



# MaxTrac<sup>®</sup> 100/300 Conventional Radio 12 Watt RF Power

900 MHz



THIS MANUAL HAS BEEN  
DISCONTINUED

## Service Manual

68P02980G40-O



**MOTOROLA INC.**

Communications  
Sector

# MaxTrac<sup>®</sup> 100/300 Conventional Radio 12 Watt RF Power

900 MHz

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**technical writing services**

PL=PRIVATE LINE  
 DPL=DIGITAL PRIVATE LINE  
 CSQ=CHANNEL SQUELCH  
 TA=TALK-AROUND

## Maxtrac® 100/300 900 MHz Conventional Radio

**12 Watt RF Power**

MODEL	FRQ	Maxtrac VERSION		
D27MJA73A5AK	2	100 (PL/DPL/CSQ)	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Maxtrac® 100/300</h3> <h4 style="margin: 0;">900 MHz Conventional Radio</h4> <p style="margin: 10px 0 0 0;"><b>12 Watt RF Power</b></p> </div>	
D27MJA73A6AK	2	100 (PL/DPL/CSQ) T/A		
D27MJA77A4AK	6	300 (PL/DP4/CSQ) T/A		
D27MJA7DA6AK	16	300 (PL/DPL/CSQ) SCAN T/A		
			ITEM	DESCRIPTION
●	●	●	FUF1014A	UNIFIED CHASSIS KIT:
			FLF5298A	RF BOARD
			FRN5529A	LOGIC BOARD
			FLN6216A	CHASSIS HWR
			FLF1016A	PA 12 WATT
●	●	●	FLF1016A	PA 12 WATT (See note):
			FLF5515A	12 W PA BOARD
			FLN5046A	12 W HEAT SINK HWR
●	●		FCN1604B	FRONT PANEL 2-FRQ
			HLN5174A	FRONT PANEL DISPLAY BOARD
			FLN6361A	FRONT PANEL HARDWARE
			FLN5064A	FRONT PANEL SWITCH BOARD
		●	FCN1615A	FRONT PANEL 6 FRQ
			HLN5175A	FRONT PANEL DISPLAY BOARD
			FLN6362A	FRONT PANEL HARDWARE
			FLN5064A	FRONT PANEL SWITCH BOARD
		●	FCN1603C	FRONT PANEL 16 FRQ
			HLN5175A	FRONT PANEL DISPLAY BOARD
			FLN6360P	FRONT PANEL HARDWARE
			FLN5064A	FRONT PANEL SWITCH BOARD
●	●		HLN5289A	ESCUTCHEON 2-FRQ
		●	HLN9063A	ESCUTCHEON 6-FRQ
		●	HLN5191A	ESCUTCHEON 16-FRQ
●	●	●	HKN4137A	POWER CABLE KIT
●	●	●	HMN1056C	COMPACT MICROPHONE KIT
●	●	●	HLN9073A	MICROPHONE HANG-UP CLIP
●	●	●	HHN4029A	COVER KIT
●	●	●	HLN5189A	INSTALLATION HARDWARE KIT
●	●	●	PRA4935A	ANTENNA KIT
●	●	●	HBN4040A	PACKING KIT
●	●		HLN5283A	LABEL - MaxTrac 100
●	●	●	FVN4019A	ROM KIT
		●	HLN5284A	LABEL - MaxTrac 300

NOTE: FLF1016A IS PART OF FUF1014A

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## OPTIONS

- B18 5-Watt External Speaker
- B20 Telephone Interconnect (DTMF Full Size Mic).
- B22 Compact Mic with Clip (omits Desk Mic)
- B32 Omit Power Supply
- B70 Omit Antenna Altogether
- B71 Omit Microphone
- B81 Key Lock Mount
- B87 Omit External Speaker
- B90 Omit All Accessories Except Microphone
- B109 Handset with Hang-up Cup
- B113 Ignition Switch Cable
- B161 Omit Power Cable
- B239 Noise Canceling Microphone
- B291 Floor Mount
- B329 4 W RF Power
- B382 Full Size Palm Microphone
- B392 Compact Mic with long cord
- B470 Emergency Alarm Foot Switch
- B561 Quick Call II
- B663 Extra Stability Mount (12 W model only)
- B665 Control Station
- B674 External Alarm Relay/Cable/Switch Kit
- B688 Emergency Alarm Push Button
- B700 Public Address with Internal/External Speaker and A/B Receive Audio Switch. (Includes two 6 W external power amplified speakers, one 5 W external audio receive speaker, and a control switch panel.)
- B835 MDC-1200
- B946 Telephone Interconnect Receive Only

## FCC INFORMATION

Applicable part of Rules . . . . . 90  
 Authorized Emission . . . . . 11K0F3E, 11K0F2D, 10K0F1D

Model Series	Transmitter Power Output	Type Acceptance Number
D27MJA	2 to 15 Watts continuously variable	ABZ89FT5728

The following are trademarks of Motorola Inc: MaxTrac, MDC-1200, Quick-Call II, Motorola .

## PERFORMANCE SPECIFICATIONS

### GENERAL

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Model series	<b>MaxTrac 100</b> D27MJA73A5AK (PL/DPL/CSQ), 2 frequencies  D27MJA73A6AK (PL/DPL/CSQ) with Talk-Around (TA), 2 frequencies  <b>MaxTrac 300</b> D27MJA77A4AK (PL/DPL/CSQ) with TA, 6 frequencies  D27MJA7DA6AK (PL/DPL/CSQ), scan with TA, 16 frequencies
No. of frequencies	Up to 16
Frequencies	Transmit: 896-902 MHz 935-941 MHz (Talk-Around)  Receive: 935-941 MHz
Dimensions	2x7x7.75" (50.8x178x198mm)
Weight	61 oz. (1.73 kg)
Typical RF output (into 50 ohm load @ 13.6 V)	12 W
Maximum current drain	Receive (5 W): 1.5 A Transmit: 6.5 A Standby: 500 mA
FCC Designation	ABZ89FT5728
Metering	All adjustments and alignments are performed electronically using an IBM personal computer, a Radio Interface Box (RIB) and field maintenance software.
Operation	12 V dc negative ground

### TRANSMITTER

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Output impedance	50 ohms
Spurious and harmonics	55 dB below carrier (for EIA Spec RS 152B)

Frequency stability	±0.00015%
Modulation	10K0F1D, 11K0F2D, 11K0F3E
Maximum frequency separation	6 MHz within each of two groups, 896-902 and 935-941 MHz
Audio distortion	5% measured per EIA
Audio frequency response	+1 to -3 dB from 6 dB per octave pre-emphasis characteristic from 300 to 3000 Hz
Modulation sensitivity	50-130 mV rms for 60% maximum deviation at 1000 Hz

#### RECEIVER

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Channel spacing	12.5 kHz
Sensitivity 12 dB SINAD	0.40 uV
Selectivity (EIA SINAD)	65 dB
Intermodulation (EIA SINAD)	65 dB
Spurious and image rejection	70 dB
Input impedance	50 ohms
Audio output	3 W @ less than 5% distortion
Maximum frequency separation	6 MHz
Frequency stability	±0.00015%

#### OPTIONAL SPEAKER ACCESSORY

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Speaker impedance	2 ohms
Audio output	5 watts
Dimensions	5x5x2.5" (127x127x63mm), excluding mounting bracket

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**



**MOTOROLA INC.**

Communications  
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# MaxTrac<sup>®</sup> 100/300 Conventional Radio 12 Watt RF Power

900 MHz

## 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.

### 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.

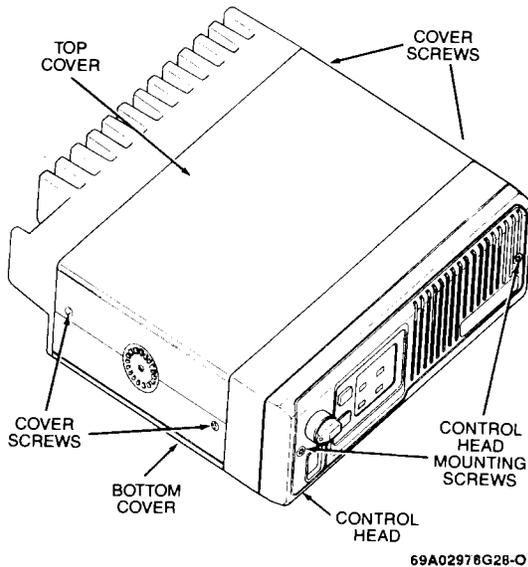


Figure 1

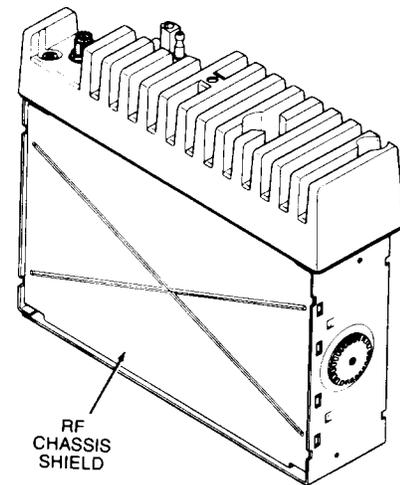


Figure 2

**technical writing services**

### 1.3 TO REMOVE THE POWER AMPLIFIER HEAT SINK

- (1) Disconnect the transmit and receive coaxial 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 BOARD

- (1) After the PA heat sink has been removed, pry off the RF shield (Figure 5). Be careful not to overbend any one corner or side.
- (2) After removing the RF shield, 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.

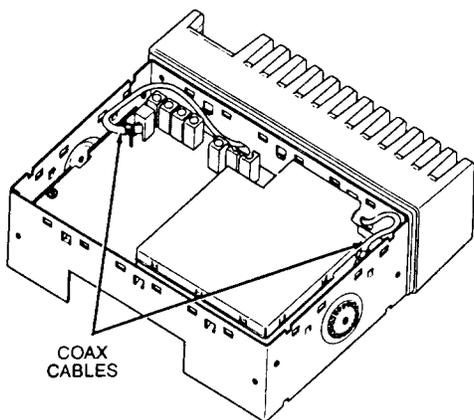
### 1.6 TO REMOVE THE POWER AMPLIFIER CIRCUIT BOARD

- (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 power connector feedthrough leads (Figure 8).

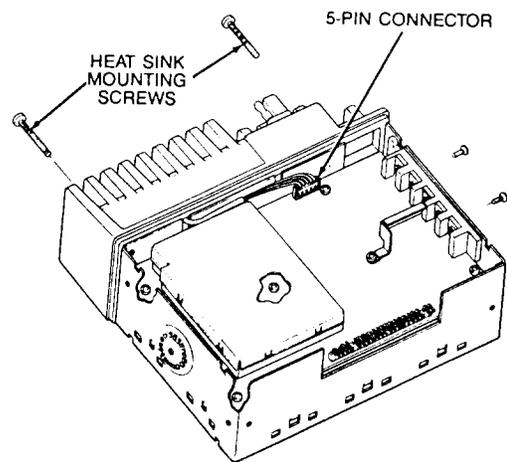
- (3) Remove antenna connector lock washer (Figure 8).

- (4) Remove two power device mounting screws and all PA board mounting screws (Figure 8), and then take out the PA board.



69A02978Q30-O

Figure 3



69A02978Q31-O

Figure 4

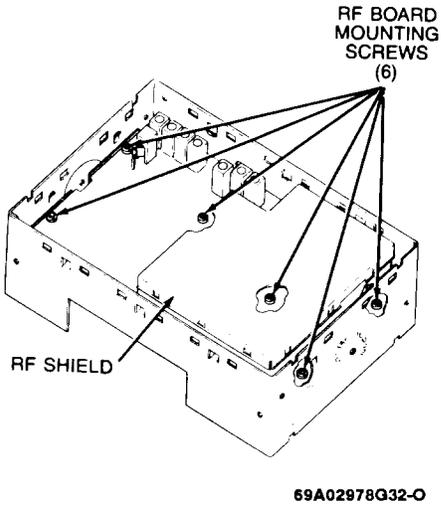


Figure 5

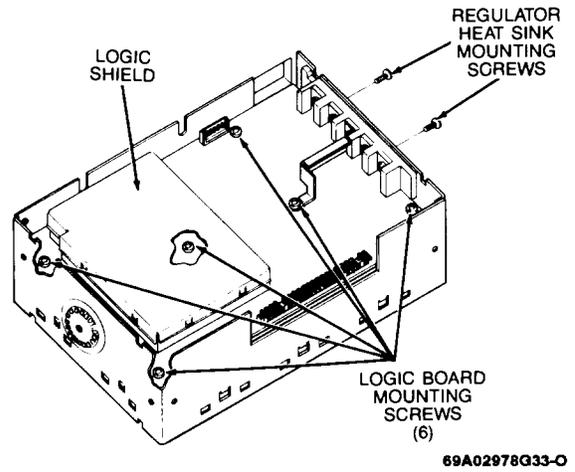


Figure 6

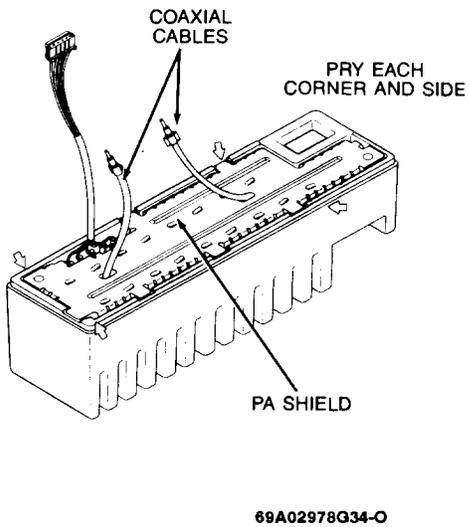


Figure 7

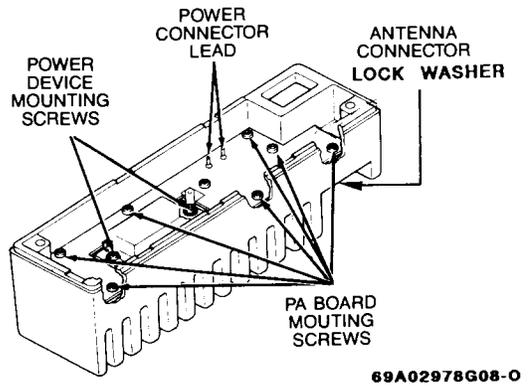


Figure 8

## 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 procedures eliminate the need for traditional tuning tasks.

All the circuits in the MaxTrac Radios have been aligned at the factory with specialized equipment.

Alignment should only be attempted in a qualified service shop.

## 2.1 PROGRAMMING

The MaxTrac 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 Slave Scan List

Table 1. Fasteners, Tools and Torques

PART NUMBER	DESCRIPTION	LOCATION	QTY.	DRIVER SIZE	INPUT TORQUE	REPAIR TORQUE
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.
03-10943M04	Taplrite M2.5 x 8 Slit. Torx. Pan Hd.	Regulator H.S. Device Mtg.	5	T8	6-8 in. lbs.	4-6 in. lbs.
03-10943M09	Taplrite M3 x 6 Slit. Torx. Pan Hd.	RF/Logic Brd. Mounting	12	T10	8-9 in. lbs.	8-9 in. lbs.
03-10943M10	Taplrite M3 x 8 Slit. Torx. Pan Hd.	P.A. Device/Brd. Mtg.	8	T10	11-13 in. lbs.	8-10 in. lbs.
03-10943R04	Taplrite M2.5 x 8 Torx. Flt. Hd.	Regulator H.S. Mounting	2	T8	8-10 in. lbs.	6-8 in. lbs.
03-10943R55	Taplrite M3 x 8 Torx Flt. Hd. Blk.	Chassis Covers	4	T10	10-12 in. lbs.	8-10 in. lbs.
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. 6-19 x 7/8 Phl. Pan	Ext. Spkr. Rear Hsg.	4	P-2	6-8 in. lbs.	6-8 in. lbs.
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.
02-00007003	Hex Nut 8-32	P.A.-Stud Device Mtg.	1	5/16" Hex Driver	5 in. lbs.	5 in. lbs.
38-80041M01	Plug, Button	Heat Sink Plug	1	—	—	—
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	Taplrite 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			
03-10913A43	Mach. M5 x 8 Slit. Torx. Flt. Hd.	Base Mic Mtg. Clip	1	T25	12-14 in. lbs.	12-14 in. lbs.
03-10908B08	Mach. M5 x 10 Slit. Torx. Pn. Hd.	Locking Trunnion Radio Mtg.	2	T25	Field Inst'l.	Field Inst'l.
03-10943M11	Taplrite M3x10 S/L Torx, Pam Hd.	Power Connector	2	T10	9-11 in. lb.	7-9 in. lb.

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To adjust or calibrate a MaxTrac radio requires the MaxTrac RADIO SERVICE SOFTWARE package (RVN4019 for 5.25" drives and RVN4020 for 3.5" drives).

A personal computer and the appropriate software diskette will be required in addition to the items listed in the Recommended Test Equipment paragraph. Table 2, below, details the items required for field programming.

We strongly suggest the servicer become familiar with the programming techniques applicable to the MaxTrac radios.

### 3. MAINTENANCE AND TROUBLE-SHOOTING PROCEDURES

These troubleshooting charts allow you to trace a problem to a specific board in the radio. Each radio has five boards. A switch board, and a front panel (LED) board in the control head, an RF power amplifier board in the heat sink casting and an RF board and a logic board mounted in the chassis. Start troubleshooting with the "Basic Troubleshooting" which will refer you to other charts depending on the symptoms observed. Also refer to Table 3, Error Tones.

Table 2. Field Programming Items

ITEM	KIT/PART NO.	DESCRIPTION
1.	RVN4020 RVN4019	RADIO SERVICE SOFTWARE (on 3 1/2" disc) RADIO SERVICE SOFTWARE (on 5 1/4" disc) Used for programming and servicing MaxTrac radios on IBM PC-XT, or IBM PC-AT computers equipped as follows: IBM DOS 3.1 or higher, RS-232 Asynchronous Serial Communications Adapter, and 512k byte (min.) RAM memory. Software user's manual included .
2.	01-80353A74	RADIO INTERFACE BOX (RIB). Shifts voltage level to enable communications between the radio and the computer's RS-232 Serial Communications Adapter.
3.	01-80357A57	WALL-MOUNT POWER SUPPLY. Used to supply power to the RIB. For 120 V ac use only.
4.	30-80369B71 30-80369B72	IBM PC-XT COMPUTER INTERFACE CABLE IBM PC-AT COMPUTER INTERFACE CABLE Connects the appropriate computer's RS-232 Asynchronous Serial Communications Adapter to the Radio Interface Box. IBM PC-XT computers use a 25-pin connector cable and IBM PC-AT computers use a 9-pin connector cable.
5.	30-80070N01	MaxTrac RADIO INTERFACE CABLE. Connects the MaxTrac radio to the Radio Interface Box.

