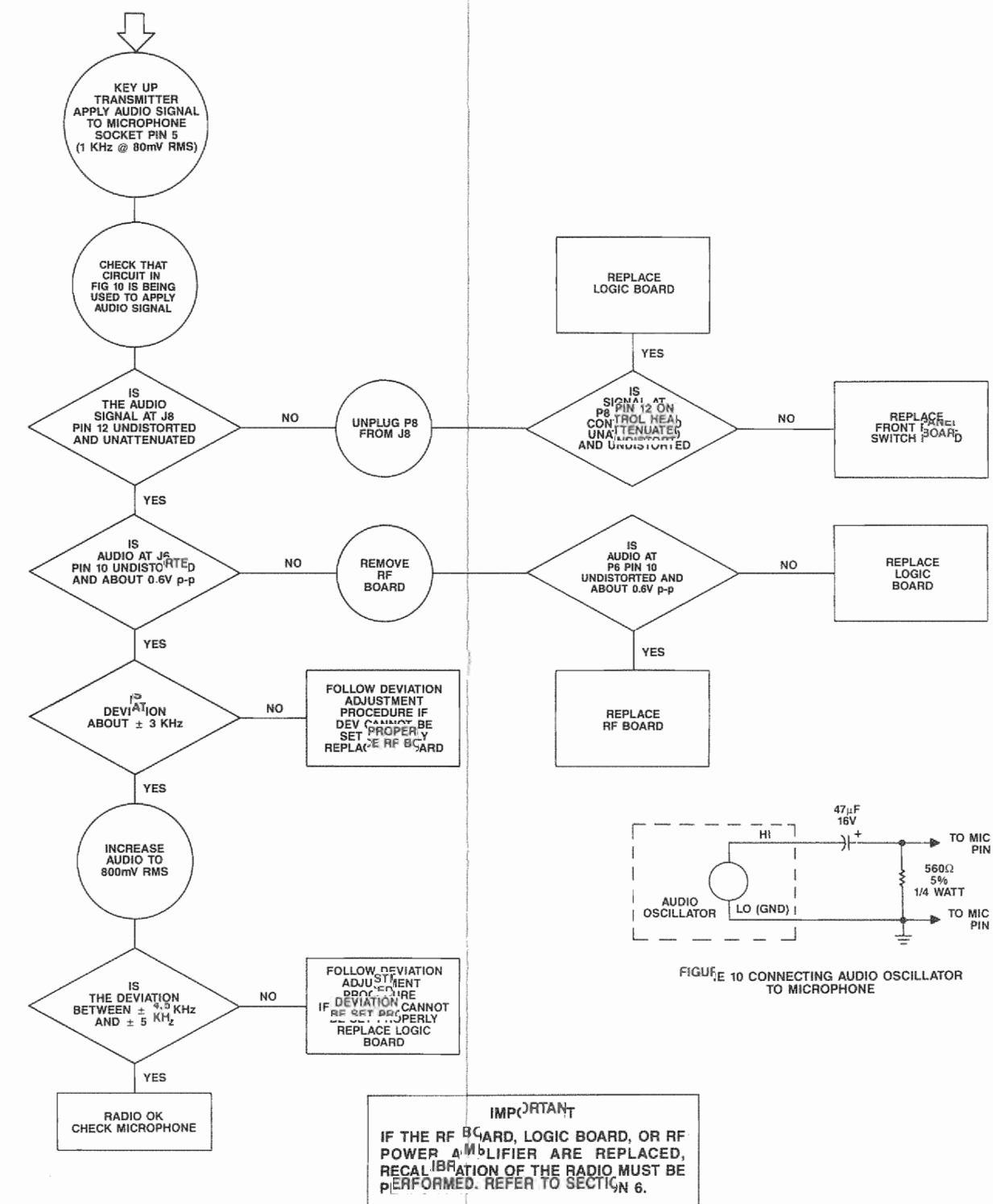
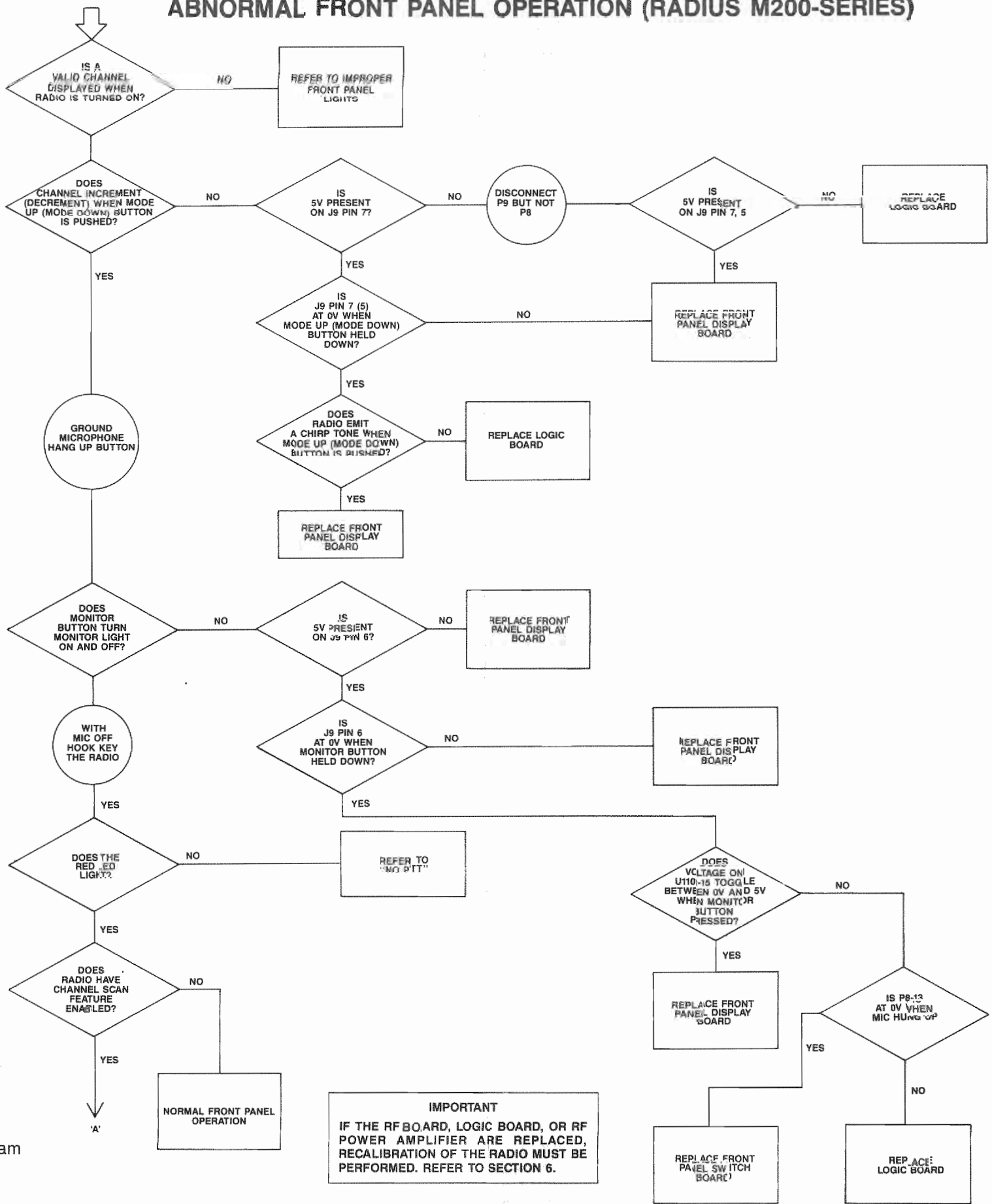


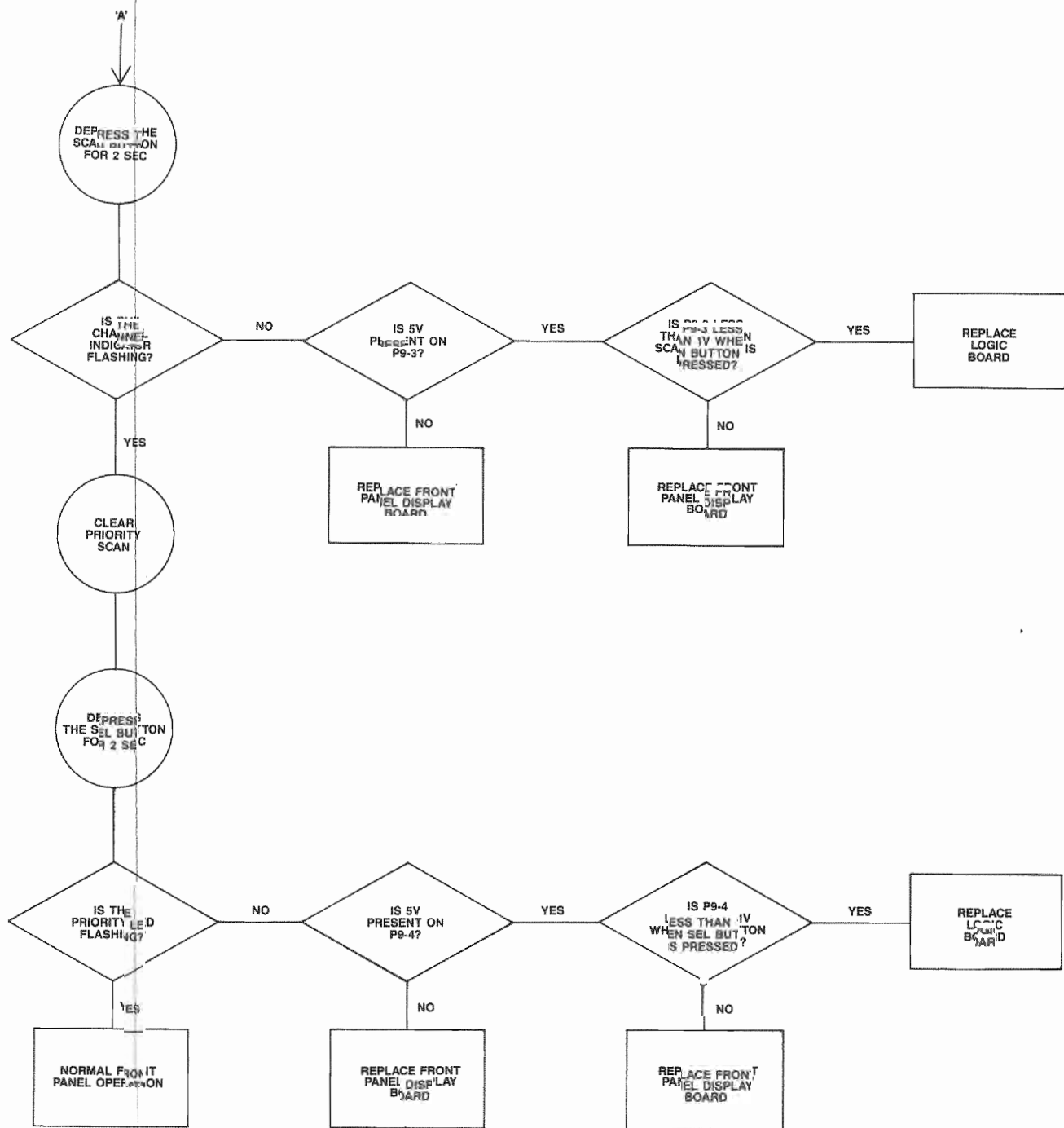
FIGURE 10 CONNECTING AUDIO OSCILLATOR TO MICROPHONE

ABNORMAL FRONT PANEL OPERATION (RADIUS M200-SERIES)



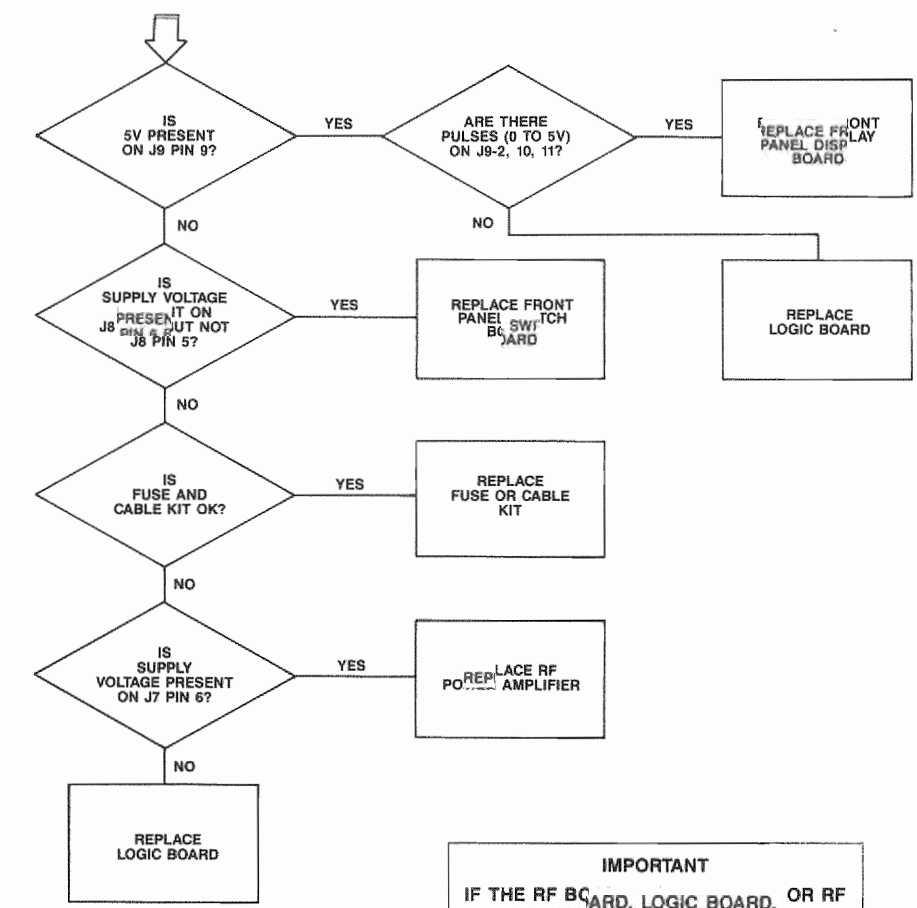
IMPORTANT
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 6.

ABNORMAL FRONT PANEL OPERATION CONT'D (FOR RADIOS WITH CHANNEL SCAN FEATURES)

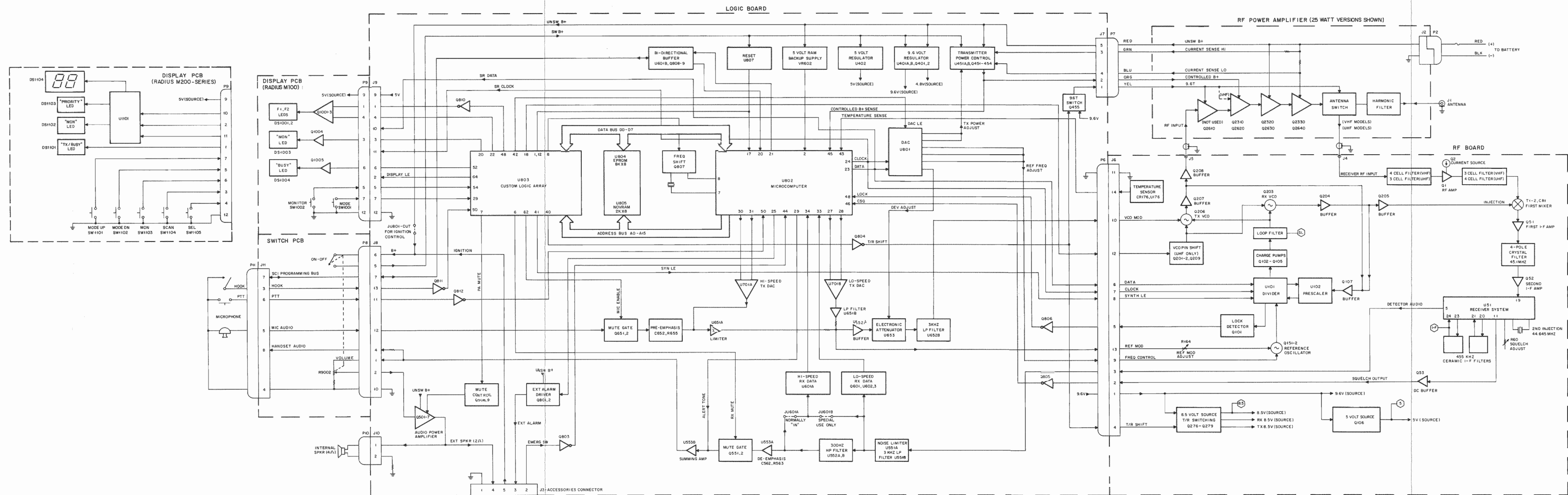


IMPORTANT
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 6.

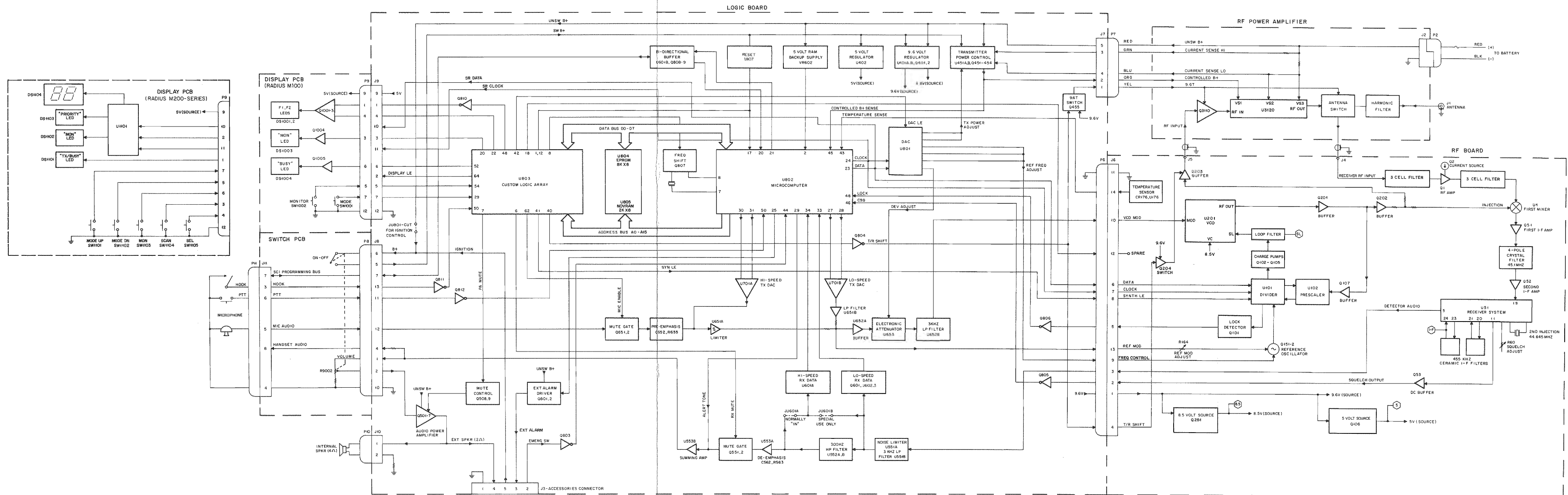
IMPROPER FRONT PANEL LIGHTS (RADIUS M200-SERIES)

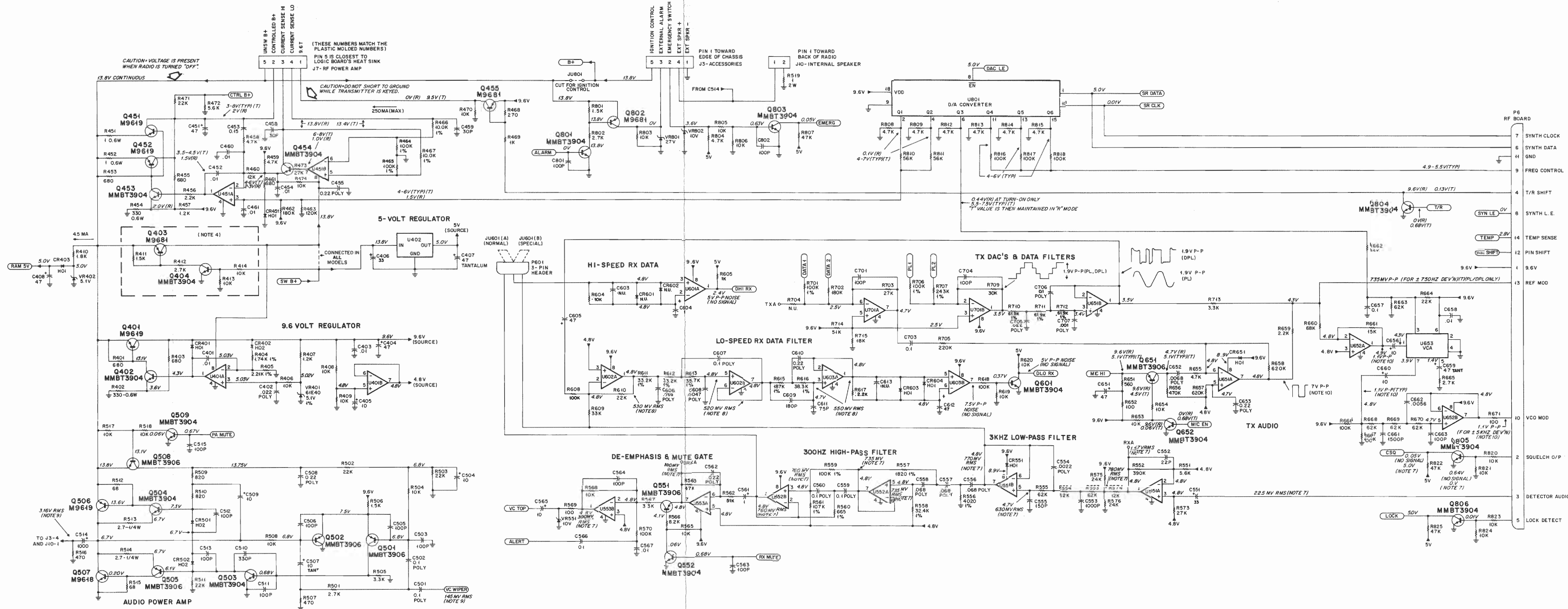


IMPORTANT
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 6.

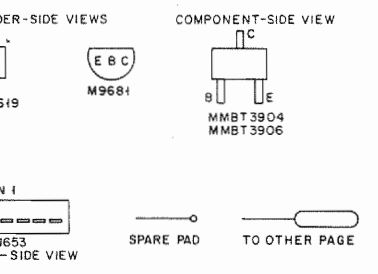


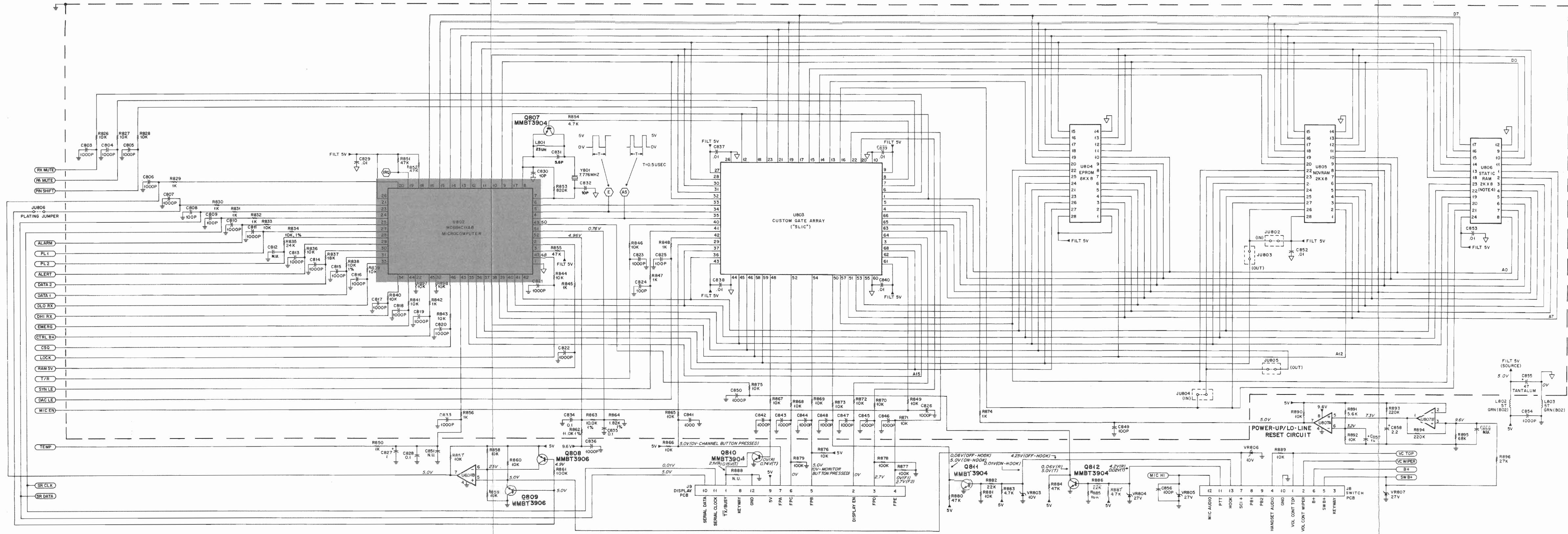
Functional Block Diagram
VHF/UHF Models
6880101W58-A
1-1988



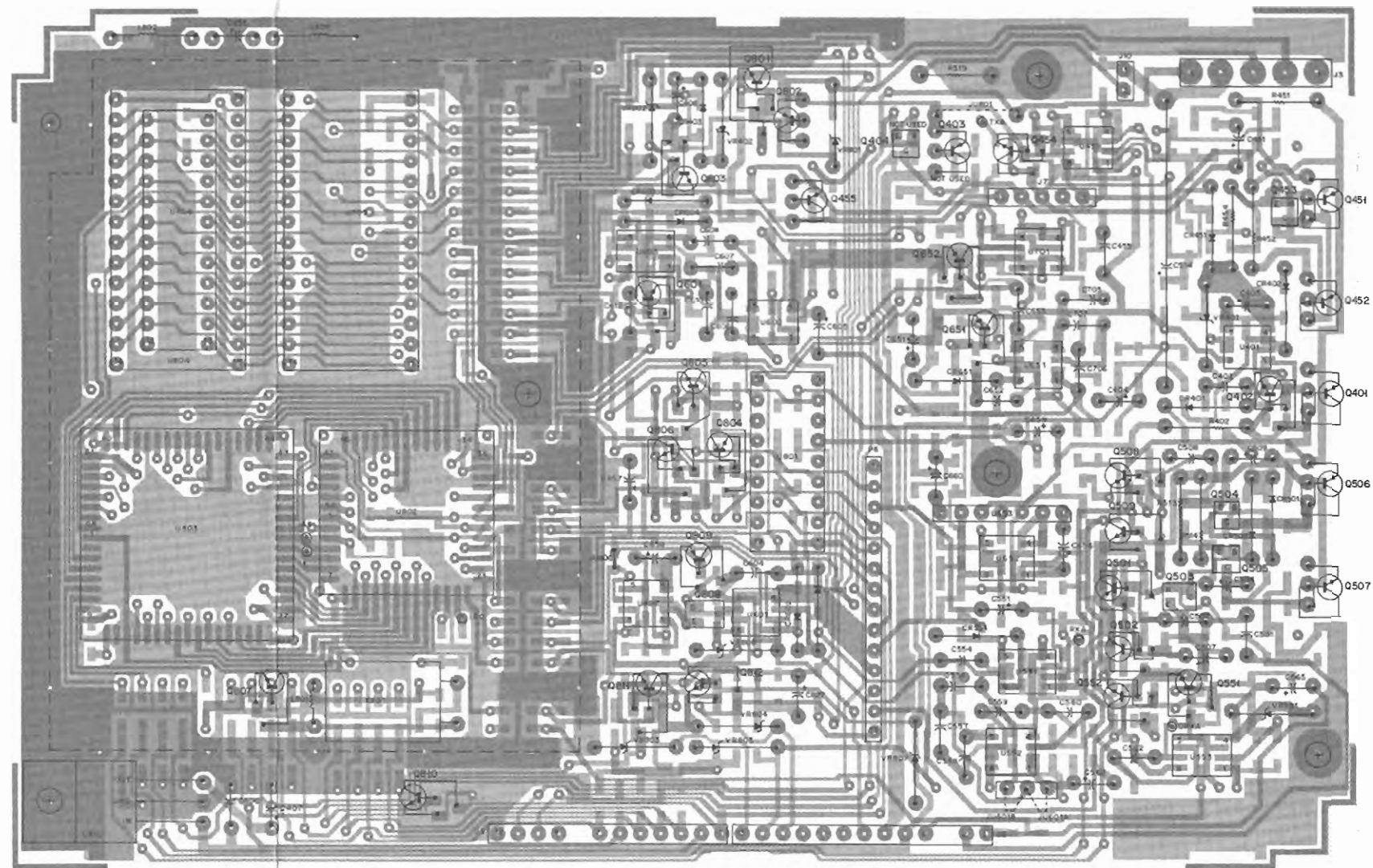


- NOTES:
- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN MICROFARADS, INDUCTOR VALUES ARE IN MICROHENRIES.
 - NON-POLARIZED CAPACITORS ARE CHIP-TYPE UNLESS OTHERWISE INDICATED.
 - POLARIZED CAPACITORS ARE ALUMINUM ELECTROLYTIC TYPE UNLESS OTHERWISE INDICATED.
 - NOT USED.
 - DC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE (10 MEGOHM) DC VOLTMETER.
 - ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:
(R) RECEIVE MODE
(T) TRANSMIT MODE
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION. MEASURED WITH AN AC RMS VOLTMETER.
 - SAME AS NOTE 7, EXCEPT MODULATING FREQUENCY IS 100 HZ.
 - SAME AS NOTE 7, EXCEPT WITH VOLUME CONTROL ADJUSTED FOR 5 WATTS (3.16 VOLTS RMS ACROSS 2 OHM LOAD).
 - MEASURED IN THE TRANSMIT MODE WITH 1 KHZ, 800 MV RMS SIGNAL APPLIED TO MICROPHONE INPUT FROM 600 OHM SOURCE.





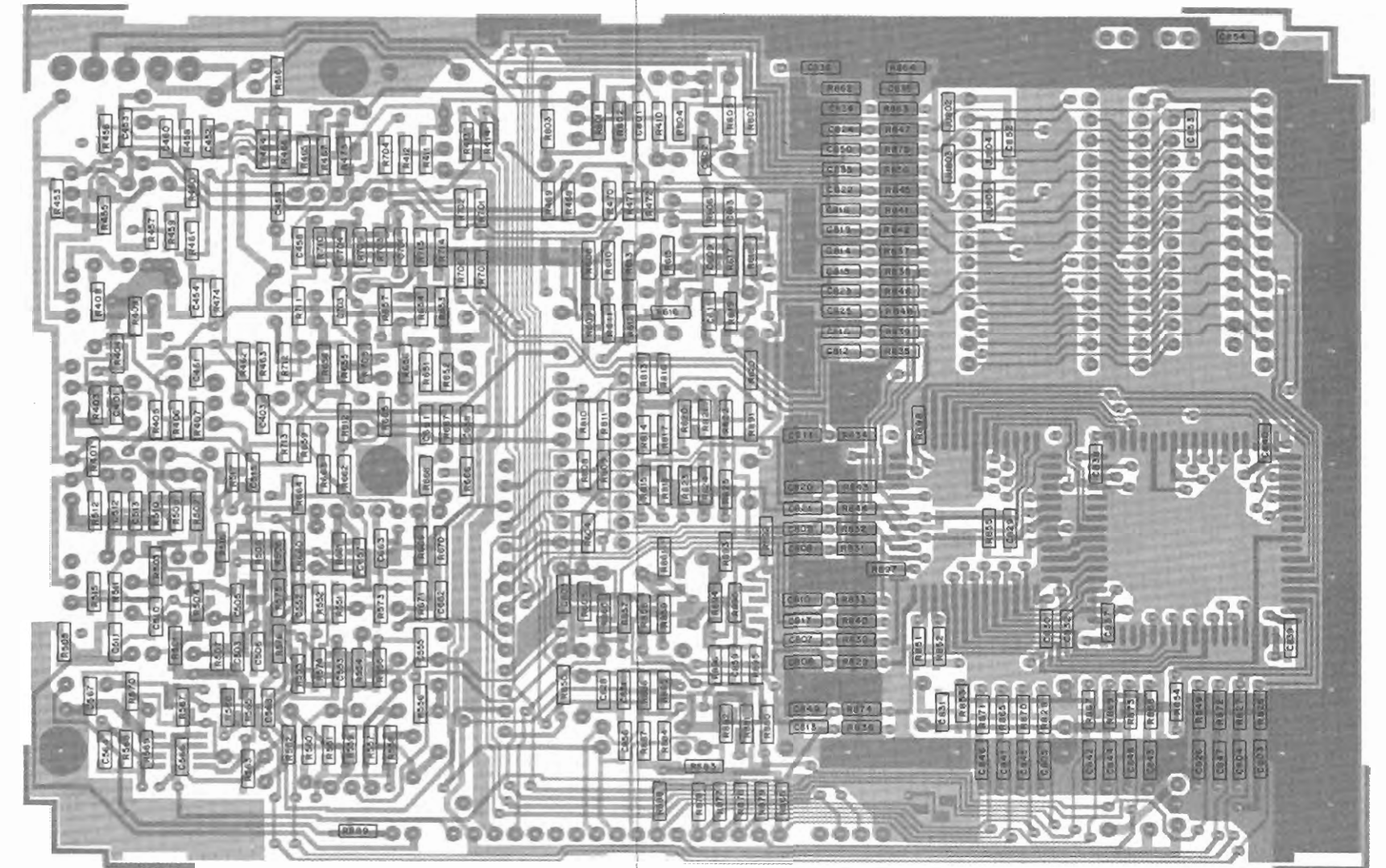
IMPORTANT
 COMPONENTS WITHIN SHADED AREA ARE NOT FIELD-SERVICEABLE. IF SERVICING IS REQUIRED, THE ENTIRE BOARD MUST BE REPLACED. REFER TO SECTION 6.



COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

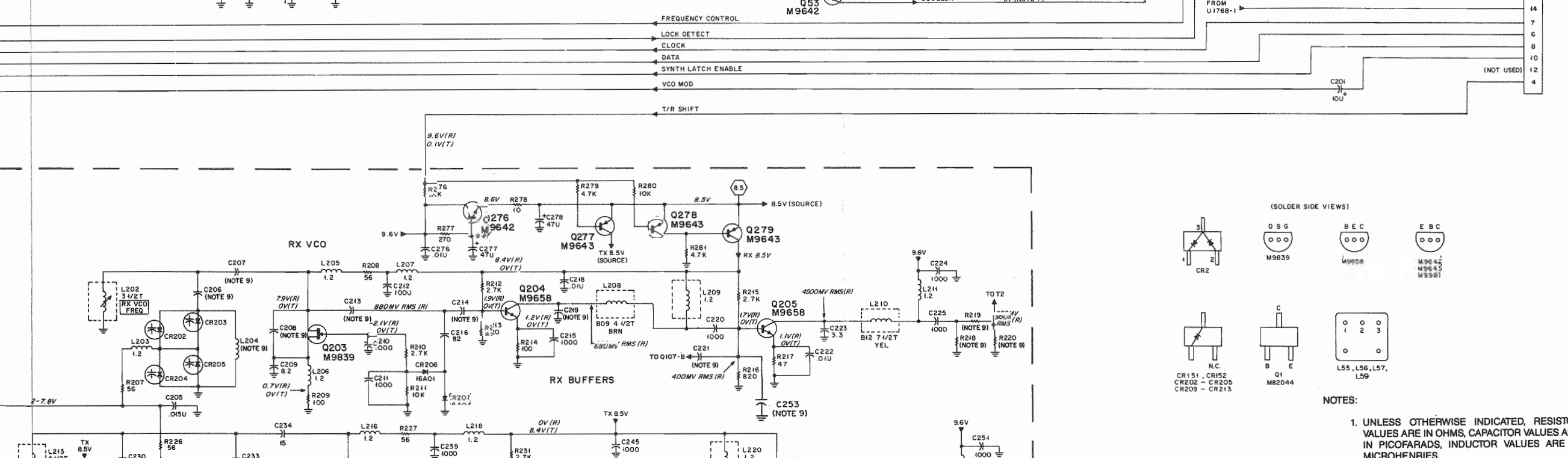
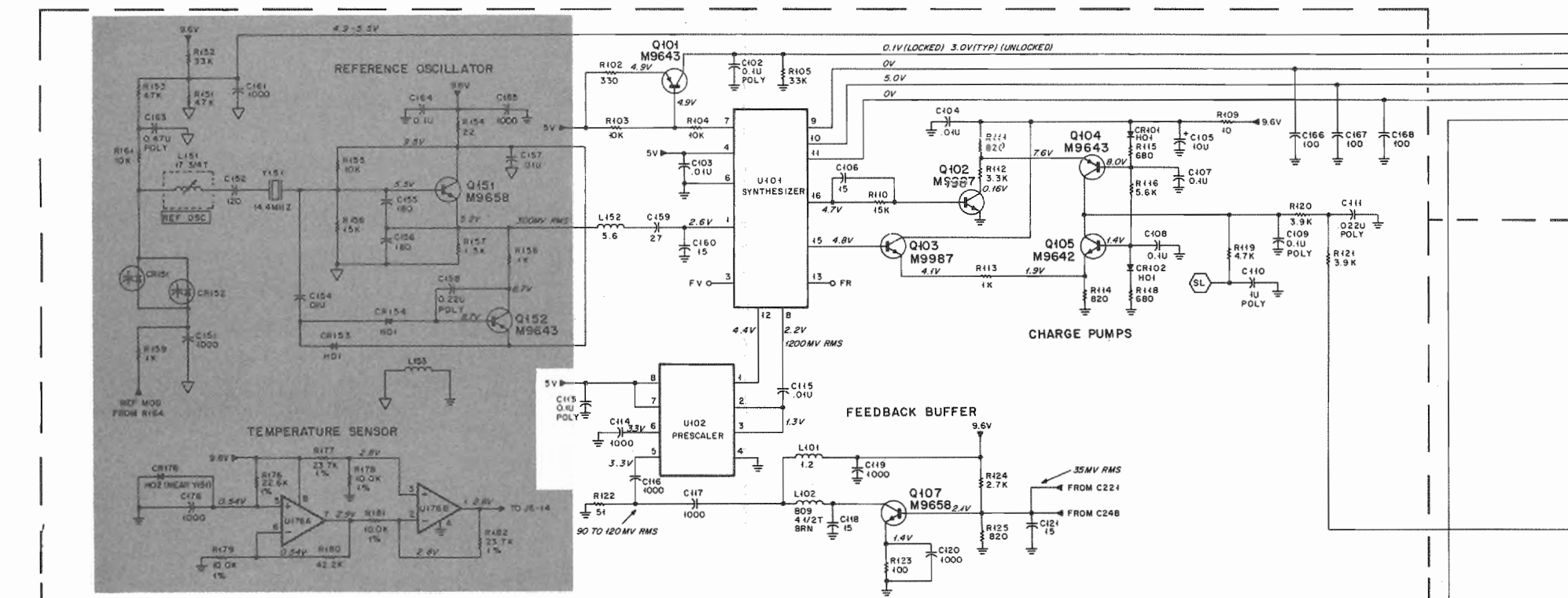
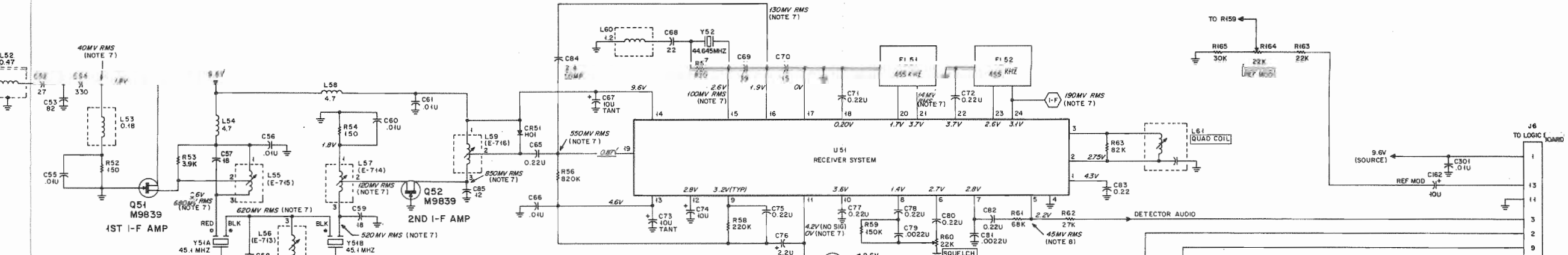
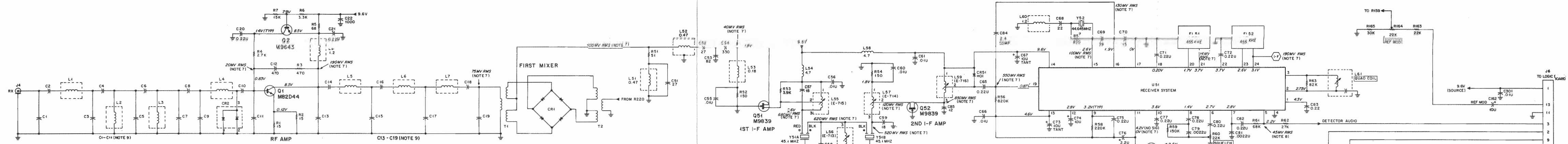
SHOWN FROM COMPONENT SIDE

NOTE: INNER TWO LAYERS NOT SHOWN

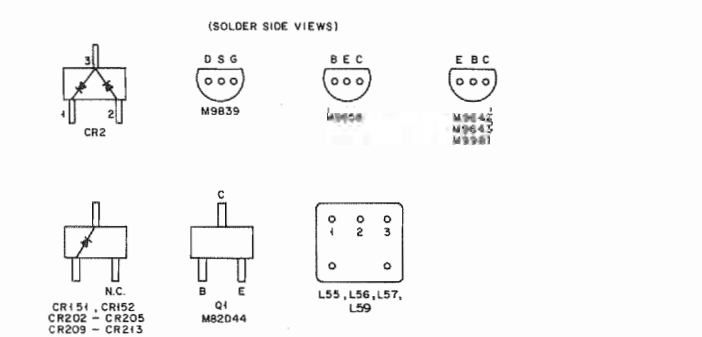


COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

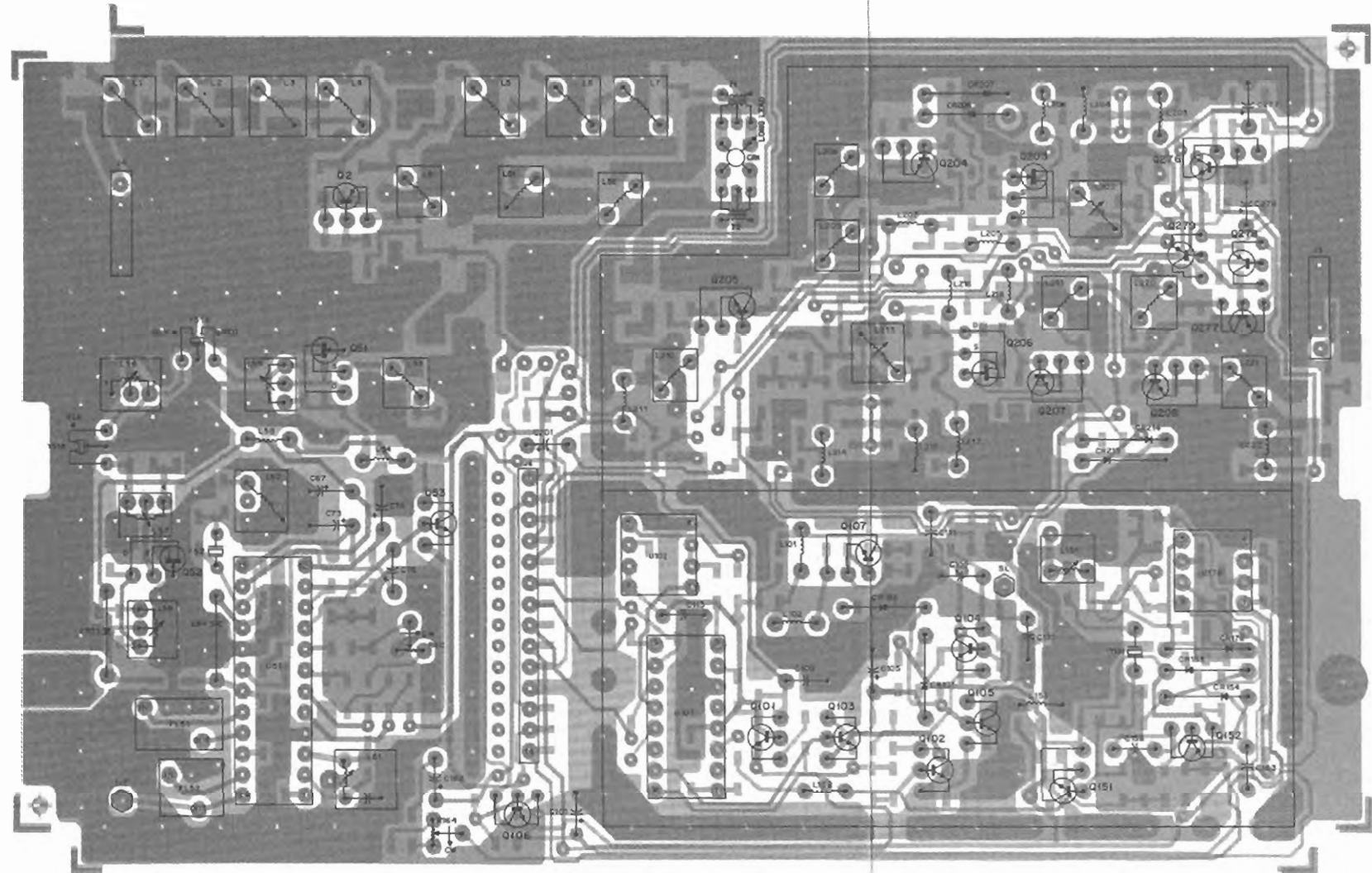
SHOWN FROM SOLDER SIDE



IMPORTANT
COMPONENTS WITHIN SHADED AREA ARE NOT FIELD-SERVICEABLE. IF SERVICING IS REQUIRED, THE ENTIRE BOARD MUST BE REPLACED. REFER TO SECTION 6.

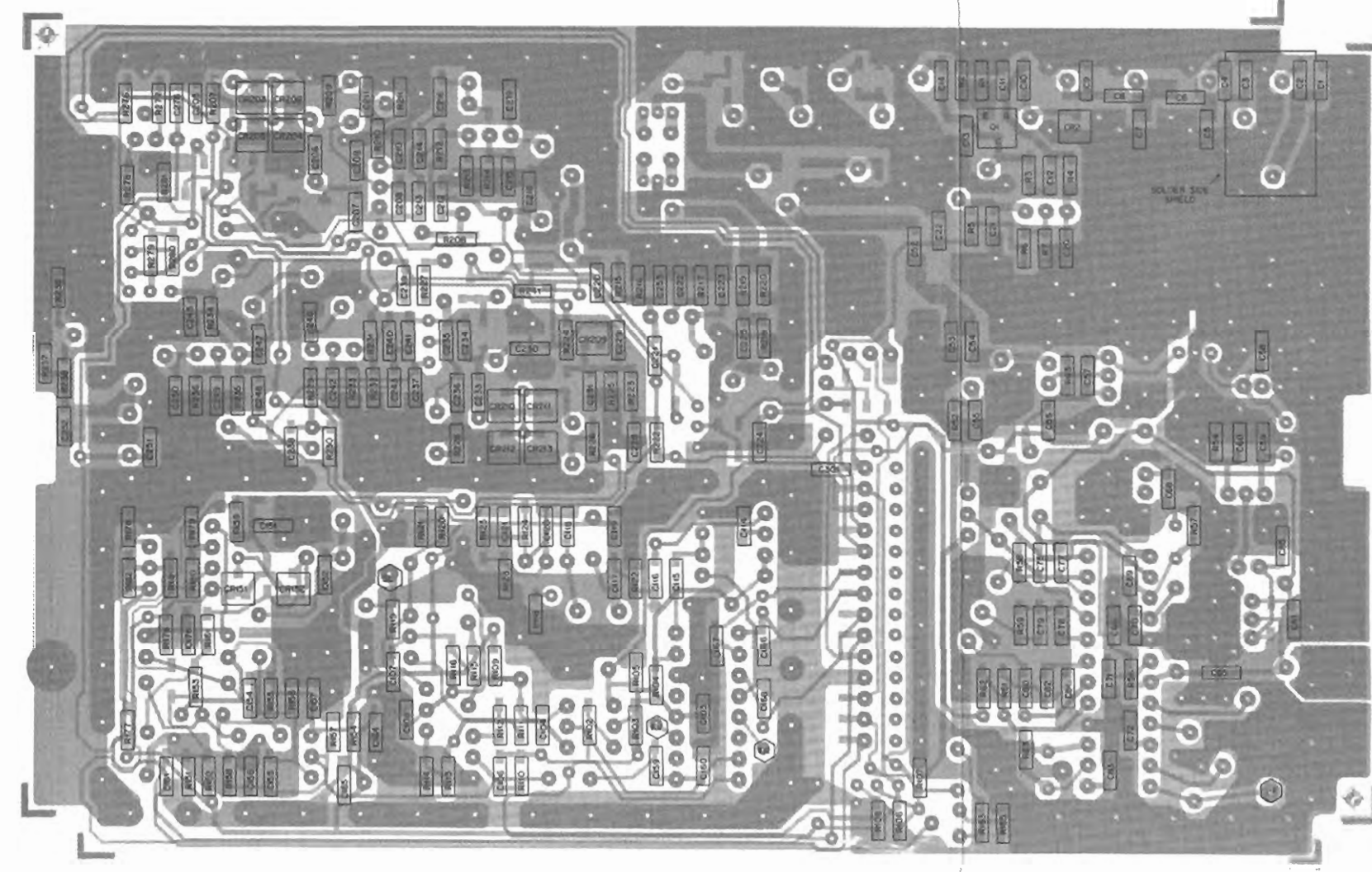


- NOTES:
- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN PICOFARADS, INDUCTOR VALUES ARE IN MICROHENRIES.
 - NON-POLARIZED CAPACITORS ARE CHIPTYPE UNLESS OTHERWISE INDICATED.
 - POLARIZED CAPACITORS ARE ALUMINUM ELECTROLYTIC TYPE UNLESS OTHERWISE INDICATED.
 - DC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE (10 MEGOHM) DC VOLTMETER.
 - AC RF VOLTAGES ARE MEASURED WITH A HIGH-IMPEDANCE RF MILLIVOLTMETER.
 - ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:
(R) RECEIVE MODE
(T) TRANSMIT MODE
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL UNMODULATED SIGNAL AT A LEVEL OF -20 DBM.
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION. MEASURED WITH AN AC RMS VOLTMETER.
 - COMPONENT VALUE IS RANGE SENSITIVE. REFER TO PARTS LIST FOR VALUE.



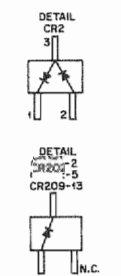
SHOWN FROM COMPONENT SIDE

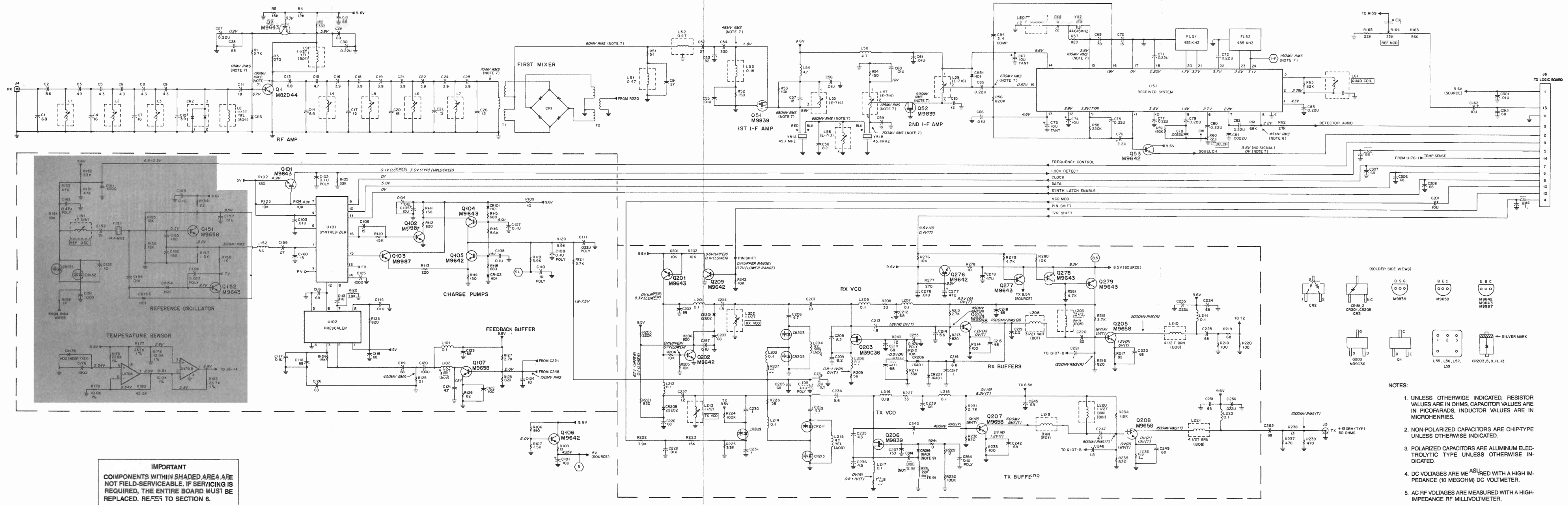
COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —



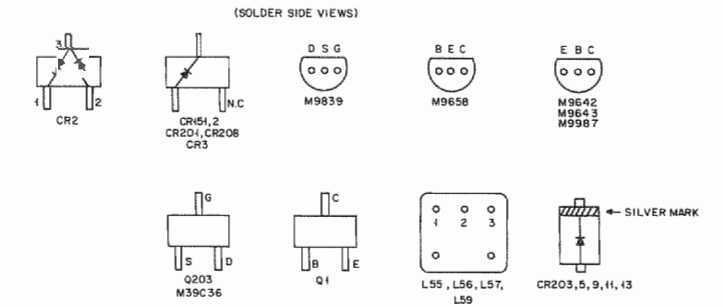
SHOWN FROM SOLDER SIDE

COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

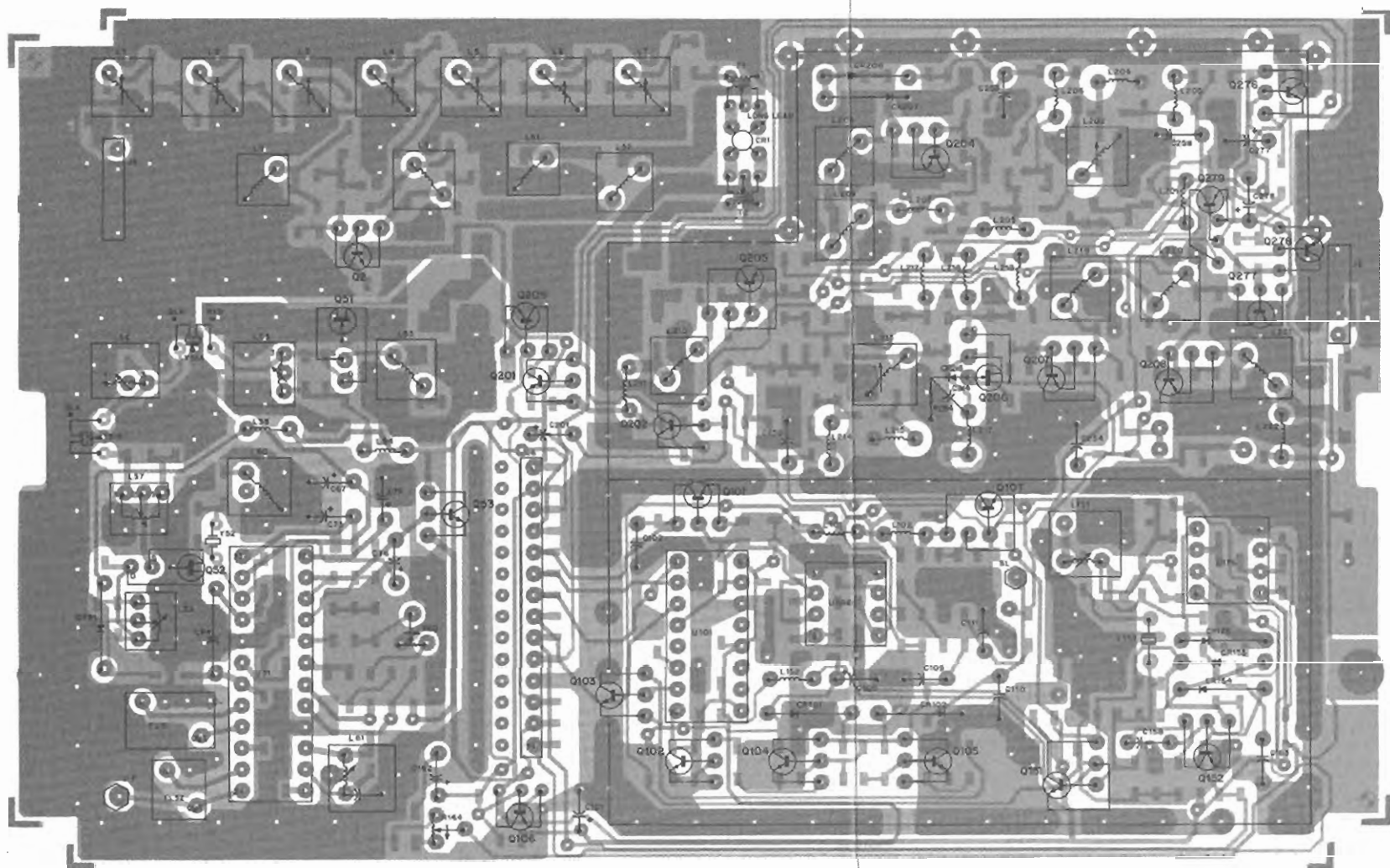




IMPORTANT
COMPONENTS WITHIN SHADED AREA ARE NOT FIELD-SERVICEABLE. IF SERVICING IS REQUIRED, THE ENTIRE BOARD MUST BE REPLACED. REFER TO SECTION 6.

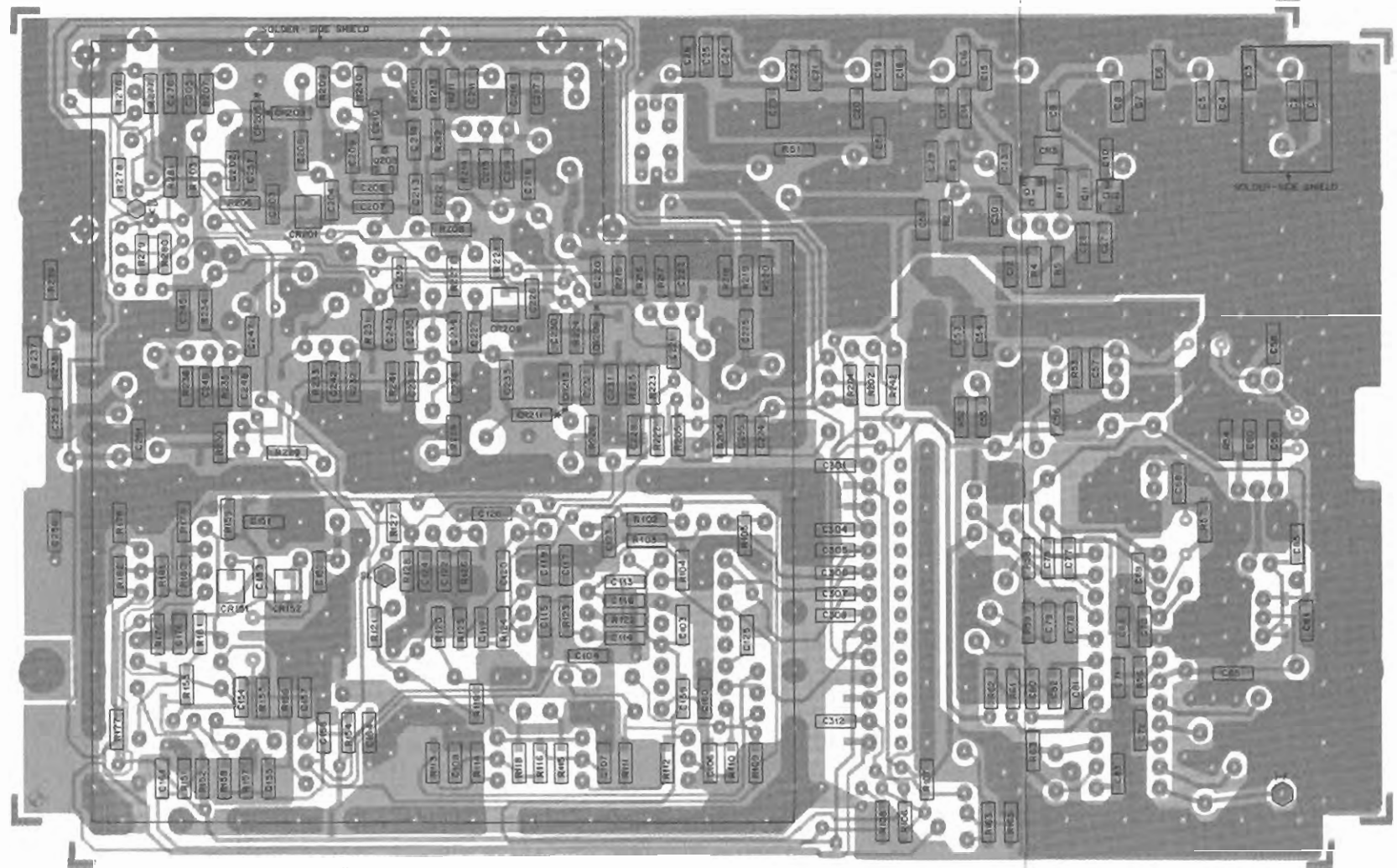


- NOTES:**
- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS. CAPACITOR VALUES ARE IN PICOFARADS, INDUCTOR VALUES ARE IN MICROHENRIES.
 - NON-POLARIZED CAPACITORS ARE CHIP-TYPE UNLESS OTHERWISE INDICATED.
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 - ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:
(R) RECEIVE MODE
(T) TRANSMIT MODE
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL UNMODULATED SIGNAL AT A LEVEL OF -20 DBM.
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION. MEASURED WITH AN AC RMS VOLTMETER.
 - CR216, C314, AND R228 ARE MOUNTED AS AN ASSEMBLY ON THE COMPONENT SIDE OF THE BOARD.



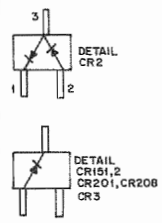
COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

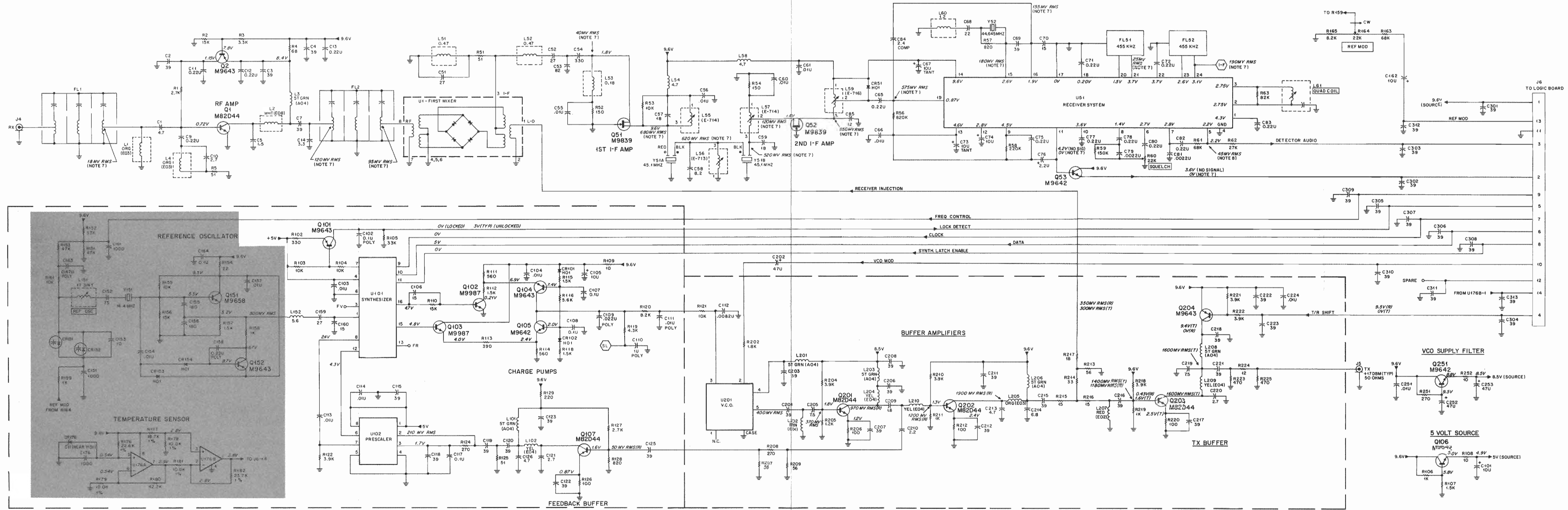
SHOWN FROM THE COMPONENT SIDE



COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

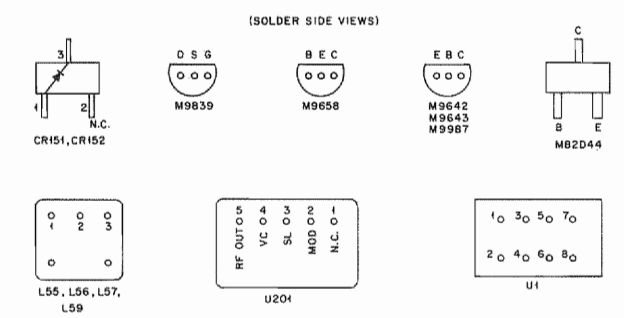
SHOWN FROM SOLDER SIDE

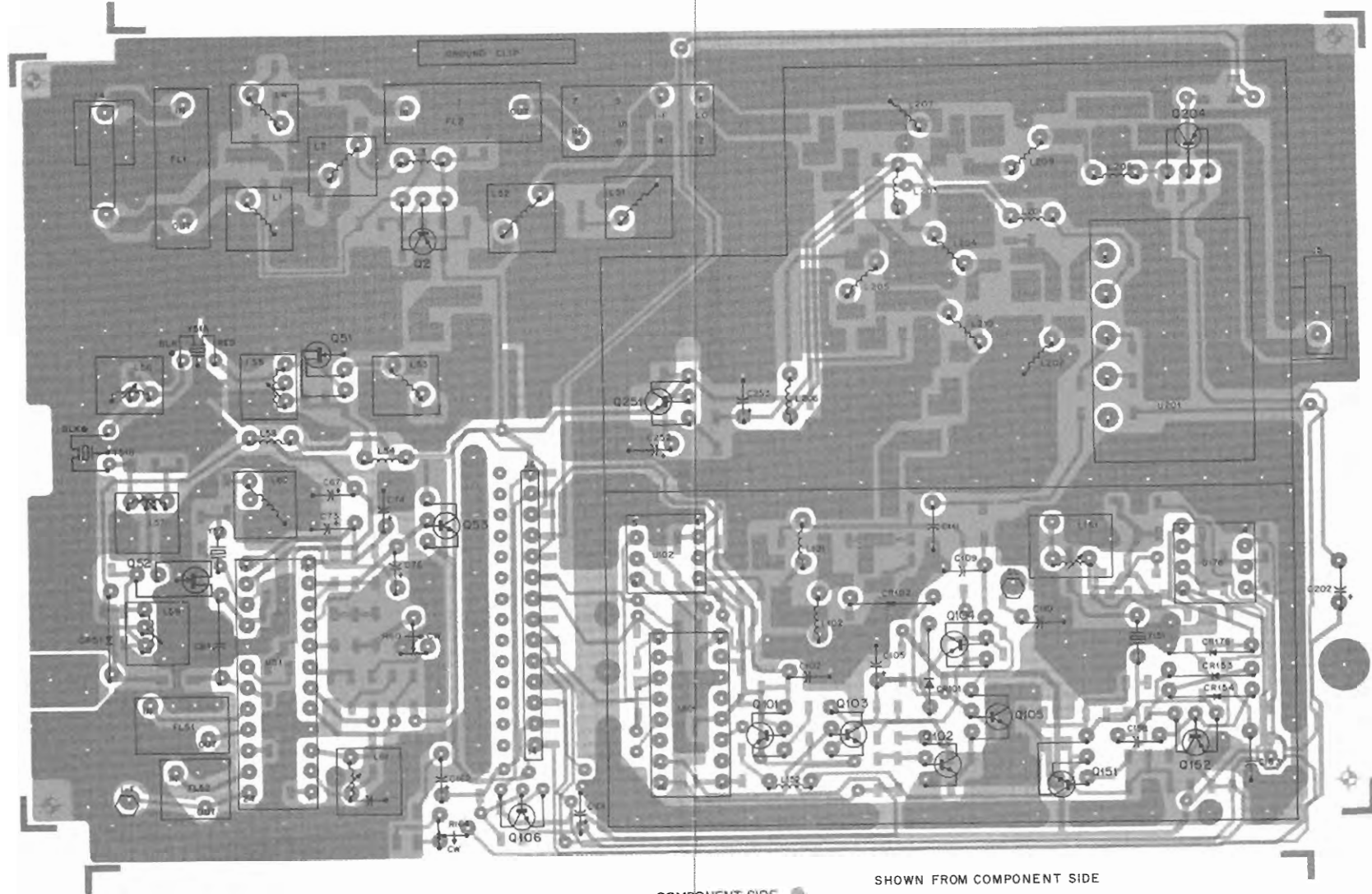




IMPORTANT
 COMPONENTS WITHIN SHADED AREA ARE NOT FIELD-SERVICEABLE. IF SERVICING IS REQUIRED, THE ENTIRE BOARD MUST BE REPLACED. REFER TO SECTION 6.

