



MAINTENANCE MANUAL
FOR
GENERAL ELECTRIC
MPI
PERSONAL RADIO
403-512 MHz, 2/4 WATTS



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COMBINATION NOMENCLATURE

DIGITS 1&2	DIGIT 3	DIGIT 4	DIGIT 5	DIGIT 6	DIGIT 7	DIGIT 8	DIGIT 9
Product Code	Package	TX Frequency Range	RX Frequency Range	Channel Spacing	RF Power Output	Max. Channel Capacity	Control
P5 MPI	B Accessory Cover Local	M 403-425 MHz	M 403-425 MHz	5 25 KHz	5 1.7-3.8 Watts	B 2 Tx-2 Rx	E Standard
	C Local/Remote	N 420-450 MHz	N 420-450 MHz		6 3.9-6.4 Watts	C 2 Tx-1 Rx	
		R 450-470 MHz	R 450-470 MHz			D 1 Tx-2 Rx	
		S 470-494 MHz	M 470-494 MHz				
		T 489-512 MHz	T 489-512 MHz				

RC4365A

STRUCTURED OPTIONS

A Option TX Xtals	B Option RX Xtals	C Option	D Option	E Option	F Option	H Option	K Alt IF
A 1 Xtal	A 1 Xtal	O None	O None	O None	O None	O None	O None
B 2 Xtals	B 2 Xtals	2 1 Tone Enc CG	L T-99 Ind.	I DTMF	4 Int. Safe	A CGE UHF	3 Alt IF
O No Xtals	O No Xtals	U 1 Tone/Enc DCG	M T-99 Ind.-Group			B CGE HB	
		4 1 Code Enc. DCG.	N T-99 Ind. CG Enc				
		D 1 Code Enc/ Dcc DCG					
		R 1 Tone CG Enc w/Switch					
		S 1 Tone DCG Enc w/Switch					

RC4345A Sheet 2

TYPICAL SPECIFICATIONS* SYSTEM

FCC IDENTIFICATION NUMBER	AXA9MZTR102A-450-470 MHz
2-WATT	AXA9MZTR121A-450-470 MHz
4-WATT	AXA9MZTR121B-470-494 MHz
	AXA9MZTR121C-489-512 MHz
FREQUENCY RANGE	403-512 MHz
BATTERY DRAIN (MAXIMUM)	
Receiver	
Standby	15 milliamperes
Rated Audio	150 milliamperes
Transmitter	
	800 milliamperes @ 7.5 Volts (2-Watt)
	1250 milliamperes @ 10 Volts (4-Watt)
	7.81 on 4-Watt
TEMPERATURE RANGE	-30°C (-22°F) to +60°C (140°F)
DIMENSIONS (EIA) LESS ACCESSORIES	7.11 x 2.59 x 1.46 inches
(H X W X D)	(180.5 x 65.7 x 37.1 millimeters)
WEIGHT, WITH ANTENNA	
	2-Watt 455 grams (16 ounces)
	4-Watt 492 grams (17.3 ounces)
BATTERY LIFE	
At 5% - 5% - 90% Duty Cycle	<u>2-Watt</u> 8 hours
At 2% - 8% - 90% Duty Cycle	<u>4-Watt</u> 6.5 hours
	12 hours
	11 hours