It is recommended to use the following test equipment:

R2001D Communications System Analyzer, or R2200B Service Monitor, or R2012 Trunking Service Monitor, or R2021D Trunking Service Monitor

R1011B Power Supply

R1037A Digital Multimeter, or 1024B Digital Multimeter

Also refer to Table 4 for MaxTrac radio's recommended service aids.

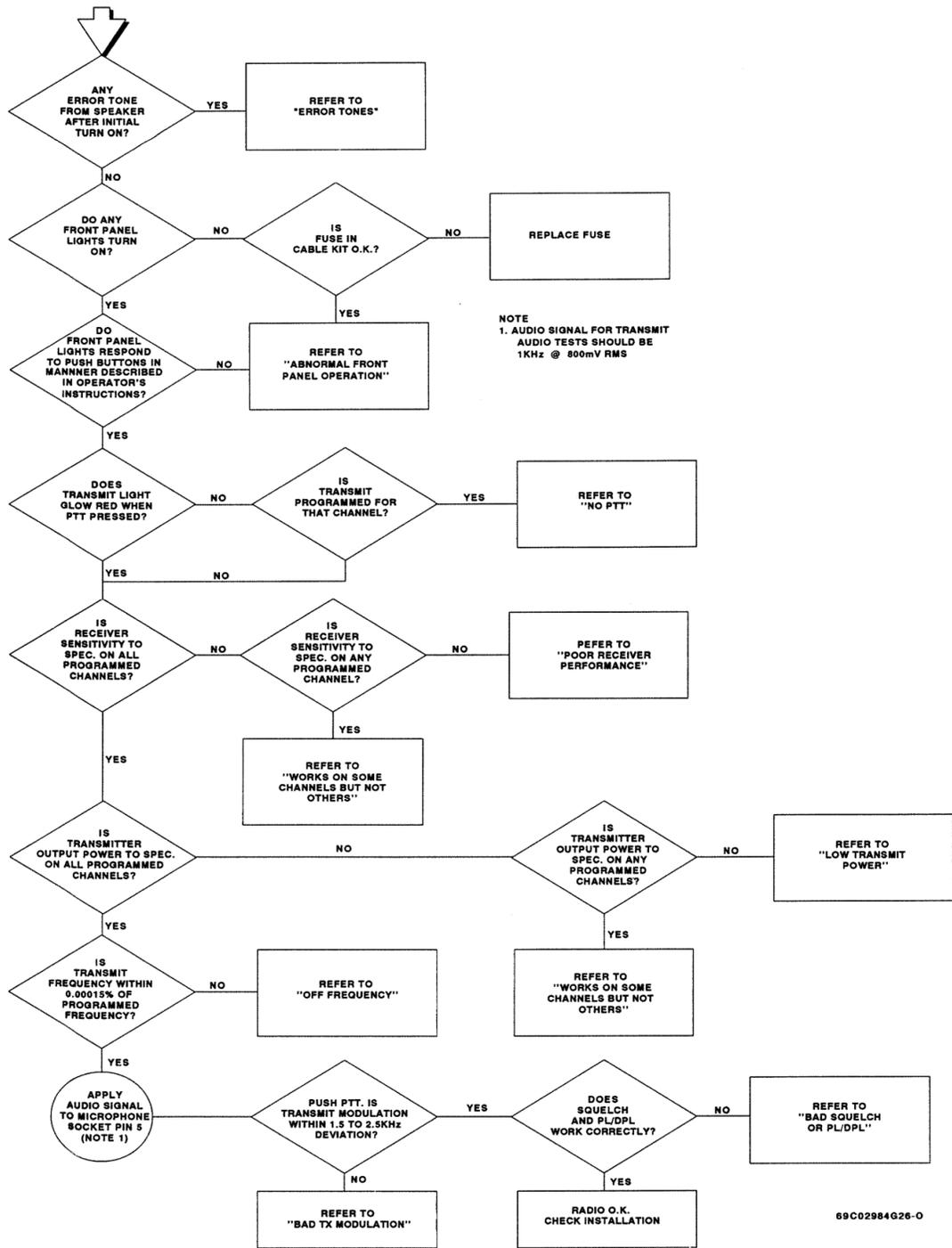
Table 3. Error Tones

TONES	PROBLEM
Low pitched tone (163 Hz) for 5 seconds after turn on.	Try to reprogram tuning code plug. If this does not clear the fault or if the problem recurs, replace the logic board.
A volume set tone (450 Hz) for 1 second, followed by an illegal function tone after turn on.	Reprogram or replace the code plug.
Continuous pattern of one beep (1000 Hz) followed by a pause after turn on.	Microprocessor RAM failure. Replace the logic board.
Continuous pattern of two beeps (1000 Hz) followed by a pause after turn on.	External RAM failure. Replace the logic board.
Continuous pattern of three beeps (1000 Hz) followed by a pause after turn on.	Watchdog error. Reprogram the microprocessor Config register. If the error exists, replace the logic board.
Continuous pattern of five beeps (1000 Hz) followed by a pause after turn on.	External ROM checksum failure. Reprogram or replace external ROM.

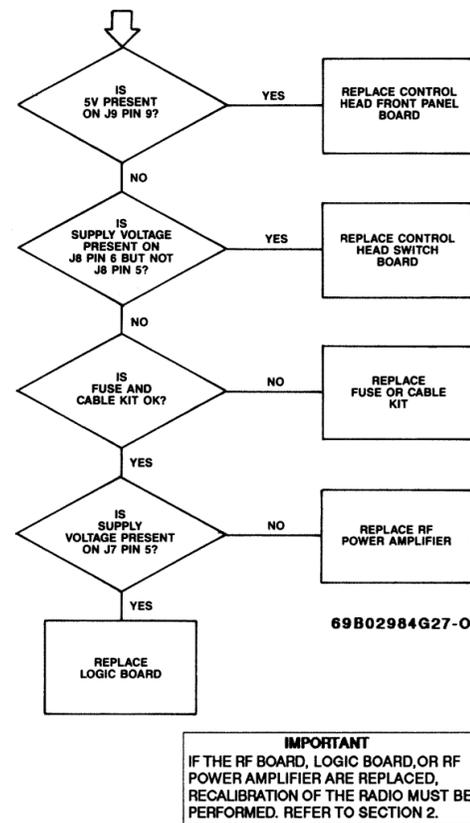
Table 4. Recommended Service Aids

ITEM	PART NO.	DESCRIPTION
1.	28-84606M01	Mini-UHF connector (male) for coax cable RG58 or equivalent. For mating to antenna connector. Requires crimping tool.
2.	30-80093P01	RF board extension cable for troubleshooting.
3.	30-80373B41	VCO test cable. Provides the interface between the RF board and the test equipment for troubleshooting.
4.	30-80373B42	Test cable. Mini-UHF to "N"-type RF coax (low loss) cable (14") used for connecting the radio antenna connector to the RF test instruments.
5.	58-80367B21	Mini-UHF male to "N"-type female adapter
6.	58-80367B22	Mini-UHF male to UHF female adapter
7.	66-80388A26	Crimping tool. For customer installations requiring crimping of mini-UHF RF connector (28-84606M01) onto antenna cable.
8.	66-80947W01	Extraction tool. Provides the ability to remove the terminal pins (29-84249N01) from the 16-pin expanded option connector housing (15-80922V01).

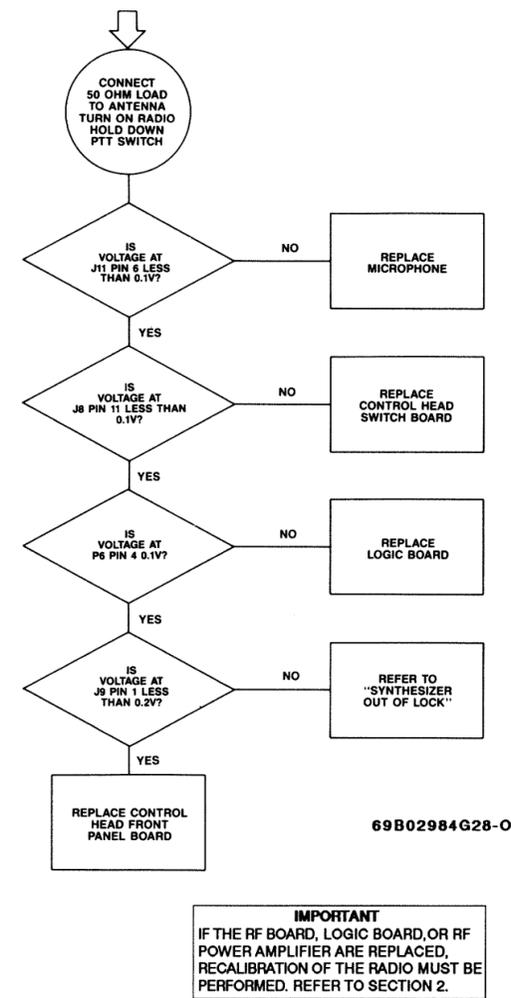
**BASIC TROUBLESHOOTING (START WITH THIS CHART)**



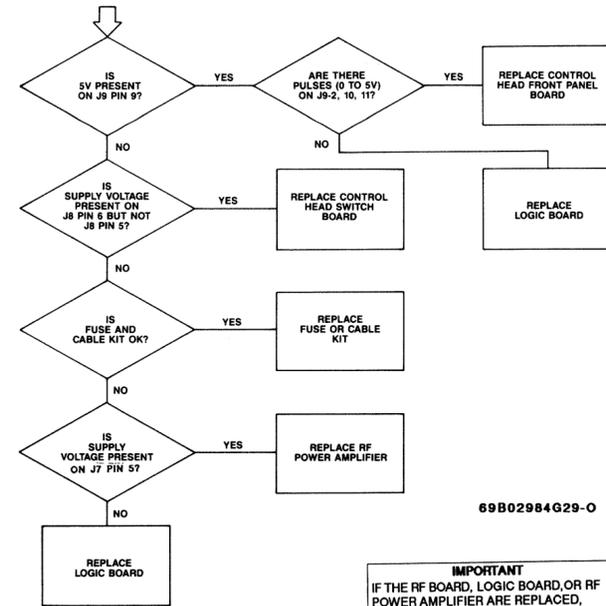
**NO FRONT PANEL LIGHTS (MaxTrac 300, 100)**



**NO PTT**



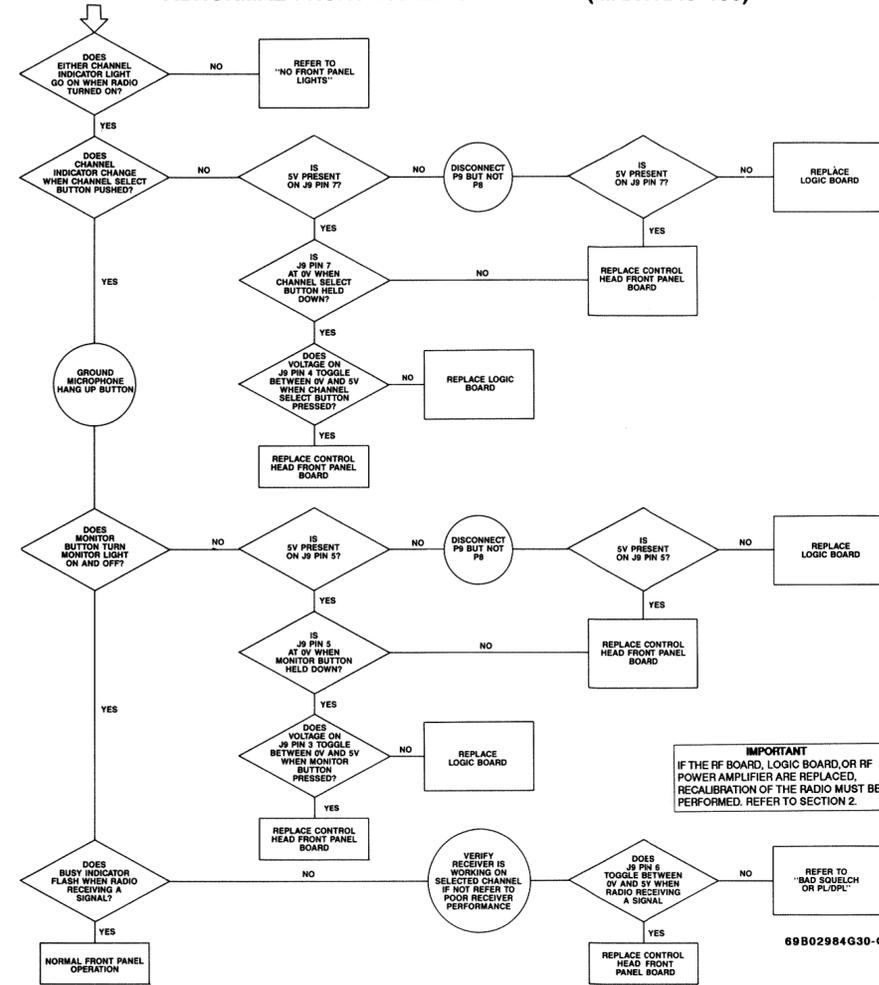
**IMPROPER FRONT PANEL LIGHTS (MaxTrac 300,100)**



69B02984G29-O

**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

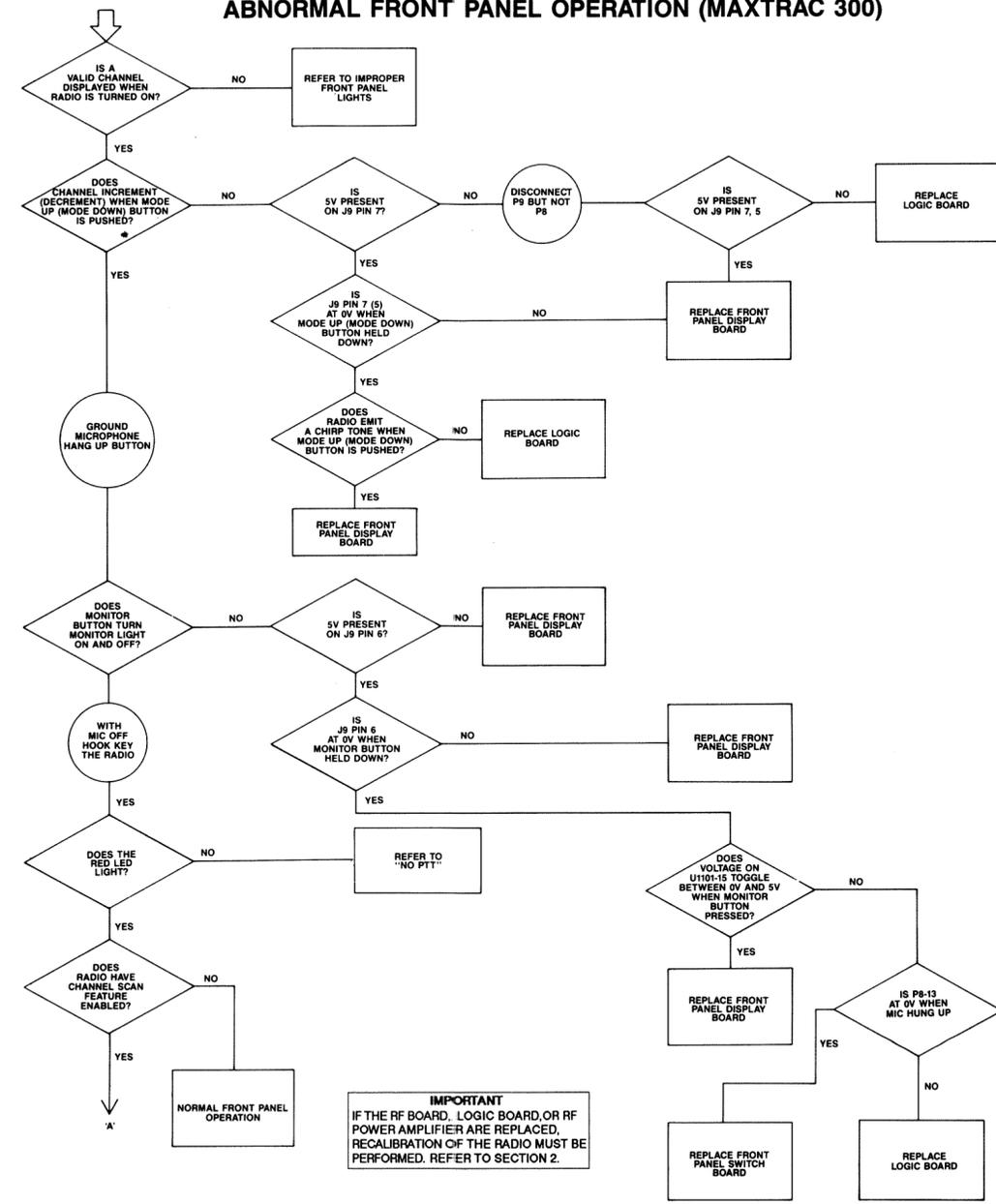
**ABNORMAL FRONT PANEL OPERATION (MAXTRAC 100)**