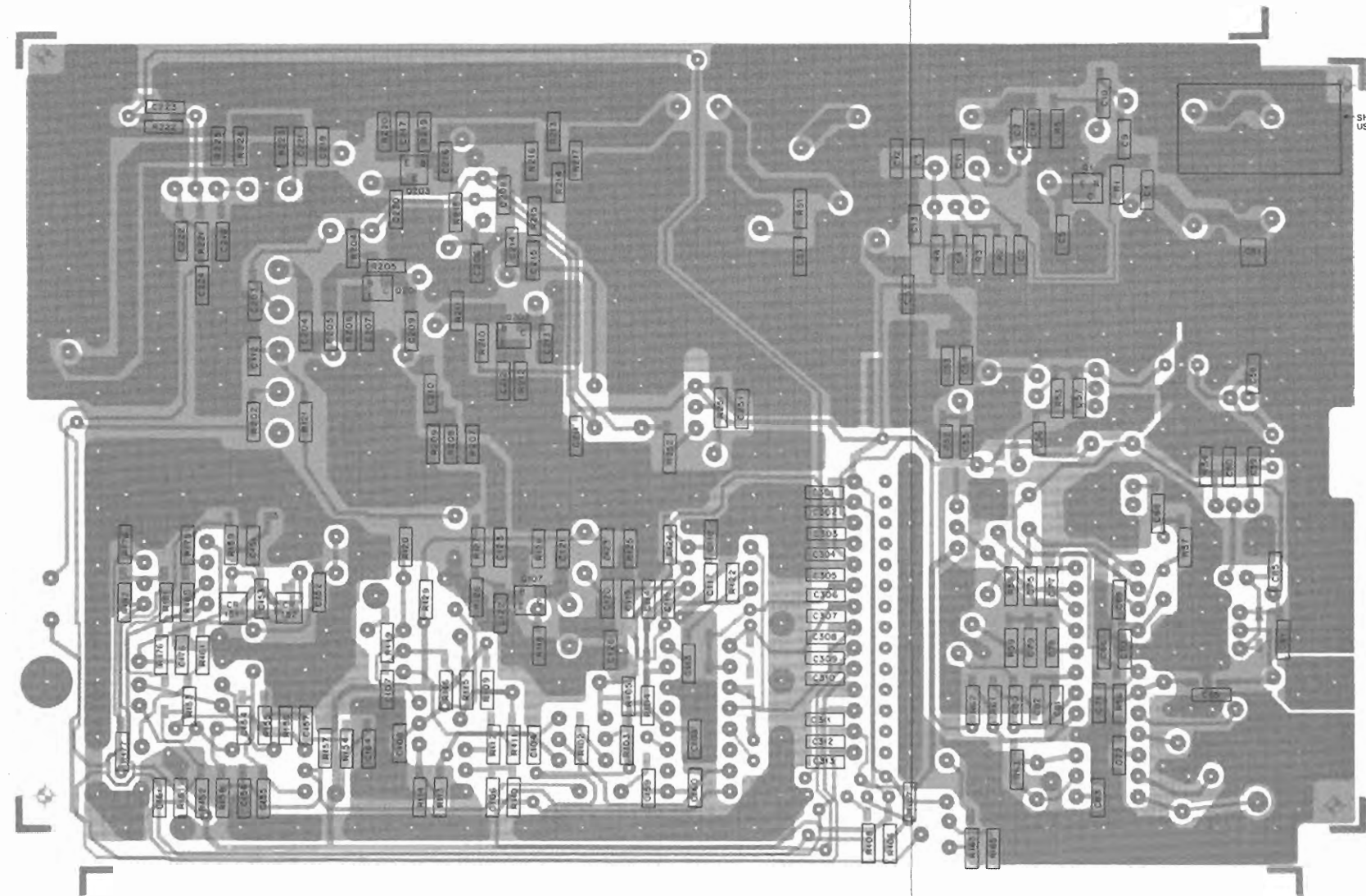
- NOTES:
- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN MICROFARADS, INDUCTOR VALUES ARE IN MICROHENRIES.
 - NON-POLARIZED CAPACITORS ARE CHIP-TYPE UNLESS OTHERWISE INDICATED.
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 - AC RF VOLTAGES ARE MEASURED WITH A HIGH-IMPEDANCE RF MILLIVOLTMETER.
 - ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:
 (R) RECEIVE MODE
 (T) TRANSMIT MODE
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL UNMODULATED SIGNAL AT A LEVEL OF -20 DBM.
 - MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION, MEASURED WITH AN AC RMS VOLTMETER.
 - CR216, C314, AND R284 ARE MOUNTED AS AN ASSEMBLY ON THE COMPONENT SIDE OF THE BOARD.





COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

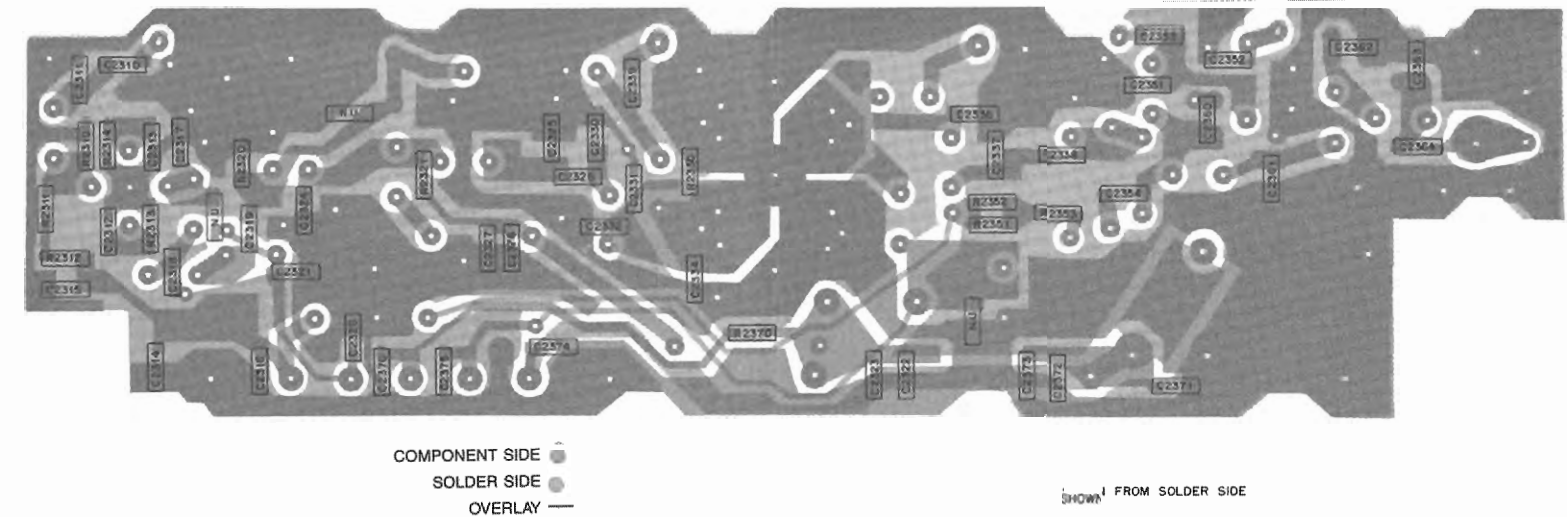
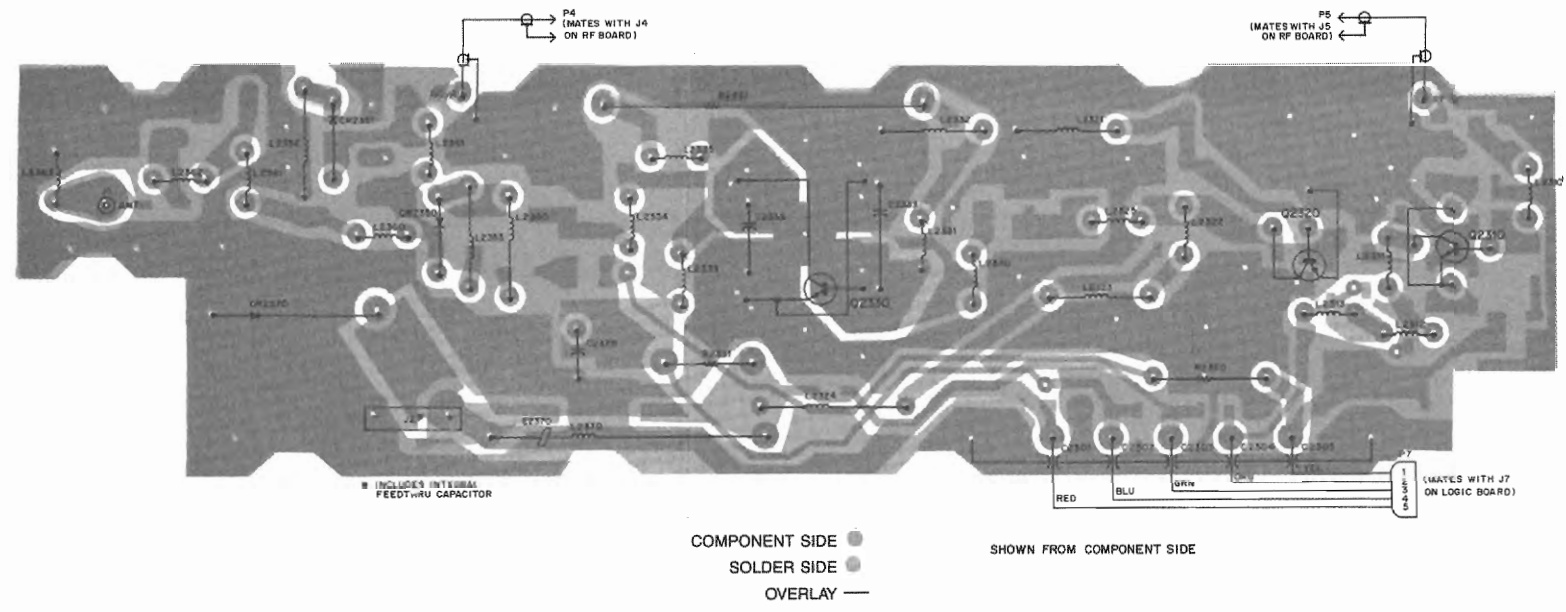
SHOWN FROM COMPONENT SIDE



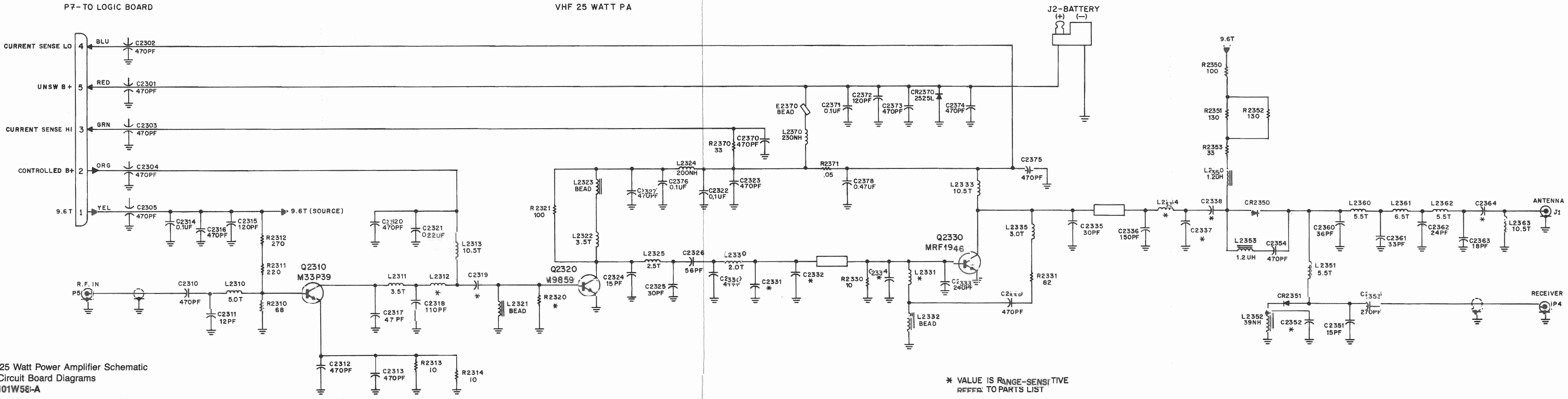
COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —

SHOWN FROM SOLDER SIDE

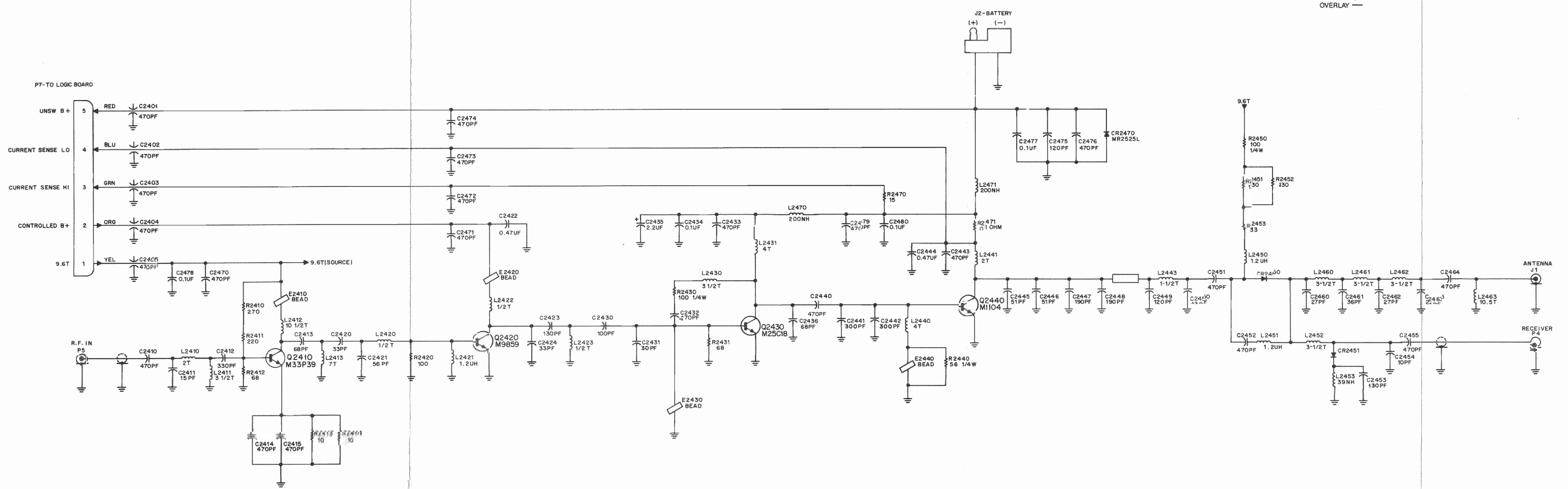
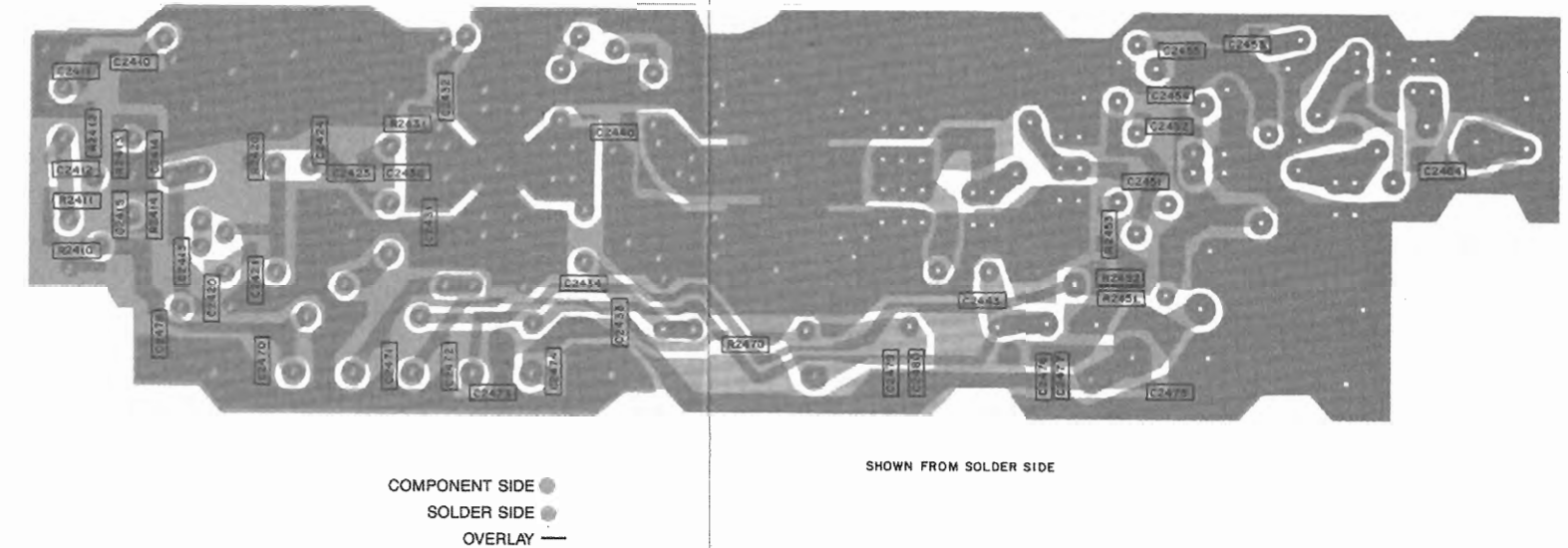
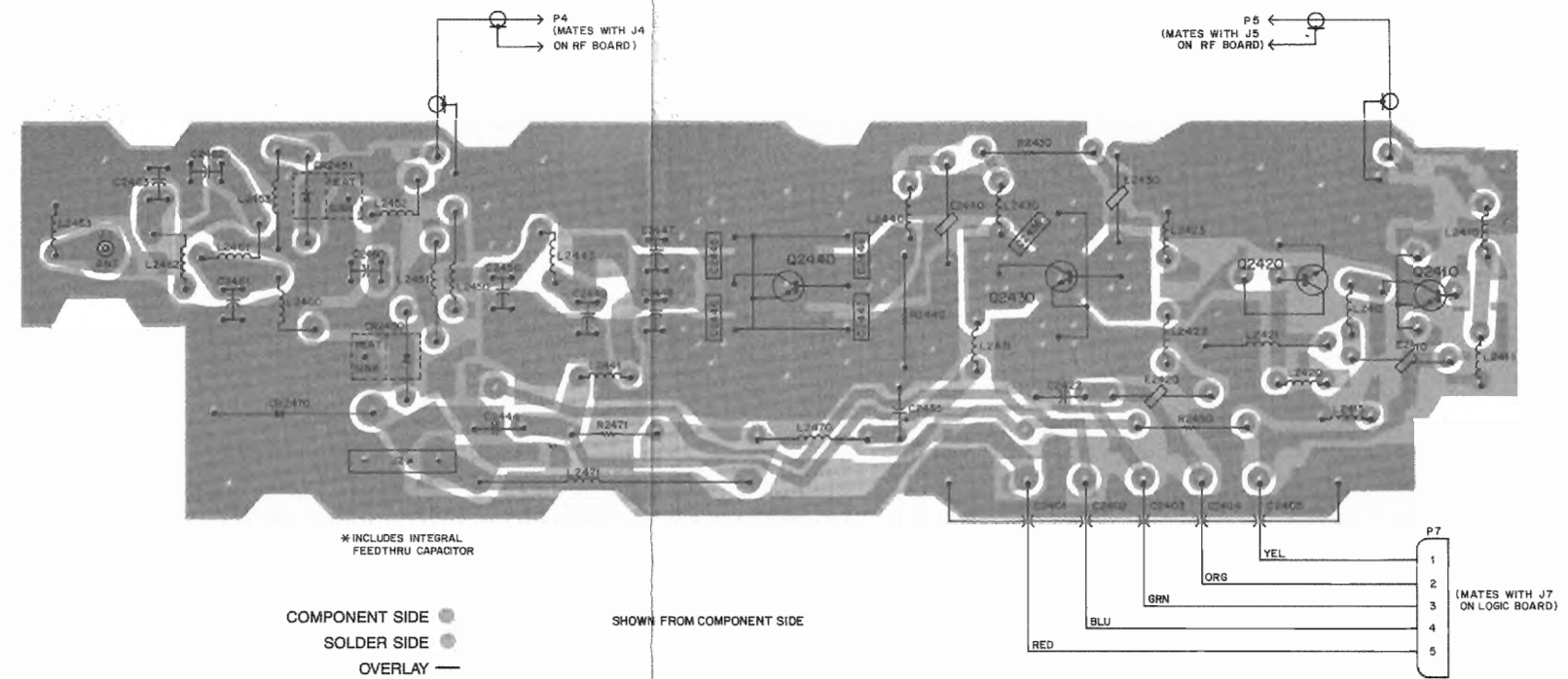
SHIELD-ONLY
USED FOR SIMPLEX



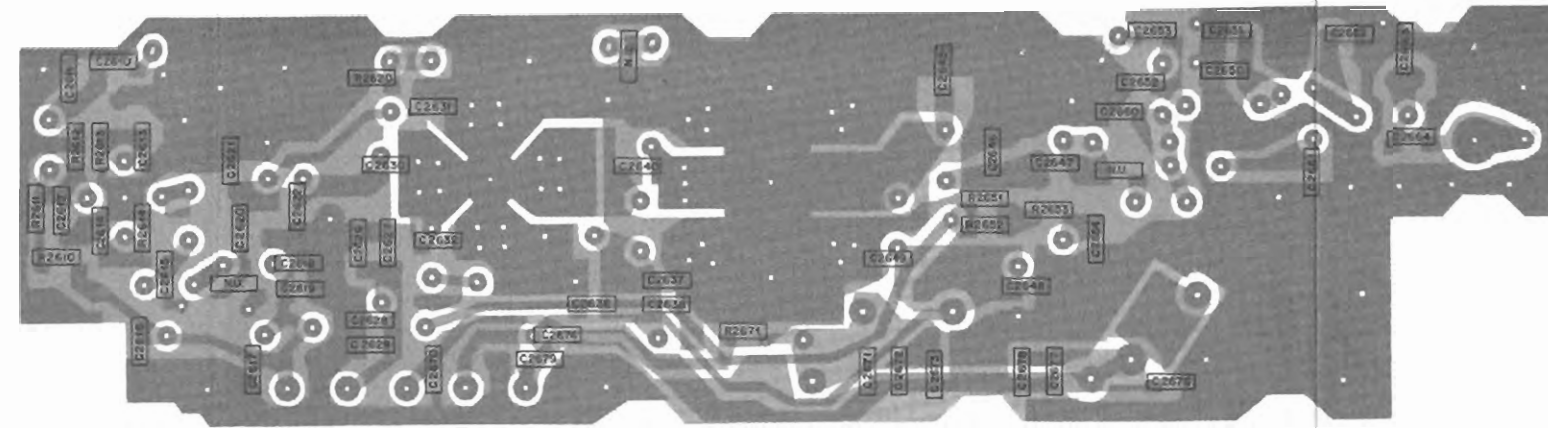
VHF 25 WATT PA



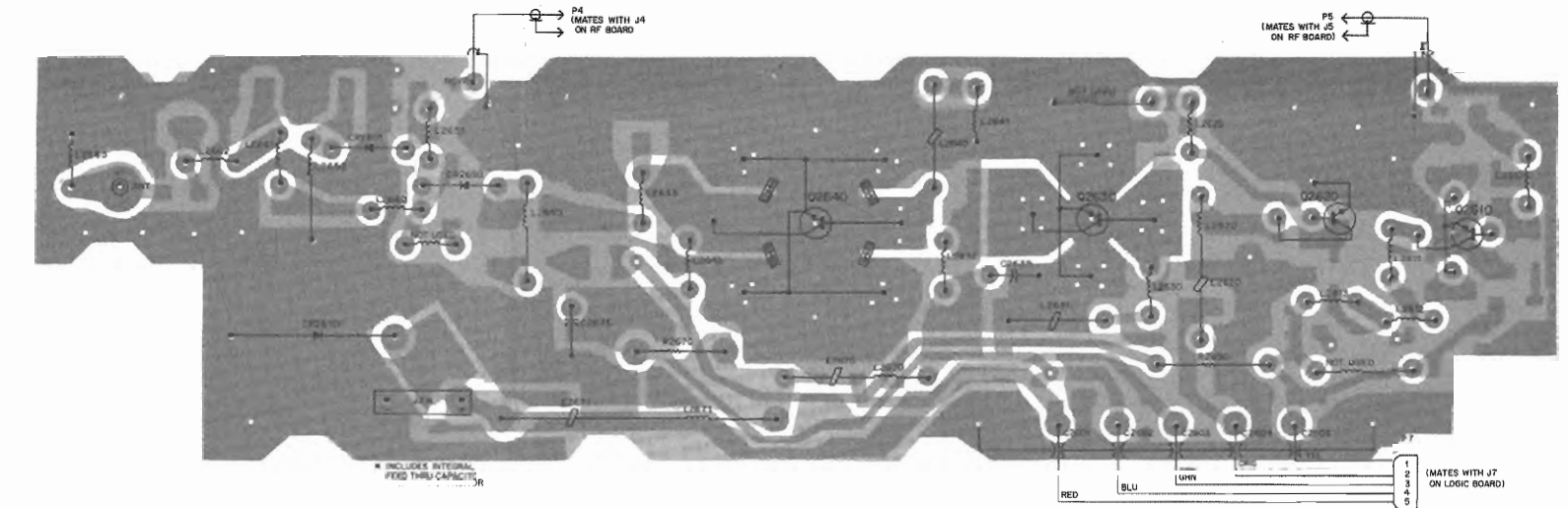
VHF 25 Watt Power Amplifier Schematic
And Circuit Board Diagrams
6880101W58-A
1-1988



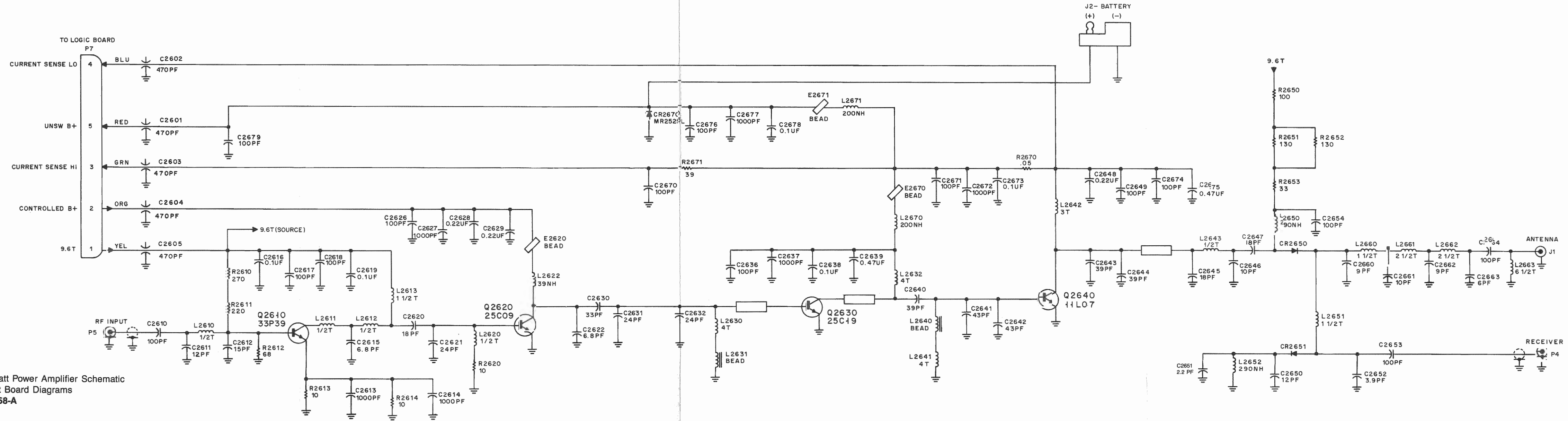
VHF 40 Watt Power Amplifier Schematic
 And Circuit Board Diagrams
 68811C1W58-A
 1-1988
 23



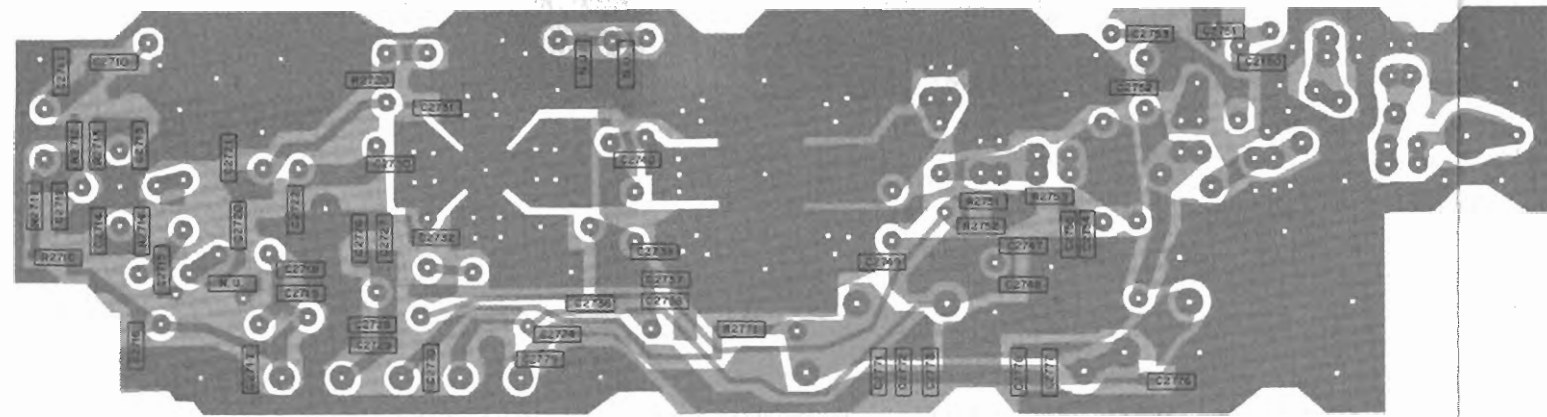
COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —
 SHOWN FROM SOLDER SIDE



COMPONENT SIDE ●
 SOLDER SIDE ●
 OVERLAY —
 SHOWN FROM COMPONENT SIDE

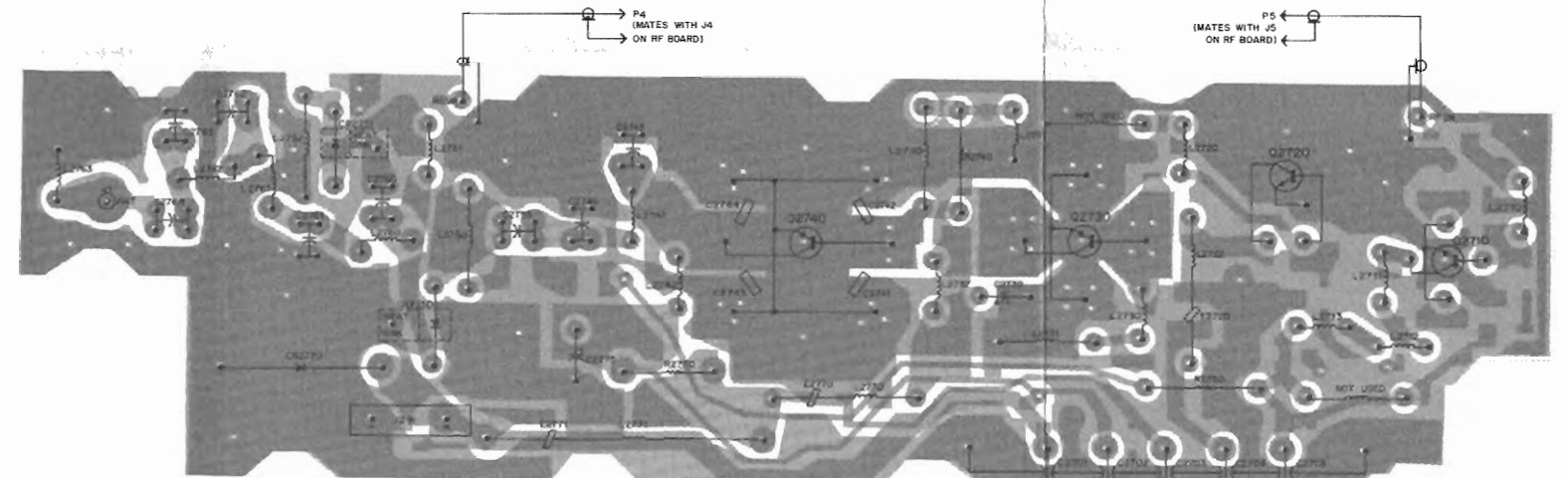


UHF 25 Watt Power Amplifier Schematic
 And Circuit Board Diagrams
 6881101W58-A
 1-1988
 24