<u>TRANSMITTER</u>				<u>RECEIVER</u>			
POWER OUTPUT	2 Watts/4 Watts			AUDIO OUTPUT (to 8.0 ohm speaker)	500 milliwatts (less than 5% distortion)		
FREQUENCY STABILITY	0.0005%			SENSITIVITY			
CONDUCTED SPURIOUS AND HARMONIC EMISSION	-16 dBm			12 dB SINAD	0.35 uV		
				20 dB Quieting	0.50 uV		
RATED SYSTEM DEVIATION	±5 kHz			FREQUENCY STABILITY	0.0005%		
FM HUM & NOISE	Greater than 50 dB			SELECTIVITY			
AUDIO FREQUENCY CHARACTERISTICS FCC and EIA.	Frequency Response per EIA RS 316-B. Post limiter filter per			EIA Two-Signal Method	-70 dB @ ±25 kHz		
				SPURIOUS RESPONSE	-60 dB		
DISTORTION	Less than 5% (300 to 3000 Hz)			INTERMODULATION	-65 dB		
				MODULATION ACCEPTANCE	±6.7 kHz		
DEVIATION SYMMETRY	1.0 kHz maximum			SQUELCH SENSITIVITY	<6 dB SINAD		
				FREQUENCY RESPONSE	EIA RS 316-B		
	<u>NO</u>	<u>1 dB</u>	<u>3 dB</u>		<u>NO</u>	<u>3 dB</u>	<u>6 dB</u>
	<u>DEGRADATION</u>	<u>DEGRADATION</u>	<u>DEGRADATION</u>		<u>DEGRADATION</u>	<u>DEGRADATION</u>	<u>DEGRADATION</u>
MAXIMUM FREQUENCY SPREAD	7 MHz	9 MHz	10 MHz	MAXIMUM FREQUENCY SPREAD	2 MHz	4 MHz	6 MHz
RF OUTPUT IMPEDANCE	50 ohms			RF INPUT IMPEDANCE	50 ohms		

* These specifications are intended primarily for use of the serviceman. Refer to the appropriate Specifications Sheet for the complete specifications.

DESCRIPTION

General Electric MPI Personal radios are extremely compact, high performance two-way FM radios designed for operation in the 450-470 MHz range. The lightweight radio utilizes both discrete components and Integrated Circuit modules (IC's).

All operating controls except the Push-To-Talk (PTT) switch and frequency select switch are conveniently located on the top of the radio. The frequency select and PTT switches are located on the side of the radio. An earphone jack, located above the PTT switch, is used with an earphone to provide message privacy, or to permit the operator to receive messages in noisy locations.

In Local/Remote combinations, an external microphone jack is located next to the earphone jack. This permits the transmitter to be keyed and messages transmitted using the external microphone.

Power for the radio is supplied by a rechargeable nickel-cadmium battery pack that fits in the bottom front section of the case. The battery pack can be recharged either in or out of the radio.

Test Adaptor 4EX12A12 is available to provide audio connections for servicing the transmitter and receiver.

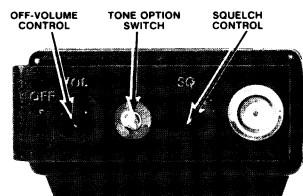
OPERATION

If the radio is equipped with an option switch, disable the option before adjusting the radio by placing the switch in the OFF or MONITOR position. After adjusting the radio, place the option switch back in the CG OR T99 position (See Figure 1).

ADJUSTING THE RADIO

To Receive a Message:

1. Turn the OFF-VOLUME control about half way to the right.



2. Disable any option by placing the option control toggle switch (if present) in the OFF or MONITOR POSITION.
3. Turn the SQUELCH (SQ) control to the right as far as possible. A hissing sound will be heard from the speaker.
4. Adjust the VOLUME control until the hissing sound is easily heard but not annoyingly loud.
5. Turn the SQUELCH control slowly to the left until the hissing noise just stops. This adjustment is very important as it eliminates annoying noise when no one is calling you. It also determines how sensitive your radio will be to incoming calls.
6. In two-frequency units, select the proper frequency. You are now ready to receive messages from other radios in your system.

To Send a Message:

1. Turn on the radio as directed in the "To Receive a Message" section.
2. In two-frequency units, select the proper frequency. Then listen to make sure that no one is using the channel.
3. Hold the radio so that the antenna is vertical. Then, press the Push-To-Talk (PTT) bar and speak directly into the microphone in a clear and distinctive voice. Always release the PTT bar as soon as you stop talking. You cannot receive messages while the PTT bar is pressed.

CHARGERS

Three battery chargers are available for recharging the Nickel-Cadmium battery pack. For specific instructions, refer to the applicable operating instruction or maintenance manual.