**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

69B02984G30-O

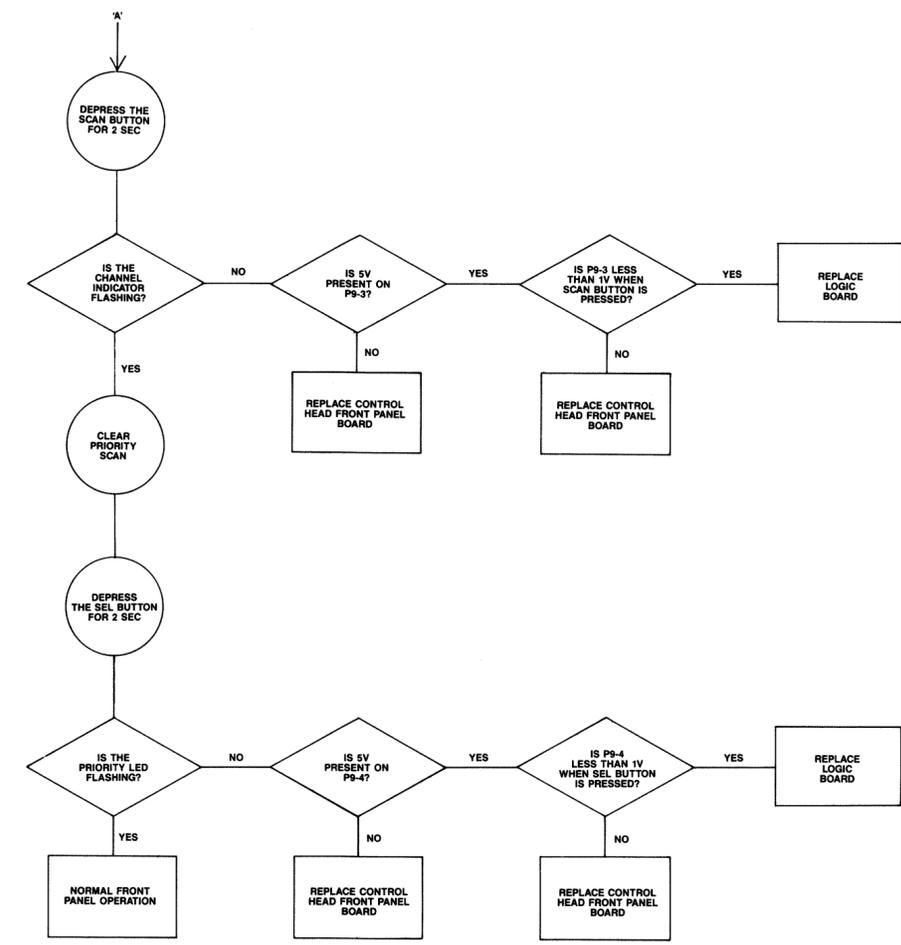
**ABNORMAL FRONT PANEL OPERATION (MAXTRAC 300)**



**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

69B02984G31-O

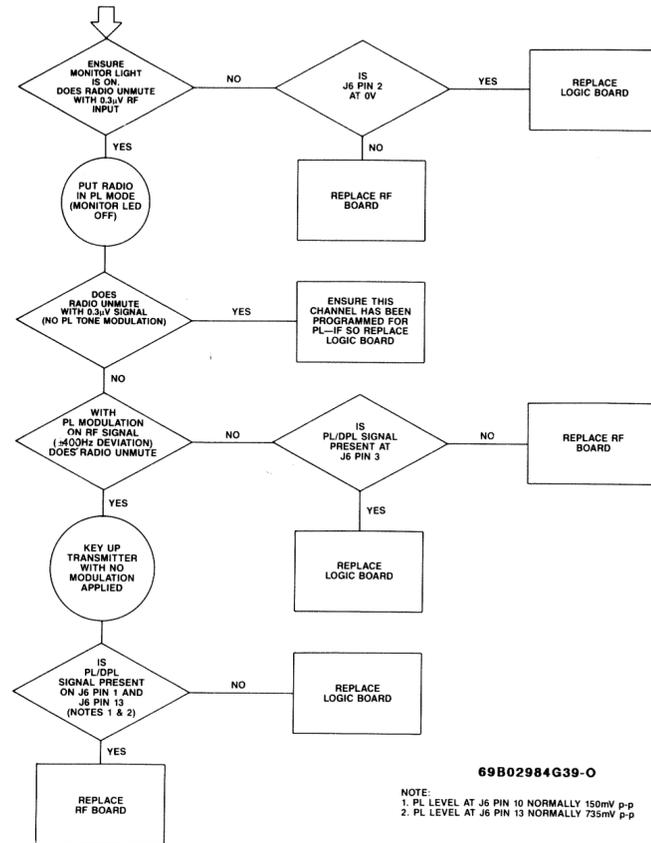
**ABNORMAL FRONT PANEL OPERATION CONT' D (FOR RADIOS WITH CHANNEL SCAN FEATURES)**



**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

69B02984G32-O

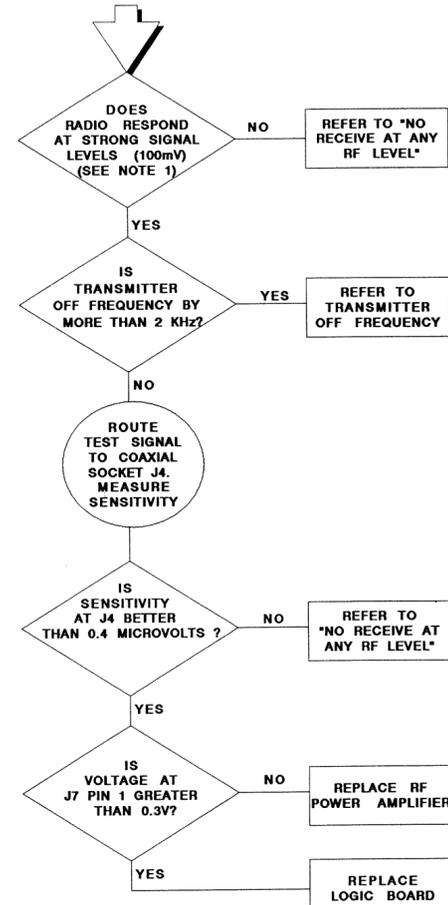
### BAD SQUELCH OR PL/DPL



**69B02984G39-O**  
 NOTE:  
 1. PL LEVEL AT J6 PIN 10 NORMALLY 150mV p-p  
 2. PL LEVEL AT J6 PIN 13 NORMALLY 735mV p-p

**IMPORTANT**  
 IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

### POOR RECEIVER PERFORMANCE

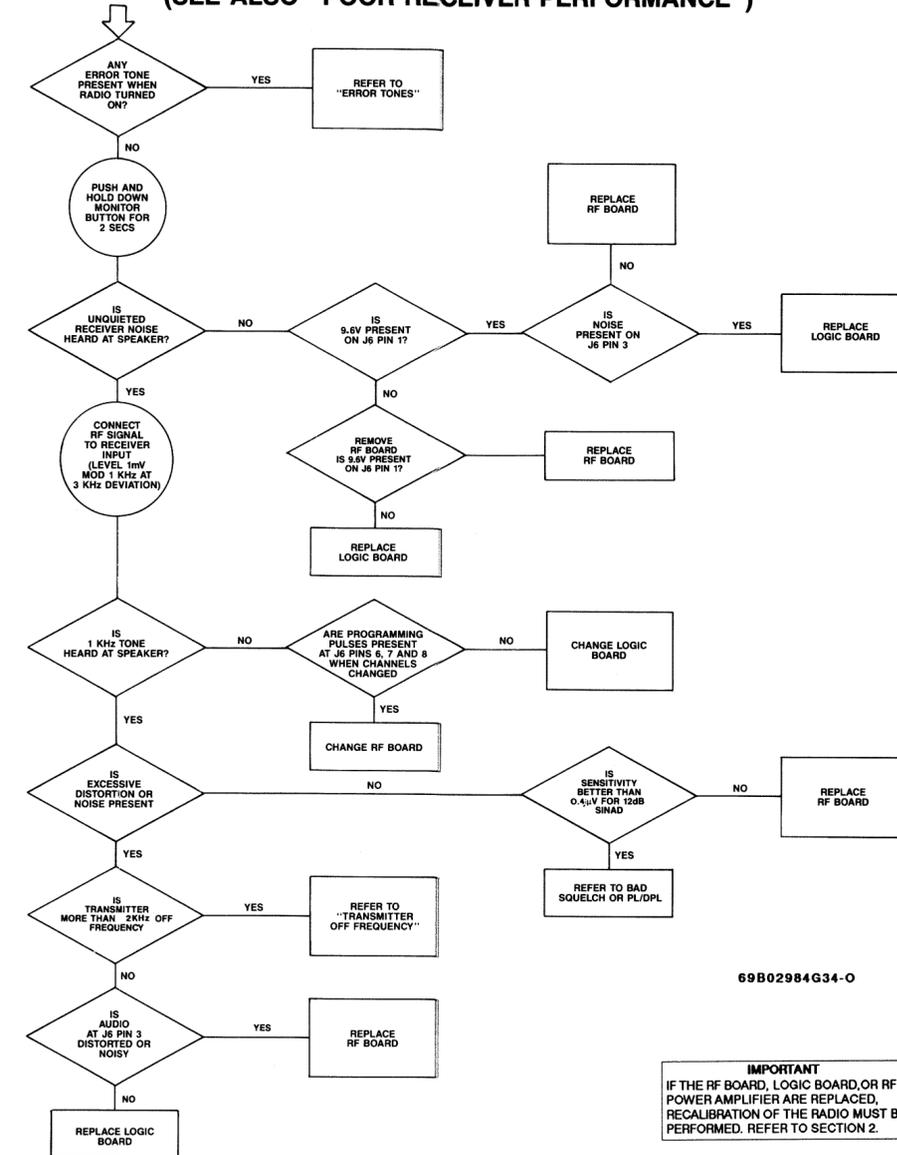


**69A02984G33-O**

**NOTE:**  
 1. RF SIGNAL SHOULD BE MODULATED WITH 1 KHz @ + 1.5 KHz DEVIATION.

**IMPORTANT**  
 IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

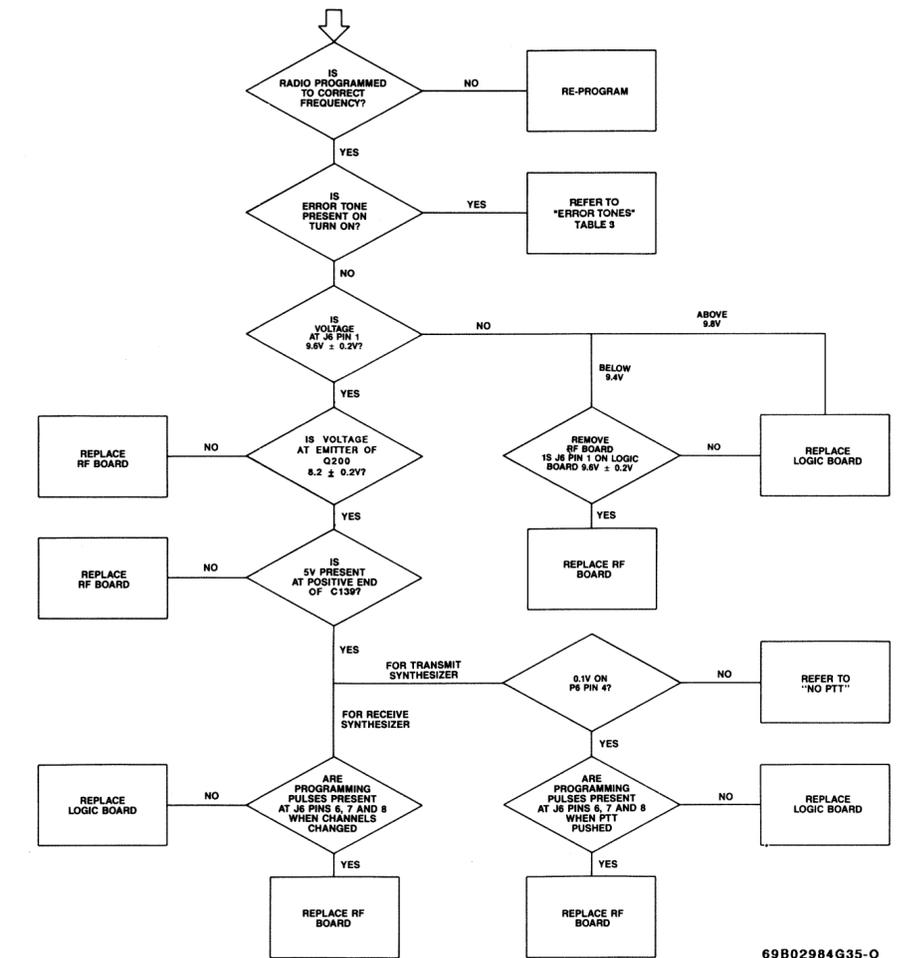
### NO RECEIVE AT ANY RF LEVEL (SEE ALSO "POOR RECEIVER PERFORMANCE")



**69B02984G34-O**

**IMPORTANT**  
 IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

### SYNTHESIZER OUT OF LOCK



**69B02984G35-O**

**IMPORTANT**  
 IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

### LOW TRANSMITTER POWER

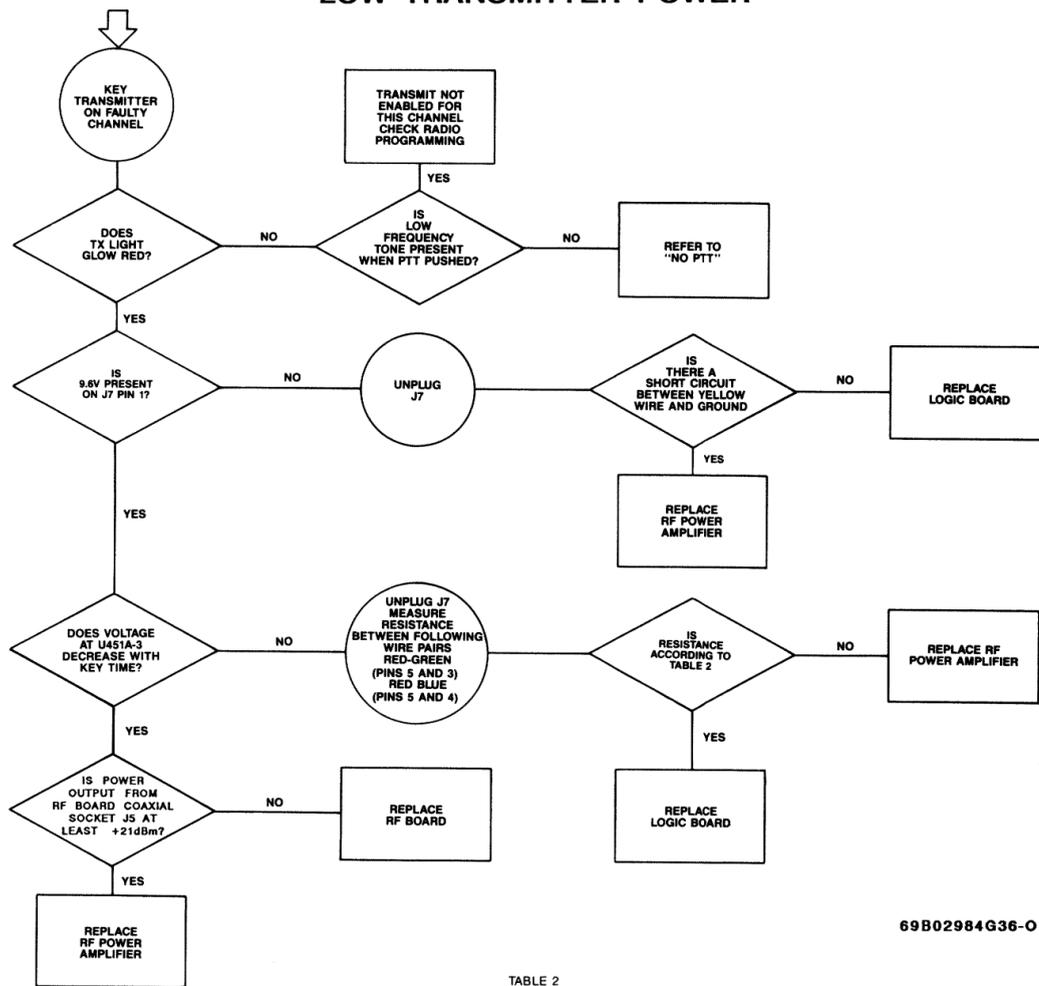


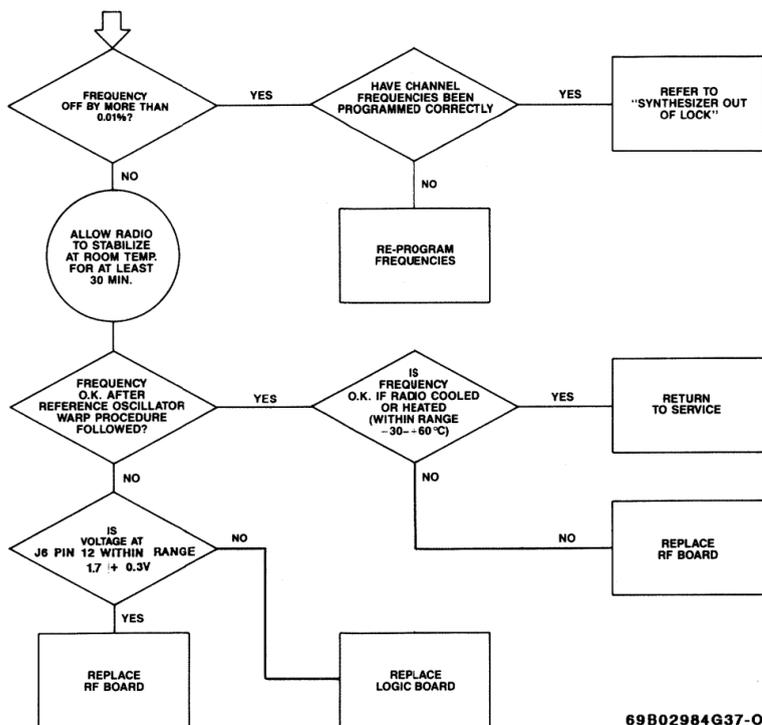
TABLE 2

WIRE PAIR	RESISTANCE
RED-GREEN	39 OHMS
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 2.