COMPONENT SIDE
 SOLDER SIDE
 OVERLAY

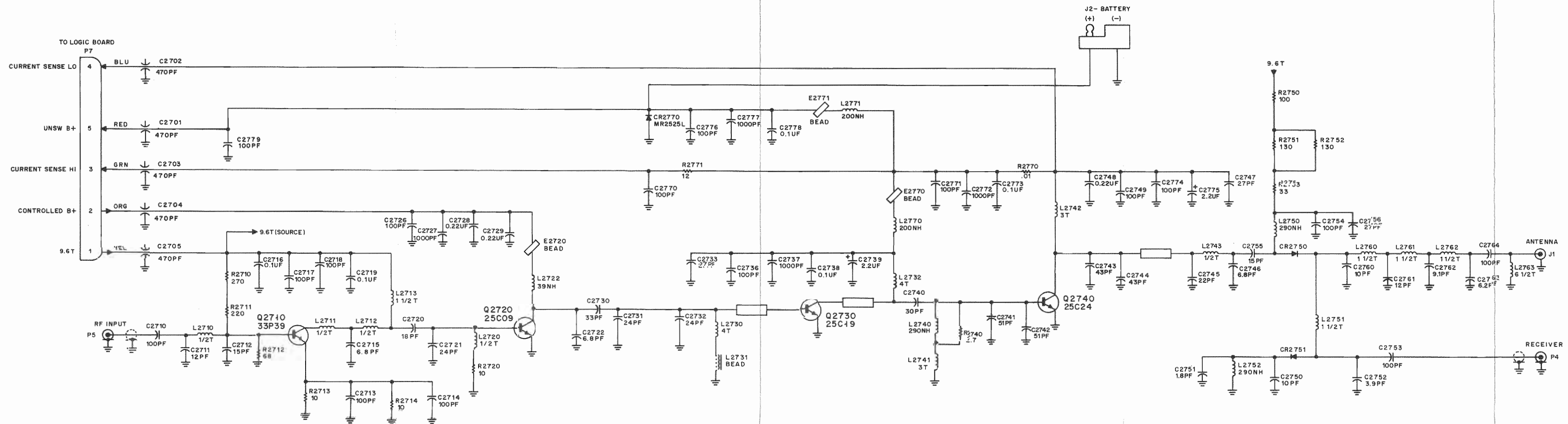
SHOWN FROM SOLDER SIDE



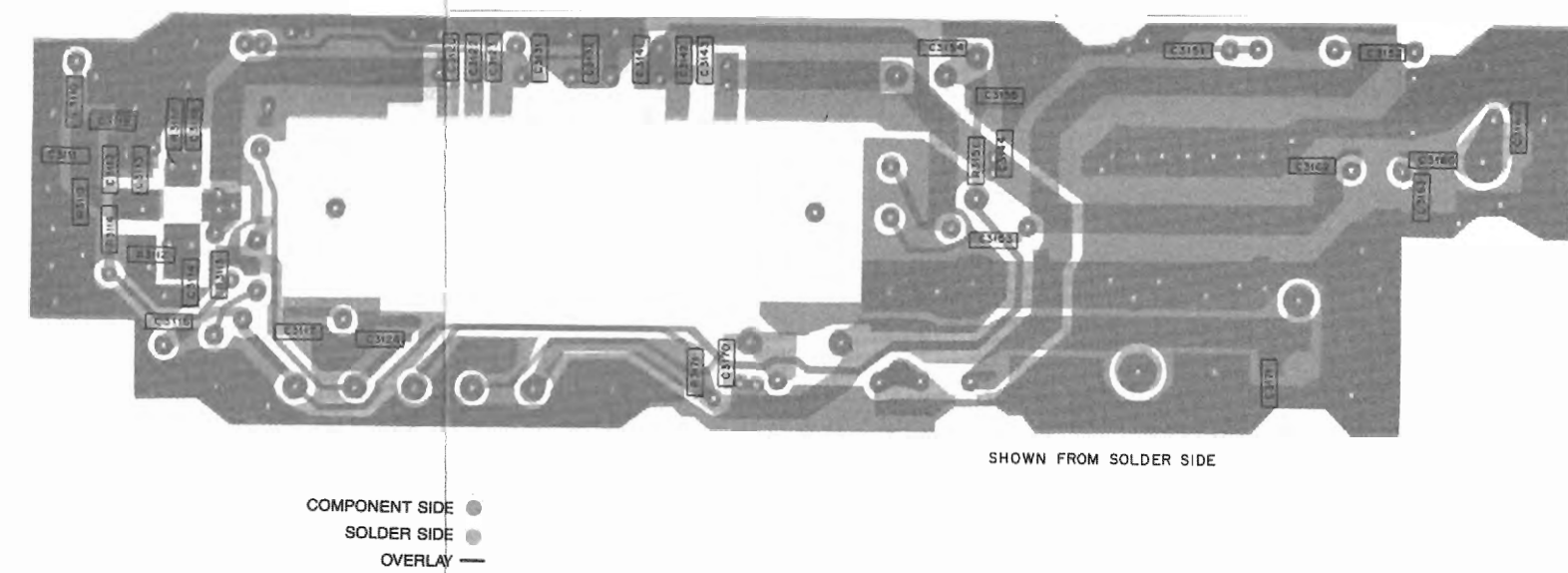
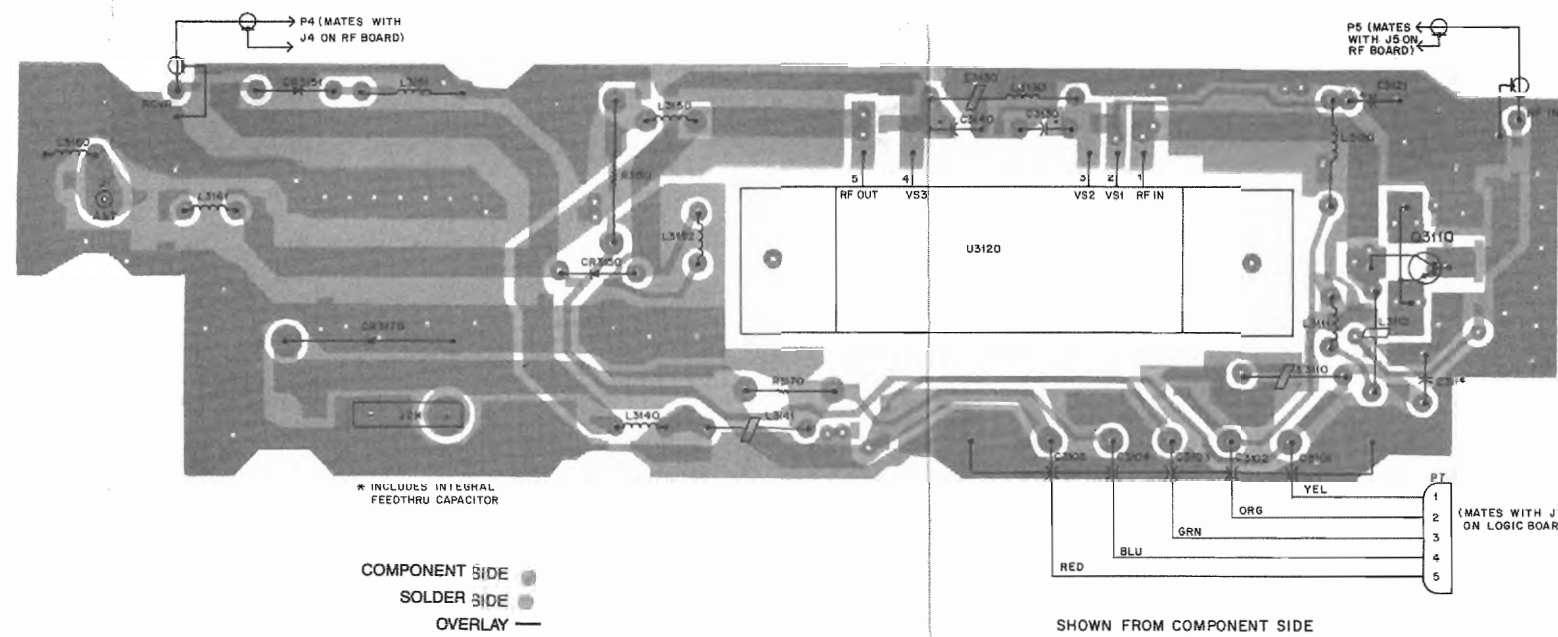
* INCLUDES INTERNAL FEEDTHRU CAPACITOR

COMPONENT SIDE
 SOLDER SIDE
 OVERLAY

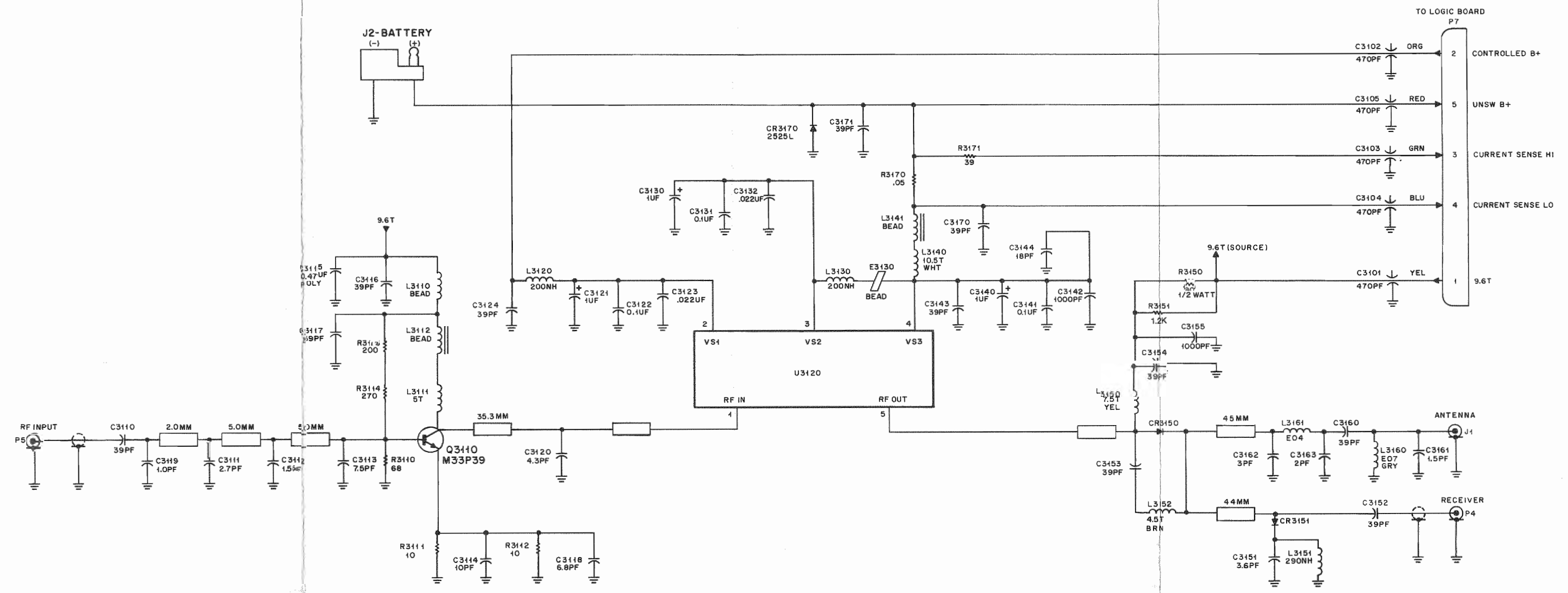
SHOWN FROM COMPONENT SIDE

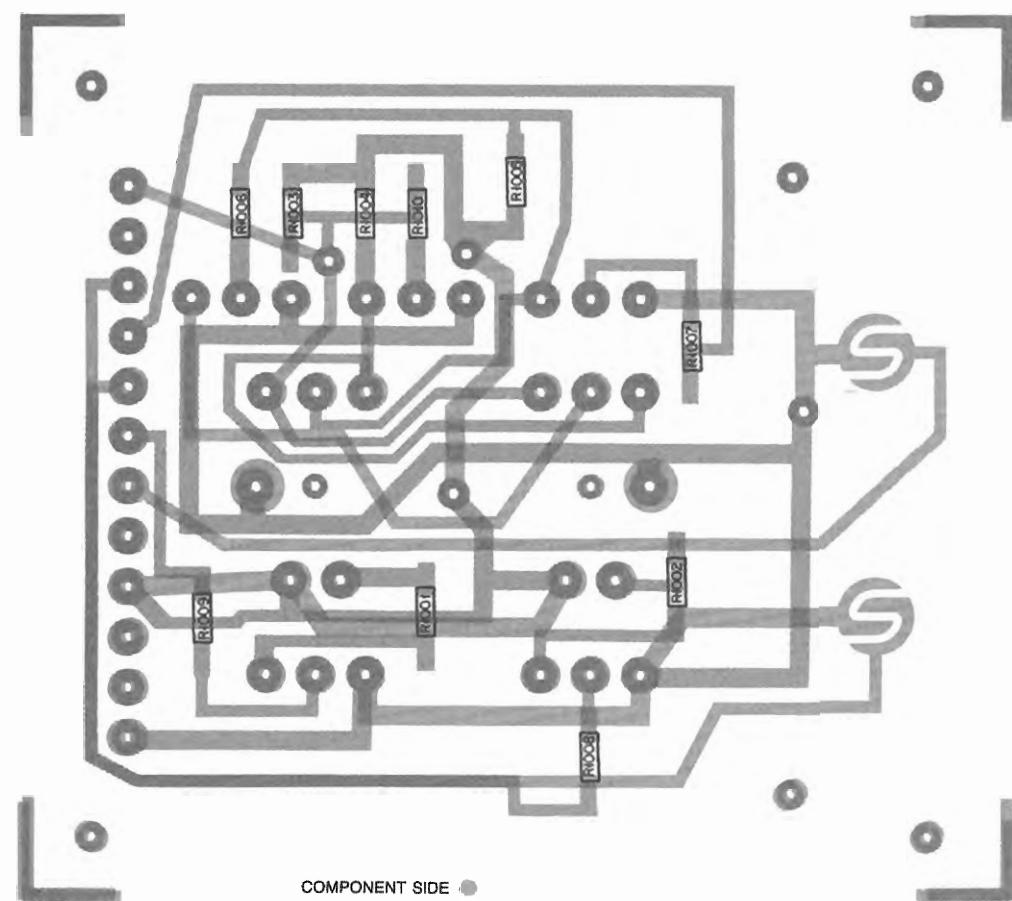


UHF 35 Watt Power Amplifier Schematic
 And Circuit Board Diagrams
 5880101W58.A



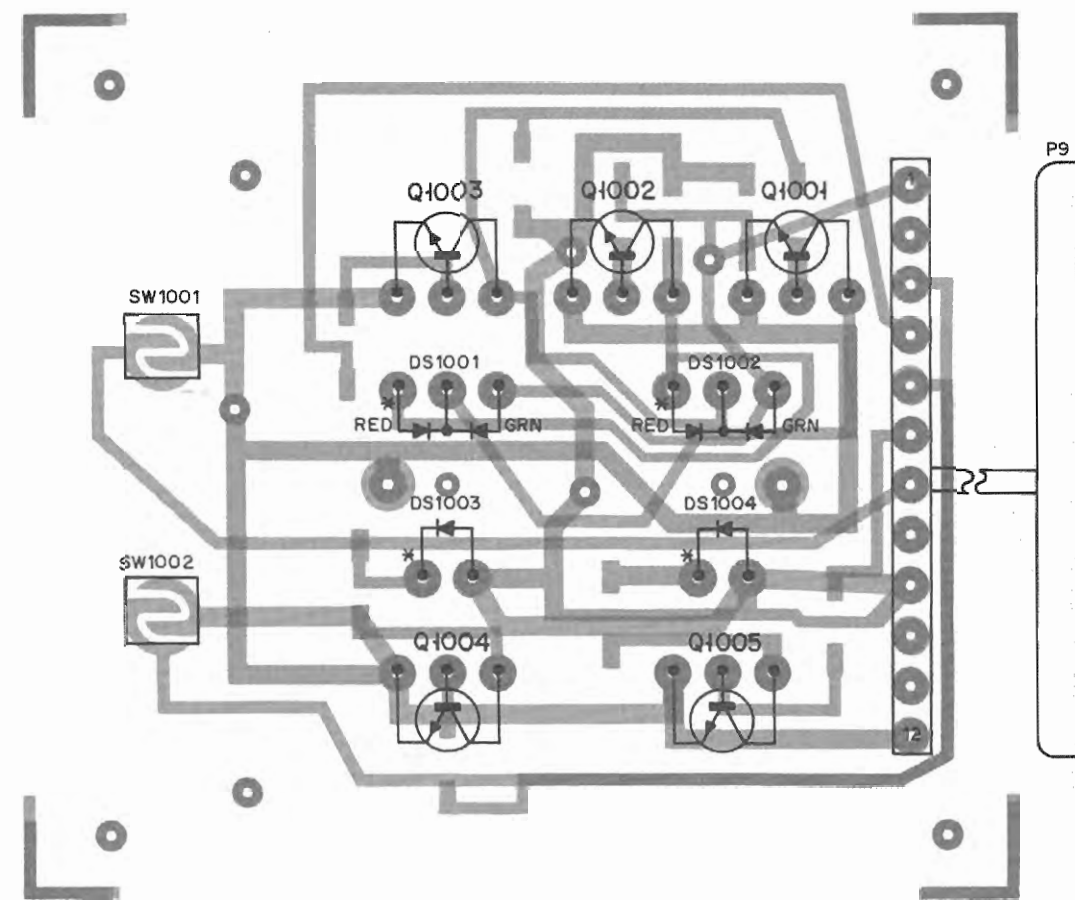
800 MHZ 15 WATT SIMPLEX PA





COMPONENT SIDE ●
SOLDER SIDE ●
OVERLAY —

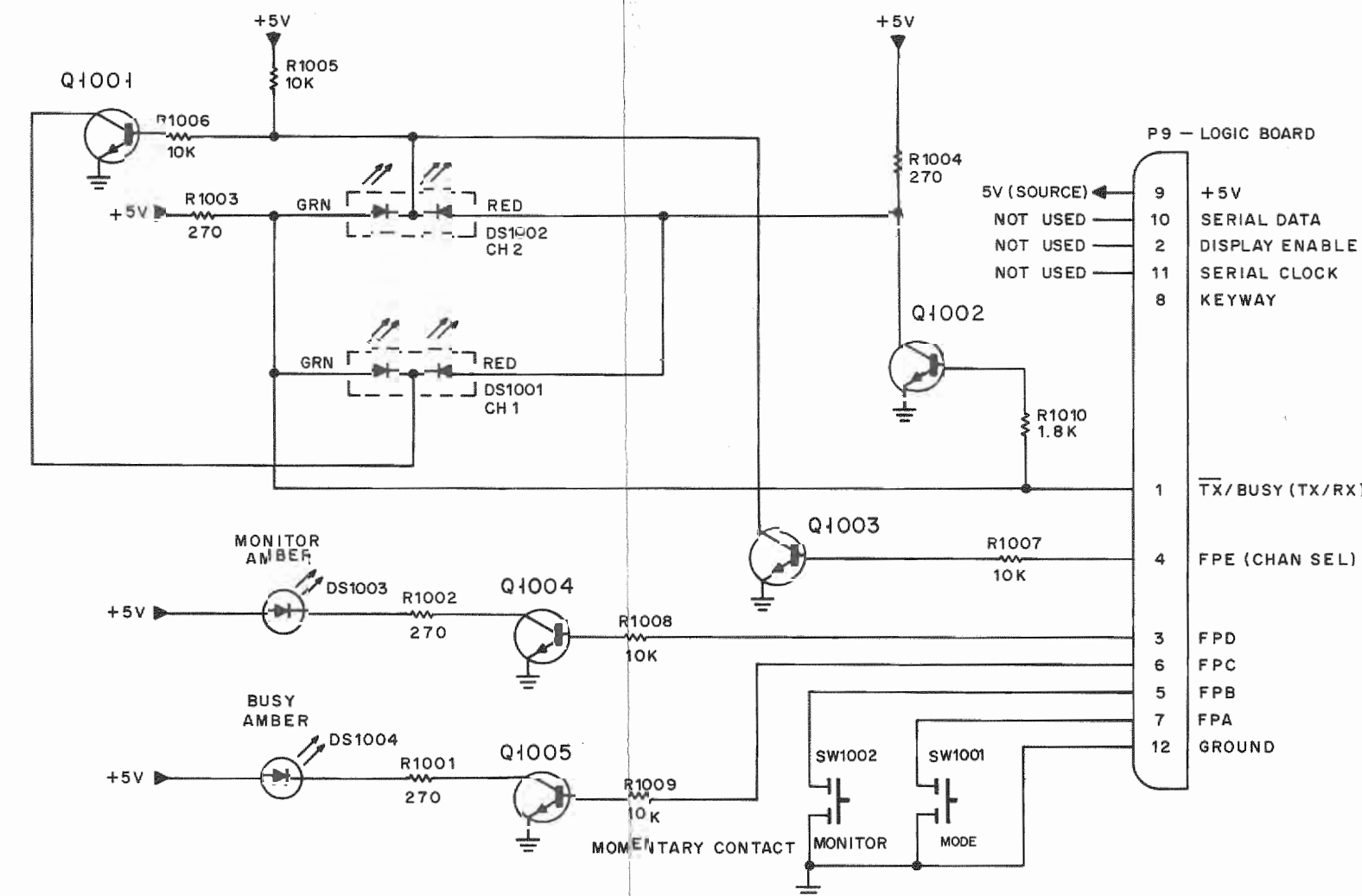
SHOWN FROM SOLDER SIDE



COMPONENT SIDE ●
SOLDER SIDE ●
OVERLAY —

* SHORTER LEAD

SHOWN FROM COMPONENT SIDE



parts list

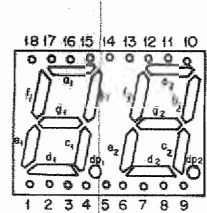
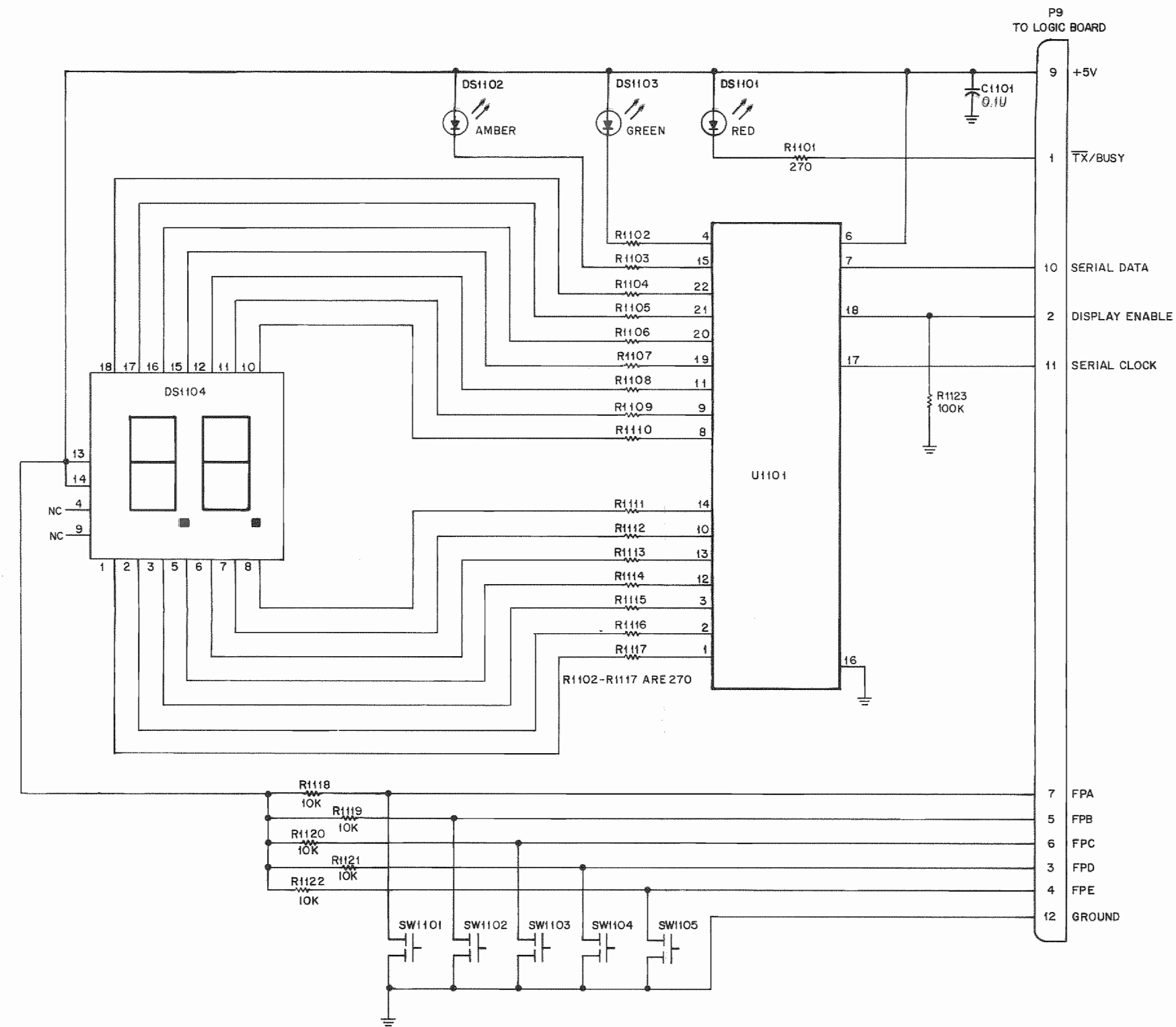
HLN5174A Front Panel Display Board

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
DS1001,2	48-80051M07	Display, LED red/green
DS1003,4	48-80051M06	amber
Q1001-5	48-00869642	Transistor (see note) NPN; type M9642
R1001-4	06-11024A35	Resistor, chip, 5%, 1/8 watt 270
R1005-9	06-11024A73	10k
R1010	06-11024A65	1.8k
	01-80747T11	Mechanical parts cable assembly (includes P9)
	42-80052N01	ground strap
	43-80279L01	spacer, LED

note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

Circuit Board Diagrams,
Schematic and Parts List for
Front Panel 2 Freq. Display Board
61380101W58-A

1-1988



DS1104 PIN ASSIGNMENTS

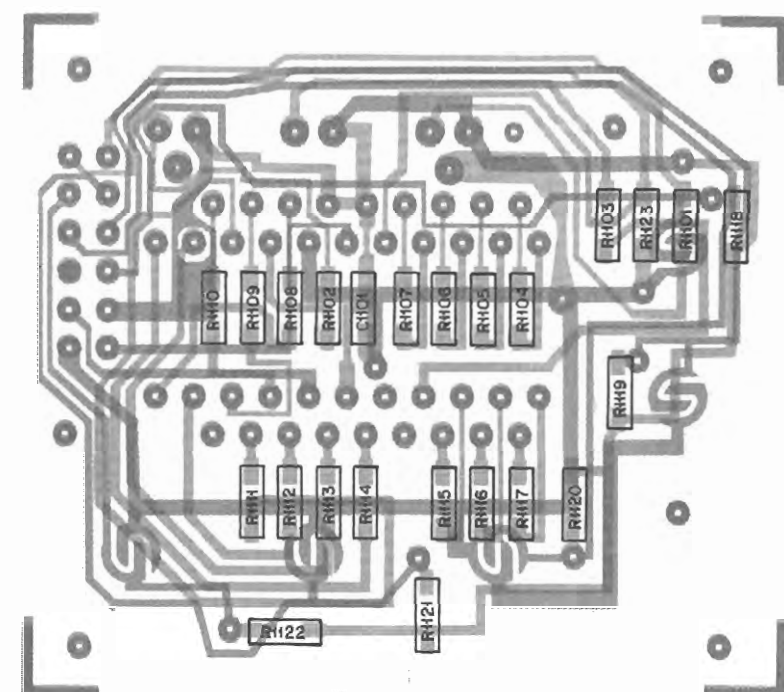
Pin	Assignment
1	Cathode g1
2	Cathode d1
3	Cathode c1
4	Cathode dp1
5	Cathode e2
6	Cathode d2
7	Cathode g2
8	Cathode c2
9	Cathode dp2
10	Cathode b2
11	Cathode a2
12	Cathode f2
13	Anode digit 2
14	Anode digit 1
15	Cathode b1
16	Cathode a1
17	Cathode g1
18	Cathode f1

parts list

HLN5175A MaxTrac 300 Display Board, 6/16 Freq.

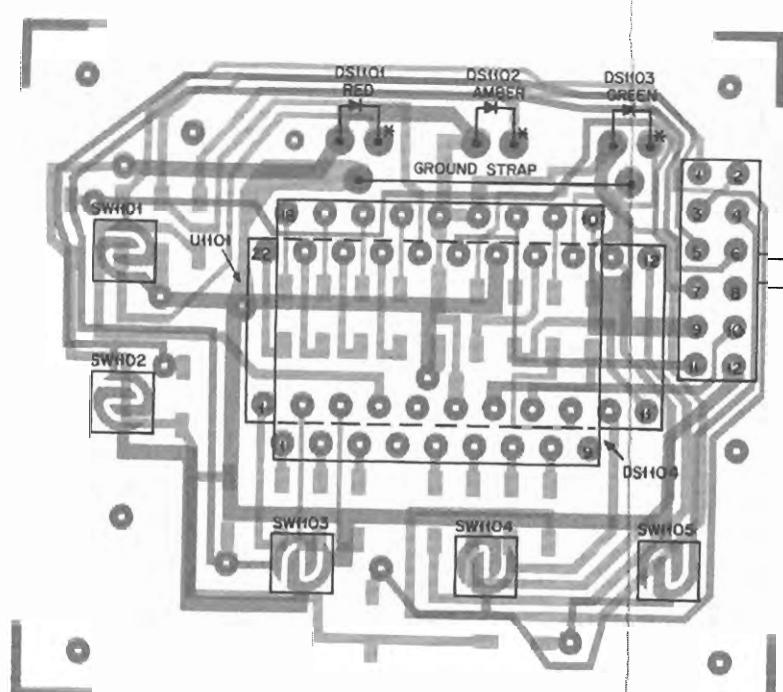
REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
DS1101	48-80051M01	Display, LED red
DS1102	48-80051M03	amber
DS1103	48-80051M02	green
DS1104	48-80055M01	dual 7 segment
R1101-1117	06-11024A35	Resistor, chip, 5%, 1/8 watt 270
R1118-1122	06-11024A73	10k
R1123	06-11024A97	100k
U1101	51-84944N29	Integrated Circuit (see note) driver, serial to parallel
	01-9074T11	Mechanical parts cable assembly (includes P9)
	42-80053N01	ground strap
	43-8027BL01	spacer, LED display
	43-80280L01	spacer, LED

note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.