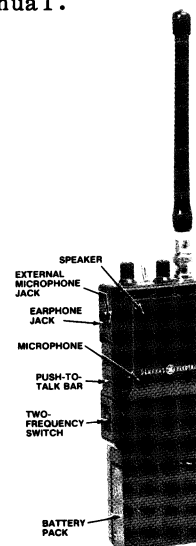
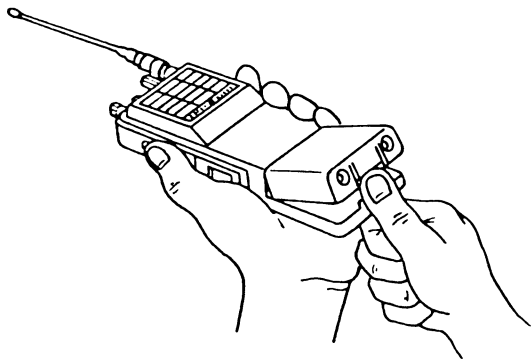


Figure 1 - Operating Controls

BATTERY PACK REPLACEMENT

To remove the battery pack from the radio:

1. Turn the radio OFF.
2. Place thumb on bottom of battery pack and press battery pack to-ward the top of radio as shown.
3. Then push bottom of battery pack away from the radio.



WARNING

Do not dispose of battery packs or batteries by burning. To do so may cause an explosion.

OSCILLATOR CRYSTAL REPLACEMENT

Crystals Y1, Y2, Y4, and Y5 are plug-in types for ease of replacement. Note that one lead is grounded to the crystal can. This lead must be plugged into the socket which is connected to the ground plane of the Transmit/Receive Board.

CIRCUIT ANALYSIS

TRANSMITTER

The Transmitter is a crystal-controlled, frequency modulated transmitter for one- or two-frequency operation in the 450-470 MHz bands. The transmitter utilizes discrete components to provide a minimum RF power output of two watts. The transmitter consists of the following assemblies.

- Audio Board - with the microphone amplifier/limiter, post-limiter filter and oscillator compensator circuits.
- Transmit/Receive (TR) Board - Oscillator, Multiplier stages, amplifier, driver and PA stages, TR switch, and low-pass filter.

All supply voltages for the transmitter are provided by the battery and the Regulator. The different transmitter voltages required are shown in the following chart:

Voltage	Used For
Continuous 7.5 Volts	Post-limiter filter, driver and PA circuits
Switched TX 7.5 Volts	Multipliers, 1st amplifier, and driver base voltage
Switched TX 5.4 Volts	Mic amp/limiter, microphone and oscillator
Regulated 5.4 Volts	Compensator and modulator circuits

References to symbol numbers mentioned in the following text are found on the Schematic Diagrams, Outline Diagrams and Parts List. A block diagram of the complete transmitter and receiver is shown in Figure 2.

AUDIO CIRCUITS

Audio from the microphone is applied to a 6 dB pre-emphasis network (R16, D1, C15 and C18) and then to amplifier-limiters Q3 and Q4. The output of Q4 is applied to the post-limiter filter consisting of Q6, Q7, Q8 and associated circuitry.

The output of the post-limiter filter is coupled through C30 and the modulation circuitry to transmitter oscillator Q15.