69B02984G36-O

### TRANSMITTER OFF FREQUENCY



69B02984G37-O

**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.

### BAD TX MODULATION

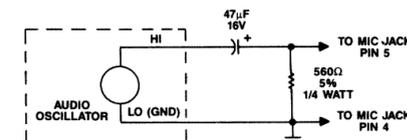
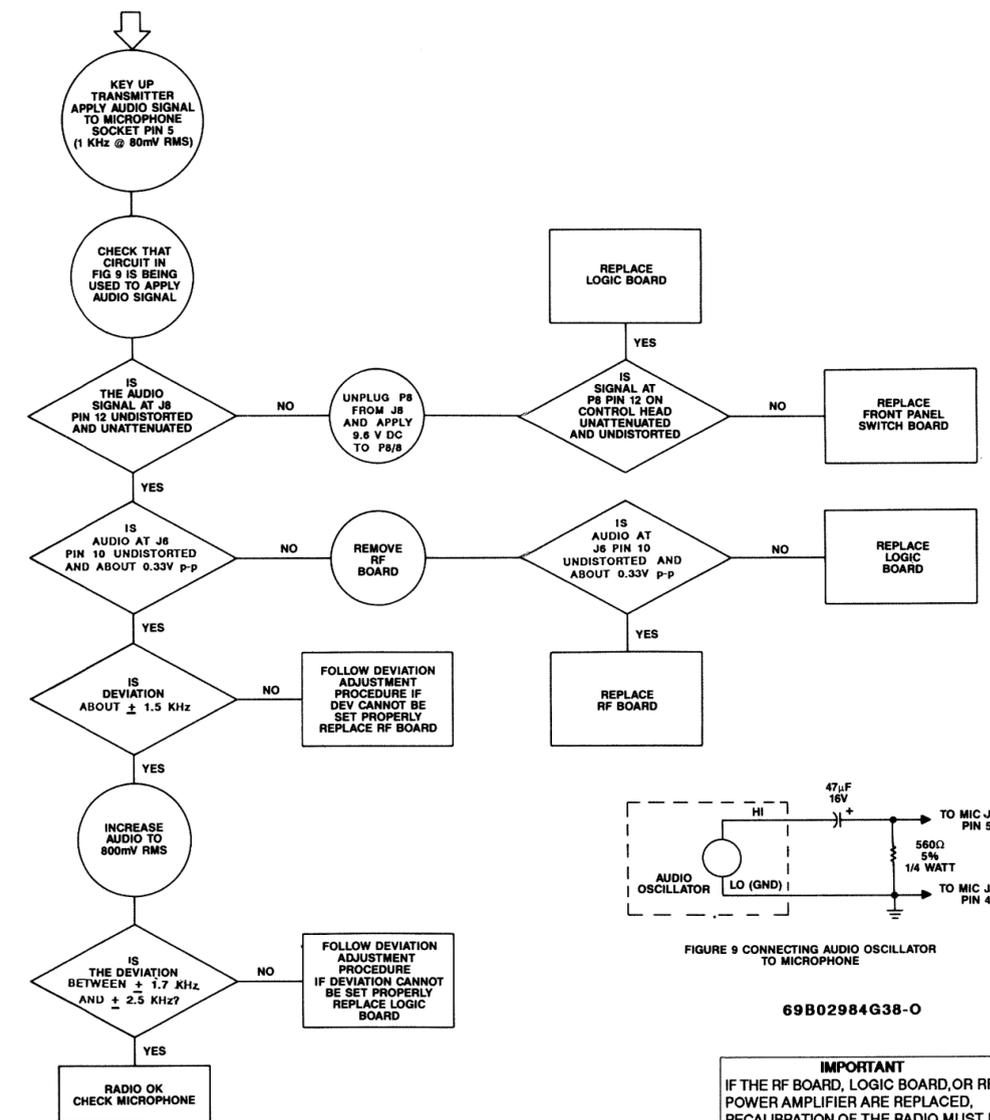
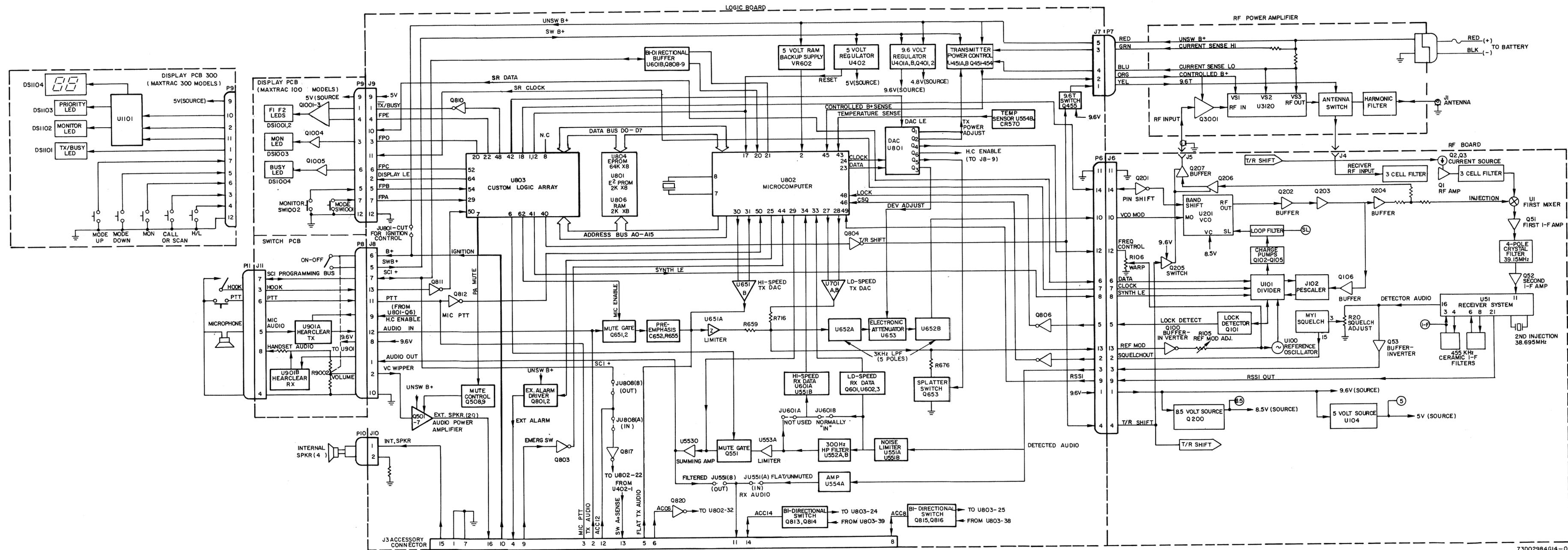


FIGURE 9 CONNECTING AUDIO OSCILLATOR TO MICROPHONE

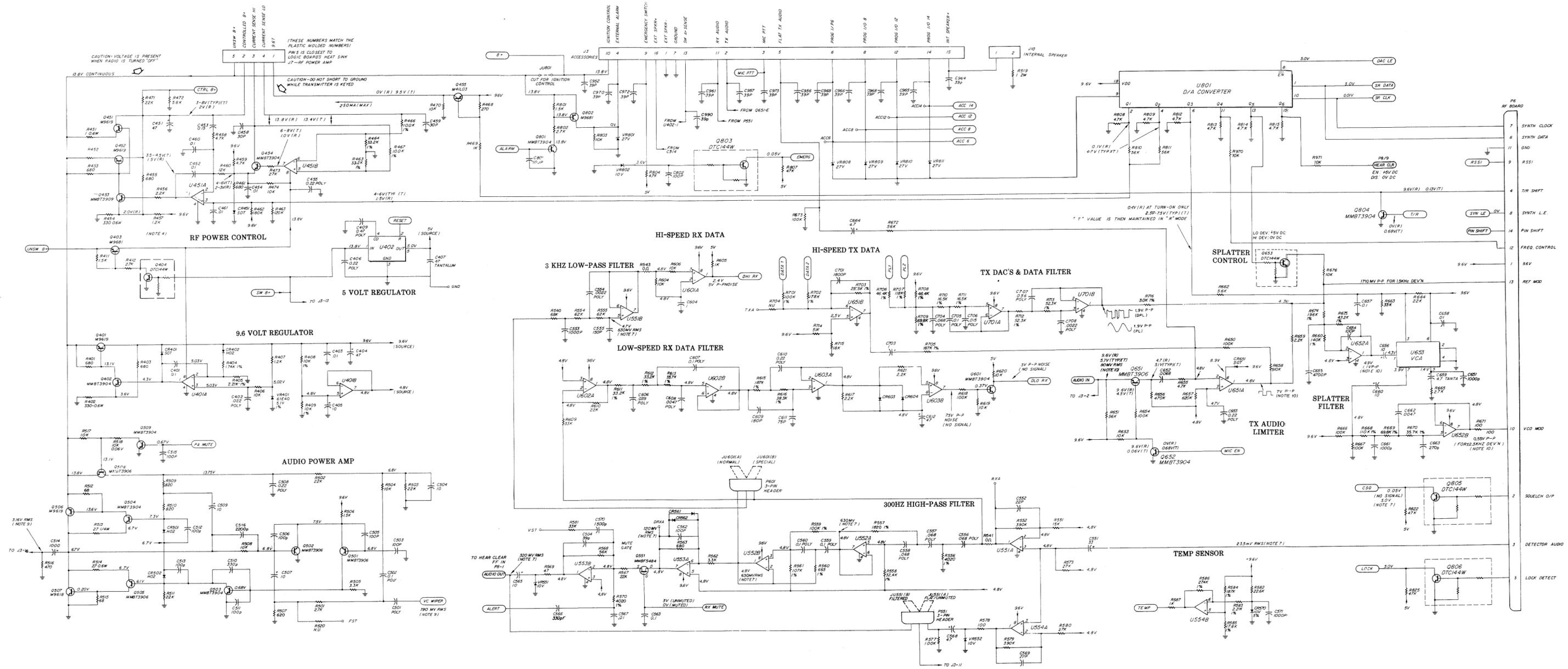
69B02984G38-O

**IMPORTANT**  
IF THE RF BOARD, LOGIC BOARD, OR RF POWER AMPLIFIER ARE REPLACED, RECALIBRATION OF THE RADIO MUST BE PERFORMED. REFER TO SECTION 2.



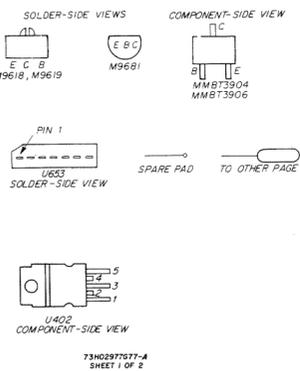
Functional Block Diagram  
May, 1990



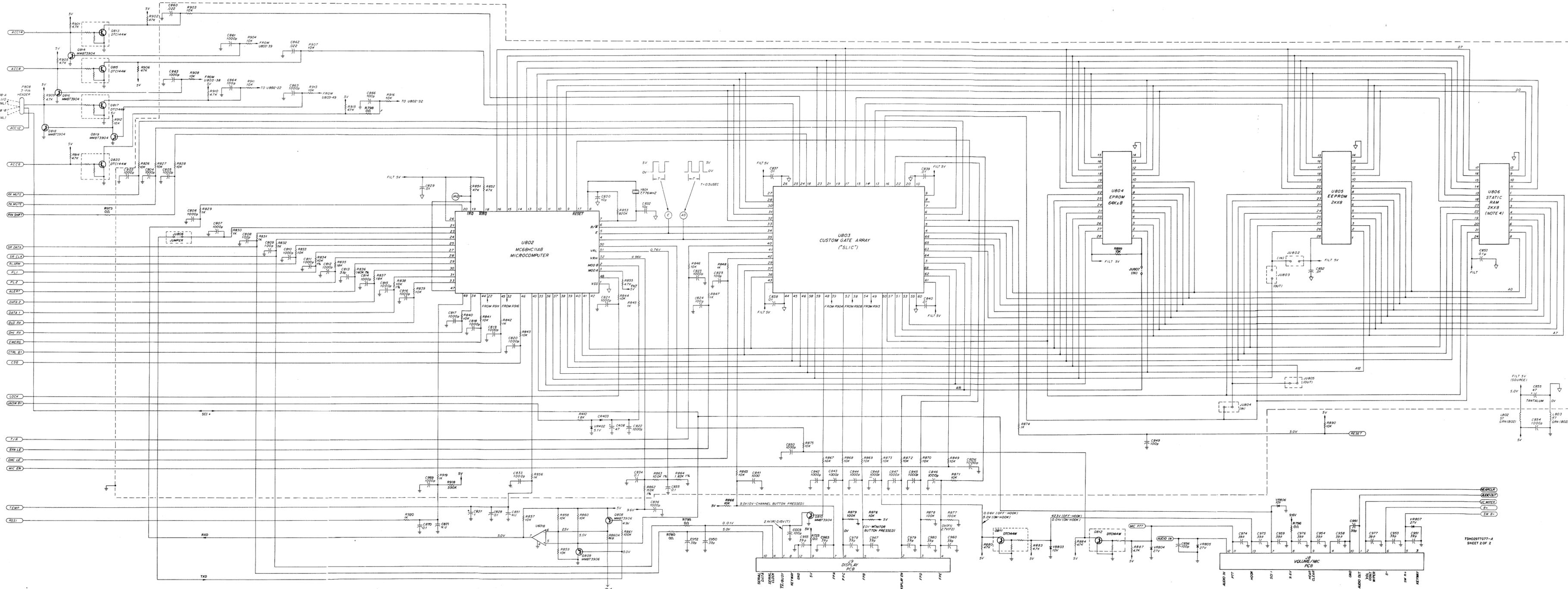


NOTES:

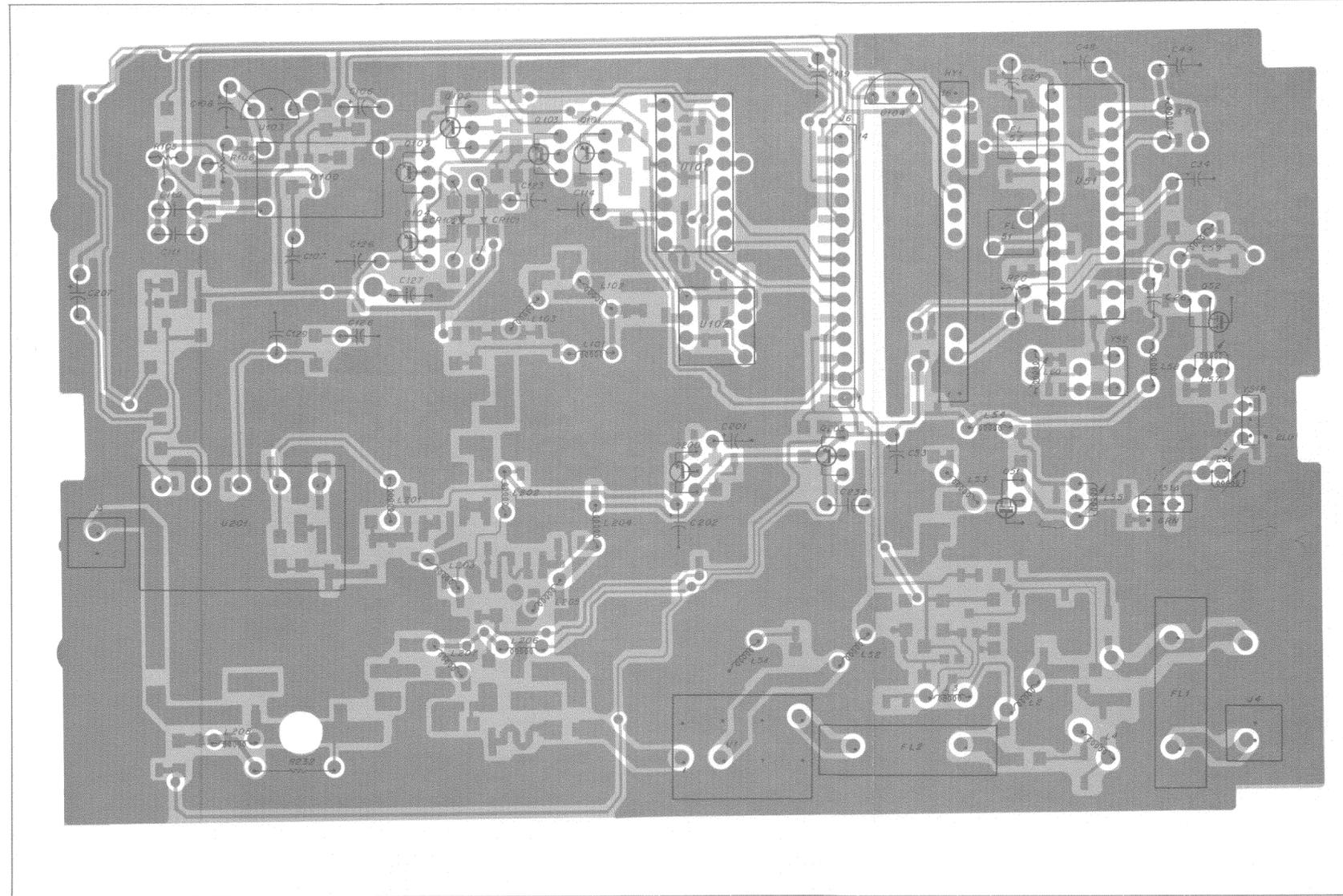
- 1 UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN MICROFARADS, INDUCTOR VALUES ARE IN MICROHENRIES
- NON-POLARIZED CAPACITORS ARE CHIP-TYPE UNLESS OTHERWISE INDICATED
- 3 POLARIZED CAPACITORS ARE ALUMINUM ELECTROLYTIC TYPE UNLESS OTHERWISE INDICATED
- 4 UB06 IS LOCATED UNDER UB04
- 5 DC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE (10 MEGOHM) DC VOLTMETER
- 6 ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:  
(R) RECEIVE MODE  
(T) TRANSMIT MODE
- 7 MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -19.6 DBM MODULATED WITH 1 KHZ AT 15 KHZ DEVIATION MEASURED WITH AN AC RMS VOLTMETER
- 8 SAME AS NOTE 7 EXCEPT MODULATING FREQUENCY IS 100HZ
- 9 SAME AS NOTE 7, EXCEPT WITH VOLUME CONTROL ADJUSTED FOR 5 WATTS (3.16 VOLTS RMS ACROSS 2 OHM LOAD)
- 10 MEASURED IN THE TRANSMIT MODE WITH 1 KHZ, 80 MV RMS SIGNAL APPLIED TO MICROPHONE INPUT FROM 600 OHM SOURCE
- 11