COMPONENT SIDE
SOLDER SIDE
OVERLAY

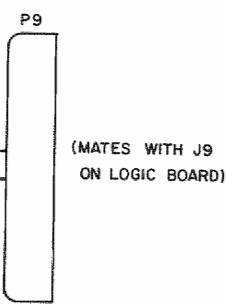
SHOWN FROM SOLDER SIDE



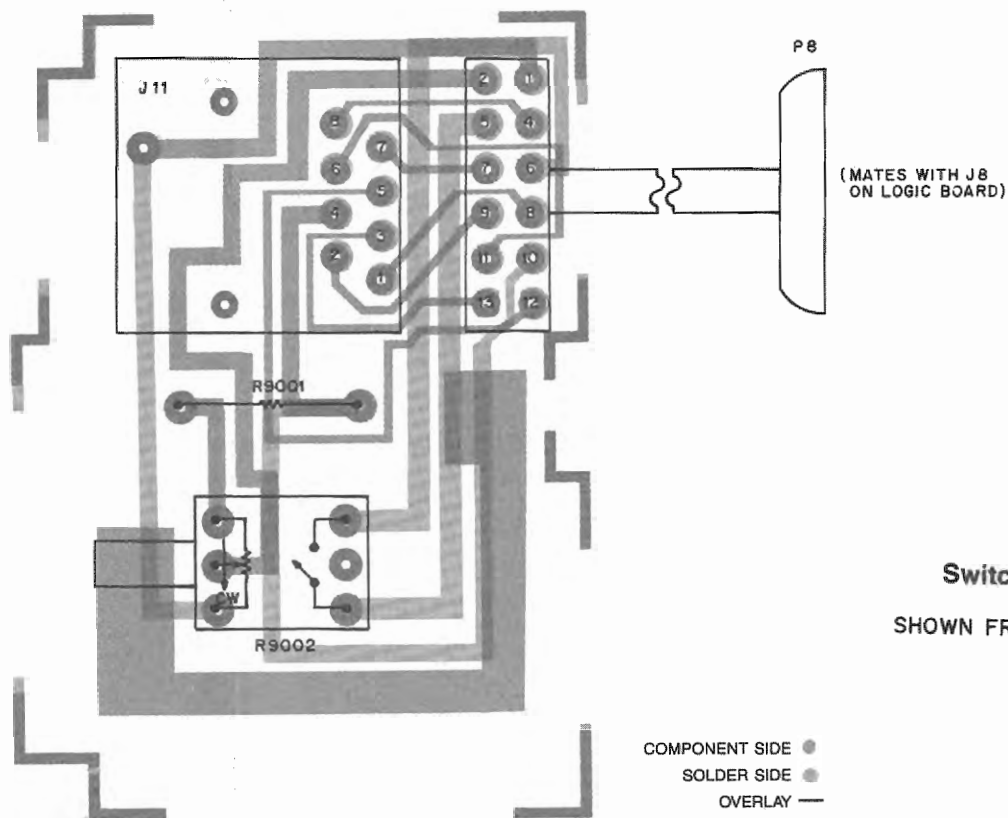
* SHORTER LEAD

SHOWN FROM COMPONENT SIDE

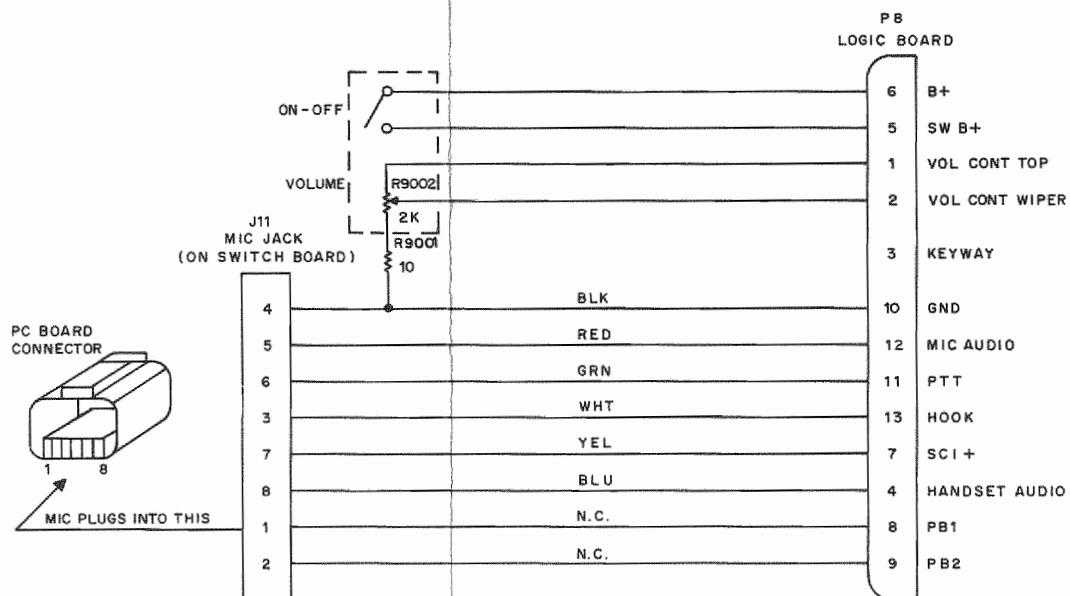
COMPONENT SIDE
SOLDER SIDE
OVERLAY



Circuit Board Diagram,
Schematic and Parts List for
Front Panel 6/14 Freq. Display Board
6880101W58-A
1-1988



Switchboard
SHOWN FROM COMPONENT SIDE



parts list

HLN 5184A Front Panel Switch Board

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
J11	09-80132M01	Receptacle, jack telephone type, 8 contact
R9001	06-1109A01	Resistor 10, 5%, 1/4 watt
R9002	18-8014M01	2k, VOLUME, with switch
	01-80747T12	Mechanical parts cable assembly (includes P8)

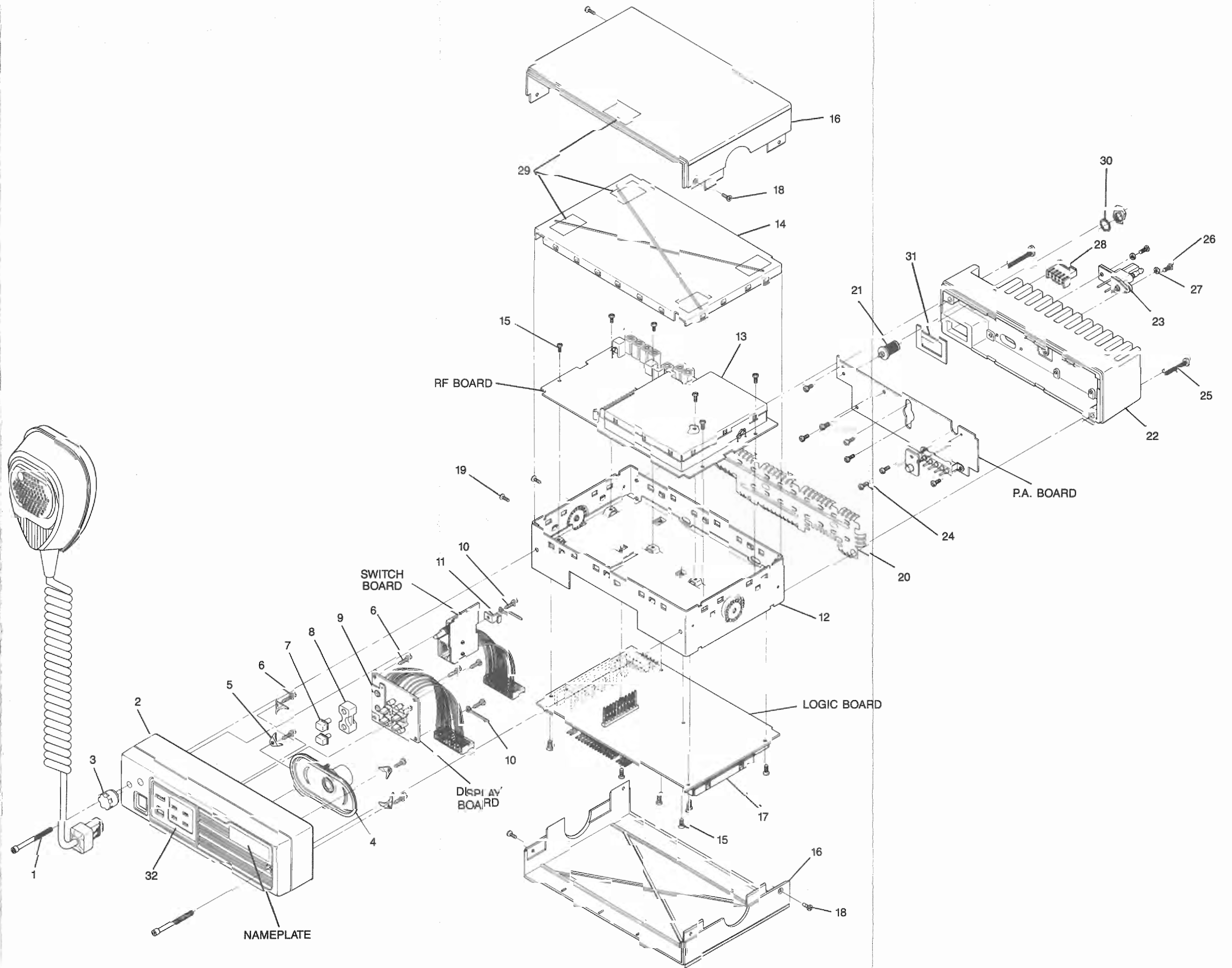
Circuit Board Diagram,
Schematic and Parts List for
Front Panel Switch Board
6880101W58-A

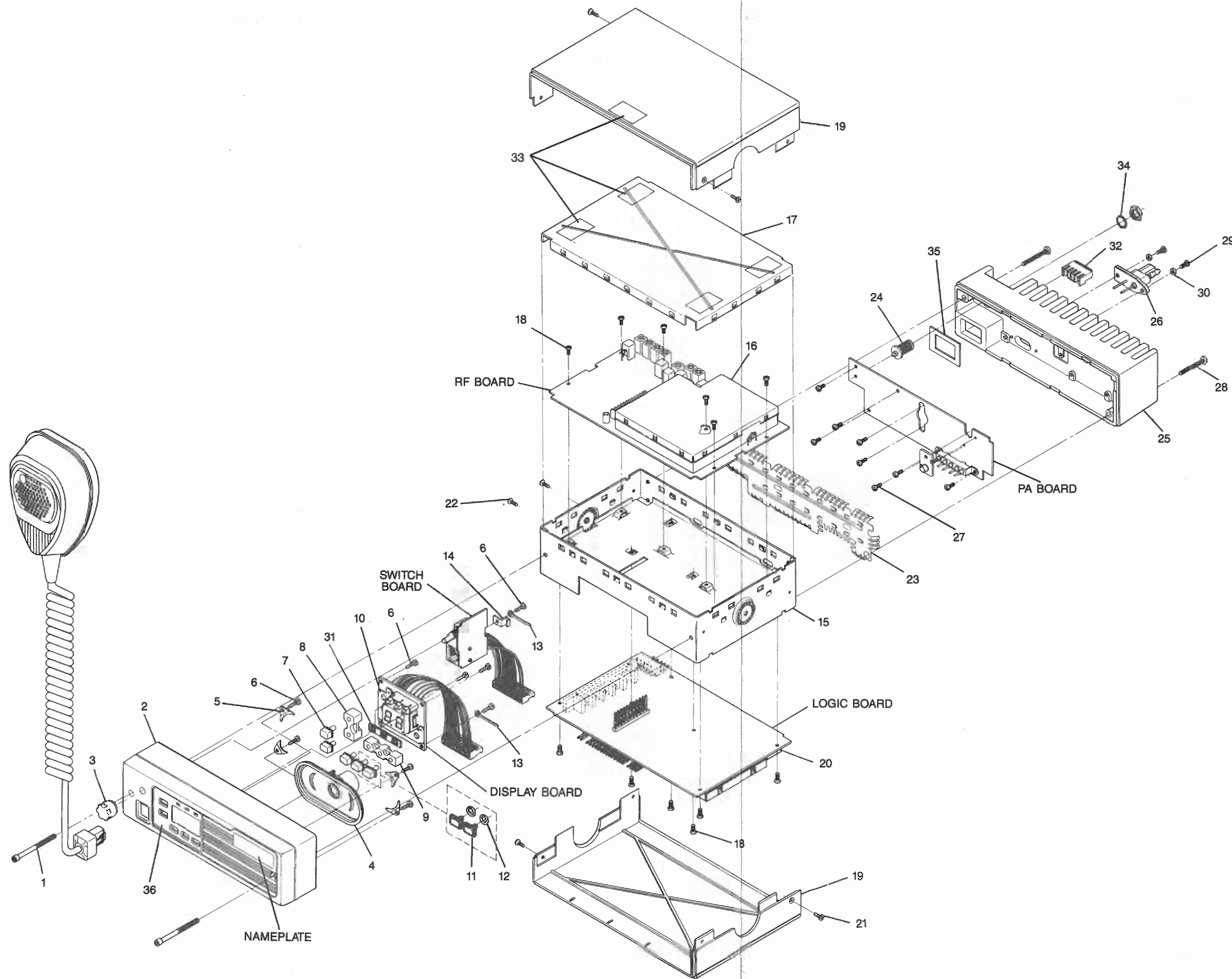
1-1988

parts list

REF. SYMBOL	MOTOROLA PART NUMBER	DESCRIPTION	QTY. USED
1	03-80270L01	FRONT, MTG. SCREWS	2
2	15-80074M04	CONTROL HEAD HOUSING	1
3	36-80106M02	CONTROL KNOB	1
4	50-80085D01	SPEAKER	1
5	42-80253L01	SPEAKER RETAINER	4
6	03-10945A11	PLASTIC SCREW	9
7	38-80272L02	PUSH BUTTON	2
8	43-80273L01	PUSH BUTTON SPACER	1
9	75-80200L01	KEYPAD	1
10	295129883	WIRE WRAP	2
11	07-80037M01	BRACKET, SWITCH BD.	1
12	27-80128L02	CHASSIS FRAME	1
13	15-80953T01	COVER, VCO SHIELD	1
14	26-80038M01	SHIELD, CHASSIS R.F.	1
15	03-10943M09	TAPTITE SCREW (M3x8)	12
16	15-80127L01	COVER, HOUSING	2
17	15-80124M01	COVER, LOGIC SHIELD	1
18	03-10943R55	TAPTITE SCREW (M3x8, FLATHEAD)	4
19	03-10943R04	TAPTITE SCREW (M2.5x8, FLATHEAD)	2
20	26-80223M03	SHIELD, PA. VHF & UHF	1
21	26-80223M04	SHIELD, PA. 800 MHZ	1
22	09-80131M01	CONNECTOR, ANTENNA	1
23	26-80124L01	HEATSINK UHF & VHF	1
24	26-80124L02	HEATSINK, 800 MHZ	1
25	09-80255E01	CONNECTOR, POWER	1
26	03-10943M10	TAPTITE SCREW (M3x8)	8
27	03-80271L01	MACHINE SCREW (M4x17)	2
28	03-10943M11	TAPTITE SCREW (M3x10)	2
29	04-131974	WASHER	2
30	15-80076M01	HOUSING, ACCESSORY CONNECTOR	1
31	75-80918T02	PAD, SHOCK INSULATING	5
32	04-00002636	WASHER, INT LOC	1
33	32-80014N02	GASKET, ACCESSORY CONNECTOR	1
34	13-80276L01	ESCUTCHEON, 2 FREQ.	1

NOTE: THE PART NUMBER FOR THE SPEAKER LEAD ASSEMBLY, INCLUDING CONNECTOR P10 AND TWO SPEAKER LUGS, IS 1-80747T30.





parts list

REF. SYMBOL	MOTOROLA PART NUMBER	DESCRIPTION	QTY. USED
1	03-80270L01	FRONT MTG. SCREWS	2
2	15-80074M05	CONTROL HEAD HOUSING	1
3	38-80108M02	CONTROL KNOB	1
4	50-80085D01	SPEAKER	1
5	42-80233L01	SPEAKER RETAINER	4
6	03-10946A11	PLASTIC SCREW	9
7	38-80272L02	PUSH BUTTON	1
	(8 FREQ. MODELS)		3
	(14 FREQ. MODELS)		5
8	43-80274L01	PUSH BUTTON SPACER (1x2)	1
9	43-80275L01	PUSH BUTTON SPACER (1x3)	1
10	75-80201L01	KEYPAD	1
11	38-80077N01	BUTTON PLUG	2
12	32-80907T01	GASKET (6 FREQ. MODELS ONLY)	2
13	29S129883	WIRE WRAP	2
14	07-80037M01	BRACKET SWITCH BD.	1
15	27-80128L02	CHASSIS FRAME	1
16	15-80953T01	COVER, VCO SHIELD	1
17	26-80038M01	SHIELD, CHASSIS, RF	1
18	03-10948M09	TAPTITE SCREW (M3x8)	12
19	15-80127L01	COVER, HOUSING	2
20	15-80124M01	COVER, LOGIC SHIELD	1
21	03-10948R55	TAPTITE SCREW (M3x8)-FLAT	4
22	03-10948R04	TAPTITE SCREW (M2.5x8)-FLAT	2
23	26-80223M03	SHIELD, PA VHF & UHF	1
24	26-80223M04	SHIELD, PA 800 MHZ	1
25	09-80131M01	CONNECTOR ANTENNA	1
26	26-80124L01	HEATSINK, UHF & VHF	1
27	26-80124L02	HEATSINK, 800 MHZ	1
28	09-80265E01	CONNECTOR POWER	1
29	03-10948M10	TAPTITE SCREW (M3x3)	8
30	03-80271L01	MACHINE SCREW (M4x27)	2
31	03-10948M11	TAPTITE SCREW (M3x10)	2
32	04-131974	WASHER	2
33	32-80039M01	GASKET	1
34	15-80078M01	HOUSING, ACCESSORY CONNECTOR	1
35	75-80918T02	PAD, SHOCK INSULATING	5
36	04-00002836	WASHER, INT LOC	1
	32-80014N02	GASKET, ACCESSORY CONNECTOR	1
	13-80277L05	ESCUTCHEON (6 FREQ. MODELS)	1
	13-80277L01	ESCUTCHEON (14 FREQ. MODELS)	1

NOTE: THE PART NUMBER FOR THE SPEAKER LEAD ASSEMBLY, INCLUDING CONNECTOR P10 AND TWO SPEAKER LUGS, IS 1-8074730.

Radius M200-Series Exploded View
and Mechanical Parts List
6880101W58-A

EXTERNAL SPEAKER

MODEL HSN4019A

INSTALLATION

Required Tools for Installation

- Portable Drill
- Hammer
- Center Punch
- 5/16" Hex Nut Driver
- 5/32" Diameter Drill Bit

Trunnion bracket installation procedure refer to the illustration, detail A.

(1) Remove the speaker from the trunnion bracket by loosening the two wing screws.

(2) Choose a place to mount the speaker.

(3) Using the trunnion bracket as a template, mark the locations of the three mounting holes.

(4) Centerpunch and drill a 5/32" dia. hole at each location.

(5) Mount the trunnion bracket with the screws supplied.

(6) Insert the speaker into the trunnion bracket and tighten the two wing screws.

(7) Route and secure the speaker cable.

(8) Remove the accessory housing connector from the rear of the radio.

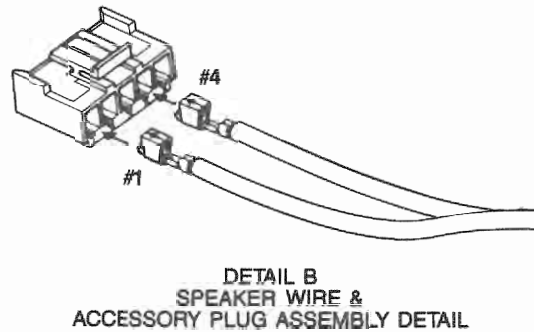
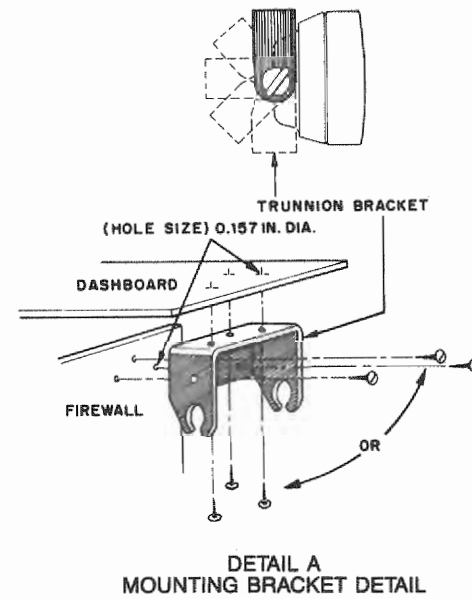
(9) Push the external speaker accessory plug into the five pin accessory connector at the back of the radio.

If replacement of the accessory connector should be necessary, refer to detail B for proper location of the wires. Incorrect wiring may damage the speaker.

Optional External Speaker

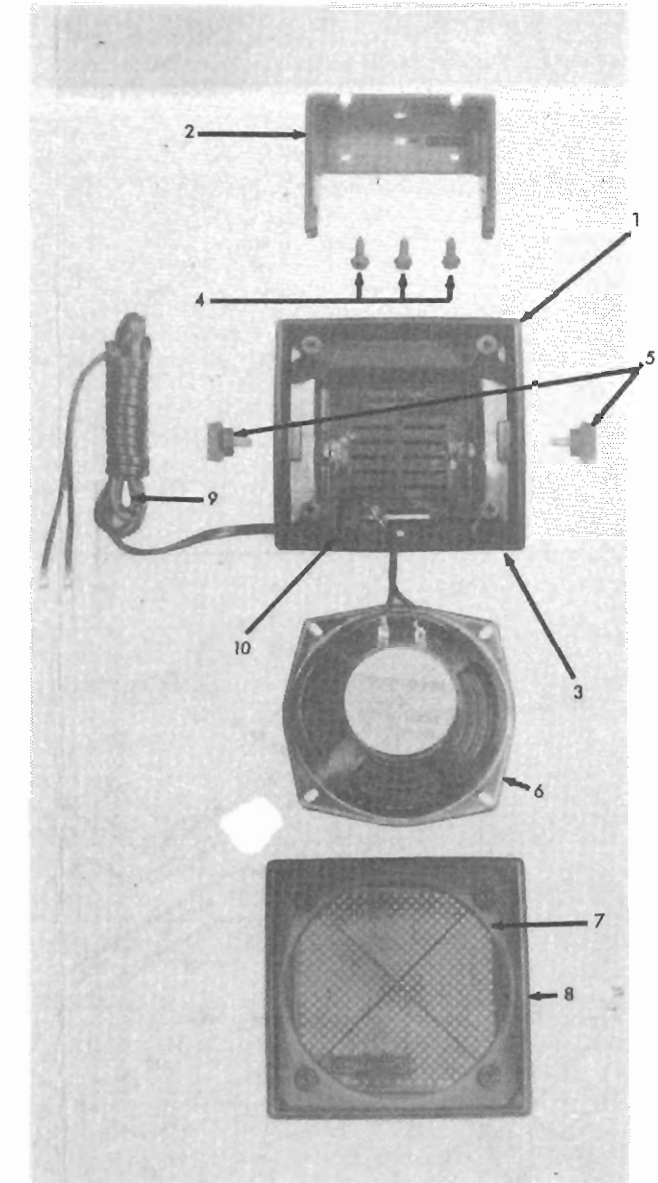
6880101W58-A

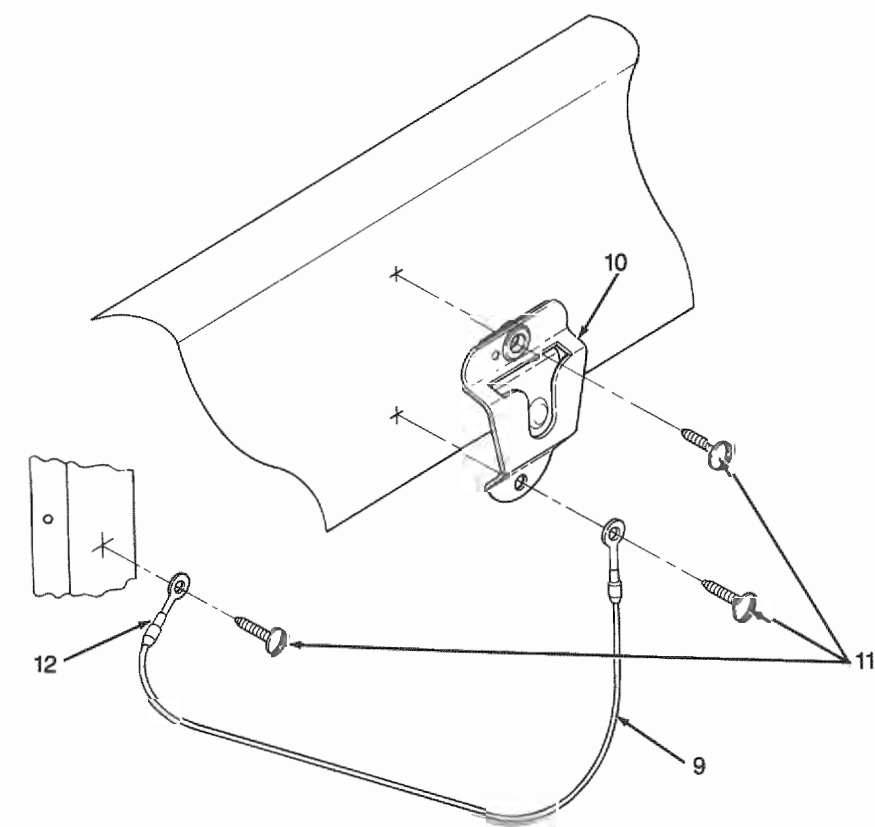
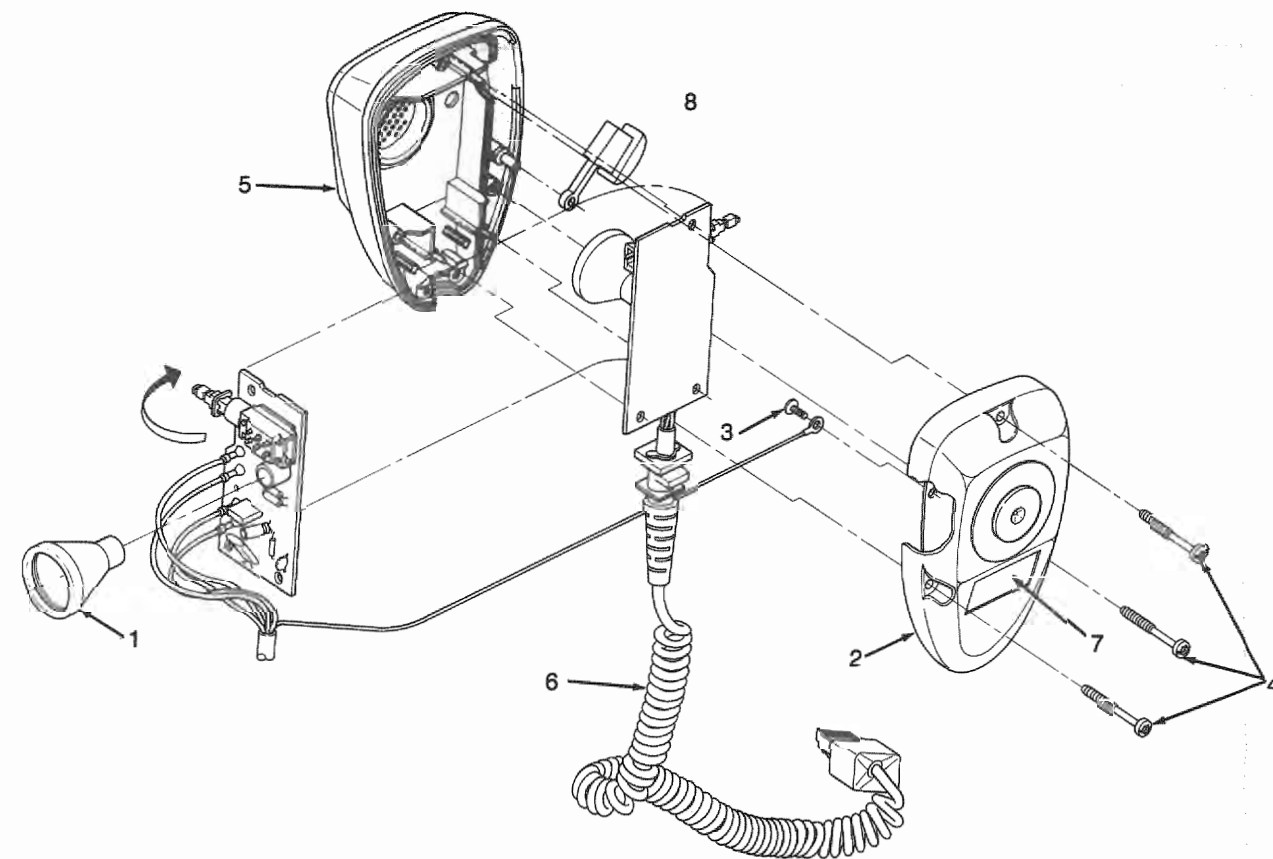
1-1988



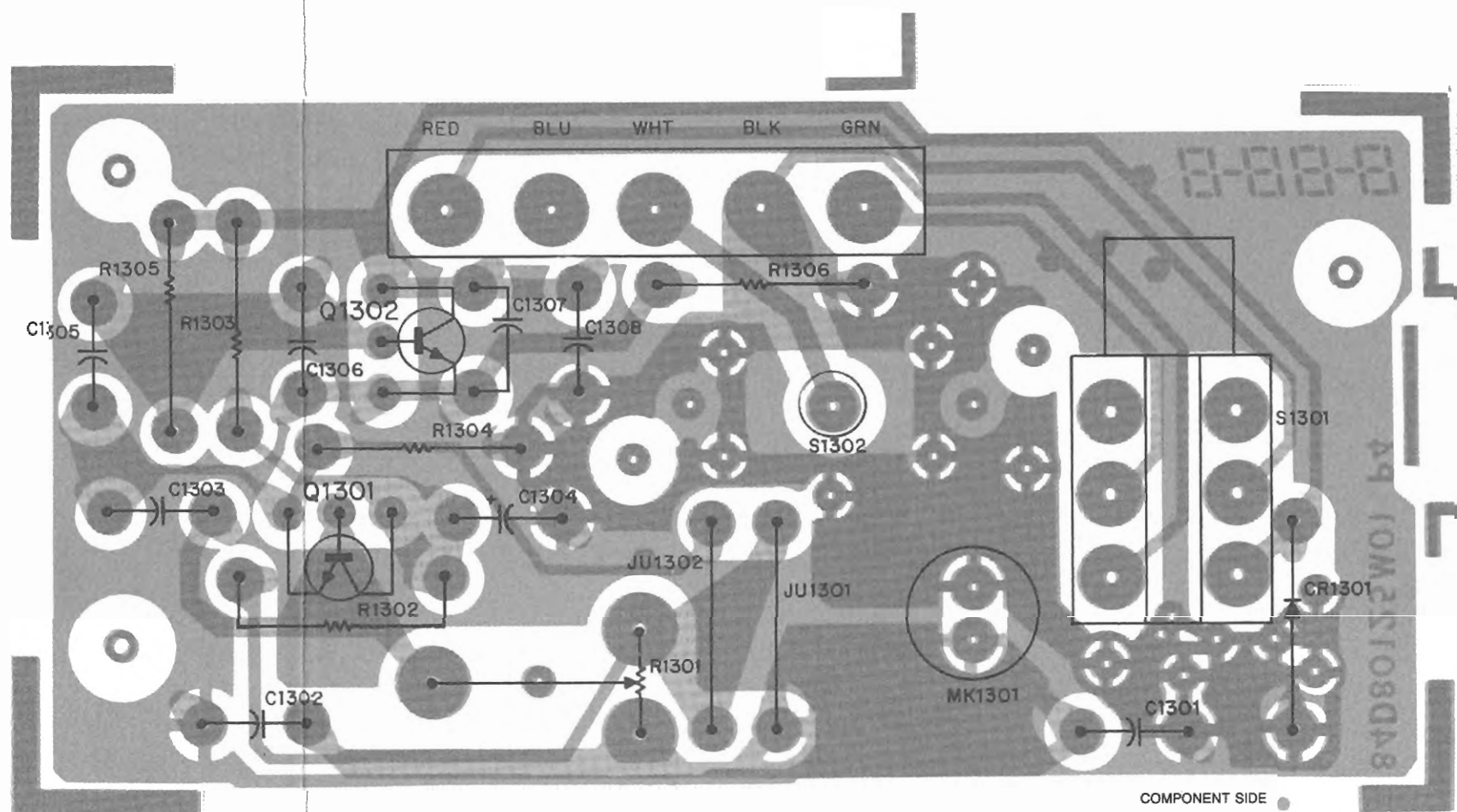
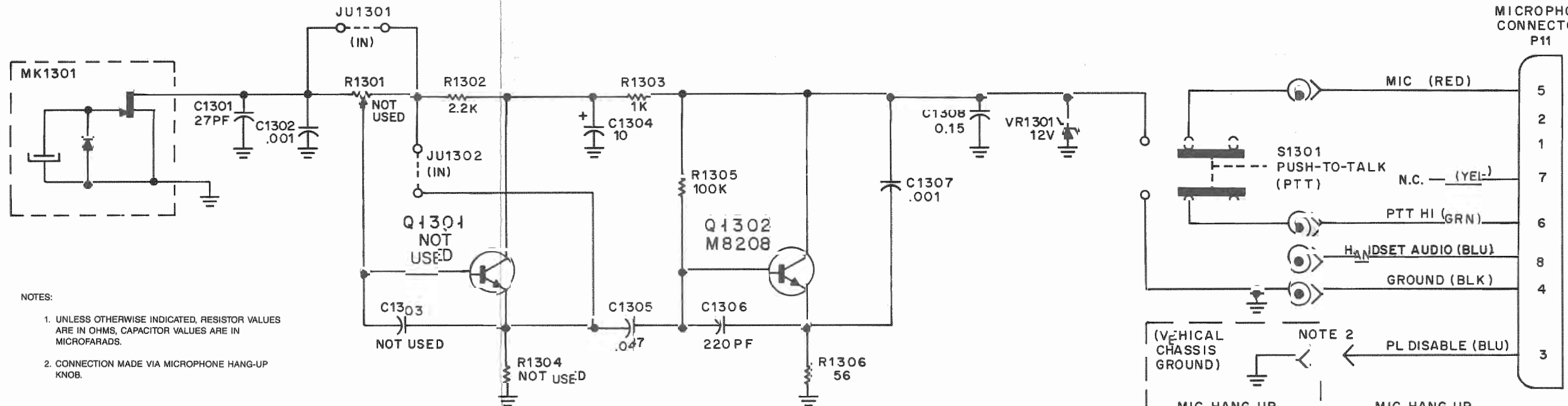
parts list

CODE NUMBER	MOTOROLA PART NO.	DESCRIPTION
1	1-80747T38	Housing assembly rear; includes: 15-84981B10 housing; 3-140001 screw, machine, 6-32x13/16" philips round head (4 used)
2	7-80200E01	Bracket, trunnion
3	33-83425N01	Nameplate
4	3-136756	Screw, tapping; No. 10 x 5/8" plain hex head (3 used)
5	3-84244C03	Screw, wing; 10-32 x 3/8" (2 used)
6	50-84561B03	Loudspeaker, "pin cushion" type; 2 ohms, 15 watts
7	32-84564P01	Gasket, speaker-mounting
8	13-82671M05	Bezel, speaker (front)
9	1-80747T39	Cable assembly; includes: 30-83155H01 2 conductor cable, 18 gauge; 9-80134M01 female terminal (2 used); 15-80076M01 housing, accessory connector (not shown)
10	42-82018H05	Retainer, cable entrance





- NOTES:
- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN MICROFARADS.
 - CONNECTION MADE VIA MICROPHONE HANG-UP KNOB.



SHOWN FROM COMPONENT SIDE

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
C1301	21-11038H35	Capacitor, fixed disc 27 pF 5% 50V
C1302	21-11039B13	disc 1000 pF 10% 50V
C1304	23-11019A20	lytic 10 μF 20% 25V
C1305	08-11017A14	poly .047 μF 5% 50V
C1306	21-11038P50	disc 220 pF 5% 50V
C1307	21-11039B13	disc 1000 pF 10% 50V
C1308	08-11051A14	poly .15 μF 5% 63V
JU1301	06-11009B23	Resistor, jumper
JU1302	06-11009B23	Resistor, jumper
MK1301	50-80258E04	Microphone electret cartridge
Q1302	48-80182D08	Transistor (see note) NPN; type 18 M82K
R1302	06-11009C57	Resistor, fixed, 5%, 1/4 watt 2.2k
R1303	06-11009C49	1k
R1305	06-11009C97	100k
R1306	06-11009A19	56
S1301	40-80065E02	Switch momentary
VR1301	48-82256C25	Voltage regulator zener 12V
1	05-80148D01 14-84360C01	Mechanical parts grommet insulator, switch

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
2	01-80743T71	microphone rear housing
3	03-1094	screw M3x.5x6
4	03-8003E04	screw metric hi-lo (3 used)
5	15-8014D05	microphone front housing
6	30-8014	cord
7	00095E51	name plate, HMN1035A
8	35-80144D03	button, push-to-talk

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
9	01-80736T05	black wire and lug
10	01-80743T91	hang-up clip
11	03-00139913	screw 8-18x1/2 (3 used)
12	29-00824456 42-10217A02	ring lug strap tie

IGNITION SWITCH CABLE

MODEL HKN4284A

1. DESCRIPTION

The Model HKN4284A Ignition Switch Cable allows the radio to be turned on and off by the vehicle ignition switch.

2. INSTALLATION

The following installation procedure assumes that the location for mounting the radio has been selected and the mounting bracket has been installed.

(1) Remove the accessory housing plug from the rear of the radio. If your radio is equipped with an external speaker the speaker wires will be plugged into this accessory housing plug.

(2) Plug the lead of the ignition switch cable with the crimped on terminal into the #5 socket of the accessory plug. (See illustration.)

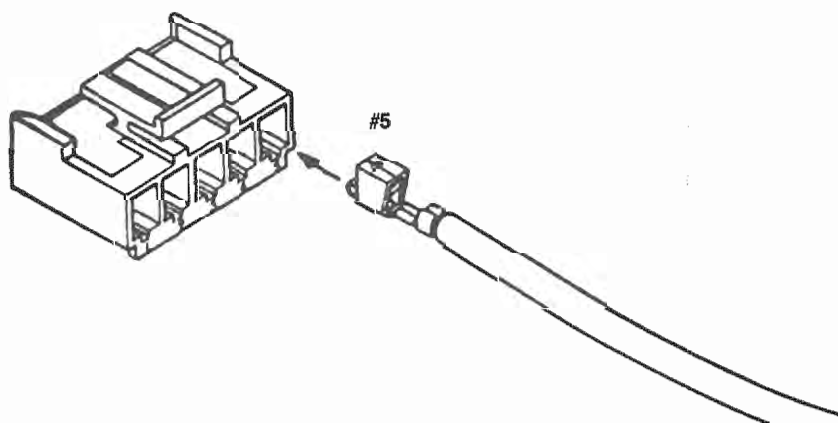
(3) Route and secure the cable.

(4) Connect the other lead of the accessory cable to the ignition switch of the vehicle.

(5) Open the radio and remove the bottom cover thus exposing the logic printed circuit board.

(6) Refer to the service manual and **identify the JU801 jumper and cut it**. The jumper is located in the rear, near the accessory connector.

(7) Reinstall the cover, plug the accessory housing plug to the rear of the radio and mount the radio to the mounting bracket.