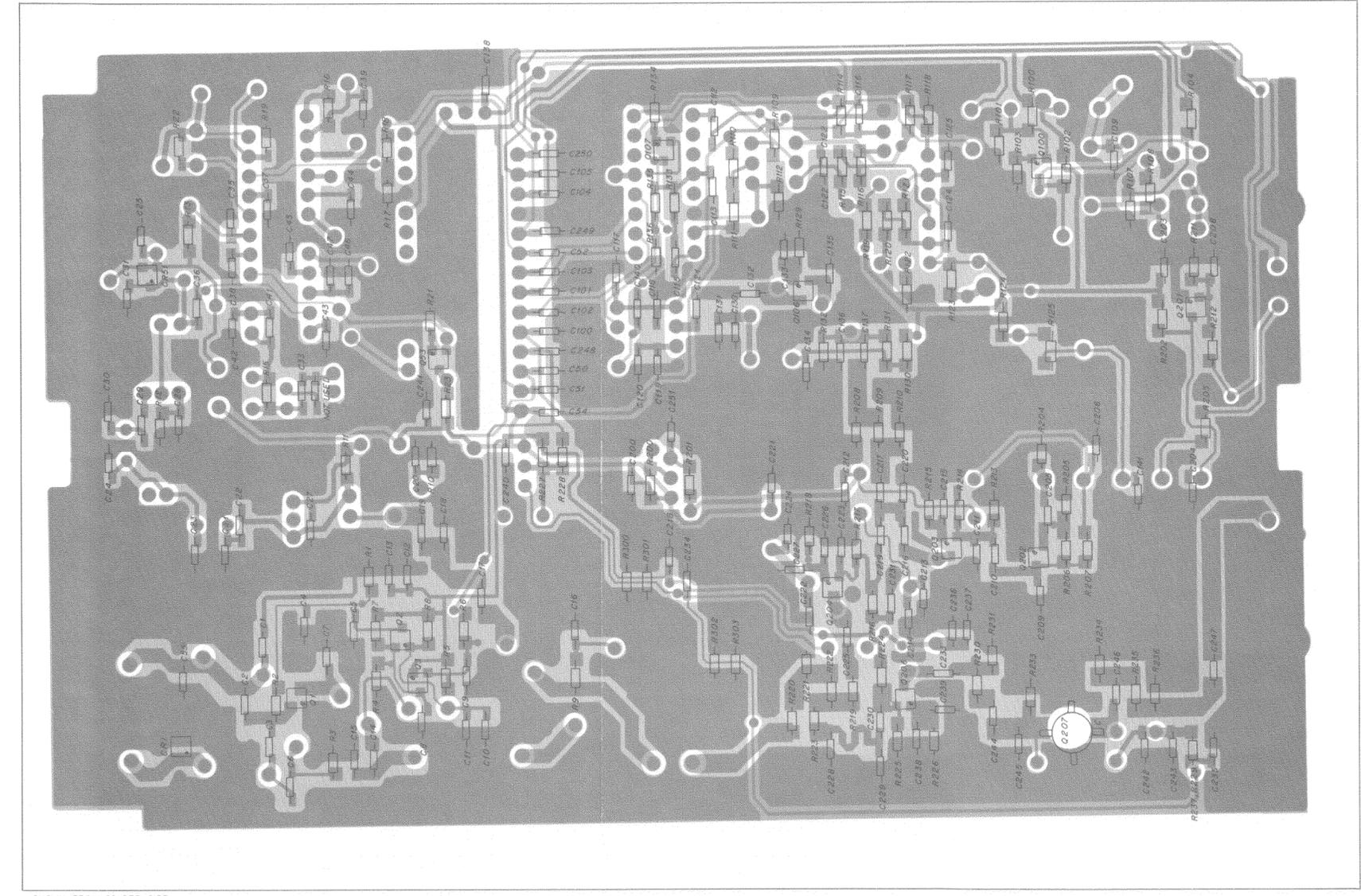
FRN5529A Logic Board  
Schematic Diagram  
(Sheet 1 of 2)  
May, 1990

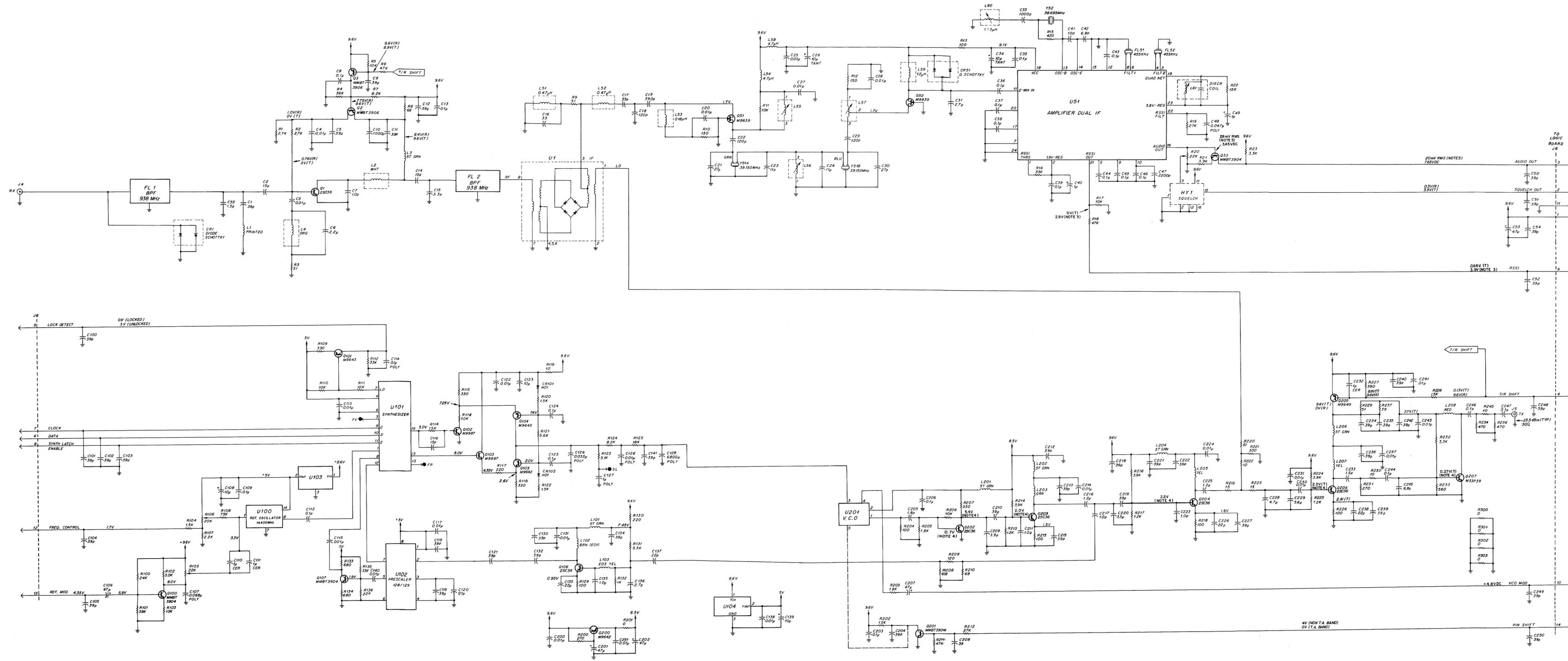


FRN5529A Logic Board  
Schematic Diagram  
(Sheet 2 of 2)  
May, 1990



FLF5298A 900 MHz RF Board  
 Circuit Board Diagrams  
 May, 1990





- NOTES:
- 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 TONE AT 1.5 kHz PEAK DEVIATION. AC VOLTAGES ARE MEASURED WITH AN AC RMS HIGH-IMPEDANCE VOLTMETER.
  - SAME AS NOTE 1, BUT RF CHOKE SHOULD BE ADDED IN SERIES TO PROBE (PIN 241100A04).

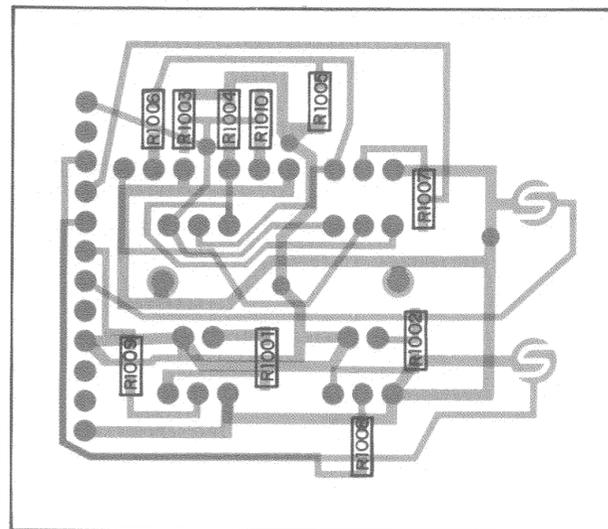
FL5298A 900 MHz RF Board  
Schematic Diagram  
May, 1990

73E02975G91-B

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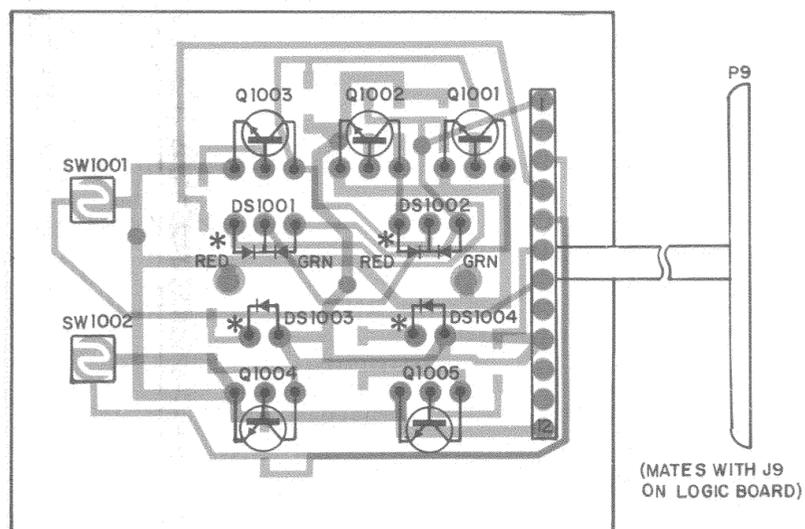


SHOWN FROM SOLDER SIDE



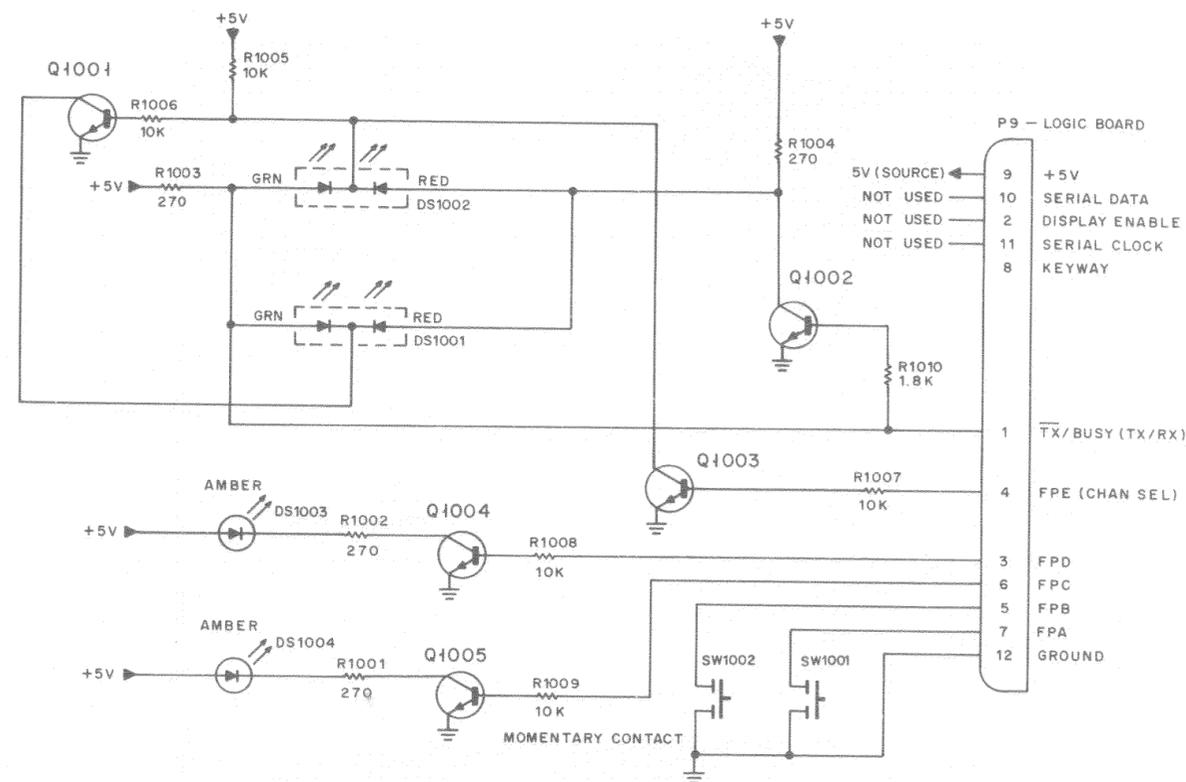
OVERLAY ● 79A02981G11-0  
 COMPONENT SIDE ● 79A02981G12-0  
 SOLDER SIDE ● 79A02981G13-0

SHOWN FROM COMPONENT SIDE



OVERLAY ● 79A02981G10-0  
 COMPONENT SIDE ● 79A02981G12-0  
 SOLDER SIDE ● 79A02981G13-0

\* SHORTER LEAD



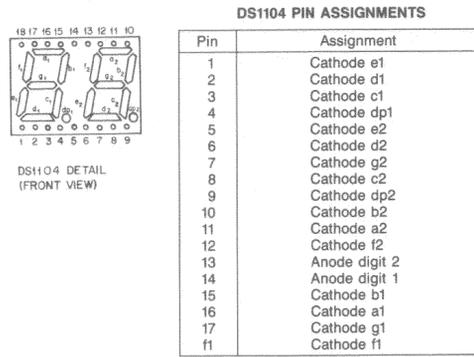
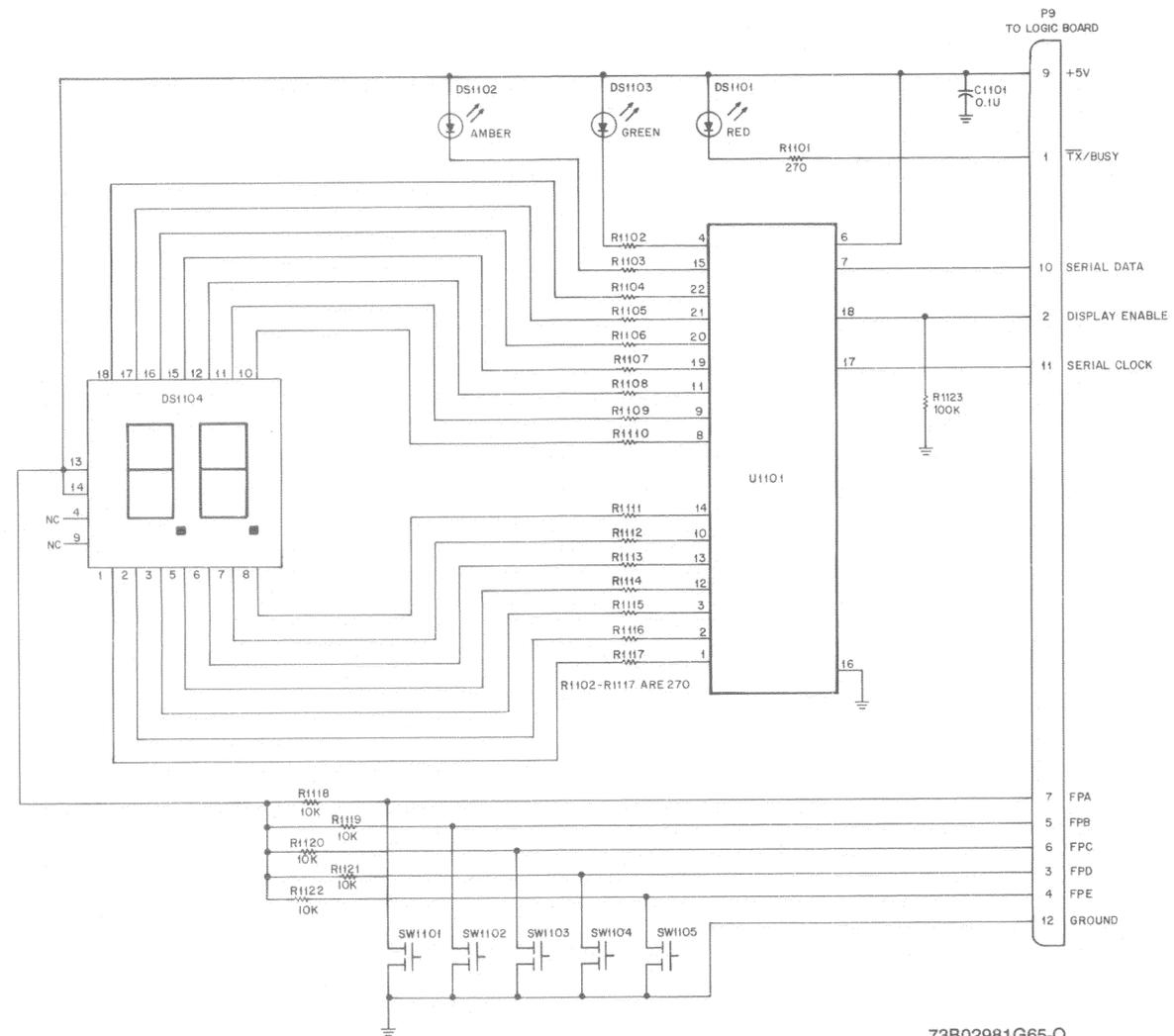
73B02981G93-0

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	06-11024A55	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.