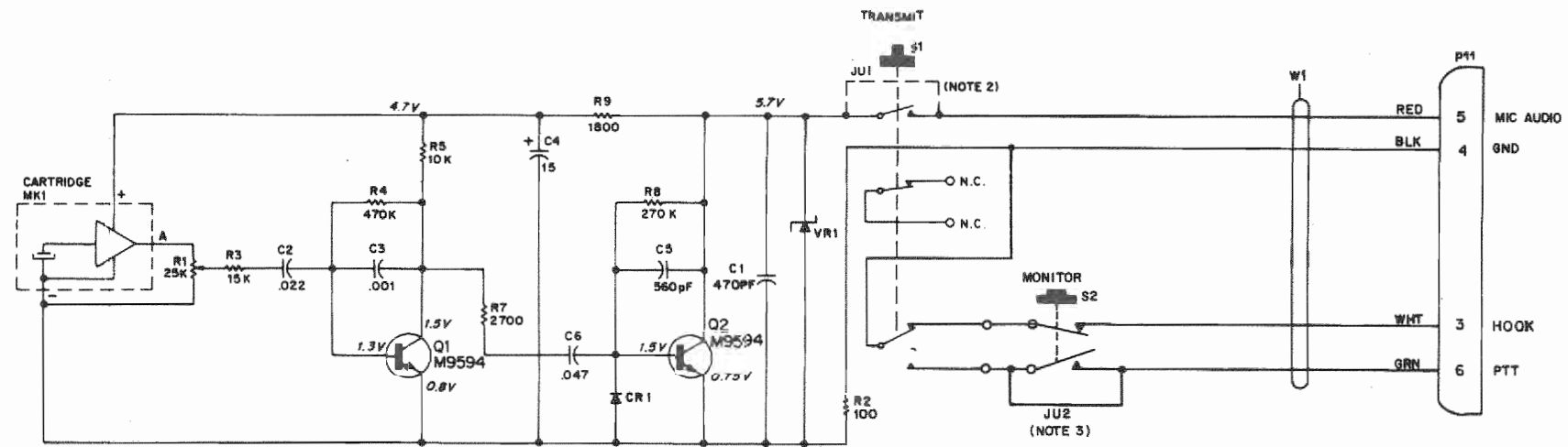


parts list

MOTOROLA PART NO.	DESCRIPTION
09-80124M01	Receptacle, connector, 1 pin
30-80093G01	Cable, ignition switch
30-80094G01	Cable, power adapter
65-80283E02	Fuse, blade type, 4A

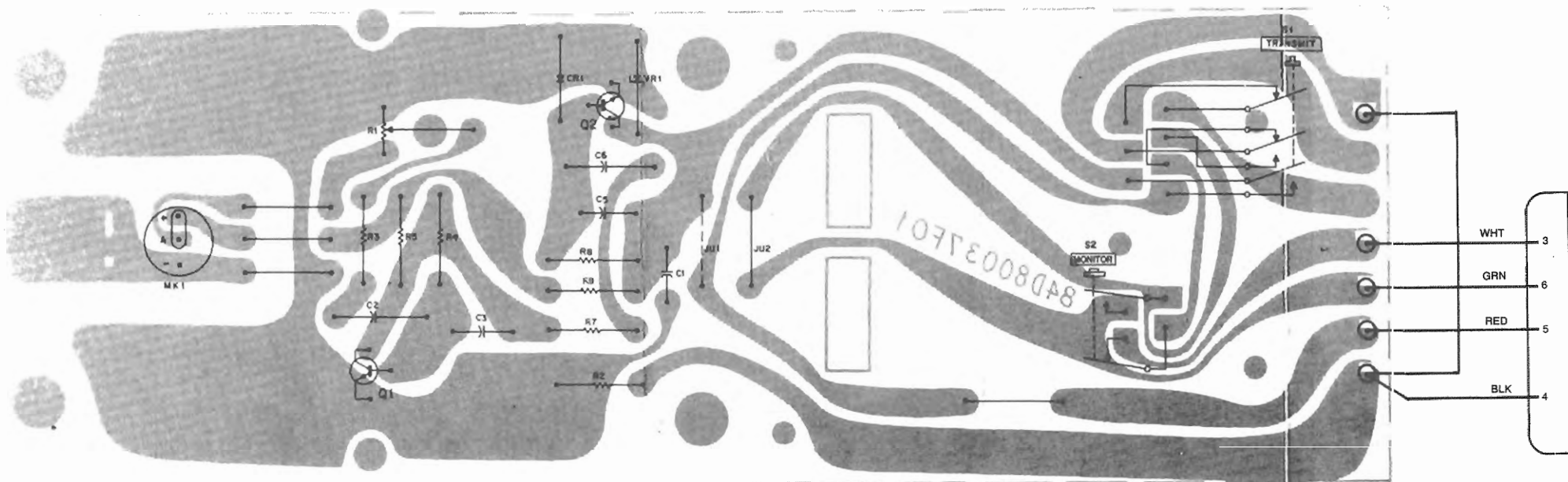
Optional Ignition Switch Cable
6880101W58-A

1-1988



NOTES:

1. UNLESS OTHERWISE STATED: ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. JU1 NORMALLY OUT.
3. JU2 IS NORMALLY IN.
4. ALL DC VOLTAGE READINGS ARE WITH RESPECT TO THE MIC LO LEAD.



SHOWN FROM COMPONENT SIDE

SOLDER SIDE ● 80-DEPS-35872-9
○ 0L-DEPSI-35873-A



TRANSISTOR BASE DETAIL

DESK MICROPHONE
MODEL HMN1038A

parts list

HHN4021A Housing & Hardware Kit

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
S1, S2	40-8471E03	switch, microphone leaf
non-referenced items		
	2-10101A69	NUT, spring; 2 used
	3-135102	SCREW, switch mtg.; 4-40 x 1/4"; 3 used
	3-138809	SCREW, baseplate: 4-40 x 5/16"; 4 used
	3-140047	SCREW, front cover: 4-20 x 5/8"; 2 used
	3-140251	SCREW, front cover: 4-20 x 3/4"; 2 used
	4-10058B10	WASHER, Teflon
	15-82978M04	COVER, front
	15-82978M04	COVER, rear
	15-84191E03	HOUSING, microphone
	38-84184E08	BUTTON
	38-84192E06	BUTTON
	42-82143C05	CLAMP, cable
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, button mtg. pivot
	47-84194E01	SHAFT, extension
	64-82977M01	PLATE, base
	75-84722E01	PAD, base plate

HLN4436A Microphone Circuit Board

PL-8346-0

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
C1	21-82187B45	capacitor, fixed: uF ± 10%; 500 V; unless otherwise stated
C2	8-82096J08	470 pF
C3	21-82187B44	.022; 250 V
C4	23-148685F03	.001; 100 V
C5	21-148685F03	15 + 150 - 10%; 25 V
C6	8-82096J04	560 pF
CR1	48-83654H01	diode: (see note) silicon
MK1	50-1-825M02	cartridge, microphone: electret
Q1, 2	48-869594	transistor: (see note) NPN; type M9594
R1	18-84944C02	resistor, fixed: ± 5%; 1/4 W; unless otherwise stated
R2	6-11009C25	variable: 25k ± 20%
R3	6-11009C77	100
R4	6-11009D14	15k
R5	6-11009C73	470k
R7	6-11009C59	10k
R8	6-11009D08	2.7k
R9	6-11009C55	270k
VR1	48-82256C38	1.8k diode: (see note) Zener; 9.1 V ± 5%

note: For optimum performance diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

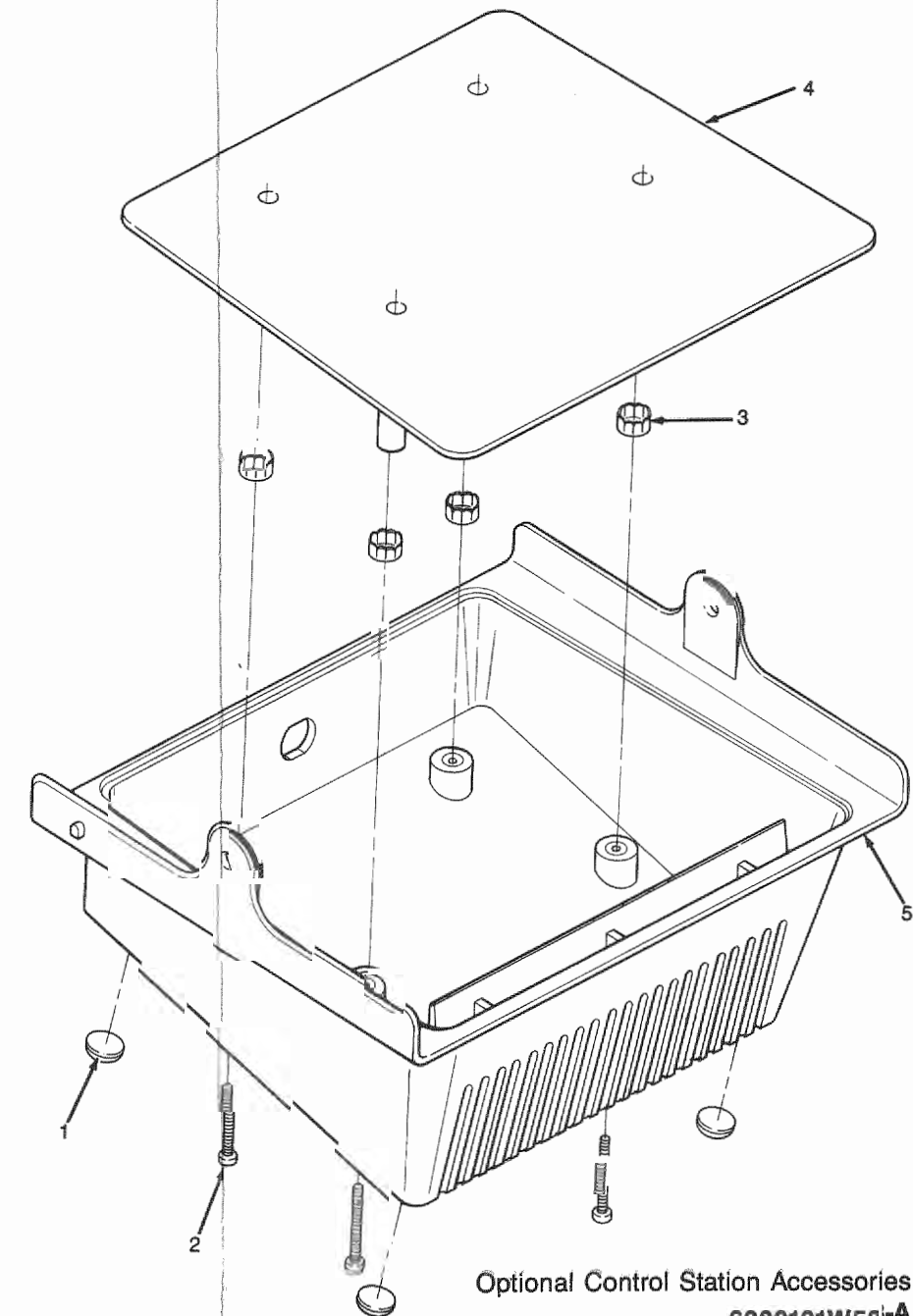
HKN4291A Microphone Cable Kit

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
W1	30-80152H06	CABLE, coiled: (includes connector P11)

DESK TRAY
MODEL HLN5309A

parts list

REF. SYMBOL	MOTOROLA PART NUMBER	DESCRIPTION	QTY. USED
1	75-10806A06	FOOT, RUBBER	4
2	03-00136518	TAPPING SCREW	4
3	38-80000K01	CLIP FASTENER	4
4	15-80154J02	COVER	1
5	15E80289E02	HOUSING	1



Optional Control Station Accessories

6880101W5g-A

1-1988

35

HLN5173A Logic Board

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitor, chip, 5%, 50V unless otherwise indicated

C401	21-11032A21	.01 uF 10%
C402	08-11051A09	poly .022 uF 63V
C403	21-11032A21	.01 uF 10%
C404	23-11048B19	lytic 47 uF 20% 16V
C405	23-11048B13	lytic 10 uF 20% 16V
C406	23-11048A17	lytic 33 uF 20% 25V
C407	23-11013A56	tantalum 47 uF 20% 6V
C408	23-11048B19	lytic 47 uF 20% 16V
C451	23-11048B19	lytic 47 uF 20% 16V
C452	21-11032A21	.01 uF 10%
C453	21-11032B14	.15 uF +80/-20%
C454	21-11032A21	.01 uF 10%
C455	08-11051A15	poly .22 uF 63V
C458	21-11031A26	30 pF
C459	21-11031A26	30 pF
C460	21-11032A21	.01 uF 10%
C461	21-11032A21	.01 uF 10%
C501	08-11051A13	poly .1 uF 63V
C502	08-11051A13	poly .1 uF 63V
C503	21-11031A39	100 pF
C504	23-11048B13	lytic 10 uF 20% 16V
C505	21-11031A39	100 pF
C506	21-11031A39	100 pF
C507	23-11013D13	tantalum 10 uF 10% 20V
C508	08-11051A15	poly .22 uF 63V
C509	23-11048B13	lytic 10 uF 20% 16V
C510	21-11031A51	330 pF
C511	21-11031A39	100 pF
C512	21-11031A39	100 pF
C513	21-11031A39	100 pF
C514	23-02308M01	lytic 1000 uF 20% 16V
C515	21-11031A39	100 pF
C551	23-11048A17	lytic 33 uF 20% 25V
C552	21-11031A23	22 pF
C553	21-11031A61	1000 pF
C554	08-11051A03	poly .0022 uF 63V
C555	21-11031A43	150 pF
C556	08-11051A12	poly .068 uF 63V
C557	08-11051A12	poly .068 uF 63V
C558	08-11051A12	poly .068 uF 63V
C559	08-11051A13	poly .1 uF 63V
C560	08-11051A13	poly .1 uF 63V
C561	23-11048B05	lytic 1 uF 20% 50V
C562	08-11051A09	poly .022 uF 63V
C563	21-11031A39	100 pF
C564	21-11031A39	100 pF
C565	23-11048B13	lytic 10 uF 20% 16V
C566	21-11032A21	.01 uF 10%
C567	21-11032A21	.01 uF 10%
C603		not used
C604	23-11048B05	lytic 1 uF 20% 50V
C605	23-11048B19	lytic 47 uF 20% 16V
C606	08-11044A22	poly .039 uF 63V
C607	08-11051A13	poly .1 uF 63V
C608	08-11051A05	poly .0047 uF 63V
C609	21-11031A45	180 pF
C610	08-11051A15	poly .22 uF 63V
C611	21-11031A36	75 pF
C612	23-11048B19	lytic 47 uF 20% 16V
C613		not used
C651	23-11048B19	lytic 47 uF 20% 16V
C652	08-11051A06	poly .0068 uF 63V
C653	08-11051A15	poly .22 uF 63V
C656	23-11048B13	lytic 10 uF 20% 16V
C657	21-11032B13	.1 uF +80/-20%
C658	21-11032A21	.01 uF 10%
C659	23-11013A56	tantalum 47 uF 20% 6V
C660	23-11048B13	lytic 10 uF 20% 50V
C661	21-11031A64	1500 pF
C662	21-11032A18	.0056 uF 10%
C663		

C701	21-11031A39	100 pF
C703	21-11032B13	.1 uF +80/-20%
C704	21-11031A39	100 pF
C705	08-11051A09	poly .022 uF 63V
C706	08-11051A13	poly .1 uF 63V
C707	08-11051A01	poly .001 uF 63V
C801	21-11031A39	100 pF
C802	21-11031A39	100 pF
C803	21-11031A61	1000 pF
C804	21-11031A61	1000 pF
C805	21-11031A61	1000 pF
C806	21-11031A61	1000 pF
C807	21-11031A61	1000 pF
C808	21-11031A39	100 pF
C809	21-11031A39	100 pF
C810	21-11031A61	1000 pF
C811	21-11031A61	1000 pF
C812		not used
C813	21-11031A61	1000 pF
C814	21-11031A61	1000 pF
C815	21-11031A61	1000 pF
C816	21-11031A61	1000 pF
C817	21-11031A61	1000 pF
C818	21-11031A61	1000 pF
C819	21-11031A61	1000 pF
C820	21-11031A61	1000 pF
C821	21-11031A61	1000 pF
C822	21-11031A61	1000 pF
C823	21-11031A61	1000 pF
C824	21-11031A39	100 pF
C825	21-11031A39	100 pF
C826	21-11031A61	1000 pF
C827	23-11048B05	lytic 1 uF 20% 50V
C828	21-11032B13	.1 uF +80/-20%
C829	21-11032A21	.01 uF 10%
C830	21-11031A15	10 +/- .5 pF
C831	21-11031F10	5.6 +/- .5 pF N750
C832	21-11031A15	10 +/- .5 pF
C833	21-11031A61	1000 pF
C834	21-11032B13	.1 uF +80/-20%
C835	21-11032B13	.1 uF +80/-20%
C836	21-11031A61	1000 pF
C837	21-11032A21	.01 uF 10%
C838	21-11032A21	.01 uF 10%
C839	21-11032A21	.01 uF 10%
C840	21-11032A21	.01 uF 10%
C841	21-11031A61	1000 pF
C842	21-11031A61	1000 pF
C843	21-11031A61	1000 pF
C844	21-11031A61	1000 pF
C845	21-11031A61	1000 pF
C846	21-11031A61	1000 pF
C847	21-11031A61	1000 pF
C848	21-11031A61	1000 pF
C849	21-11031A39	100 pF
C850	21-11031A61	1000 pF
C851		not used
C852	21-11032A21	.01 uF 10%
C853	21-11032A21	.01 uF 10%
C854	21-11031A61	1000 pF
C855	23-11054A09	tantalum 47 uF 20% 6V
C856	21-11031A39	100 pF
C857	23-11048B13	lytic 10 uF 20% 16V
C858	23-11048B06	lytic 2.2 uF 20% 50V
C859		not used

Diodes (see note)

CR401	48-83654H01	silicon
CR402	48-83654H02	silicon
CR403	48-83654H01	silicon
CR451	48-83654H01	silicon
CR501	48-83654H02	silicon
CR502	48-83654H02	silicon
CR551	48-83654H01	silicon
CR601		not used
CR602		not used

CR603	48-83654H01	silicon	R407	06-11024A51	1.2k
CR604	48-83654H01	silicon	R408	06-11024A73	10k
CR651	48-83654H01	silicon	R409	06-11024A73	10k
Connectors, receptacle			R410	06-11024A55	1.8k
J3	28-80129M01	5-pin, accessories	R411		not used
J7	28-80128M01	5-pin, RF power amplifier	R412		not used
J8/J9	28-80126M01	23-pin, includes J8 and J9	R413		not used
J10	28-80128M02	2-pin, internal speaker	R414		not used
Jumpers			R451	06-02369M01	metal film 1 0.6 watt
JU601	09-84181L01	push-on jumper, 2-pin	R452	06-02369M01	metal film 1 0.6 watt
JU801	06-11009B23	axial jumper	R453	06-11024A45	680
JU802	06-11024B23	chip jumper	R454	06-02369M31	metal film 330 0.6 watt
JU803		not used	R455	06-11024A45	680
JU804	06-11024B23	chip jumper	R456	06-11024A57	2.2k
JU805		not used	R457	06-11024A51	1.2k
JU806		plating jumper	R458	06-11024A65	4.7k
Coils			R459	06-11024A65	4.7k
L801	24-82723H35	23 uH	R460	06-11024A75	12k
L802	24-83961B02	5 turns GRN	R461	06-11024A45	680
L803	24-83961B02	5 turns GRN	R462	06-11024B04	180k
Connector, plug			R463	06-11024A99	120k
P6	28-80127M01	14-pin, RF board	R464	06-11024H88	100k 1%
P601	28-80250M01	3-pin, for JU601	R465	06-11024H88	100k 1%
Transistors (see note)			R466	06-11024G91	10.0k 1%
Q401	48-00869619	PNP; type M9619	R467	06-11024G91	10.0k 1%
Q402	48-80214G02	NPN; type MMBT3904	R468	06-11024A35	270
Q403		not used	R469	06-11024A49	1k
Q404		not used	R470	06-11024A73	10k
Q451	48-00869619	PNP; type M9619	R471	06-11024A81	22k
Q452	48-00869619	PNP; type M9619	R472	06-11024A67	5.6k
Q453	48-80214G02	NPN; type MMBT3904	R473	06-11024A83	27k
Q454	48-80214G02	NPN; type MMBT3904	R474	06-11024A73	10k
Q455	48-00869681	PNP; type M9681	R501	06-11024A59	2.7k
Q501	48-05128M16	PNP; type MMBT3906	R502	06-11024A81	22k
Q502	48-05128M16	PNP; type MMBT3906	R503	06-11024A81	22k
Q503	48-80214G02	NPN; type MMBT3904	R504	06-11024A73	10k
Q504	48-80214G02	NPN; type MMBT3904	R505	06-11024A61	3.3k
Q505	48-05128M16	PNP; type MMBT3906	R506	06-11024A53	1.5k
Q506	48-00869619	PNP; type M9619	R507	06-11024A41	470
Q507	48-00869618	NPN; type M9618	R508	06-11024A73	10k
Q508	48-05128M16	PNP; type MMBT3906	R509	06-11024A47	820
Q509	48-80214G02	NPN; type MMBT3904	R510	06-11024A47	820
Q551	48-05128M16	PNP; type MMBT3906	R511	06-11024A81	22k
Q552	48-80214G02	NPN; type MMBT3904	R512	06-11024A21	68
Q601	48-80214G02	NPN; type MMBT3904	R513	06-00124B55	carbon 2.7 1/4 watt
Q651	48-05128M16	PNP; type MMBT3906	R514	06-00124B55	carbon 2.7 1/4 watt
Q652	48-80214G02	NPN; type MMBT3904	R515	06-11024A21	68
Q801	48-80214G02	NPN; type MMBT3904	R516	06-11024A41	470
Q802	48-00869681	PNP; type M9681	R517	06-11024A73	10k
Q803	48-80214G02	NPN; type MMBT3904	R518	06-11024A73	10k
Q804	48-80214G02	NPN; type MMBT3904	R519	06-80185M01	metal plate 1 2 watt
Q805	48-80214G02	NPN; type MMBT3904	R551	06-11024A67	5.6k
Q806	48-80214G02	NPN; type MMBT3904	R552	06-11024B12	390k
Q807	48-80214G02	NPN; type MMBT3904	R553	06-11024A92	62k
Q808	48-05128M16	PNP; type MMBT3906	R554	06-11024A92	62k
Q809	48-05128M16	PNP; type MMBT3906	R555	06-11024A92	62k
Q810	48-80214G02	NPN; type MMBT3904	R556	06-11024G53	4.02k 1%
Q811	48-80214G02	NPN; type MMBT3904	R557	06-11024G20	1.82k 1%
Q812	48-80214G02	NPN; type MMBT3904	R558	06-11024H41	32.4k 1%
Resistors, chip, 5%, 1/8 watt, unless otherwise indicated			R559	06-11024H88	100k 1%
R401	06-11024A45	680	R560	06-11024F77	665 1%
R402	06-02369M31	metal film 330 0.6 watt	R561	06-11024H91	107k 1%
R403	06-11024A45	680	R562	06-11024A90	51k
R404	06-11024G18	1.74k 1%	R563	06-11024A89	47k
R405	06-11024G28	2.21k 1%	R565	06-11024A73	10k
R406	06-11024A73	10k	R566	06-11024A71	8.2k
			R567	06-11024A61	3.3k
			R568	06-11024A73	10k
			R569	06-11024A25	100
			R570	06-11024A97	100k
			R573	06-11024A83	27k
			R574	06-11024A75	12k
			R575	06-11024A82	24k
			R576	06-11024A82	24k
			R604	06-11024A73	10k
			R605	06-11024A49	1k
			R608	06-11024A97	100k
			R609	06-11024A85	33k

R610	06-11024A81	22k
R611	06-11024H42	33.2k 1%
R612	06-11024H42	33.2k 1%
R613	06-11024H45	35.7k 1%
R615	06-11024J15	187k 1%
R616	06-11024H48	38.3k 1%
R617	06-11024A57	2.2k
R618	06-11024A97	100k
R619	06-11024A73	10k
R620	06-11024A73	10k
R651	06-11024A43	560
R652	06-11024A25	100
R653	06-11024A73	10k
R654	06-11024A73	10k
R655	06-11024A65	4.7k
R656	06-11024B14	470k
R657	06-11024B17	620k
R658	06-11024B17	620k
R659	06-11024A57	2.2k
R660	06-11024A93	68k
R661	06-11024A77	15k
R662	06-11024A91	56k
R663	06-11024A92	62k
R664	06-11024A81	22k
R665	06-11024A59	2.7k
R666	06-11024A97	100k
R667	06-11024A97	100k
R668	06-11024A92	62k
R669	06-11024A92	62k
R670	06-11024A92	62k
R671	06-11024A25	100
R701	06-11024H88	100k 1%
R702	06-11024B04	180k
R703	06-11024A83	27k
R704		not used
R705	06-11024B06	220k
R706	06-11024H88	100k 1%
R707	06-11024J26	243k 1%
R709	06-11024A84	30k
R710	06-11024H68	61.9k 1%
R711	06-11024H68	61.9k 1%
R712	06-11024H68	61.9k 1%
R713	06-11024A61	3.3k
R714	06-11024A90	51k
R715	06-11024A79	18k
R801	06-11024A53	1.5k
R802	06-11024A59	2.7k
R803	06-11024A73	10k
R804	06-11024A65	4.7k
R805	06-11024A73	10k
R806	06-11024A73	10k
R807	06-11024A89	47k
R808	06-11024A65	4.7k
R809	06-11024A65	4.7k
R810	06-11024A91	56k
R811	06-11024A91	56k
R812	06-11024A65	4.7k
R813	06-11024A65	4.7k
R814	06-11024A65	4.7k
R815	06-11024A65	4.7k
R816	06-11024A97	100k
R817	06-11024A97	100k
R818	06-11024A97	100k
R820	06-11024A73	10k
R821	06-11024A73	10k
R822	06-11024A89	47k
R823	06-11024A73	10k
R824	06-11024A73	10k
R825	06-11024A89	47k
R826	06-11024A73	10k
R827	06-11024A73	10k
R828	06-11024A73	10k
R829	06-11024A49	1k
R830	06-11024A49	1k
R831	06-11024A49	1k
R832	06-11024A49	1k
R833	06-11024A73	10k
R834	06-11024G91	10.0k 1%

R835	06-11024A82	24k
R836	06-11024A73	10k
R837	06-11024A79	18k
R838	06-11024G91	10.0k 1%
R839	06-11024A73	10k
R840	06-11024A73	10k
R841	06-11024A73	10k
R842	06-11024A49	1k
R843	06-11024A73	10k
R844	06-11024A73	10k
R845	06-11024A49	1k
R846	06-11024A73	10k
R847	06-11024A49	1k
R848	06-11024A49	1k
R849	06-11024A73	10k
R850	06-11024A49	1k
R851	06-11024A89	47k
R852	06-11024A89	47k
R853	06-11024B20	820k
R854	06-11024A65	4.7k
R855	06-11024A89	47k
R856	06-11024A49	1k
R857	06-11024A73	10k
R858	06-11024A73	10k
R859	06-11024A73	10k
R860	06-11024A73	10k
R861	06-11024A97	100k
R862	06-11024G95	11.0k 1%
R863	06-11024G91	10.0k 1%
R864	06-11024G20	1.82k 1%
R865	06-11024A73	10k
R866	06-11024A73	10k
R867	06-11024A73	10k
R868	06-11024A73	10k
R869	06-11024A73	10k
R870	06-11024A73	10k
R871	06-11024A73	10k
R872	06-11024A73	10k
R873	06-11024A73	10k
R874	06-11024A49	1k
R875	06-11024A73	10k
R876	06-11024A73	10k
R877	06-11024A97	100k
R878	06-11024A97	100k
R879	06-11024A97	100k
R880	06-11024A89	47k
R881	06-11024A73	10k
R882	06-11024A81	22k
R883	06-11024A65	4.7k
R884	06-11024A89	47k
R885	06-11024A73	10k
R886	06-11024A81	22k
R887	06-11024A65	4.7k
R888		not used
R889	06-11024A73	10k
R890	06-11024A73	10k
R891	06-11024A67	5.6k
R892	06-11024A73	10k
R893	06-11024B06	220k
R894	06-11024B06	220k
R895	06-11024A93	68k
R896	06-11024A83	27k
R897	06-11024A73	10k
R898	06-11024A73	10k

Integrated Circuits (see note)

U401	51-80056M04	dual op-amp SOIC
U402	51-80068C06	regulator, 5 volts
U451	51-80056M04	dual op-amp SOIC
U551	51-80056M04	dual op-amp SOIC
U552	51-80056M04	dual op-amp SOIC
U553	51-80056M04	dual op-amp SOIC
U601	51-80056M01	dual comparator SOIC
U602	51-80056M04	dual op-amp SOIC
U603	51-80056M04	dual op-amp SOIC
U651	51-80056M04	dual op-amp SOIC
U652	51-80056M04	dual op-amp SOIC

U653	51-80059M01	voltage-controlled attn
U701	51-80056M04	dual op-amp SOIC
U801	51-80135C10	D/A convertor
U802	51-97024A01	microcomputer MC68HC11A8
U803	51-82862N09	logic array
U804	51-99002D03	EPROM 8Kx8 CMOS
U805	51-80057M01	NOVRAM 2Kx8
U806		not used
U807	51-80056M01	dual comparator SOIC

Voltage Regulators, 5% unless otherwise specified

VR401	48-83461E40	zener diode 5.1V 1%
VR402	48-82256C15	zener diode 5.1V
VR551	48-82256C11	zener diode 10V
VR801	48-82256C20	zener diode 27V
VR802	48-82256C11	zener diode 10V
VR803	48-82256C11	zener diode 10V
VR804	48-82256C20	zener diode 27V
VR805	48-82256C20	zener diode 27V
VR806	48-82256C11	zener diode 10V
VR807	48-82256C20	zener diode 27V

Crystals

Y801	48-80173D09	7.776 MHz
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Non-Referenced Items

03-10943M04	screw M2.5 X 8 (5 used)
04-00001718	washer (4 used)
07-80925T01	bracket, heat sink
09-82071K09	14 pin socket (2 used for U804)
14-80145M01	insulator accessory (under J3)
14-83820M05	insulator TO-118 (5 used)
15-80076M01	plastic housing 5 pin (for J3)
26-80123M01	shield frame hi-speed logic
26-80125L02	heat sink, audio/regulator

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLD4321A RF Board, 136-162 MHz (L)
HLD4322A RF Board, 146-174 MHz (H)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitor, chip, 5%, 50V unless otherwise indicated

C1(L)	21-11031A26	30 pF
C1(H)	21-11031A25	27 pF
C2(L)	21-11031A33	56 pF
C2(H)	21-11031A29	39 pF
C3(L)	21-11031A34	62 pF
C3(H)	21-11031A33	56 pF
C4(L)	21-11031A21	18 pF
C4(H)	21-11031A19	15 pF
C5(L)	21-11031A04	1.8 +/- .25 pF
C5(H)	21-11031A03	1.5 +/- .25 pF
C6(L)	21-11031A07	3.3 +/- .25 pF
C6(H)	21-11031A06	2.7 +/- .25 pF
C7(L)	21-11031A04	1.8 +/- .25 pF
C7(H)	21-11031A03	1.5 +/- .25 pF
C8(L)	21-11031A21	18 pF
C8(H)	21-11031A19	15 pF
C9(L)	21-11031A34	62 pF
C9(H)	21-11031A33	56 pF
C10(L)	21-11031A31	47 pF
C10(H)	21-11031A29	39 pF
C11(L)	21-11031A15	10 +/- .5 pF
C11(H)	21-11031A09	4.7 +/- .25 pF
C12	21-11031A55	470 pF
C13(L)	21-11031A21	18 pF
C13(H)	21-11031A14	9.1 +/- .5 pF
C14(L)	21-11031A39	100 pF
C14(H)	21-11031A53	390 pF
C15(L)	21-11031A37	82 pF
C15(H)	21-11031A36	75 pF
C16(L)	21-11031A26	30 pF
C16(H)	21-11031A24	24 pF
C17(L)	21-11031A37	82 pF
C17(H)	21-11031A36	75 pF
C18(L)	21-11031A28	36 pF
C18(H)	21-11031A25	27 pF
C19(L)	21-11031A30	43 pF
C19(H)	21-11031A29	39 pF
C20	21-11032B15	.22 uF +80/-20%
C21	21-11032B15	.22 uF +80/-20%
C22	21-11031A61	1000 pF
C51	21-11031A25	27 pF
C52	21-11031A25	27 pF
C53	21-11031A37	82 pF
C54	21-11031A51	330 pF
C55	21-11032A21	.01 uF 10%
C56	21-11032A21	.01 uF 10%
C57	21-11031A21	18 pF
C58	21-11031A13	8.2 +/- .5 pF
C59	21-11031A21	18 pF
C60	21-11032A21	.01 uF 10%
C61	21-11032A21	.01 uF 10%
C65	21-11032B15	.22 uF +80/-20%
C66	21-11032A21	.01 uF 10%
C67	23-11013D13	tantalum 10 uF 10% 20V
C68	21-11031A23	22 pF
C69	21-11031A29	39 pF
C70	21-11031A19	15 pF
C71	21-11032B15	.22 uF +80/-20%
C72	21-11032B15	.22 uF +80/-20%
C73	23-11013D13	tantalum 10 uF 10% 20V
C74	23-11048B13	lytic 10 uF 20% 16V
C75	21-11032B15	.22 uF +80/-20%
C76	23-11048B06	lytic 2.2 uF 20% 50V
C77	21-11032B15	.22 uF +80/-20%
C78	21-11032B15	.22 uF +80/-20%
C79	21-11032A13	.0022 uF 10%
C80	21-11032B15	.22 uF +80/-20%
C81	21-11032A13	.0022 uF 10%
C82	21-11032B15	.22 uF +80/-20%
C83	21-11032B15	.22 uF +80/-20%