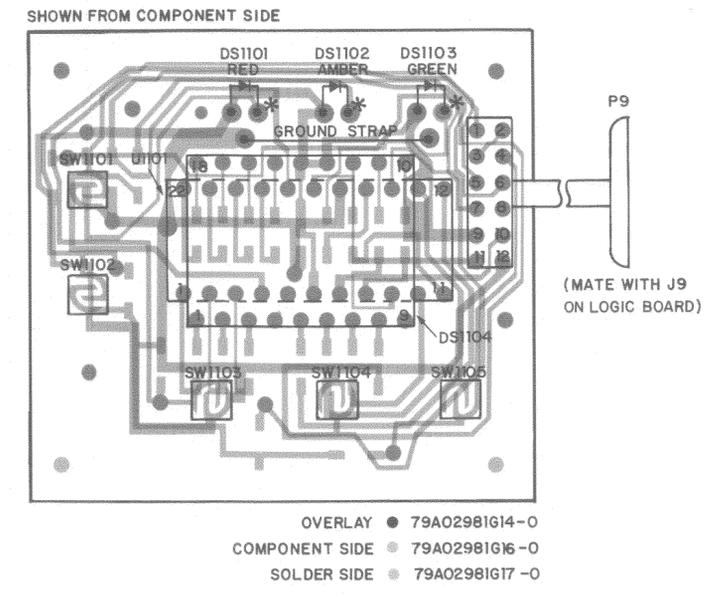
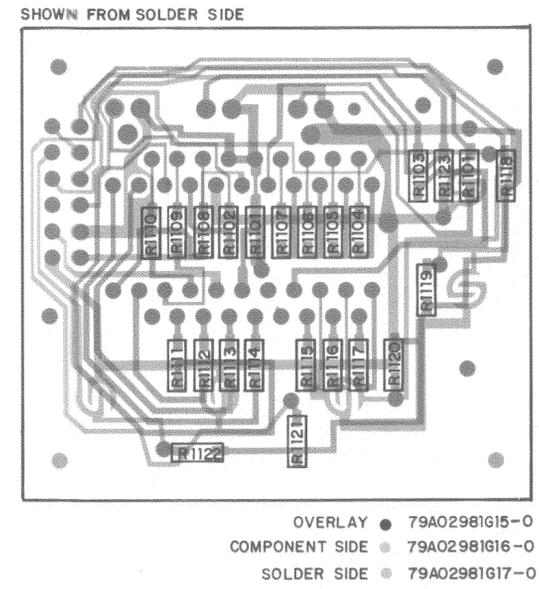


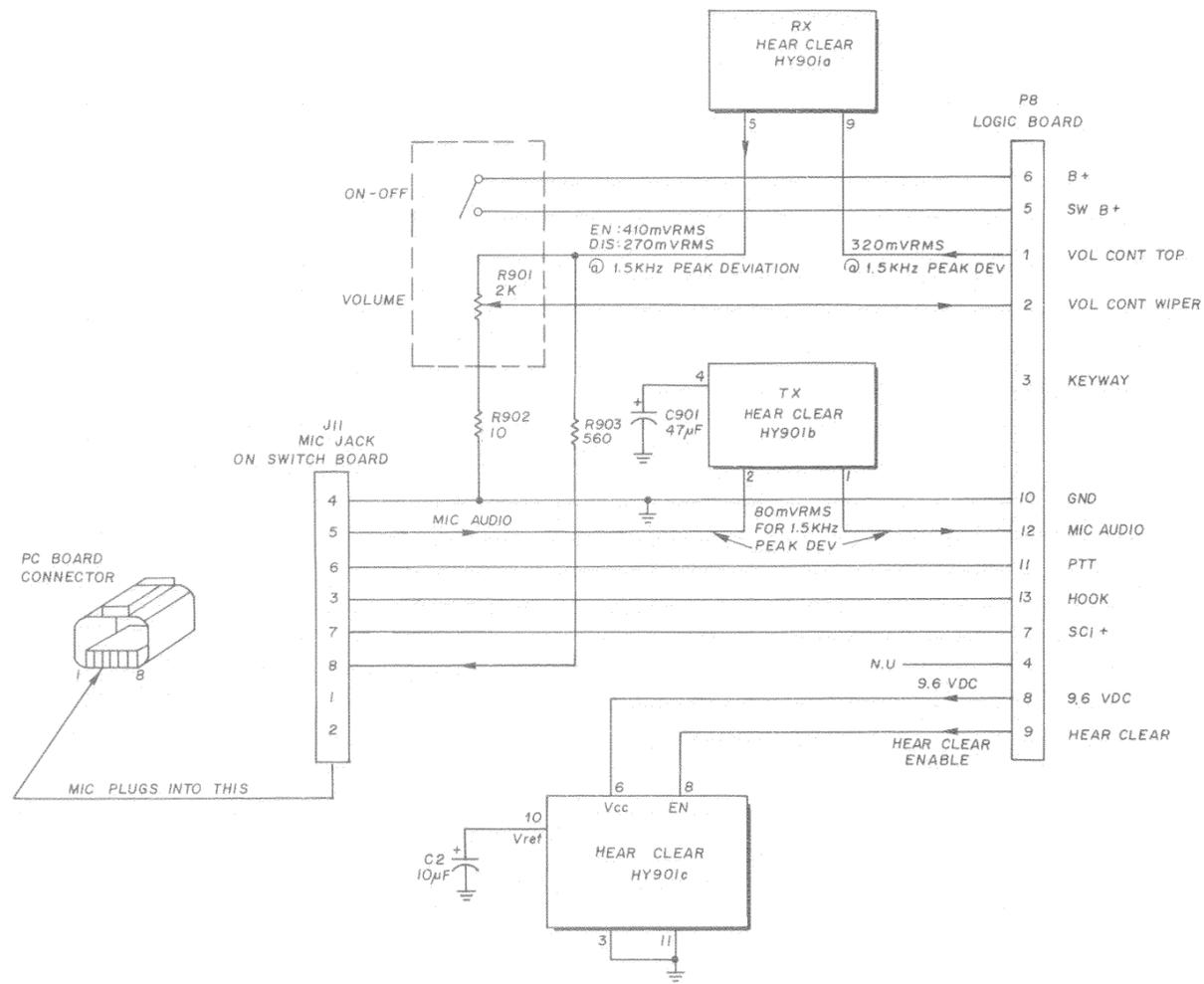
**parts list**

HLN5175A MaxTrac 840 Display Board, 6/16 Freq.

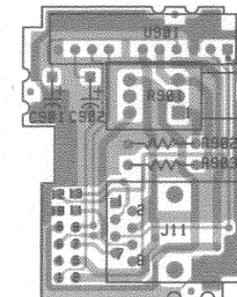
REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
DS1101	48-80051M01	Display, LED red
DS1102	48-80051M03	amber
DS1103	48-80051M02	green
DS1104	48-80055M01	dual 7 segment
R1101-1117	06-11024A35	Resistor, chip, 5%, 1/8 watt 270
R1118-1122	06-11024A73	10k
R1123	06-11024A97	100k
U1101	51-84944N29	Integrated Circuit (see note) driver, serial to parallel
	01-8074T11	Mechanical parts cable assembly (includes P9)
	42-80053N01	ground strap
	43-8027BL01	spacer, LED display
	43-8028BL01	spacer, LED

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





73C02967669-0



SHOWN FROM COMPONENT SIDE

OVERLAY ■ 79A82974676-B  
 COMPONENT SIDE ■ 79A82974677-B  
 SOLDER SIDE ■ 79A82974678-B

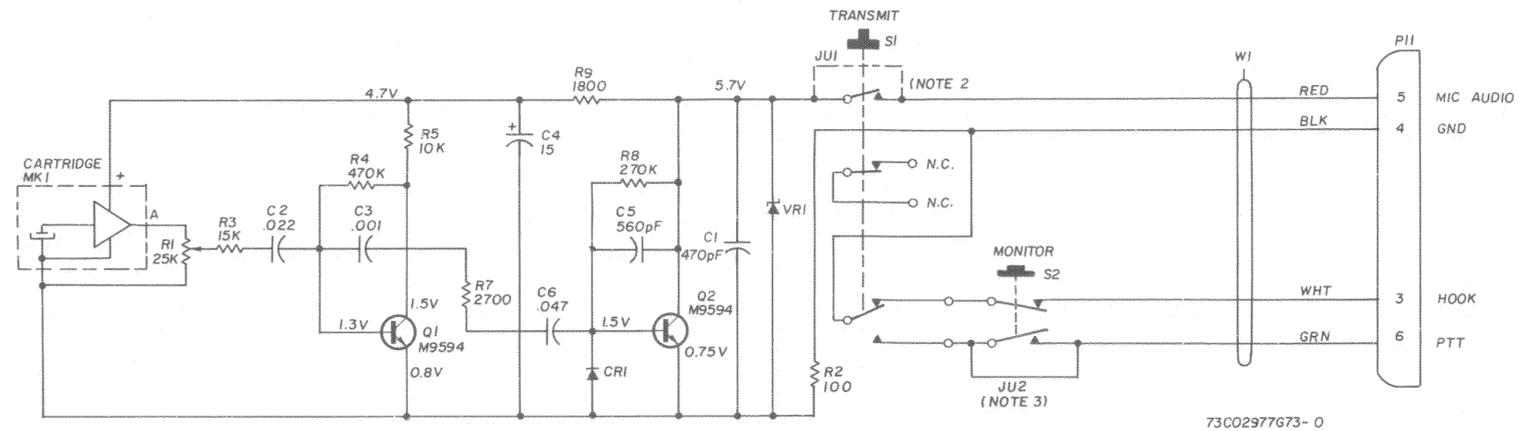
FLN5064A SWITCH BOARD PL-1077-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Capacitors: uF, unless otherwise specified		
C901	2311048B19	47UF 20V 20% ELECTROLYTIC
C902	2311054H08	10UF 25V TANTALUM
Connectors, receptacle:		
J11	0980132M01	8 PIN MIC JACK
Resistors:		
R901	1880140M01	2K POT. SWITCH, VOLUME
R902	0611009C01	10 OHM 1/4W 5%
R903	0611009C43	560 OHM 1/4W 5%
Integrated Circuits:		
(See Note)		
U901	5102512S01	HYBRID HEAR CLEAR
Qty		
1	0180747T12	Non-referenced Items: CABLE ASSEMBLY FOR LOGIC BOARD

Note:

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

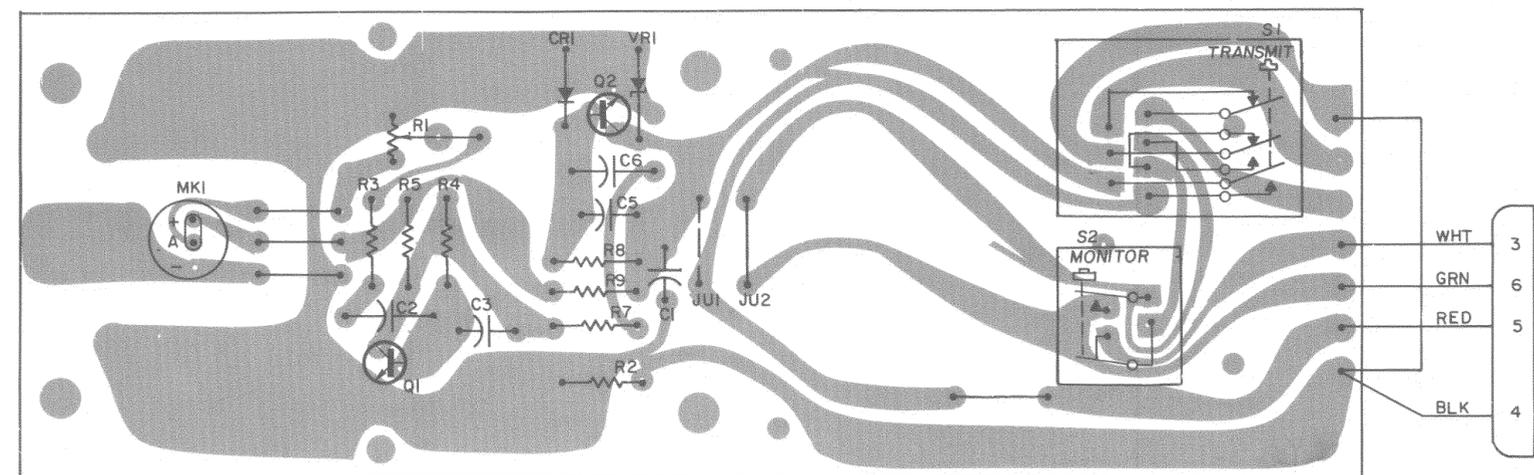
FLN5064A Front Panel Switch Board  
 Schematic and Circuit Board Diagram  
 May, 1990



NOTES:

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

73C02977G73-0



SHOWN FROM COMPONENT SIDE

OVERLAY  
 COMPONENT SIDE ● 79C02978G54-0  
 ■ 79C02978G55-0

E B C



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; 470 pF
C2	8-82096J08	.022; 250 V
C3	21-82187B44	.001; 100 V
C4	23-84665F09	15 + 150 - 10%; 25 V
C5	21-82187B06	560 pF
C6	8-82096J04	.047; 250 V
CR1	48-83654H01	diode (see note) silicon
MK1	50-82825M02	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	15k
R4	6-11009D14	470k
R5	6-11009C73	10k
R7	6-11009C59	2.7k
R8	6-11009D08	270k
R9	6-11009C55	1.8k
VR1	48-82256C38	diode (see note) Zener; 9.1 V ± 5%

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

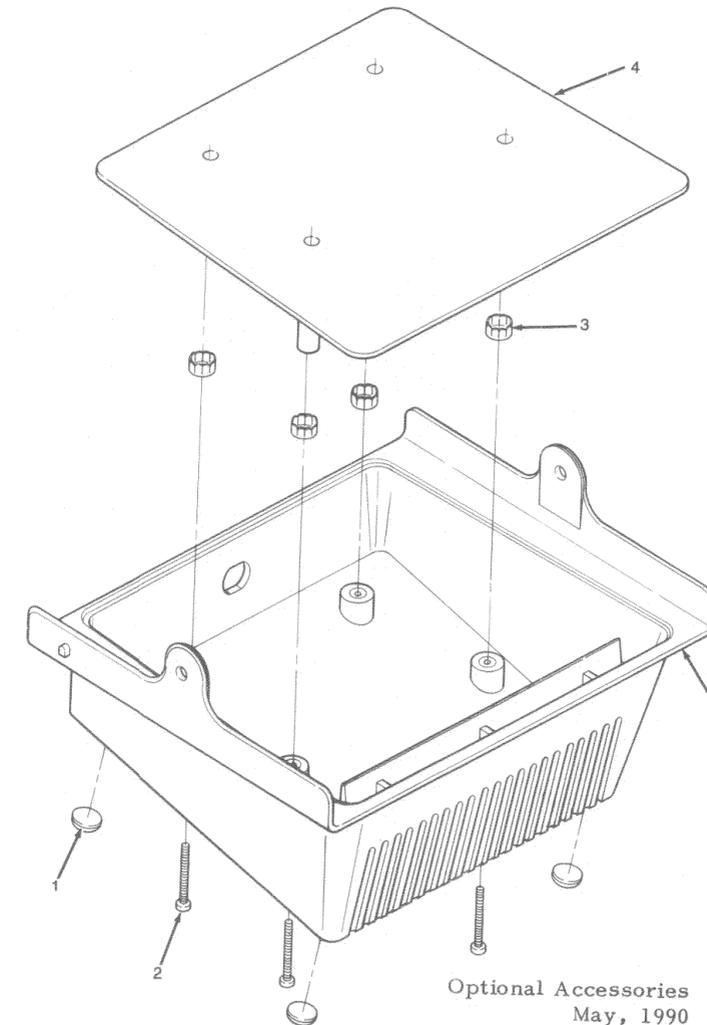
HKN4291A Microphone Cable Kit

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	75-10606A06	FOOT, RUBBER	4
2	03-00136518	TAPPING SCREW	4
3	38-80000K01	CLIP FASTENER	4
4	15-80154J02	COVER-HOUSING	1
5	15E80289E02	HOUSING	1