C84	21-82450B14	composition 2.4 pF 500V
C85	21-11031A17	12 pF
C101	23-11048B13	lytic 10 uF 20% 16V
C102	08-11051A13	poly .1 uF 63V
C103	21-11032A21	.01 uF 10%
C104	21-11032A21	.01 uF 10%
C105	23-11048B13	lytic 10 uF 20% 16V
C106	21-11031A19	15 pF
C107	21-11032B13	.1 uF +80/-20%
C108	21-11032B13	.1 uF +80/-20%
C109	08-11051A13	poly .1 uF 63V
C110	08-11044A33	poly 1 uF
C111	08-11051A09	poly .022 uF 63V
C113	08-11051A13	poly .1 uF 63V
C114	21-11031A61	1000 pF
C115	21-11032A21	.01 uF 10%
C116	21-11031A61	1000 pF
C117	21-11031A61	1000 pF
C118	21-11031A19	15 pF
C119	21-11031A61	1000 pF
C120	21-11031A61	1000 pF
C121	21-11031A19	15 pF
C151	21-11031A61	1000 pF
C152	21-11031A41	120 pF
C154	21-11032A21	.01 uF 10%
C155	21-11031A45	180 pF
C156	21-11031A45	180 pF
C157	21-11032A21	.01 uF 10%
C158	08-11051A15	poly .22 uF 63V
C159	21-11031A25	27 pF
C160	21-11031A19	15 pF
C161	21-11031A61	1000 pF
C162	23-11048B13	lytic 10 uF 20% 16V
C163	08-11051A17	poly .47 uF 63V
C164	21-11032B13	.1 uF +80/-20%
C165	21-11031A61	1000 pF
C166	21-11031A39	100 pF
C167	21-11031A39	100 pF
C168	21-11031A39	100 pF
C176	21-11031A61	1000 pF
C201	23-11048B13	lytic 10 uF 20% 16V
C205	21-11032A23	.015 uF 10%
C206(L)	21-11031A22	20 pF
C206(H)	21-11031A17	12 pF
C207(L)	21-11031A15	10 +/- .5 pF
C207(H)	21-11031A19	15 pF
C208(L)	21-11031A13	8.2 +/- .5 pF
C208(H)	21-11031A17	12 pF
C209	21-11031A13	8.2 +/- .5 pF
C210	21-11031A61	1000 pF
C211	21-11031A61	1000 pF
C212	21-11031A61	1000 pF
C213(L)	21-11031A09	4.7 +/- .25 pF
C213(H)	21-11031A10	5.6 +/- .5 pF
C214(L)	21-11031A05	2.2 +/- .25 pF
C214(H)	21-11031A07	3.3 +/- .25 pF
C215	21-11031A61	1000 pF
C216	21-11031A37	82 pF
C218	21-11032A21	.01 uF 10%
C219(L)		not used
C219(H)	21-11031A07	3.3 +/- .25 pF
C220	21-11031A61	1000 pF
C221(L)	21-11031A05	2.2 +/- .25 pF
C221(H)	21-11031A03	1.5 +/- .25 pF
C222	21-11032A21	.01 uF 10%
C223	21-11031A07	3.3 +/- .25 pF
C224	21-11031A61	1000 pF
C225	21-11031A61	1000 pF
C228	21-11032A21	.01 uF 10%
C229	21-11031A03	1.5 +/- .25 pF
C230	21-11031A03	1.5 +/- .25 pF
C231	21-11031A28	36 pF
C233(L)	21-11031A28	36 pF
C233(H)	21-11031A27	33 pF
C234	21-11031A19	15 pF
C235	21-11031A13	8.2 +/- .5 pF
C236	21-11031A13	8.2 +/- .5 pF
C237	21-11031A61	1000 pF

C238	21-11031A61	1000 pF
C239	21-11031A61	1000 pF
C240(L)	21-11031A05	2.2 +/- .25 pF
C240(H)	21-11031A07	3.3 +/- .25 pF
C241(L)	21-11031A09	4.7 +/- .25 pF
C241(H)	21-11031A10	5.6 +/- .25 pF
C242	21-11031A61	1000 pF
C243	21-11031A37	82 pF
C245	21-11031A61	1000 pF
C246(L)		not used
C246(H)	21-11031A07	3.3 +/- .25 pF
C247	21-11031A61	1000 pF
C248	21-11031A03	1.5 +/- .25 pF
C249	21-11032A21	.01 uF 10%
C250	21-11031A09	4.7 +/- .25 pF
C251	21-11031A61	1000 pF
C252	21-11031A61	1000 pF
C253(L)		not used
C253(H)	21-11031A19	15 pF
C276	21-11032A21	.01 uF 10%
C277	23-11048B19	lytic 47 uF 20% 16V
C278	23-11048B19	lytic 47 uF 20% 16V
C301	21-11032A21	.01 uF 10%

Diodes (see note)

CR1	48-80236E16	quad Schottky ring
CR2	48-80154K03	dual Schottky SOT
CR51	48-83654H01	silicon
CR101	48-83654H01	silicon
CR102	48-83654H01	silicon
CR151	48-82190H54	silicon varactor SOT
CR152	48-82190H54	silicon varactor SOT
CR153	48-83654H01	silicon
CR154	48-83654H01	silicon
CR176	48-83654H02	silicon
CR202	48-82190H54	silicon varactor SOT
CR203	48-82190H54	silicon varactor SOT
CR204	48-82190H54	silicon varactor SOT
CR205	48-82190H54	silicon varactor SOT
CR206	48-84616A01	silicon hot carrier
CR207	48-84616A01	silicon hot carrier
CR209	48-82190H54	silicon varactor SOT
CR210	48-82190H54	silicon varactor SOT
CR211	48-82190H54	silicon varactor SOT
CR212	48-82190H54	silicon varactor SOT
CR213	48-82190H54	silicon varactor SOT
CR214	48-84616A01	silicon hot carrier
CR215	48-84616A01	silicon hot carrier

Filters

FL51	91-80097D06	455 kHz, 6D
FL52	91-80098D06	455 kHz, 4D

Connectors, receptacle

J4	09-80135M01	coaxial (RX)
J5	09-80135M01	coaxial (TX)
J6	09-80130M02	14-pin socket (logic board)

Coils

L1	24-80148M06	4-1/2 turns YEL
L2	24-80148M06	4-1/2 turns YEL
L3	24-80148M06	4-1/2 turns YEL
L4	24-80148M06	4-1/2 turns YEL
L5	24-80148M06	4-1/2 turns YEL
L6	24-80148M06	4-1/2 turns YEL
L7	24-80148M06	4-1/2 turns YEL
L8	24-80063M14	1.2 uH
L51	24-80063M09	.47 uH
L52	24-80063M09	.47 uH
L53	24-80063M04	.18 uH
L54	24-80063M21	4.7 uH
L55	24-80164M02	tunable .7 uH E715
L56	24-80164M01	tunable .7 uH E713
L57	24-80164M04	tunable .7 uH E714

L58	24-80063M21	4.7 uH
L59	24-80164M03	tunable .7 uH E716
L60	24-80063M14	1.2 uH
L61	25-80000E01	tunable 455 kHz with cap
L101	24-80063M14	1.2 uH
L102	24-11030B09	4-1/2 turns BRN
L151	24-80299D01	tunable, 17-3/4 turns
L152	24-80063M22	5.6 uH
L153	30-10286A72	sleeved jumper
L202	24-80148M05	tunable 3-1/2 turns
L203	24-80063M14	1.2 uH
L204(L)	24-11030B11	6-1/2 turns ORG
L204(H)	24-11030B08	4-1/2 turns BRN
L205	24-80063M14	1.2 uH
L206	24-80063M14	1.2 uH
L207	24-80063M14	1.2 uH
L208	24-11030B09	4-1/2 turns BRN
L209	24-80063M14	1.2 uH
L210	24-11030B12	7-1/2 turns YEL
L211	24-80063M14	1.2 uH
L213	24-80148M08	tunable 4-1/2 turns
L214	24-80063M14	1.2 uH
L215(L)	24-11030B14	9-1/2 turns BLU
L215(H)	24-11030B12	7-1/2 turns YEL
L216	24-80063M14	1.2 uH
L217	24-80063M14	1.2 uH
L218	24-80063M14	1.2 uH
L219	24-11030B09	4-1/2 turns BRN
L220	24-80063M14	1.2 uH
L221	24-11030B14	9-1/2 turns BLU
L222	24-80063M14	1.2 uH

Transistors (see note)

Q1	48-80182D44	NPN; type M82D44
Q2	48-00869643	PNP; type M9643
Q51	48-00869839	field effect; type M9839
Q52	48-00869839	field effect; type M9839
Q53	48-00869642	NPN; type M9642
Q101	48-00869643	PNP; type M9643
Q102	48-00869987	NPN; type M9987
Q103	48-00869987	NPN; type M9987
Q104	48-00869643	PNP; type M9643
Q105	48-00869642	NPN; type M9642
Q106	48-00869642	NPN; type M9642
Q107	48-00869658	NPN; type M9658
Q151	48-00869658	NPN; type M9658
Q152	48-00869643	PNP; type M9643
Q203	48-00869839	field effect; type M9839
Q204	48-00869658	NPN; type M9658
Q205	48-00869658	NPN; type M9658
Q206	48-00869839	field effect; type M9839
Q207	48-00869658	NPN; type M9658
Q208	48-00869658	NPN; type M9658
Q276	48-00869642	NPN; type M9642
Q277	48-00869643	PNP; type M9643
Q278	48-00869643	PNP; type M9643
Q279	48-00869643	PNP; type M9643

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R1	06-11024A05	15
R2	06-11024A05	15
R3	06-11024A41	470
R4	06-11024A59	2.7k
R5	06-11024A21	68
R6	06-11024A61	3.3k
R7	06-11024A77	15k
R51	06-11024A18	51
R52	06-11024A29	150
R53	06-11024A63	3.9k
R54	06-11024A29	150
R56	06-11024B20	820k
R57	06-11024A47	820
R58	06-11024B06	220k
R59	06-11024B02	150k
R60	18-05500L08	variable 22k
R61	06-11024A93	68k

R62	06-11024A83	27k
R63	06-11024A95	82k
R102	06-11024A37	330
R103	06-11024A73	10k
R104	06-11024A73	10k
R105	06-11024A85	33k
R106	06-11024A49	1k
R107	06-11024A53	1.5k
R108	06-11024A01	10
R109	06-11024A01	10
R110	06-11024A77	15k
R111	06-11024A47	820
R112	06-11024A61	3.3k
R113	06-11024A49	1k
R114	06-11024A47	820
R115	06-11024A45	680
R116	06-11024A67	5.6k
R118	06-11024A45	680
R119	06-11024A65	4.7k
R120	06-11024A63	3.9k
R121	06-11024A63	3.9k
R122	06-11024A18	51
R123	06-11024A25	100
R124	06-11024A59	2.7k
R125	06-11024A47	820
R151	06-11024A89	47k
R152	06-11024A85	33k
R153	06-11024A89	47k
R154	06-11024A09	22
R155	06-11024A73	10k
R156	06-11024A77	15k
R157	06-11024A53	1.5k
R158	06-11024A49	1k
R159	06-11024A49	1k
R161	06-11024A73	10k
R163	06-11024A81	22k
R164	18-05500L08	variable 22k
R165	06-11024A84	30k
R176	06-11024H26	22.6k 1%
R177	06-11024H28	23.7k 1%
R178	06-11024G91	10.0k 1%
R179	06-11024G91	10.0k 1%
R180	06-11024H52	42.2k 1%
R181	06-11024G91	10.0k 1%
R182	06-11024H28	23.7k 1%
R207	06-11024A19	56
R208	06-11024A19	56
R209	06-11024A25	100
R210	06-11024A59	2.7k
R211	06-11024A73	10k
R212	06-11024A59	2.7k
R213	06-11024A47	820
R214	06-11024A25	100
R215	06-11024A59	2.7k
R216	06-11024A47	820
R217	06-11024A17	47
R218	06-11024A25	100
R219	06-11024A21	68
R220	06-11024A25	100
R222	06-11024A59	2.7k
R223(L)	06-11024A73	10k
R223(H)	06-11024A75	12k
R224	06-11024A97	100k
R225	06-11024A83	27k
R226	06-11024A19	56
R227	06-11024A19	56
R228(L)	06-11024A29	150
R228(H)	06-11024A25	100
R229	06-11024A59	2.7k
R230	06-11024A73	10k
R231	06-11024A59	2.7k
R232	06-11024A47	820
R233	06-11024A25	100
R234	06-11024A59	2.7k
R235	06-11024A47	820
R236	06-11024A17	47
R237	06-11024A41	470
R238	06-11024A03	12

R239	06-11024A41	470
R241	06-11024A97	100k
R276	06-11024A73	10k
R277	06-11024A35	270
R278	06-11024A01	10
R279	06-11024A65	4.7k
R280	06-11024A73	10k
R281	06-11024A65	4.7k

Transformers

T1	25-80163M02	balun
T2	25-80163M02	balun

Integrated Circuits (see note)

U51	51-05479G05	receiver system
U101	51-84704M75	synthesizer
U102	51-84810F66	prescaler
U176	51-84621K89	dual op-amp

Crystals

Y51	91-80022M02	filter 45.1 MHz (includes Y51A, Y51B)
Y52	48-80008K02	44.645 MHz
Y151	48-80174D05	14.4 MHz

Non-Referenced Items

14-05160A01	insulator (for Y151)
26-80097M01	shield coil can (for L151)
26-80098M01	shield coil can (11 used)
26-80228L01	shield can (2 used, for J4 and J5)
26-80229L03	shield VCO frame
26-80256L02	shield RF front end
75-05295B07	insulator (3 used, for Y51A/B, Y52)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitor, chip, 5%, 50V unless otherwise indicated

C1	21-11031A11	6.8 +/- .5 pF
C2	21-11031A10	5.6 +/- .5 pF
C3	21-11031A67	4.3 +/- .25 pF
C4	21-11031A20	16 pF
C5	21-11031A67	4.3 +/- .25 pF
C6	21-11031A67	4.3 +/- .25 pF
C7	21-11031A20	16 pF
C8	21-11031A67	4.3 +/- .25 pF
C9	21-11031A67	4.3 +/- .25 pF
C10	21-11031A08	3.9 +/- .25 pF
C11	21-11031A21	18 pF
C12	21-11031A35	68 pF
C13	21-11031A11	6.8 +/- .5 pF
C14	21-11031A11	6.8 +/- .5 pF
C15	21-11031A09	4.7 +/- .25 pF
C16	21-11031A08	3.9 +/- .25 pF
C17	21-11031A19	15 pF
C18	21-11031A08	3.9 +/- .25 pF
C19	21-11031A08	3.9 +/- .25 pF
C20	21-11031A21	18 pF
C21	21-11031A08	3.9 +/- .25 pF
C22	21-11031A08	3.9 +/- .25 pF
C23	21-11031A19	15 pF
C24	21-11031A08	3.9 +/- .25 pF
C25	21-11031A08	3.9 +/- .25 pF
C26	21-11031A17	12 pF
C27	21-11032B15	.22 uF +80/-20%
C28	21-11031A35	68 pF
C29	21-11031A35	68 pF
C30	21-11032B15	.22 uF +80/-20%
C51	21-11031A25	27 pF
C52	21-11031A25	27 pF
C53	21-11031A37	82 pF
C54	21-11031A51	330 pF
C55	21-11032A21	.01 uF 10%
C56	21-11032A21	.01 uF 10%
C57	21-11031A21	18 pF
C58	21-11031A13	8.2 +/- .5 pF
C59	21-11031A21	18 pF
C60	21-11032A21	.01 uF 10%
C61	21-11032A21	.01 uF 10%
C65	21-11032B15	.22 uF +80/-20%
C66	21-11032A21	.01 uF 10%
C67	23-11013D13	tantalum 10 uF 10% 20V
C68	21-11031A23	22 pF
C69	21-11031A29	39 pF
C70	21-11031A19	15 pF
C71	21-11032B15	.22 uF +80/-20%
C72	21-11032B15	.22 uF +80/-20%
C73	23-11013D13	tantalum 10 uF 10% 20V
C74	23-11048B13	lytic 10 uF 20% 16V
C75	21-11032B15	.22 uF +80/-20%
C76	23-11048B06	lytic 2.2 uF 20% 50V
C77	21-11032B15	.22 uF +80/-20%
C78	21-11032B15	.22 uF +80/-20%
C79	21-11032A13	.0022 uF 10%
C80	21-11032B15	.22 uF +80/-20%
C81	21-11032A13	.0022 uF 10%
C82	21-11032B15	.22 uF +80/-20%
C83	21-11032B15	.22 uF +80/-20%
C84	21-82450B14	composition 2.4 pF 500V
C85	21-11031A17	12 pF
C101	23-11048B13	lytic 10 uF 20% 16V
C102	08-11051A13	poly .1 uF 63V
C103	21-11032A21	.01 uF 10%
C104	21-11032A21	.01 uF 10%
C105	23-11048B13	lytic 10 uF 20% 16V
C106	21-11031A19	15 pF
C107	21-11032B13	.1 uF +80/-20%
C108	21-11032B13	.1 uF +80/-20%
C109		
C110	08-11044A33	poly 1 uF
C111	08-11051A09	poly .022 uF 63V
C113	21-11032A21	.01 uF 10%
C114	21-11032A21	.01 uF 10%
C115	21-11031A35	68 pF
C116	21-11031A35	68 pF
C117	21-11032B13	.1 uF +80/-20%
C118	21-11031A35	68 pF
C119	21-11031A35	68 pF
C120	21-11031A61	1000 pF
C121	21-11031A09	4.7 +/- .25 pF
C122	21-11031A39	100 pF
C123	21-11031A35	68 pF
C124	21-11031A15	10 +/- .5 pF
C125	21-11031A61	1000 pF
C126	21-11031A35	68 pF
C151	21-11031A61	1000 pF
C152	21-11031A36	75 pF
C153	21-11031A15	10 +/- .5 pF
C154	21-11032A21	.01 uF 10%
C155	21-11031A45	180 pF
C156	21-11031A45	180 pF
C157	21-11032A21	.01 uF 10%
C158	08-11051A15	poly .22 uF 63V
C159	21-11031A25	27 pF
C160	21-11031A19	15 pF
C161	21-11031A61	1000 pF
C162	23-11048B13	lytic 10 uF 20% 16V
C163	08-11051A17	poly .47 uF 63V
C164	21-11032B13	.1 uF +80/-20%
C176	21-11031A61	1000 pF
C201	23-11048B13	lytic 10 uF 20% 16V
C202	21-11031A35	68 pF
C203	21-11031A35	68 pF
C204	21-11031A03	1.5 +/- .25 pF
C205	21-11031A35	68 pF
C206	21-11031A09	4.7 +/- .25 pF
C207	21-11031A15	10 +/- .5 pF
C208	21-11031A13	8.2 +/- .5 pF
C209	21-11031A13	8.2 +/- .5 pF
C210	21-11031A35	68 pF
C211	21-11031A35	68 pF
C212	21-11031A35	68 pF
C213	21-11031A03	1.5 +/- .25 pF
C214	21-11031A10	5.6 +/- .5 pF
C215	21-11031A35	68 pF
C216	21-11031A11	6.8 +/- .5 pF
C217	21-11031A01	1 +/- .25 pF
C218	21-11031A35	68 pF
C219	21-11031A05	2.2 +/- .25 pF
C220	21-11031A23	22 pF
C221	21-11031A01	1 +/- .25 pF
C222	21-11031A35	68 pF
C224	21-11031A35	68 pF
C225	21-11031A35	68 pF
C226	21-11031A35	68 pF
C227	21-11031A02	1.2 +/- .25 pF
C228	21-11032A21	.01 uF 10%
C230	21-11031A01	1 +/- .25 pF
C231	21-11031A01	1 +/- .25 pF
C233	21-11031A07	3.3 +/- .25 pF
C234	21-11031A10	5.6 +/- .5 pF
C235	21-11031A67	4.3 +/- .25 pF
C236	21-11031A67	4.3 +/- .25 pF
C237	21-11031A43	150 pF
C239	21-11031A35	68 pF
C240	21-11031A01	1 +/- .25 pF
C242	21-11031A35	68 pF
C245	21-11031A35	68 pF
C247	21-11031A09	4.7 +/- .25 pF
C248	21-11031A04	1.8 +/- .25 pF
C249	21-11031A35	68 pF
C251	21-11031A35	68 pF
C252	21-11031A35	68 pF
C253	08-11051A17	poly .47 uF 63V
C254	08-11051A13	poly .1 uF 63V
C255	21-11032A25	.022 uF 10%

C256	21-11032A25	.022 uF 10%
C257	21-11032B13	.1 uF +80/-20%
C258	08-11051A07	poly .01 uF 63V
C259	08-11051A07	poly .01 uF 63V
C276	21-11032A21	.01 uF 10%
C277	23-11048B19	lytic 47 uF 20% 16V
C278	23-11048B19	lytic 47 uF 20% 16V
C301	21-11032A21	.01 uF 10%
C304	21-11031A35	68 pF
C305	21-11031A35	68 pF
C306	21-11031A35	68 pF
C307	21-11031A35	68 pF
C308	21-11031A35	68 pF
C312	21-11031A35	68 pF
C314	21-11022H16	disc 5.6 pF

Diodes (see note)

CR1	48-80236E16	quad Schottky crossed
CR2	48-80154K02	dual Schottky SOT
CR3	48-80939T01	Schottky SOT
CR51	48-83654H01	silicon
CR101	48-83654H01	silicon
CR102	48-83654H01	silicon
CR151	48-82190H54	silicon varactor SOT
CR152	48-82190H54	silicon varactor SOT
CR153	48-83654H01	silicon
CR154	48-83654H01	silicon
CR176	48-83654H02	silicon
CR201	48-84622E02	silicon PIN SOT
CR203	48-05649Q01	silicon varactor
CR205	48-05649Q02	silicon varactor
CR206	48-84616A01	silicon hot carrier
CR207	48-84616A01	silicon hot carrier
CR208	48-84622E02	silicon PIN SOT
CR209	48-05649Q02	silicon varactor
CR211	48-05649Q02	silicon varactor
CR213	48-05649Q01	silicon varactor
CR216	48-84616A01	silicon hot carrier

Filters

FL51	91-80097D06	455 kHz, 6D
FL52	91-80098D06	455 kHz, 4D

Connectors, receptacle

J4	09-80135M01	coaxial (RX)
J5	09-80135M01	coaxial (TX)
J6	09-80130M02	14-pin socket (logic board)

Coils

L1	24-80148M01	tunable 1-1/2 turns BRN
L2	24-80148M01	tunable 1-1/2 turns BRN
L3	24-80148M01	tunable 1-1/2 turns BRN
L4	24-80148M01	tunable 1-1/2 turns BRN
L5	24-80148M01	tunable 1-1/2 turns BRN
L6	24-80148M01	tunable 1-1/2 turns BRN
L7	24-80148M01	tunable 1-1/2 turns BRN
L8	24-11030B04	1-1/2 turns YEL
L9	24-11030B04	1-1/2 turns YEL
L51	24-80063M09	.47 uH
L52	24-80063M09	.47 uH
L53	24-80063M04	.18 uH
L54	24-80063M21	4.7 uH
L55	24-80164M04	tunable E714
L56	24-80164M01	tunable E713
L57	24-80164M04	tunable E714
L58	24-80063M21	4.7 uH
L59	24-80164M03	tunable E716
L60	24-80063M14	1.2 uH
L61	25-80000E01	tunable 455 kHz with cap
L101	24-80063M01	.10 uH
L102	24-11030B08	4-1/2 turns BRN
L151	24-80299D01	tunable 17-3/4 turns
L152	24-80063M22	5.6 uH
L201	24-80063M01	.10 uH

L202	24-80148M01	tunable 1-1/2 turns BRN
L203	24-80063M01	.10 uH
L204	24-11030A04	5 turns GRN
L205	24-80063M01	.10 uH
L206	24-80063M01	.10 uH
L207	24-80063M01	.10 uH
L208	24-11030B07	3-1/2 turns WHT
L209	24-11030B05	2-1/2 turns GRN
L210	24-11030B08	4-1/2 turns BRN
L211	24-80063M01	.10 uH
L212	24-80063M01	.10 uH
L213	24-80148M01	tunable 1-1/2 turns BRN
L214	24-80063M01	.10 uH
L215	24-11030A03	4 turns YEL
L216	24-80063M04	.18 uH
L217	24-80063M01	.10 uH
L218	24-80063M01	.10 uH
L219	24-11030E01	1/2 turn BRN
L220	24-11030B01	1-1/2 turns BRN
L221	24-11030B09	4-1/2 turns BRN
L222	24-80063M01	.10 uH

Transistors (see note)

Q1	48-80182D44	NPN; type M82D44
Q2	48-00869643	PNP; type M9643
Q51	48-00869839	field effect; type M9839
Q52	48-00869839	field effect; type M9839
Q53	48-00869642	NPN; type M9642
Q101	48-00869643	PNP; type M9643
Q102	48-00869987	NPN; type M9987
Q103	48-00869987	NPN; type M9987
Q104	48-00869643	PNP; type M9643
Q105	48-00869642	NPN; type M9642
Q106	48-00869642	NPN; type M9642
Q107	48-00869658	NPN; type M9658
Q151	48-00869658	NPN; type M9658
Q152	48-00869643	PNP; type M9643
Q201	48-00869643	PNP; type M9643
Q202	48-00869642	NPN; type M9642
Q203	48-84939C36	field effect; type M39C36
Q204	48-00869658	NPN; type M9658
Q205	48-00869658	NPN; type M9658
Q206	48-00869839	field effect; type M9839
Q207	48-00869658	NPN; type M9658
Q208	48-00869658	NPN; type M9658
Q209	48-00869642	NPN; type M9642
Q276	48-00869642	NPN; type M9642
Q277	48-00869643	PNP; type M9643
Q278	48-00869643	PNP; type M9643
Q279	48-00869643	PNP; type M9643

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R1	06-11024A59	2.7k
R2	06-11024A37	330
R3	06-11024A35	270
R4	06-11024A75	12k
R5	06-11024A77	15k
R51	06-11024A18	51
R52	06-11024A29	150
R53	06-11024A73	10k
R54	06-11024A29	150
R56	06-11024B20	820k
R57	06-11024A47	820
R58	06-11024B06	220k
R59	06-11024B02	150k
R60	18-05500L08	variable 22k
R61	06-11024A93	68k
R62	06-11024A83	27k
R63	06-11024A95	82k
R102	06-11024A37	330
R103	06-11024A73	10k
R104	06-11024A73	10k
R105	06-11024A85	33k
R106	06-11024A48	910
R107	06-11024A53	1.5k
R108	06-11024A01	10

R109	06-11024A01	10
R110	06-11024A77	15k
R111	06-11024A29	150
R112	06-11024A47	820
R113	06-11024A33	220
R114	06-11024A29	150
R115	06-11024A45	680
R116	06-11024A67	5.6k
R118	06-11024A45	680
R119	06-11024A63	3.9k
R120	06-11024A63	3.9k
R121	06-11024A59	2.7k
R122	06-11024A63	3.9k
R123	06-11024A47	820
R124	06-11024A53	1.5k
R125	06-11024A18	51
R126	06-11024A23	82
R127	06-11024A59	2.7k
R128	06-11024A47	820
R151	06-11024A89	47k
R152	06-11024A85	33k
R153	06-11024A89	47k
R154	06-11024A09	22
R155	06-11024A73	10k
R156	06-11024A77	15k
R157	06-11024A53	1.5k
R158	06-11024A49	1k
R159	06-11024A49	1k
R161	06-11024A73	10k
R163	06-11024A91	56k
R164	18-05500L08	variable 22k
R165	06-11024A81	22k
R176	06-11024H26	22.6k 1%
R177	06-11024H28	23.7k 1%
R178	06-11024G91	10.0k 1%
R179	06-11024G91	10.0k 1%
R180	06-11024H52	42.2k 1%
R181	06-11024G91	10.0k 1%
R182	06-11024H28	23.7k 1%
R201	06-11024A73	10k
R202	06-11024A73	10k
R203	06-11024B06	220k
R204	06-11024A73	10k
R205	06-11024A73	10k
R206	06-11024A47	820
R207	06-11024A19	56
R208	06-11024A13	33
R209	06-11024A19	56
R210	06-11024A73	10k
R211	06-11024A85	33k
R212	06-11024A59	2.7k
R213	06-11024A47	820
R214	06-11024A25	100
R215	06-11024A59	2.7k
R216	06-11024A47	820
R217	06-11024A23	82
R218	06-11024A25	100
R219	06-11024A21	68
R220	06-11024A25	100
R221	06-11024A47	820
R222	06-11024A63	3.9k
R223	06-11024A77	15k
R224	06-11024A97	100k
R225	06-11024A61	3.3k
R226	06-11024A19	56
R227	06-11024A13	33
R228	06-11024A19	56
R229	06-11024A23	0
R230	06-11024A97	100k
R231	06-11024A59	2.7k
R232	06-11024A47	820
R233	06-11024A25	100
R234	06-11024A55	18k
R235	06-11024A47	820
R236	06-11024A23	82
R237	06-11024A41	470
R238	06-11024A03	12
R239	06-11024A41	470

R240	06-11024A01	10
R241	06-11024B23	0
R242	06-11024A73	10k
R276	06-11024A73	10k
R277	06-11024A35	270
R278	06-11024A01	10
R279	06-11024A65	4.7k
R280	06-11024A73	10k
R281	06-11024A65	4.7k
R284	06-11009A81	carbon film 22k 1/4 watt

Transformers

T1	25-80163M02	balun
T2	25-80163M02	balun

Integrated Circuits (see note)

U51	51-05479G05	receiver system
U101	51-84704M75	synthesizer
U102	51-83977M45	prescaler
U176	51-84621K89	dual op-amp

Crystals

Y51	91-80022M02	filter 45.1 MHz (includes Y51A, Y51B)
Y52	48-80008K02	44.645 MHz
Y151	48-80174D05	14.4 MHz

Non-Referenced Items

11-80924T01	adhesive, spring finger
14-05160A01	insulator (for Y151)
26-80097M01	shield coil can (for L151)
26-80098M01	shield coil can (12 used)
26-80226L02	shield VCO solder-side
26-80228L01	shield can (2 used, for J4 and J5)
26-80229L02	shield VCO frame
26-80256L02	shield RF front end
29-80923T01	spring finger
37-00122N33	tubing (15 used for VCO solder-side shield)
75-05295B07	insulator (3 used, for Y51A/B, Y52)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitor, chip, 5%, 50V unless otherwise indicated

C1	21-11031A09	4.7 +/- .25 pF
C2	21-11031A29	39 pF
C3	21-11031A29	39 pF
C4	21-11031A29	39 pF
C5	21-11031A03	1.5 +/- .25 pF
C7	21-11031A29	39 pF
C9	21-11032B15	.22 uF + 80/-20%
C10	21-11031A06	2.7 +/- .25 pF
C11	21-11032B15	.22 uF + 80/-20%
C12	21-11032B15	.22 uF + 80/-20%
C13	21-11032B15	.22 uF + 80/-20%
C14	21-11031A07	3.3 +/- .25 pF
C51	21-11031A25	27 pF
C52	21-11031A25	27 pF
C53	21-11031A37	82 pF
C54	21-11031A51	330 pF
C55	21-11032A21	.01 uF 10%
C56	21-11032A21	.01 uF 10%
C57	21-11031A21	18 pF
C58	21-11031A13	8.2 +/- .5 pF
C59	21-11031A21	18 pF
C60	21-11032A21	.01 uF 10%
C61	21-11032A21	.01 uF 10%
C65	21-11032B15	.22 uF + 80/-20%
C66	21-11032A21	.01 uF 10%
C67	23-11013D13	tantalum 10 uF 10% 20V
C68	21-11031A23	22 pF
C69	21-11031A29	39 pF
C70	21-11031A19	15 pF
C71	21-11032B15	.22 uF + 80/-20%
C72	21-11032B15	.22 uF + 80/-20%
C73	23-11013D13	tantalum 10 uF 10% 20V
C74	23-11048B13	lytic 10 uF 20% 16V
C75	21-11032B15	.22 uF + 80/-20%
C76	23-11048B06	lytic 2.2 uF 20% 50V
C77	21-11032B15	.22 uF + 80/-20%
C78	21-11032B15	.22 uF + 80/-20%
C79	21-11032A13	.0022 uF 10%
C80	21-11032B15	.22 uF + 80/-20%
C81	21-11032A13	.0022 uF 10%
C82	21-11032B15	.22 uF + 80/-20%
C83	21-11032B15	.22 uF + 80/-20%
C84	21-82450B14	composition 2.4 pF 500V
C85	21-11031A17	12 pF
C101	23-11048B13	lytic 10 uF 20% 16V
C102	08-11051A13	poly .1 uF 63V
C103	21-11032A21	.01 uF 10%
C104	21-11032A21	.01 uF 10%
C105	23-11048B13	lytic 10 uF 20% 16V
C106	21-11031A19	15 pF
C107	21-11032B13	.1 uF + 80/-20%
C108	21-11032B13	.1 uF + 80/-20%
C109	08-11051A09	poly .022 uF 63V
C110	08-11044A33	poly 1 uF
C111	08-11051A07	poly .01 uF 63V
C112	21-11032A20	.0082 uF 10%
C113	21-11032A21	.01 uF 10%
C114	21-11032A21	.01 uF 10%
C115	21-11031A29	39 pF
C117	21-11032B13	.1 uF + 80/-20%
C118	21-11031A29	39 pF
C119	21-11031A29	39 pF
C120	21-11031A29	39 pF
C121	21-11031A06	2.7 +/- .25 pF
C122	21-11031A29	39 pF
C123	21-11031A29	39 pF
C125	21-11031A29	39 pF
C126	21-11031A09	4.7 +/- .25 pF
C151	21-11031A61	1000 pF
C152	21-11031A36	75 pF

C153	21-11031A15	10 +/- .5 pF
C154	21-11032A21	.01 uF 10%
C155	21-11031A45	180 pF
C156	21-11031A45	180 pF
C157	21-11032A21	.01 uF 10%
C158	08-11051A15	poly .22 uF 63V
C159	21-11031A25	27 pF
C160	21-11031A19	15 pF
C161	21-11031A61	1000 pF
C162	23-11048B13	lytic 10 uF 20% 16V
C163	08-11051A17	poly .47 uF 63V
C164	21-11032B13	.1 uF
C176	21-11031A61	1000 pF
C202	23-11048B19	lytic 47 uF 20% 16V
C203	21-11031A29	39 pF
C204	21-11031A29	39 pF
C205	21-11031A12	7.5 +/- .5 pF
C206	21-11031A29	39 pF
C207	21-11031A29	39 pF
C208	21-11031A29	39 pF
C209	21-11031A04	1.8 +/- .25 pF
C210	21-11031A05	2.2 +/- .25 pF
C211	21-11031A29	39 pF
C212	21-11031A29	39 pF
C213	21-11031A09	4.7 +/- .25 pF
C214	21-11031A11	6.8 +/- .5 pF
C215	21-11031A29	39 pF
C216	21-11031A29	39 pF
C217	21-11031A29	39 pF
C218	21-11031A29	39 pF
C219	21-11031A12	7.5 +/- .5 pF
C220	21-11031A06	2.7 +/- .25 pF
C221	21-11031A29	39 pF
C222	21-11031A29	39 pF
C223	21-11031A29	39 pF
C224	21-11032A21	.01 uF 10%
C251	21-11032A21	.01 uF 10%
C252	23-11048B19	lytic 47 uF 20% 16V
C253	23-11048B19	lytic 47 uF 20% 16V
C301	21-11031A29	39 pF
C302	21-11031A29	39 pF
C303	21-11031A29	39 pF
C304	21-11031A29	39 pF
C305	21-11031A29	39 pF
C306	21-11031A29	39 pF
C307	21-11031A29	39 pF
C308	21-11031A29	39 pF
C309	21-11031A29	39 pF
C310	21-11031A29	39 pF
C311	21-11031A29	39 pF
C312	21-11031A29	39 pF
C313	21-11031A29	39 pF

Diodes (see note)