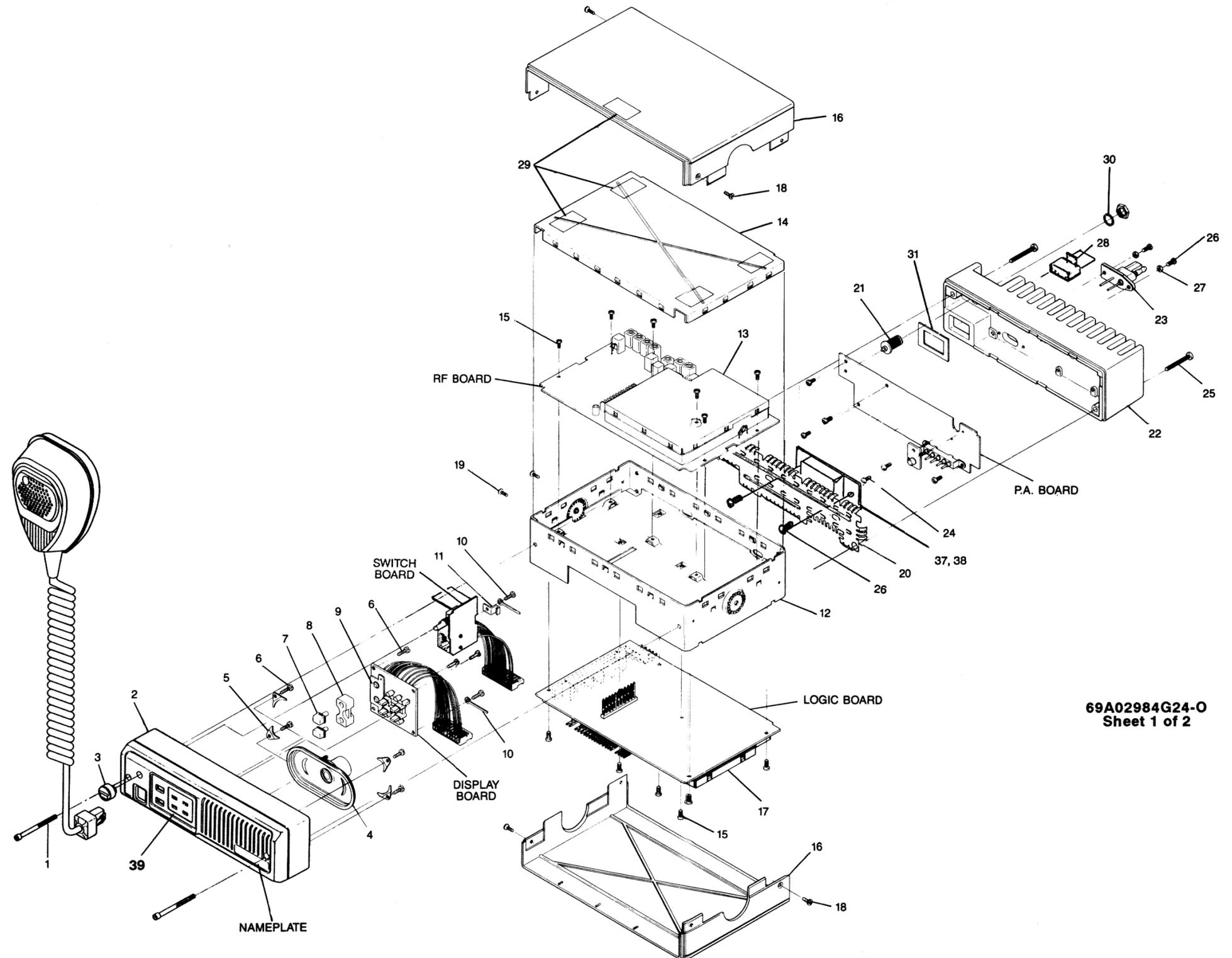


Optional Accessories  
 May, 1990

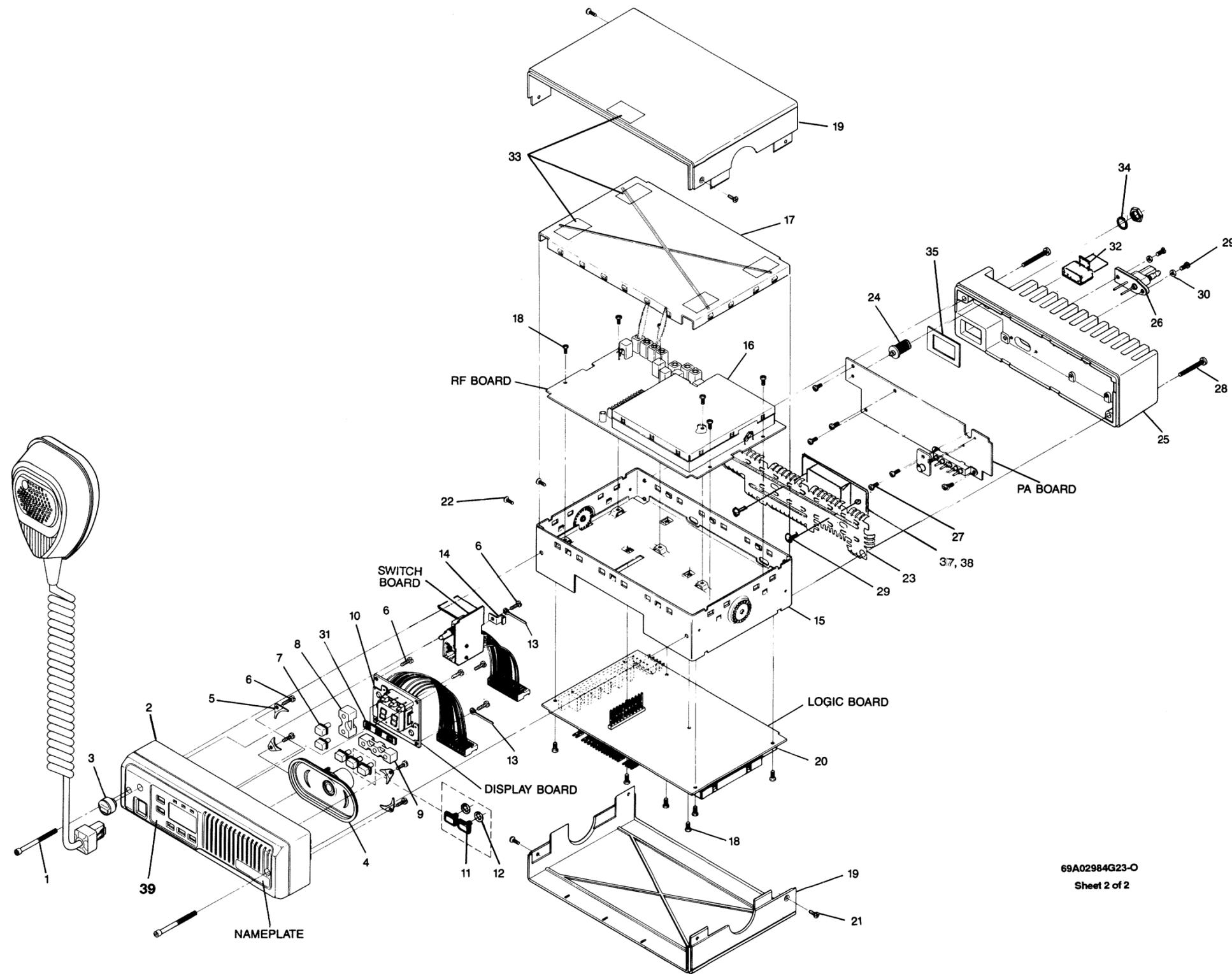
### parts lists

Ref. Symbol	Motorola Part Number	Description	Quantity
1	03-80270L01	FRONT MTG, SCREWS	2
2	15-80129L01	CONTROL HEAD HOUSING	1
3	36-80144M01	CONTROL KNOB	1
4	50-80085D02	SPEAKER	1
5	42-80253L01	SPEAKER RETAINER	4
6	03-10945A11	PLASTIC SCREW	9
7	38-80272L02	PUSHBUTTON	2
8	43-80273L01	PUSHBUTTON SPACER	1
9	75-80200L01	KEYPAD	1
10	29-00129883	WIRE WRAP	2
11	07-80037M01	BRACKET, SWITCH BOARD	1
12	27-80128L03	CHASSIS FRAME	1
13	15-80953T04	COVER, VCO SHIELD	1
14	26-80038M01	SHIELD CHASSIS, RF	1
15	03-10943M09	TAPTITE SCREW (M3x6)	11
	03-10943M55	TAPTITE SCREW (M3x8) FOR 5V REG. ON LOGIC BOARD	1
16	15-80127L01	COVER, HOUSING	2
17	15-80124M01	COVER, LOGIC SHIELD	1
18	03-10943R55	TAPTITE SCREW (M3x8)-FLAT	4
19	03-10943R04	TAPTITE SCREW (M2.5x8)-FLAT	2
20	26-80223M04	SHIELD, PA	1
21	09-80131M01	CONNECTOR, ANTENNA	1
22	26-80124L02	HEATSINK	1
23	09-80255E01	CONNECTOR, POWER	1
24	03-10943M10	TAPTITE SCREW (M3x8)	8
25	03-80271L01	MACHINE SCREW (M4x27)	2
26	03-10943M11	TAPTITE SCREW (M3x10)	4
27	04-00131974	WASHER	2
28	01-80701Y58	OPTION, ACCESSORY CONNECTOR	1
29	75-80918T02	PAD SHOCK INSULATING	5
30	04-00002636	WASHER INT. LOCK	1
31	32-80014N02	GASKET, ACCESSORY CONNECTOR	1
37	26-80013M01	MODULE SHIELD	1
38	51-80110E03	POWER MODULE	1
39	13-80276L02	ESCUTCHEON, MODEL 100 (2-FRQ)	1

69A02984G24-O  
sheet 2 of 2



69A02984G24-O  
Sheet 1 of 2



69A02984G23-O  
Sheet 2 of 2

**parts lists**

Ref. Symbol	Motorola Part Number	Description	Quantity
1	03-80270L01	FRONT MTG, SCREWS	2
2	15-80129L02	CONTROL HEAD HOUSING	1
3	36-80144M01	CONTROL KNOB	1
4	50-80085D02	SPEAKER	1
5	42-80253L01	SPEAKER RETAINER	4
6	03-10945A11	PLASTIC SCREW	9
7	38-80272L02	PUSHBUTTON	5
8	43-80274L01	PUSHBUTTON SPACER (1x2)	1
9	43-80275L01	PUSHBUTTON SPACER (1x3)	1
10	75-80201L01	KEYPAD	1
11	38-80077N01	BUTTON PLUG (6-CHANNEL ONLY)	1
12	32-80907T01	GASKET (6-FRQ MODELS ONLY)	1
13	29-00129883	WIRE WRAP	2
14	07-80037M01	BRACKET, SWITCH BOARD	1
15	27-80128L03	CHASSIS FRAME	1
16	15-80953T04	COVER, VCO SHIELD	1
17	26-80038M01	SHIELD CHASSIS, RF	1
18	03-10943M09	TAPTITE SCREW (M3x6)	11
	03-10943M55	TAPTITE SCREW (M3x8) for 5V REG. ON LOGIC BOARD	1
19	15-80127L01	COVER, HOUSING	2
20	15-80124M01	COVER, LOGIC SHIELD	1
21	03-10943R55	TAPTITE SCREW (M3x8)-FLAT	4
22	03-10943R04	TAPTITE SCREW (M2.5x8)-FLAT	2
23	26-80223M04	SHIELD, PA	1
24	09-80131M01	CONNECTOR, ANTENNA	1
25	26-80124L02	HEATSINK	1
26	09-80255E01	CONNECTOR, POWER	1
27	03-10943M10	TAPTITE SCREW (M3x8)	8
28	03-80271L01	MACHINE SCREW (M4x27)	2
29	03-10943M01	TAPTITE SCREW (M3x10)	4
30	04-00131974	WASHER	2
31	32-90039M01	GASKET	1
32	01-80701Y58	OPTION, ACCESSORY CONNECTOR	1
33	75-80918T02	PAD SHOCK INSULATING	5
34	04-00002636	WASHER INT. LOCK	1
35	32-80014N02	GASKET, ACCESSORY CONNECTOR	1
37	26-80013M01	MODULE SHIELD	1
38	51-80110E03	POWER MODULE	1
39	13-80277L05	ESCUTCHEON, MODEL 300 (6-FRQ)	1
	13-80277L01	OR ESCUTCHEON, MODEL 300 (16-FRQ)	1

69A02984G23-O  
sheet 2 of 2

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		Capacitors: uF, chip, 5%, 50V, unless otherwise specified
C401	2113741B45	0.01u
C402	0811051A09	MTLZ POLYEST .022 5 63V
C403	2113741B45	0.01u
C404	2311048B19	ALU 47 20 16V A/I
C405	2311048B13	ALU 10 20 16V A/I
C406	0811051A15	MTLZ POLYEST .22 5 63V
C407	2311013A56	TANT 47 20 6V
C408	2311048B19	ALU 47 20 16V A/I
C409	0811051A17	MTLZ POLYEST .47 5 63V
C451	2311048B19	ALU 47 20 16V A/I
C452	2113741B45	0.01u
C453	2111032B14	0.15u
C454	2113741B45	0.01u
C455	0811051A15	MTLZ POLYEST .22 5 63V
C458-459	2113740B36	30p
C460-461	2113741B45	0.01u
C501-502	0811051A13	MTLZ POLYEST .1 5 63V
C503	2113740B49	100p
C504	2311048B13	ALU 10 20 16V A/I
C505-506	2113740B49	100p
C507	2311013D13	TANT 10 10 20V
C508	0811051A15	MTLZ POLYEST .22 5 63V
C509	2311048B13	ALU 10 20 16V A/I
C510	2113740B61	330p
C511-513	2113740B49	100p
C514	2302308M01	ALU ELECT 1000U 16V
C515	2113740B49	100p
C516	2113740B80	2200p
C551	2311048A17	ALU 33 20 25V A/I
C552	2113740B33	22p
C553	2113740B73	1000p
C554	0811051A03	MTLZ POLYEST .0022 5 63V
C555	2113740B53	150p
C556-558	0811051A12	MTLZ POLYEST .068 5 63V
C559-560	0811051A13	MTLZ POLYEST .1 5 63V
C562	2113740B49	100p
C563	2113741B69	0.1u
C564	2113740B39	39p
C565	2311048B13	ALU 10 20 16V A/I
C566	2113740B61	330p
C567	2113741B45	0.01u
C568	2311048B19	ALU 47 20 16V A/I
C569	2113740B33	22p
C570	2113740B76	1500p
C571	2113740B73	1000p
C604	2311048B05	ALU 1 20 50V A/I
C606	0811051A22	MTLZ POLYEST 0.039 5 63V
C607	0811051A13	MTLZ POLYEST .1 5 63V

C608	0811051A05	MTLZ POLYEST .0047 5 63V
C609	2113740B55	180p
C610	0811051A15	MTLZ POLYEST .22 5 63V
C611	2113740B46	75p
C612	2311048B19	ALU 47 20 16V A/I
C651	2102384C12	NPO 1NF 50V
C652	0811051A06	MTLZ POLYEST .0068 5 63V
C653	0811051A15	MTLZ POLYEST .22 5 63V
C654	2113740B49	100p
C655	2113741B37	4700p
C656	2311048B13	ALU 10 20 16V A/I
C657	2113741B69	0.1u
C658	2113741B45	0.01u
C659	2311013A56	TANT 47 20 6V
C660	2311048B13	ALU 10 20 16V A/I
C661	2113740B73	1000p
C662	2113741B37	4700p
C663	2113740B59	270p
C664	2311048B09	ALU 4.7 20 35V A/I
C701	2113740B78	1800p
C703	2311048B05	ALU 1 20 50V A/I
C704	0811051A12	MTLZ POLYEST .068 5 63V
C705	0811051A13	MTLZ POLYEST .1 5 63V
C706	0811051A08	MTLZ POLYEST .015 5 63V
C707	0811051A23	MTLZ POLYEST 0.056 5 63V
C708	0811051A03	MTLZ POLYEST .0022 5 63V
C801-802	2113740B49	100p
C803-807	2113740B73	1000p
C808-809	2113740B49	100p
C810-812	2113740B73	1000p
C813	2113740B39	39p
C814-823	2113740B73	1000p
C824-825	2113740B49	100p
C826	2113740B73	1000p
C827	2311048B05	ALU 1 20 50V A/I
C828	2113741B69	0.1u
C829	2113741B45	0.01u
C830	2113740B25	10p
C831	2113740B73	1000p
C832	2113740B25	10p
C833	2113740B73	1000p
C834-835	2113741B69	0.1u
C836	2113740B73	1000p
C837-840	2113741B45	0.01u
C841-848	2113740B73	1000p
C849	2113740B49	100p
C850	2113740B73	1000p
C852-853	2113741B45	0.01u
C854	2113740B73	1000p
C855	2311013A56	TANT 47 20 6V
C856	2113740B49	100p
C860	2113741B53	0.022u
C861	2113740B73	1000p
C862	2113741B53	0.022u
C863	2113740B73	1000p
C864	2113740B49	100p

C865	2113740B73	1000p
C866,868	2113740B49	100p
C869	2113740B73	1000p
C870	2113741B69	0.1u
C950-968,970,	2113740B39	39p
C972-981,990-991		

CR401	4805129M40	Diodes: (See Note 1)
CR402	4811034A02	diodeSOT
CR403,451	4805129M40	SLCN
CR501-502,	4811034A02	diodeSOT
CR561-562		SLCN
CR570	4882256C11	ZENER 10V
CR603-604,651	4805129M40	diodeSOT

J3	2880923V01	Connectors, receptacle:
J7	2880128M01	CONNECTOR, PLUG
J10	2880128M02	PLUG CONNECTOR 5 PIN
J8,9	2880126M01	PLUG CONNECTOR 2 PIN
		PLUG CONNECTOR 23 PIN

JU551	0984181L01	Jumpers:
JU561	3010286A72	2PIN .1 PUSH ON
JU601	0984181L01	F055 JUMPER
JU801	0611009D23	2PIN .1 PUSH ON
JU802,804,806	0611077A01	JUMPER
JU807	0611009D23	0
JU808	0984181L01	JUMPER
		2PIN .1 PUSH ON

L802-803	2483961B02	Coils:
		CHK RF W/SLV GRN

P6	2880127M01	Plugs:
P551,601,808	2880250M01	HEADER, 14 PIN
		PLUG CONNECTOR 3 PIN

Q401	4800869619	Transistors:
Q402	4880214G02	(See Note 1)
Q403	4811043C10	M9619
Q404	4880947V01	MMBT3904
Q451-452	4800869619	48R00869681 A/I
Q453-454	4880214G02	DTC144W
Q455	4880141L03	M9619
Q501-502	4805128M16	MMBT3904
Q503-504	4880214G02	M41L03
Q505	4805128M16	MMBT3906
		MMBT3904
		MMBT3906

Q506	4800869619	M9619
Q507	4800869618	NPN 69618 SW
Q508	4805128M16	MMBT3906
Q509	4880214G02	MMBT3904
Q551	4880949V01	FET
Q601	4880214G02	MMBT3904
Q651	4805128M16	MMBT3906
Q652	4880214G02	MMBT3904
Q653	4880947V01	DTC144W
Q801	4880214G02	MMBT3904
Q802	4811043C10	48R00869681 A/I
Q803	4880947V01	DTC144W
Q804	4880214G02	MMBT3904
Q805-806	4880947V01	DTC144W
Q808-809	4805128M16	MMBT3906
Q810	4880214G02	MMBT3904
Q811-813	4880947V01	DTC144W
Q814	4880214G02	MMBT3904
Q815	4880947V01	DTC144W
Q816	4880214G02	MMBT3904
Q817	4880947V01	DTC144W
Q818-819	4880214G02	MMBT3904
Q820	4880947V01	DTC144W

R401	0611077A70	680
R402	0602369M31	FMF 100PPM 330 5% .6W
R403	0611077A70	680
R404	0611077F18	1740.0 1%
R405	0611077F28	2210.0 1%
R406	0611077A98	10K
R407	0611077A76	1.2K
R408-409	0611077F91	10.0K 1%
R410	0611077A80	1.8K
R411	0611077A78	1.5K
R412	0611077A84	2.7K
R451-452	0602369M01	FMF 100PPM 1 5% .6W
R453	0611077A70	680
R454	0602369M31	FMF 100PPM 330 5% .6W
R455	0611077A70	680
R456	0611077A82	2.2K
R457	0611077A76	1.2K
R458-459	0611077A90	4.7K
R460	0611077B01	12K
R461	0611077A70	680
R462	0611077B29	180K
R463	0611077B25	120K
R464-465	0611077G42	33.2K 1%
R466-467	0611077F91	10.0K 1%
R468	0611077A60	270
R469	0611077A74	1K
R470	0611077A98	10K
R471	0611077B07	22K
R472	0611077A92	5.6K

Resistors: chip, 5%, 1/8 W,  
unless otherwise specified

R473	0611077B09	27K
R474	0611077A98	10K
R501	0611077A84	2.7K
R502-503	0611077B07	22K
R504	0611077A98	10K
R505	0611077A86	3.3K
R506	0611077A78	1.5K
R507	0611077A69	620
R508	0611077A98	10K
R509-510	0611077A72	820
R511	0611077B07	22K
R512	0611077A46	68
R513-514	0611009B26	FCF 2.7 5 1/4
R515	0611077A46	68
R516	0611077A66	470
R517-518	0611077A98	10K
R519	0680185M01	1 OHM 10% 2W MTL PLATE
R540	0611077B19	68K
R541,543	0611077A01	0
R551	0611077B03	15K
R552	0611077B37	390K
R554-555	0611077B18	62K
R556	0611077F53	4020.0 1%
R557	0611077F20	1820.0 1%
R558	0611077G41	32.40K 1%
R559	0611077G88	100.0K 1%
R560	0611077E77	665.0 1%
R561	0611077G91	107.0K 1%
R562	0611077A86	3.3K
R563	0611077A70	680
R567	0611077B07	22K
R568	0611077B17	56K
R569	0611077A42	47
R570	0611077F53	4020.0 1%
R573	0611077B09	27K
R577	0611077B23	100K
R578	0611077A50	100
R579	0611077B37	390K
R580	0611077B09	27K
R581	0611077B11	33K
R582	0611077G26	22.60K 1%
R583	0611077F28	2.21K 1%
R584	0611077H15	187.0K 1%
R585	0611077G16	17.80K 1%
R586	0611077G34	27.40K 1%
R587	0611077A74	1K
R604	0611077A98	10K
R605	0611077A74	1K
R606	0611077A98	10K
R609	0611077B11	33K
R610	0611077B07	22K
R611-612	0611077G42	33.20K 1%
R613	0611077G45	35.7K 1%
R615	0611077H15	187.0K 1%
R616	0611077G48	38.3K 1%
R617	0611077A82	2.2K

R618	0611077B23	100K
R619-620	0611077A98	10K
R621	0611077A82	2.2K
R650	0611077B23	100K
R651	0611077B17	56K
R653	0611077A98	10K
R654	0611077B23	100K
R655	0611077A90	4.7K
R656	0611077B39	470K
R657	0611077B42	620K
R658	0611077B40	510K
R659	0611077A82	2.2K
R660	0611077H03	140.0K
R662	0611077B17	56K
R663	0611077B11	33K
R664	0611077B07	22K
R665	0611077A84	2.7K
R666-667	0611077B23	100K
R668	0611077G92	110.0K 1%
R669	0611077G73	69.80K 1%
R670	0611077G45	35.70K 1%
R671	0611077A50	100
R672	0611077B17	56K
R673	0611077B23	100K
R674	0611077H17	196.0K 1%
R675	0611077G53	43.2K 1%
R676	0611077F91	10.0K 1%
R701	0611077G88	100.0K 1%
R702	0611077H13	178.0K 1%
R703	0611077G31	25.50K 1%
R705	0611077H13	178.0K 1%
R706	0611077G56	46.40K 1%
R707	0611077G95	118.0K 1%
R708	0611077G56	46.4K 1%
R709	0611077G73	69.8K 1%
R710-711	0611077G13	16.50K 1%
R712-713	0611077G61	52.3K 1%
R714	0611077B16	51K
R715	0611077B05	18K
R716	0611077A85	3K
R780,793, R795-796,798	0611077A01	0
R801	0611077A78	1.5K
R802	0611077A84	2.7K
R803	0611077A98	10K
R804	0611077A90	4.7K
R807	0611077B15	47K
R808-809	0611077A90	4.7K
R810-811	0611077B17	56K
R812-815	0611077A90	4.7K
R816	-	Not Used
R822,825	0611077B15	47K
R826	0611077A90	4.7K
R827-828	0611077A98	10K
R829-832	0611077A74	1K
R833	0611077A98	10K

R834	0611077F91	10.0K 1%
R835	0611077B05	18K
R836	0611077H03	140.0K 1%
R837	0611077B05	18K
R838	0611077F91	10.0K 1%
R839-841	0611077A98	10K
R842	0611077A74	1K
R843-844	0611077A98	10K
R845	0611077A74	1K
R846	0611077A98	10K
R847-848	0611077A74	1K
R849	0611077A98	10K
R851-852	0611077B15	47K
R853	0611077B45	820K
R854	0611077A90	4.7K
R855	0611077B15	47K
R856	0611077A74	1K
R857-860	0611077A98	10K
R861	0611077B23	100K
R862	0611077F95	11.0K 1%
R863	0611077F91	10.0K 1%
R864	0611077F20	1820.0 1%
R865-873	0611077A98	10K
R874	0611077A74	1K
R875-876	0611077A98	10K
R877-879	0611077B23	100K
R880	0611077B15	47K
R883	0611077A90	4.7K
R884	0611077B15	47K
R887	0611077A90	4.7K
R890, 899	0611077A98	10K
R901	0611077A90	4.7K
R902	0611077B15	47K
R903-904	0611077A98	10K
R905	0611077A90	4.7K
R906	0611077B15	47K
R907-908	0611077A98	10K
R909	0611077A90	4.7K
R910	0611077B15	47K
R911-913	0611077A98	10K
R914	0611077A90	4.7K
R915	0611077B15	47K
R916	0611077A98	10K
R918	0611077B35	330K
R919-920	0611077A74	1K
R970-971	0611077A98	10K
R973	0611077A01	0

Integrated Circuits:

(See Note 1)

U401	5102198J22	RC4558D
U402	5180942T01	IC, 5V VOLT REG WITH RESET
U451, 551-553	5102198J22	RC4558D
U554	5108858K09	LM2904D
U601	5102198J23	LM2903D

U602-603, U651-652	5102198J22	RC4558D
U653	5180059M01	IC TV VOL CTRL 7 SIP PLASTIC
U701	5102198J22	RC4558D
U801	5180135C10	IC D/A CONVTR CMOS 18 DIP PL
U802	5180960T01	HC11-uP
U803	5182862N09	SLIC
U805	5180901W01	2K X 8 EEROM CMOS
U806	5180914V01	2K STATIC RAM 45 NSEC

Zener diodes:

(See Note 1)

VR401	4811034A10	ZENER 61E40 5.1V
VR402	4882256C15	ZENER 56C15 5.1V
VR551-552	4880140L15	zener10v
VR801	4880948V01	zener27v
VR802-803	4880140L15	zener10v
VR804-805	4880948V01	zener27v
VR806	4880140L15	zener10v
VR807-811	4880948V01	zener27v

Crystals: (See Note 2)

Y801	4880173D09	XTAL QUARTZ 7.776 MHZ HC18 P
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Non-referenced Items:

Qty

1	0180701Y58	OPTIONS CONNECTOR ASSEMBLY
1	2880001R01	PLUG CONNECTOR 1 PIN
1	2680123M02	SHIELD, LOGIC
2	0982071K09	SOCKET IC 14 PIN SIP
1	2608144S01	SHLD FOR LOGIC 900
5	0310943M04	SCRTPG TT2.5X0.45X8 INTSTAR
4	0400131974	WSHRFLT .130 .312 .030 STL C
1	0780925T01	BRACKET, AUDIO REGULATOR
5	1483820M05	INSULATOR HEAT CONDUCTIVE
1	2680125L02	HT SINK AUDIO REGLTR

Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		Capacitors: uF, chip, 5%, 50V, unless otherwise specified
C1	2113740B39	39p
C2	2113740B29	15p
C3-4	2113741B45	0.01u
C5	2113740B39	39p
C6	2113740B09	2.2p
C7	2113740B01	1.0p
C8	2113741B69	0.1u
C9	2113740B39	39p
C10	2113740B73	1000p
C11-12	2113740B39	39p
C13	2113741B69	0.1u
C14	2113740B29	15p
C15	2113740B13	3.3p
C16-17	2113740B37	33p
C18	2113740B51	120p
C19	2113740B63	390p
C20	2113741B45	0.01u
C21	2113740B35	27p
C22	2113740B51	120p
C23-24	2113740B26	11p
C25	2113741B45	0.01u
C26	2311013D13	10u TANT
C27-28	2113741B45	0.01u
C29	2113740B51	120p
C30	2113740B35	27p
C31	2113740B11	2.7p
C33	2113740B73	1000p
C34	2311013D13	10u TANT
C35-39	2113741B69	0.1u
C40	2311048B05	1u ALU
C41	2113740B25	10p
C42	2113740B21	6.8p
C43-46	2113741B69	0.1u
C47	2113740B80	2200p
C48	0811051A11	0.047u POLY
C49	2311048B05	1u ALU
C50-52	2113740B39	39p
C53	2311048B19	47u ALU
C54	2113740B39	39p
C55	2113740B05	1.5p
C100-105	2113740B39	39p
C106	2311048B19	47u ALU
C107	0811051A12	0.068u POLY
C108	2311048B13	10u ALU
C109	2113741B69	0.1u
C110-111	2108029H15	1u CER
C112	2113741B69	0.1u
C113	2113741B45	0.01u

C114	0811051A13	0.1u POLY
C115	2113741B45	0.01u
C116	2113740B29	15p
C117	2113741B45	0.01u
C118-119	2113740B39	39p
C120	2113741B69	0.1u
C121	2113740B39	39p
C122	2113741B45	0.01u
C123	2311048B13	10u ALU
C124-125	2113741B69	0.1u
C126	0811051A10	0.033u POLY
C127	0811044A33	1u POLY
C128	0811051A07	0.01u POLY
C129	0811051A06	6800p POLY
C130	2113740B39	39p
C131	2113741B45	0.01u
C132	2113740B39	39p
C133	2113740B33	22p
C134	2113740B39	39p
C135	2113740B01	1.0p
C136	2113740B11	2.7p
C137	2113740B33	22p
C138	2113741B45	0.01u
C139	2311048B13	10u ALU
C140	2113741B45	0.01u
C141	2113740B39	39p
C200	2113741B45	0.01u
C201-202	2311048B19	47u ALU
C203	2113741B69	0.1u
C204	2113740B39	39p
C205	2113740B07	1.8p
C206	2113741B69	0.1u
C207	2311048B19	47u ALU
C208	2113740B39	39p
C209	2113740B15	3.9p
C210	2113740B39	39p
C211	2113740B01	1.0p
C212-213	2113740B39	39p
C214	2113741B45	0.01u
C215	2113740B39	39p
C216	2113740B03	1.2p
C217	2113740B01	1.0p
C218-219	2113740B39	39p
C220	2113740B13	3.3p
C221-222	2113740B39	39p
C223	2113740B01	1.0p
C224	2113741B45	0.01u
C225	2113740B03	1.2p
C226	2113740B33	22p
C227	2113740B39	39p
C228	2113740B17	4.7p
C229	2113740B19	5.6p
C230-231	2113741B45	0.01u
C232	2108029H15	1u CER
C233	2113740B05	1.5p
C234-236	2113740B39	39p

C237	2113741B45	0.01u
C238	2113740B33	22p
C239-240	2113740B39	39p
C241	2113741B45	0.01u
C242	2113740B39	39p
C243	2113741B45	0.01u
C244	2113741B69	0.1u
C245	2113740B21	6.8p
C246-247	2113741B69	0.1u
C248-250	2113740B39	39p
C251	2113741B45	0.01u

CR1, 51  
CR101-102

4880154K03  
4811034A01

Diodes: (See Note 1)  
D. SCHOTTKY  
H01

FL1-2  
FL51  
FL52

9105850S02  
4805368G06  
9180098D04

Filters:  
FLTR 3-POL  
455KHz  
455KHz

HY1

5108386H01

Hybrids:  
SQUELCH HY

J4-5  
J6

0980135M01  
0980130M03

Connectors, receptacle:  
CON. COAX  
CONNECTOR

L102  
L2  
L3  
L4  
L51-52  
L53  
L54  
L55  
L56  
L57  
L58  
L59  
L60  
L61  
L101  
L103  
L201-202  
L203  
L204  
L205  
L206  
L207

2411030E01  
2411030E08  
2411030A04  
2411030E03  
2480063M09  
2480063M04  
2480063M21  
2480164M04  
2480164M01  
2480164M04  
2480063M21  
2480063M14  
2405444F09  
2580000E01  
2411030A04  
2411030E04  
2411030A04  
2411030E05  
2411030A04  
2411030E04  
2411030A04  
2411030E04  
2411030A04

Coils:  
BRN  
WHT  
5T GRN  
ORG  
0.47uH  
0.18uH  
4.7uH  
(E-714)  
(E-713)  
(E-714)  
4.7uH  
1.2uH  
1-3uH  
DISCR  
5T GRN  
YEL  
5T GRN  
GRN  
5T GRN  
YEL  
5T GRN  
YEL

L208

2411030E02

RED

Q1  
Q2-3  
Q51-52  
Q53,100  
Q101  
Q102-103  
Q104  
Q105  
Q106  
Q107  
Q200  
Q201  
Q202-204  
Q205  
Q206  
Q207

4880950X01  
4882233P14  
4811043C12  
4882233P13  
4811043C06  
4880182D20  
4811043C06  
4811043C05  
4880950X01  
4882233P13  
4811043C05  
4882233P13  
4880950X01  
4811043C08  
4880950X01  
4882233P39

Transistors:  
(See Note 1)

2SC36  
MMBT3906  
M9839  
MMBT3904  
M9643  
M9987  
M9643  
M9642  
2SC36  
MMBT3904  
M9642  
MMBT3904  
2SC36  
M9649  
2SC36  
M33P39

R1-2  
R3  
R4  
R5  
R6  
R7  
R8  
R9  
R10  
R11  
R12  
R13  
R15  
R16  
R17  
R18  
R19  
R20  
R21  
R22  
R23  
R100  
R101  
R102  
R103  
R104  
R105  
R107  
R108  
R109  
R110-111  
R112

0611077A84  
0611077A43  
0611077B12  
0611077A98  
0611077B15  
0611077A96  
0611077A46  
0611077A43  
0611077A54  
0611077A98  
0611077A54  
0611077A50  
0611077A66  
0611077B11  
0611077A98  
0611077B15  
0611077B09  
1805500L08  
0611077A88  
0611077B03  
0611077A86  
0611077B08  
0611077B13  
0611077A85  
0611077A98  
0611077A78  
1805500L08  
0611077A82  
0611077B20  
0611077A62  
0611077A98  
0611077B11

Resistors: chip, 5%, 1/8W,  
unless otherwise specified

2.7K  
51  
36K  
10K  
47K  
8.2K  
68  
51  
150  
10K  
150  
100  
470  
33K  
10K  
47K  
27K  
22K POT  
3.9K  
15K  
3.3K  
24K  
39K  
3.0K  
10K  
1.5K  
22K POT  
2.2K  
75K  
330  
10K  
33K

R114	0611077B03	15K
R115	0611077A62	330
R116	0611077A74	1.0K
R117	0611077A58	220
R118	0611077A62	330
R119	0611077A26	10
R120	0611077A78	1.5K
R121	0611077A92	5.6K
R122	0611077A78	1.5K
R123	0611077A91	5.1K
R124	0611077A96	8.2K
R125	0611077B05	18K
R129	0611077A50	100
R130	0611077A58	220
R131	0611077A86	3.3K
R132	0611077A74	1.0K
R133-134	0611077A70	680
R135	0611077B11	33K
R136	0611077B07	22K
R200	0611077A60	270
R201	0611077A01	0
R202	0611077A78	1.5K
R203	0611077A80	1.8K
R204	0611077A50	100
R205	0611077A80	1.8K
R206	0611077A98	10K
R207	0611077A62	330
R208	0611077A46	68
R209	0611077A52	120
R210	0611077A46	68
R211	0611077B15	47K
R212	0611077B09	27K
R213	0611077A76	1.2K
R214	0611077A88	3.9K
R215	0611077A50	100
R216	0611077A88	3.9K
R217	0611077A76	1.2K
R218	0611077A50	100
R219	0611077A30	15
R220	0611077A26	10
R221	0611077A61	300
R222	0611077A26	10
R223	0611077A30	15
R224	0611077A88	3.9K
R225	0611077A76	1.2K
R226	0611077A50	100
R227	0611077A64	390
R228	0611077A78	1.5K
R229	0611077A43	51
R230	0611077A26	10
R231	0611077A60	270
R232	0611009C69	3.3K 1/4
R233	0611077A68	560
R234	0611077A66	470
R235	0611077A26	10

R236	0611077A66	470
R237	0611077A40	39
R300-303	0611077A01	0

		Integrated Circuits:
		(See Note 1)
U51	5183977M67	DUAL IF AMPLIFIER
U101	5184704M75	SYNZR
U101+R106	4802377L02	TCXO+TRIMPOT
U102	5184976P60	PRESC.128/129
U103-104	5184621K27	78L05 5V REG
U201	5102617S04	VCO

		Crystals: (See Note 2)
Y51A+51B	4805245J24	39.150MHZ FILTER
Y52	4808005K21	38.695MHZ

<u>Qty</u>		Non-referenced Items:
3	0510281A20	RIV DRV PIN
3	2608207S01	SHLD FOR RF
6	2680098M01	SHLD COIL
2	2680228L01	SHLD COAX
1	2680229L03	SHLD RF VCO
1	2680256L01	SHLD BOT COAX
1	2682671D31	SHLD COIL
1	4202899S01	COAX CLIP
3	7505295B07	PAD XTAL
1	8402670S31	PCB PANEL

Notes:

1. For optimum performance, diodes, transistors, integrated circuits, crystal units and ceramic filters must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

FLF1016A 900MHz POWER AMPLIFIER, 12W includes:  
 FLF5515A 12W PA BOARD  
 FLN5046A 12W HEAT SINK HARDWARE KIT

FLF5515A 12W PA BOARD

PL-1028-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		Capacitors: uF, chip, 5%, 50V, unless otherwise specified
C3001	2113740B11	2.7pF
C3002	2108029H15	1uF, 10%, ceramic
C3003	2113741B45	10nF
C3004	2113741B69	0.1uF
C3005	2113741B45	10nF
C3006	2113741B69	0.1uF
C3007	2113741B45	10nF
C3008	2113740B39	39pF
C3009	2113741B69	0.1uF
C3010-3011	2113740B39	39pF
C3012-3014	2113740B03	1.2pF
C3015	2111078B59	470pF
C3016	2113740B39	39pF
C3017	2113740B07	1.8pF
C3018	2113740B11	2.7pF
C3019-3021	2113740B39	39pF
C3022	2108029H15	1uF, 10%, ceramic
C3023	2113741B69	0.1uF
C3024	2113741B45	10nF
C3025	2108029H15	1uF, 10%, ceramic
C3026	2113741B69	0.1uF
C3027	2113741B45	10nF
C3028	2111078B27	30pF
C3101-3105	2184874K01	470pF, feedthru
		Diodes: (See Note)
CR3001-3002	4883510F04	M10F04, PIN, silicon
CR3003	4880236E07	MR2525L, transient
		Coils:
L3001	2480002E02	290nH
L3002-3003	2482723H46	200nH
L3004	2480002E02	290nH
L3005	2411030D02	21.3nH, orange
L3006-3007	2482723H46	200nH
L3008	2411030E02	5.5nH, red
L3009	2411030D02	21.3nH, orange
L3010	2480002E02	290nH
		Plugs:
P7	0180747T09	5-pin housing assembly

Q3001	4882233P39	Transistors: (See Note) NPN, type M33P39
R3001	0611077A62	Resistors: chip, 5%, 1/8W, 330
R3002	0611977A26	10
R3003	0611086A37	120, FMO, 1W
R3004	0611077A40	39
R3005	0680147M01	0.05, FMF, 10%, 2W
R3006	0611077B23	100k
R3007-3008	0611077A52	120

Qty

2	2980014A01	Non-referenced Items: Clip coax terminal
3	7684069B01	Core ferrite bead

FLN5046A 12W HEAT SINK HARDWARE KIT

PL-1029-0

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
J1	0980131M01	Connectors, receptacle: Mini UHF coax Power
J2	0980255E01	
P4-5	3080138M02	Plugs: 105mm coaxial cable
U3001	5180110E03	Integrated Circuits: (See Note) RF power, 900MHZ
<u>Qty</u>		Non-referenced Items:
8	0310943M10	Screw, M3x0.5x8
4	0310943M11	Screw, M3x0.5x10
4	0400131974	Flat washer
1	0480943V01	Lock washer, 3/8
1	2680124L02	Heat sink
1	2680223M04	PA shield
1	2680013M01	Shield, PA module
1	3280014N02	Gasket, accessory

Note:

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

END OF DOCUMENT