CR51	48-83654H01	silicon
CR101	48-83654H01	silicon
CR102	48-83654H01	silicon
CR151	48-82190H54	silicon varactor SOT
CR152	48-82190H54	silicon varactor SOT
CR153	48-83654H01	silicon
CR154	48-83654H01	silicon
CR176	48-82256C11	silicon zener 10V 5%

Filters

FL1	91-80054M01	ceramic, 3-cell
FL2	91-80054M01	ceramic, 3-cell
FL51	91-80097D06	455 kHz, 6D
FL52	91-80098D06	455 kHz, 4D

Connectors, receptacle

J4	09-80135M01	coaxial (RX)
J5	09-80135M01	coaxial (TX)
J6	09-80130M02	14-pin socket (logic board)

Coils

L1	24-11030E03	1/2 turn ORG
L2	24-11030E08	1/2 turn WHT
L3	24-11030A04	5 turns GRN
L4	24-11030E03	1/2 turn ORG
L51	24-80063M09	.47 uH
L52	24-80063M09	.47 uH
L53	24-80063M04	.18 uH
L54	24-80063M21	4.7 uH
L55	24-80164M04	tunable .7 uH E714
L56	24-80164M01	tunable .7 uH E713
L57	24-80164M04	tunable .7 uH E714
L58	24-80063M21	4.7 uH
L59	24-80164M03	tunable .7 uH E716
L60	24-80063M14	1.2 uH
L61	25-80000E01	tunable 455 kHz with cap
L101	24-11030A04	5 turns GRN
L102	24-11030E04	1/2 turn YEL
L151	24-80299D01	tunable 17-3/4 turns
L152	24-80063M22	5.6 uH
L201	24-11030A04	5 turns GRN
L202	24-11030E01	1/2 turn BRN
L203	24-11030A04	5 turns GRN
L204	24-11030E04	1/2 turn YEL
L205	24-11030E03	1/2 turn ORG
L206	24-11030A04	5 turns GRN
L207	24-11030E02	1/2 turn RED
L208	24-11030A04	5 turns GRN
L209	24-11030E04	1/2 turn YEL
L210	21-11030E04	1/2 turn YEL

Transistors (see note)

Q1	48-80182D44	NPN; type M82D44
Q2	48-00869643	PNP; type M9643
Q51	48-00869839	field effect; type M9839
Q52	48-00869839	field effect; type M9839
Q53	48-00869642	NPN; type M9642
Q101	48-00869643	PNP; type M9643
Q102	48-00869987	NPN; type M9987
Q103	48-00869987	NPN; type M9987
Q104	48-00869643	PNP; type M9643
Q105	48-00869642	NPN; type M9642
Q106	48-00869642	NPN; type M9642
Q107	48-80182D44	NPN; type M82D44
Q151	48-00869658	NPN; type M9658
Q152	48-00869643	PNP; type M9643
Q201	48-80182D44	NPN; type M82D44
Q202	48-80182D44	NPN; type M82D44
Q203	48-80182D44	NPN; type M82D44
Q204	48-00869643	PNP; type M9643
Q251	48-00869642	NPN; type M9642

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R1	06-11024A59	2.7k
R2	06-11024A77	15k
R3	06-11024A61	3.3k
R4	06-11024A21	68
R5	06-11024A18	51
R51	06-11024A18	51
R52	06-11024A29	150
R53	06-11024A73	10k
R54	06-11024A29	150
R56	06-11024B20	820k
R57	06-11024A47	820
R58	06-11024B06	220k
R59	06-11024B02	150k
R60	18-05500L08	variable 22k
R61	06-11024A93	68k
R62	06-11024A83	27k
R63	06-11024A95	82k
R102	06-11024A37	330
R103	06-11024A73	10k
R104	06-11024A73	10k

R105	06-11024A85	33k
R106	06-11024A49	1k
R107	06-11024A53	1.5k
R108	06-11024A01	10
R109	06-11024A01	10
R110	06-11024A77	15k
R111	06-11024A43	560
R112	06-11024A53	1.5k
R113	06-11024A39	390
R114	06-11024A43	560
R115	06-11024A53	1.5k
R116	06-11024A67	5.6k
R118	06-11024A53	1.5k
R119	06-11024A64	4.3k
R120	06-11024A71	8.2k
R121	06-11024A73	10k
R122	06-11024A63	3.9k
R124	06-11024A35	270
R125	06-11024A18	51
R126	06-11024A25	100
R127	06-11024A59	2.7k
R128	06-11024A47	820
R129	06-11024A33	220
R151	06-11024A89	47k
R152	06-11024A85	33k
R153	06-11024A89	47k
R154	06-11024A09	22
R155	06-11024A73	10k
R156	06-11024A77	15k
R157	06-11024A53	1.5k
R158	06-11024A49	1k
R159	06-11024A49	1k
R161	06-11024A73	10k
R163	06-11024A93	68k
R164	18-05500L08	variable 22k
R165	06-11024A71	8.2k
R176	06-11024H26	22.6k 1%
R177	06-11024H18	18.7k 1%
R178	06-11024G91	10.0k 1%
R179	06-11024G91	10.0k 1%
R180	06-11024H52	42.2k 1%
R181	06-11024G91	10.0k 1%
R182	06-11024H28	23.7k 1%
R202	06-11024A55	1.8k
R204	06-11024A63	3.9k
R205	06-11024A51	1.2k
R206	06-11024A25	100
R207	06-11024A19	56
R208	06-11024A35	270
R209	06-11024A19	56
R210	06-11024A63	3.9k
R211	06-11024A49	1k
R212	06-11024A25	100
R213	06-11024A19	56
R214	06-11024A13	33
R215	06-11024A05	15
R216	06-11024A05	15
R217	06-11024A07	18
R218	06-11024A63	3.9k
R219	06-11024A49	1k
R220	06-11024A25	100
R221	06-11024A63	3.9k
R222	06-11024A63	3.9k
R223	06-11024A41	470
R224	06-11024A03	12
R225	06-11024A41	470
R251	06-11024A35	270
R252	06-11024A01	10

Integrated Circuits and Modules (see note)

U1	51-80058M01	mixer, double-balanced
U51	51-05479G05	receiver system
U101	51-84704M75	synthesizer
U102	51-83977M45	prescaler
U176	51-84621K89	dual op-amp
U201	51-80267L01	VCO

Crystals

Y51	91-80022M02	filter 45.1 MHz (includes Y51A, Y51B)
Y52	48-80008K02	44.645 MHz
Y151	48-80174D05	14.4 MHz

Non-Referenced Items

14-05160A01	insulator (for Y151)
26-80097M01	shield coil can (for L151)
26-80098M01	shield coil can (7 used)
26-80228L01	shield can (two used, for J4 and J5)
26-80229L03	shield VCO frame
26-80256L01	shield solder side (under J4)
42-80047N01	grounding clip
75-05295B07	insulator (3 used, for Y51A/B and Y52)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLD4323A PA Board, 25 Watt, 136-162 MHz (L)
HLD4324A PA Board, 25 Watt, 146-174 MHz (H)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip, 5%, 50 volt, unless otherwise indicated

C2310	21-11031A55	470 pF
C2311	21-11031A17	12 pF
C2312	21-11031A55	470 pF
C2313	21-11031A55	470 pF
C2314	21-11032B13	.1 uF + 80/-20%
C2315	21-11031A41	120 pF
C2316	21-11031A55	470 pF
C2317	21-11031A31	47 pF
C2318	21-11031A40	110 pF
C2319(L)	21-11031A55	470 pF
C2319(H)	21-11031A61	1000 pF
C2320	21-11031A55	470 pF
C2321	21-11032B15	.22 uF + 80/-20%
C2322	21-11032B13	.1 uF + 80/-20%
C2323	21-11031A55	470 pF
C2324	21-11031A19	15 pF
C2325	21-11031A26	30 pF
C2326	21-11031A33	56 pF
C2327	21-11031A55	470 pF
C2330	21-11031A31	47 pF
C2331(L)	21-11031A41	120 pF
C2331(H)	21-11031A39	100 pF
C2332(L)	21-11031A41	120 pF
C2332(H)	21-11031A39	100 pF
C2334(L)		not used
C2334(H)	21-80060M47	mica 150 pF 100V
C2336	21-80060M47	mica 150 pF 100V
C2337(L)	21-80060M34	mica 43 pF 500V
C2337(H)	21-80060M33	mica 39 pF 500V
C2338(L)	21-11031A49	270 pF
C2338(H)	21-11031A61	1000 pF
C2339	21-11031A55	470 pF
C2351	21-11031A19	15 pF
C2352(L)	21-11031A45	180 pF
C2352(H)	21-11031A43	150 pF
C2353	21-11031A49	270 pF
C2354	21-11031A55	470 pF
C2360	21-80060M32	mica 36 pF 500V
C2361	21-80060M31	mica 33 pF 500V
C2362	21-80060M28	mica 24 pF 500V
C2363	21-80060M25	mica 18 pF 500V
C2364(L)	21-11031A49	270 pF
C2364(H)	21-11031A61	1000 pF
C2370	21-11031A55	470 pF
C2371	21-11032B13	.1 uF + 80/-20%
C2372	21-11031A41	120 pF
C2373	21-11031A55	470 pF
C2374	21-11031A55	470 pF
C2375	21-11031A55	470 pF
C2376	21-11032B13	.1 uF + 80/-20%
C2378	08-11051A17	poly .47 uF 63V

Diodes (see note)

CR2350	48-80010E01	silicon PIN
CR2351	48-80010E01	silicon PIN
CR2370	48-80236E07	transient suppressor MR2525L

Ferrite beads

E2370	76-83960B01	core ferrite
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Coils

L2310	24-11030A04	5 turns GRN
L2311	24-11030B07	3-1/2 turns WHT
L2312(L)	24-11030E01	1/2 turn BRN
L2312(H)	24-11030E03	1/2 turn ORG

L2313	24-11030B15	10-1/2 turns WHT
L2321	24-80036A01	ferrite bead 1/2 turn
L2322	24-11030B07	3-1/2 turns WHT
L2323	24-80036A01	ferrite bead 1/2 turn
L2324	24-82723H46	200 nH
L2325	24-11030B05	2-1/2 turns GRN
L2330	24-11030A01	2 turns RED
L2331(L)	24-11030A02	3 turns ORN
L2331(H)	24-11030E01	1/2 turn BRN
L2332	24-80036A01	ferrite bead 1/2 turn
L2333	24-11030B15	10-1/2 turns WHT
L2334(L)	24-11030A02	3 turns ORG
L2334(H)	24-11030B07	3-1/2 turns WHT
L2335	24-11030A02	3 turns ORG
L2350	24-82723H49	1.2 uH
L2351	24-11030B10	5-1/2 turns RED
L2352	24-82723H44	39 nH
L2353	24-82723H49	1.2 uH
L2360	24-11030B10	5-1/2 turns RED
L2361	24-11030B11	6-1/2 turns ORG
L2362	24-11030B10	5-1/2 turns RED
L2363	24-11030B15	10-1/2 turns WHT
L2370	24-84346A02	230 nH

Transistors (see note)

Q2310	48-82233P39	NPN; type M33P39
Q2320	48-00869859	NPN; type M9859

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R2310	06-11024A21	68
R2311	06-11024A33	220
R2312	06-11024A35	270
R2313	06-11024A01	10
R2314	06-11024A01	10
R2320(L)	06-11024A01	10
R2320(H)	06-11024A09	22
R2321	06-11024A25	100
R2330	06-11024A01	10
R2331	06-80279M01	metal film 82 3 watt
R2350	06-11009A25	carbon film 100 1/4 watt
R2351	06-11024A28	130
R2352	06-11024A28	130
R2353	06-11024A13	33
R2370	06-11024A13	33
R2371	06-80147M01	metal plate .05 10% 2 watt

Non-referenced items

01-80747T09	assembly, feedthru bracket and cable includes:	
	07-80982T01	bracket, feedthru
	09-80133M01	receptacle, connector (5 used)
	15-80075M01	housing, connector 5 pin (P7)
	21-84874K01	feedthru capacitor (5 used)
	29-80014A01	clip coax terminal (2 used)
	26-80158L01	heat sink (for Q2320)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLN5183A PA Hardware Kit (VHF)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip mica, 5%

C2333	21-11078B52	240 pF 100V
C2335	21-11078B27	30 pF 100V

Connector, receptacle

J1	09-80131M01	mini UHF coax
J2	09-80255E01	power (includes feedthru)

Connector, plug

P4	30-80138M01	coaxial cable 158 mm with plug
P5	30-80138M02	coaxial cable 105 mm with plug

Transistors (see note)

Q2330	48-80225C22	NPN; type MRF1946
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Non-referenced items

03-10943M10	screw M3x.5x8 (8 used)
03-10943M11	screw M3x.5x10 (2 used for J2)
04-00002636	lockwasher (for J1)
04-00131974	washer (2 used for J2)
26-80124L01	heat sink
26-80223M03	PA shield
32-80014N02	gasket, accessory connector
38-80041M01	plug button
42-80281L01	ground clip (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip, 5%, 50 volt, unless otherwise indicated

C2410	21-11031A55	470 pF
C2411	21-11031A19	15 pF
C2412	21-11031A51	330 pF
C2413	21-11031A35	68 pF
C2414	21-11031A55	470 pF
C2415	21-11031A55	470 pF
C2420	21-11031A27	33 pF
C2421	21-11031A33	56 pF
C2422	08-11051A17	poly .47 uF 63V
C2423	21-11031A42	130 pF
C2424	21-11031A27	33 pF
C2430	21-11031A39	100 pF
C2431	21-11031A26	30 pF
C2432	21-11078B59	470 pF 100V
C2433	21-11031A55	470 pF
C2434	21-11032B13	.1 uF +80/-20%
C2435	23-11013F59	tantalum 2.2 uF 20% 35V
C2440	21-11078B59	470 pF 100V
C2443	21-11031A55	470 pF
C2444	08-11051A17	poly .47 uF 63V
C2447	21-80240G77	mica 190 pF 250V
C2448	21-80240G77	mica 190 pF 250V
C2449	21-80240G50	mica 120 pF 250V
C2450	21-80240G42	mica 43 pF 250V
C2451	21-11078B59	470 pF 100V
C2452	21-11031A55	470 pF
C2453	21-11078B45	130 pF 100V
C2454	21-11031A15	10 pF
C2455	21-11031A55	470 pF
C2460	21-80240G40	mica 27 pF 250V
C2461	21-80240G41	mica 36 pF 250V
C2462	21-80240G40	mica 27 pF 250V
C2463	21-80240G39	mica 24 pF 250V
C2464	21-11078B59	470 pF 100V
C2470	21-11031A55	470 pF
C2471	21-11031A55	470 pF
C2472	21-11031A55	470 pF
C2473	21-11031A55	470 pF
C2474	21-11031A55	470 pF
C2475	21-11031A41	120 pF
C2476	21-11031A55	470 pF
C2477	21-11032B13	.1 uF +80/-20%
C2478	21-11032B13	.1 uF +80/-20%
C2479	21-11031A55	470 pF
C2480	21-11032B13	.1 uF +80/-20%

Diodes (see note)

CR2450	48-80010E01	silicon PIN
CR2451	48-80010E01	silicon PIN
CR2470	48-80236E07	transient suppressor MR2525L

Ferrite beads

E2410	24-80036A01	ferrite bead
E2420	24-80036A01	ferrite bead
E2430	24-80036A01	ferrite bead
E2440	24-80036A01	ferrite bead

Coils

L2410	24-11030A01	2 turns RED
L2411	24-11030B07	3-1/2 turns WHT
L2412	24-11030B15	10-1/2 turns WHT
L2413	24-11030A06	7 turns VIO
L2420	24-11030E01	1/2 turn BRN
L2421	24-82723H49	1.2 uH
L2422	24-11030E01	1/2 turn BRN
L2423	24-11030E04	1/2 turn YEL
L2430	24-11030B07	3-1/2 turns WHT
L2431	24-11030A03	4 turns YEL

L2440	24-11030A03	4 turns YEL
L2441	24-11030A01	2 turns RED
L2443	24-80908T09	1-1/2 turns GRN
L2450	24-82723H49	1.2 uH
L2451	24-82723H49	1.2 uH
L2452	24-80908T22	3-1/2 turns GRN
L2453	24-82723H44	39 nH
L2460	24-80908T22	3-1/2 turns GRN
L2461	24-80908T22	3-1/2 turns GRN
L2462	24-80908T22	3-1/2 turns GRN
L2463	24-11030B15	10-1/2 turns WHT
L2470	24-82723H46	200 nH
L2471	24-84346A02	200 nH

Transistors (see note)

Q2410	48-82233P39	NPN; type M33P39
Q2420	48-00869859	NPN; type M9859

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R2410	06-11024A35	270
R2411	06-11024A33	220
R2412	06-11024A21	68
R2413	06-11024A01	10
R2414	06-11024A01	10
R2420	06-11024A25	100
R2430	06-11009E25	carbon film 100 1/4 watt
R2431	06-11024A21	68
R2440	06-11009E19	carbon film 56 1/4 watt
R2450	06-11009E25	carbon film 100 1/4 watt
R2451	06-11024A28	130
R2452	06-11024A28	130
R2453	06-11024A13	33
R2470	06-11024A05	15
R2471	06-80147M02	metal plate .01 10% 2 watt

Non-referenced items

01-80747T09	assembly, feedthru bracket and cable includes:	
	07-80982T01	bracket, feedthru
	09-80133M01	receptacle, connector (5 used)
	15-80075M01	housing, connector 5 pin (P7)
	21-84874K01	feedthru capacitor (5 used)
	26-80158L01	heat sink (for Q2420)
	26-80275M01	heat sink, diode (2 used)
	29-80014A01	clip coax terminal (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLN9071A PA Hardware Kit (40 Watt VHF)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip mica, 5%, 100V

C2436	21-11078B38	68 pF 100V
C2441	21-11078B54	300 pF 100V
C2442	21-11078B54	300 pF 100V
C2445	21-11078B35	51 pF 100V
C2446	21-11078B35	51 pF 100V

Connector, receptacle

J1	09-80131M01	mini UHF coax
J2	09-80255E01	power (includes feedthru)

Connector, plug

P4	30-80138M01	coaxial cable 158 mm with plug
P5	30-80138M02	coaxial cable 105 mm with plug

Transistors (see note)

Q2430	48-80225C18	NPN; type M25C18
Q2440	48-84411L04	NPN; type M1104

Non-referenced items

02-00007003	nut 8-32x5/16x1/8
03-10943M10	screw M3x.5x8 (8 used)
03-10943M11	screw M3x.5x10 (2 used for J2)
04-00002636	lockwasher (for J1)
04-00131974	washer (2 used for J2)
26-80124L01	heat sink
26-80223M03	PA shield
32-80014N02	gasket, accessory connector
38-80041M01	plug button
42-80281L01	ground clip (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip, 5%, 50 volt, unless otherwise indicated

C2610	21-11031A39	100 pF
C2611	21-11031A17	12 pF
C2612	21-11031A19	15 pF
C2613	21-11031A61	1000 pF
C2614	21-11031A61	1000 pF
C2615	21-11031A11	6.8 +/- .5 pF
C2616	21-11032B13	.1 uF +80/-20%
C2617	21-11031A39	100 pF
C2618	21-11031A39	100 pF
C2619	21-11032B13	.1 uF +80/-20%
C2620	21-11031A21	18 pF
C2621	21-11031A24	24 pF
C2622	21-11031A11	6.8 +/- .5 pF
C2626	21-11031A39	100 pF
C2627	21-11031A61	1000 pF
C2628	21-11032B15	.22 uF +80/-20%
C2629	21-11032B15	.22 uF +80/-20%
C2630	21-11031A27	33 pF
C2631	21-11031A24	24 pF
C2632	21-11031A24	24 pF
C2636	21-11031A39	100 pF
C2637	21-11031A61	1000 pF
C2638	21-11032B13	.1 uF +80/-20%
C2639	08-11051A17	poly .47 uF 63V
C2640	21-80060M33	mica 39 pF 500V
C2645	21-80060M25	mica 18 pF 500V
C2646	21-80060M19	mica 10 pF 500V
C2647	21-80060M25	mica 18 pF 500V
C2648	21-11032B15	.22 uF +80/-20%
C2649	21-11031A39	100 pF
C2650	21-80060M21	mica 12 pF 500V
C2651	21-11031A05	2.2 +/- .25 pF
C2652	21-11031A08	3.9 +/- .25 pF
C2653	21-11031A39	100 pF
C2654	21-11031A39	100 pF
C2660	21-80060M17	mica 9 pF 500V
C2661	21-80060M19	mica 10 pF 500V
C2662	21-80060M17	mica 9 +/- .5 pF 500V
C2663	21-80060M11	mica 6 +/- .5 pF 500V
C2664	21-80060M43	mica 100 pF 100V
C2670	21-11031A39	100 pF
C2671	21-11031A39	100 pF
C2672	21-11031A61	1000 pF
C2673	21-11032B13	.1 uF +80/-20%
C2674	21-11031A39	100 pF
C2675	08-11051A17	poly .47 uF 63V
C2676	21-11031A39	100 pF
C2677	21-11031A61	1000 pF
C2678	21-11032B13	.1 uF +80/-20%
C2679	21-11031A39	100 pF

Diodes (see note)

CR2650	48-80010E01	silicon PIN
CR2651	48-80010E01	silicon PIN
CR2670	48-80236E07	transient suppressor MR2525L

Ferrite beads

E2620	76-83960B01	ferrite bead
E2670	76-83960B01	ferrite bead
E2671	76-83960B01	ferrite bead

Coils

L2610	24-11030E01	1/2 turn BRN
L2611	24-11030E03	1/2 turn ORN
L2612	24-11030E03	1/2 turn ORN
L2613	24-11030B01	1-1/2 turns BRN

L2620	24-11030E01	1/2 turn BRN
L2622	24-82723H44	39 nH
L2630	24-11030A03	4 turns YEL
L2631	24-80036A01	ferrite bead 1/2 turn
L2632	24-11030A03	4 turns YEL
L2640	24-80036A01	ferrite bead 1/2 turn
L2641	24-11030A03	4 turns YEL
L2642	24-11030A02	3 turns ORG
L2643	24-11030E03	1/2 turn ORN
L2650	24-82723H40	290 nH
L2651	24-11030B04	1-1/2 turns YEL
L2652	24-82723H40	290 nH
L2660	24-11030B04	1-1/2 turns YEL
L2661	24-11030B06	2-1/2 turns BLU
L2662	24-11030B06	2-1/2 turns BLU
L2663	24-11030B11	6-1/2 turns ORG
L2670	24-82723H46	200 nH
L2671	24-84346A02	200 nH

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R2610	06-11024A35	270
R2611	06-11024A33	220
R2612	06-11024A21	68
R2613	06-11024A01	10
R2614	06-11024A01	10
R2620	06-11024A01	10
R2650	06-11009A25	carbon film 100 1/4 watt
R2651	06-11024A28	130
R2652	06-11024A28	130
R2653	06-11024A13	33
R2670	06-80147M01	metal plate .05 10% 2 watt
R2671	06-11024A15	39

Transistors (see note)

Q2610	48-82233P39	NPN; type M33P39
Q2620	48-80225C09	NPN; type M25C09

Non-referenced items

01-80747T09	assembly, feedthru bracket and cable includes:	
	07-80982T01	bracket, feedthru
	09-80133M01	receptacle, connector (5 used)
	15-80075M01	housing, connector 5 pin (P7)
	21-84874K01	feedthru capacitor (5 used)
	26-80158L01	heat sink (for Q2620)
	29-80014A01	clip coax terminal (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLN5182A PA Hardware Kit (UHF)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip mica, 5%, 100V

C2641	21-11078B33	43 pF
C2642	21-11078B33	43 pF
C2643	21-11078B32	39 pF
C2644	21-11078B32	39 pF

Connector, receptacle

J1	09-80131M01	mini UHF coax
J2	09-80255E01	power (includes feedthru)

Connector, plug

P4	30-80138M01	coaxial cable 158 mm with plug
P5	30-80138M02	coaxial cable 105 mm with plug

Transistors (see note)

Q2630	48-80225C19	NPN; type M25C19
Q2640	48-84411L07	NPN; type M11L07

Non-referenced items

02-00007003	nut 8-32x5/16x1/8
03-10943M10	screw M3x.5x8 (8 used)
03-10943M11	screw M3x.5x10 (2 used for J2)
04-00002636	lockwasher (for J1)
04-00131974	washer (2 used for J2)
26-80124L01	heat sink
26-80223M03	PA shield
32-80014N02	gasket, accessory connector
42-80281L01	ground clip (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip, 5%, 50 volt, unless otherwise indicated

C2710	21-11031A39	100 pF
C2711	21-11031A17	12 pF
C2712	21-11031A19	15 pF
C2713	21-11031A39	100 pF
C2714	21-11031A39	100 pF
C2715	21-11031A11	6.8 +/- .5 pF
C2716	21-11032B13	.1 uF +80/-20%
C2717	21-11031A39	100 pF
C2718	21-11031A39	100 pF
C2719	21-11032B13	.1 uF +80/-20%
C2720	21-11031A21	18 pF
C2721	21-11031A24	24 pF
C2722	21-11031A11	6.8 +/- .5 pF
C2726	21-11031A39	100 pF
C2727	21-11031A61	1000 pF
C2728	21-11032B15	.22 uF +80/-20%
C2729	21-11032B15	.22 uF +80/-20%
C2730	21-11031A27	33 pF
C2731	21-11031A24	24 pF
C2732	21-11031A24	24 pF
C2733	21-11031A25	27 pF
C2736	21-11031A39	100 pF
C2737	21-11031A61	1000 pF
C2738	21-11032B13	.1 uF +80/-20%
C2739	23-11013F59	tantalum 2.2 uF 20% 35V
C2740	21-11078B27	30 pF 100V
C2745	21-80240G38	mica 22 pF 250V
C2746	21-80240G12	mica 6.8 +/- .25 pF 250V
C2747	21-11031A25	27 pF
C2748	21-11032B15	.22 uF +80/-20%
C2749	21-11031A39	100 pF
C2750	21-11078B13	10 pF 100V
C2751	21-11031A04	1.8 +/- .25 pF
C2752	21-11031A08	3.9 +/- .25 pF
C2753	21-11031A39	100 pF
C2754	21-11031A39	100 pF
C2755	21-80240G35	mica 15 +/- 1 pF 250V
C2756	21-11031A25	27 pF
C2760	21-80240G16	mica 10 +/- 1 pF 250V
C2761	21-80240G17	mica 12 +/- 1 pF 250V
C2762	21-80240G15	mica 9.1 +/- .25 pF 250V
C2763	21-80240G11	mica 6.2 +/- .25 pF 250V
C2764	21-80240G48	mica 100 pF 250V
C2770	21-11031A39	100 pF
C2771	21-11031A39	100 pF
C2772	21-11031A61	1000 pF
C2773	21-11032B13	.1 uF +80/-20%
C2774	21-11031A39	100 pF
C2775	23-11013F59	tantalum 2.2 uF 20% 35V
C2776	21-11031A39	100 pF
C2777	21-11031A61	1000 pF
C2778	21-11032B13	.1 uF +80/-20%
C2779	21-11031A39	100 pF

Diodes (see note)

CR2750	48-80010E01	silicon PIN
CR2751	48-80010E01	silicon PIN
CR2770	48-80236E07	transient suppressor MR2525L

Ferrite beads

E2720	76-83960B01	ferrite bead
E2770	76-83960B01	ferrite bead
E2771	76-83960B01	ferrite bead

Coils

L2710	24-11030E01	1/2 turn BRN
L2711	24-11030E03	1/2 turn ORN

L2712	24-11030E03	1/2 turn ORN
L2713	24-11030B01	1-1/2 turns BRN
L2720	24-11030E01	1/2 turn BRN
L2722	24-82723H44	39 nH
L2730	24-11030A03	4 turns YEL
L2731	24-80036A01	ferrite bead 1/2 turn
L2732	24-11030A03	4 turns YEL
L2740	24-82723H40	290 nH
L2741	24-11030A02	3 turns ORN
L2742	24-11030A02	3 turns ORG
L2743	24-11030E06	1/2 turn BLU
L2750	24-82723H40	290 nH
L2751	24-11030B04	1-1/2 turns YEL
L2752	24-82723H40	290 nH
L2760	24-80908T09	1-1/2 turns RED
L2761	24-80908T09	1-1/2 turns RED
L2762	24-80908T10	1-1/2 turns GRN
L2763	24-11030B11	6-1/2 turns ORG
L2770	24-82723H46	200 nH
L2771	24-84346A02	200 nH

Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R2710	06-11024A35	270
R2711	06-11024A33	220
R2712	06-11024A21	68
R2713	06-11024A01	10
R2714	06-11024A01	10
R2720	06-11024A01	10
R2740	06-11009B26	carbon film 2.7 1/4 watt
R2750	06-11009A25	carbon film 100 1/4 watt
R2751	06-11024A28	130
R2752	06-11024A28	130
R2753	06-11024A13	33
R2770	06-80147M02	metal plate .01 10% 2 watt
R2771	06-11024A03	12

Transistors (see note)

Q2710	48-82233P39	NPN; type M33P39
Q2720	48-80225C09	NPN; type M25C09

Non-referenced items

01-80747T09	assembly, feedthru bracket and cable includes:	
	07-80982T01	bracket, feedthru
	09-80133M01	receptacle, connector (5 used)
	15-80075M01	housing, connector 5 pin (P7)
	21-84874K01	feedthru capacitor (5 used)
	26-80158L01	heat sink (for Q2720)
	26-80275M01	heat sink, diode (2 used)
	29-80014A01	clip coax terminal (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLN5274A PA Hardware Kit (35 Watt UHF)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip mica, 5%, 100V

C2741	21-11078B35	51 pF
C2742	21-11078B35	51 pF
C2743	21-11078B33	43 pF
C2744	21-11078B33	43 pF

Connector, receptacle

J1	09-80131M01	mini UHF coax
J2	09-80255E01	power (includes feedthru)

Connector, plug

P4	30-80138M01	coaxial cable 158mm with plug
P5	30-80138M02	coaxial cable 105mm with plug

Transistors (see note)

Q2730	48-80225C19	NPN; type M25C19
Q2740	48-80225C24	NPN; type M25C24

Non-referenced items

02-00007003	nut 8-32x5/16x1/8
03-10943M10	screw M3x.5x8 (8 used)
03-10943M11	screw M3x.5x10 (2 used for J2)
04-00002636	lockwasher (for J1)
04-00131974	washer (2 used for J2)
26-80124L01	heat sink
26-80223M03	PA shield
32-80014N02	gasket, accessory connector
42-80281L01	ground clip (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLF4097A PA Board, 15 Watt, 806-825 MHz, Simplex

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Capacitors, chip, 5%, 50 volt, unless otherwise indicated

C3110	21-11031A29	39 pF
C3111	21-11031A06	2.7 +/- .25 pF
C3112	21-11031A03	1.5 +/- .25 pF
C3113	21-11031A12	7.5 +/- .5 pF
C3114	21-11031A15	10 +/- .5 pF
C3115	08-11051A17	poly .47 uF 63V
C3116	21-11031A29	39 pF
C3117	21-11031A29	39 pF
C3118	21-11031A11	6.8 +/- .5 pF
C3119	21-11031A01	1 +/- .25 pF
C3120	21-11031A67	4.3 +/- .25 pF
C3121	23-11048B05	lytic 1 uF 20% 50V
C3122	21-11032B13	.1 uF +80/-20%
C3123	21-11032A25	.022 uF 10%
C3124	21-11031A29	39 pF
C3130	23-11048B05	lytic 1 uF 20% 50V
C3131	21-11032B13	.1 uF +80/-20%
C3132	21-11032A25	.022 uF 10%
C3140	23-11048B05	lytic 1 uF 20% 50V
C3141	21-11032B13	.1 uF +80/-20%
C3142	21-11031A61	1000 pF
C3143	21-11031A29	39 pF
C3144	21-11031A21	18 pF
C3151	21-11031A66	3.6 +/- .25 pF
C3152	21-11031A29	39 pF
C3153	21-11031A29	39 pF
C3154	21-11031A29	39 pF
C3155	21-11031A61	1000 pF
C3160	21-11031A29	39 pF
C3161	21-80060M02	mica 1.5 pF 500V
C3162	21-80060M05	mica 3 pF 500V
C3163	21-80060M03	mica 2 pF 500V
C3170	21-11031A29	39 pF
C3171	21-11031A29	39 pF

Diodes (see note)

CR3150	48-80010E01	silicon PIN
CR3151	48-80010E01	silicon PIN
CR3170	48-80236E07	transient suppressor MR2525L

Ferrite beads

E3130	76-83960B01	core ferrite
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Coils

L3110	24-11036A01	ferrite bead 1/2 turn
L3111	24-11030A04	5 turns GRN
L3112	24-11036A01	ferrite bead 1/2 turn
L3120	24-82723H46	200 nH
L3130	24-82723H46	200 nH
L3140	24-11030B15	10-1/2 turns WHT
L3141	24-11036A01	ferrite bead 1/2 turn
L3150	24-11030B12	7-1/2 turns YEL
L3151	24-82723H40	290 nH
L3152	24-11030B08	4-1/2 turns BRN
L3160	24-11030E07	1/2 turn GRY
L3161	24-11030E04	1/2 turn YEL

Transistors (see note)

Q3110	48-82233P39	NPN; type M33P39
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Resistors, chip, 5%, 1/8 watt, unless otherwise indicated

R3110	06-11024A21	68
R3111	06-11024A01	10

R3112	06-11024A01	10
R3113	06-11024A32	200
R3114	06-11024A35	270
R3150	06-00125A31	carbon 180 1/2 watt
R3151	06-11024A51	1.2k
R3170	06-80147M01	metal plate .05 10% 2 watt
R3171	06-11024A15	39

Non-referenced items

01-80747T09	assembly, feedthru bracket and cable includes:
07-80982T01	bracket, feedthru
09-80133M01	receptacle, connector (5 used)
15-80075M01	housing, connector 5 pin (P7)
21-84874K01	feedthru capacitor (5 used)
29-80014A01	clip coax terminal (2 used)

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

HLN5293A PA Hardware Kit (800 MHz)

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
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Connector, receptacle

J1	09-80131M01	mini UHF coax
J2	09-80255E01	power (includes feedthru)

Connector, plug

P4	30-80138M02	coaxial cable 105 mm with plug
P5	30-80138M02	coaxial cable 105 mm with plug

Integrated Circuits and Modules (see note)

U3120	51-80110E01	RF power 800 MHz 20W
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Non-referenced items

03-10943M10	screw M3x.5x8 (10 used)
03-10943M11	screw M3x.5x10 (2 used)
04-00002636	lockwasher (for J1)
04-00131974	washer (2 used for J2)
26-80124L02	heat sink
26-80223M04	PA shield
29-80921T01	terminal lug (2 used)
32-80014N02	gasket, accessory connector
42-80024N01	ground strap

Note: For optimum performance, integrated circuits and modules must be ordered by Motorola part numbers.