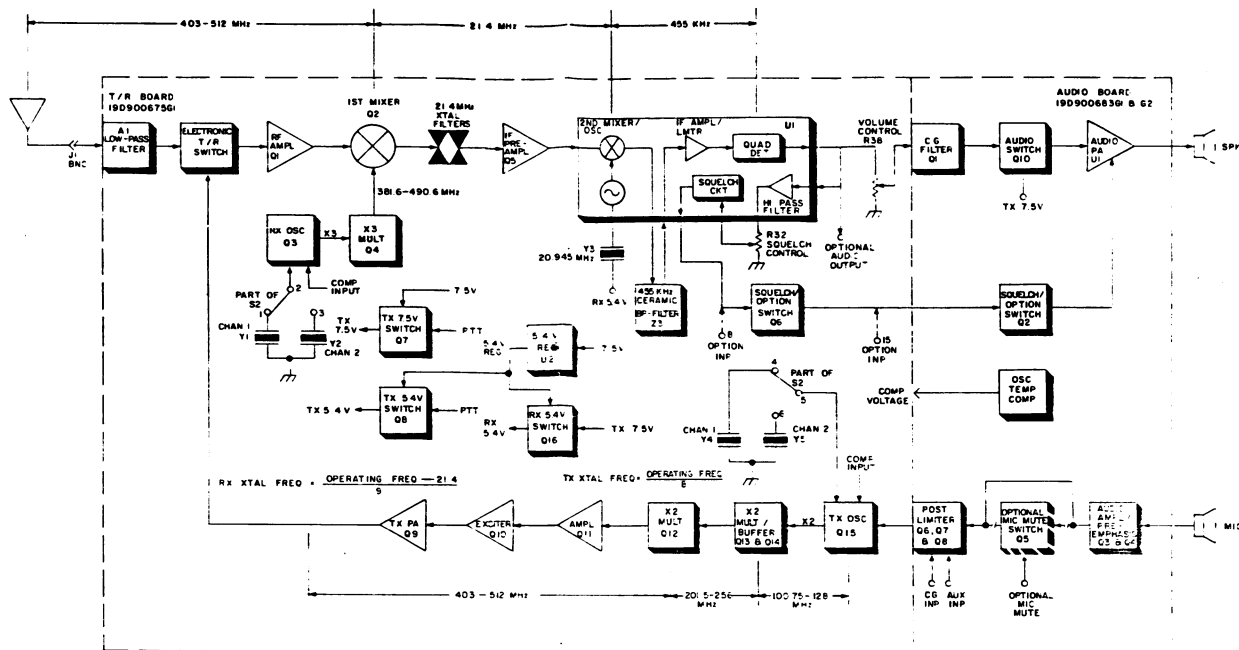
A compensator circuit (Q9 and R36 through R40) provides frequency compensation at low temperatures for the transmitter and receiver oscillators.

T/R BOARD

OSCILLATOR

The temperature compensating DC voltage and audio is applied to FM modulators D6 and D7 through MOD ADJ controls R67 and R73. The modulator varactor varies the transmit frequency at the audio rate applied from the audio board.

Q15, Y4, Y5 and associated circuitry comprise a Colpitts oscillator. The transmit oscillator is adjusted to the assigned operating frequency by L39 and L42. The oscillator output is applied to buffer Q14. Channel 1 or Channel 2 is selected by S2.



The receiver has intermediate frequencies of 21.4 MHz and 455 kHz. Adjacent channel selectivity is obtained by using three band-pass filters: (2) 21.4 MHz two-pole crystal filters and a 455 kHz ceramic filter.

All of the receiver circuitry except the audio PA and oscillator compensator is mounted on the transmitter/receiver (TR) board. The receiver consists of:

- Receiver Front End
- 21.4 MHz 1st IF circuitry
- 1st and 2nd Oscillators
- 455 kHz 2nd IF circuitry with FM Detector
- Audio PA Circuitry
- Squelch Circuitry

RECEIVER FRONT END

An RF signal from the antenna is coupled through the low-pass filter, antenna switch, and image filter to the emitter of RF amplifier Q1. The image filter consists of C3, C4, C5, C108 and L2.

The output of Q1 is coupled through two tuned circuits that provide most of the front end selectivity. The tuned circuits are L3, R4, C8 and C9, L4 and L5.

OSCILLATOR AND MULTIPLIER

Q3, Y1, D2 and associated circuitry make up a Colpitts oscillator. The frequency is controlled by a third mode crystal operated at one ninth of the required injection frequency. Voltage-variable capacitor D2, L48 and Y1 are connected in series to provide compensation capability. The compensation voltage used to control the transmitter oscillators is applied to D2 to maintain stability. L48 is adjustable to set the oscillator frequency. R8 is in parallel with Y1 to insure operation on the third overtone of the crystal.

The oscillator output is coupled through two tuned circuits (L12-C25 and L13) to the base of tripler Q4. C25 and L13 are tuned to the third harmonic of the oscillator frequency. The output of tripler Q4 is coupled to the gate of first mixer Q2 through two tuned circuits (L14 and L15). L14 and L15 are tuned to the operating frequency minus 21.4 MHz which is the ninth multiple of the crystal frequency.

The DC level of the oscillator can be monitored at J6 (TP1). The meter reading at this point is typically 5.2 volts. The DC level of tripler Q4 can be measured at J7 (TP2). This meter reading is typically 5.2 volts.

1ST MIXER AND IF FILTER

The 1st mixer uses a FET (Q2) as the active device. The FET mixer provides a high input impedance, high power gain and an output relatively free of intermodulation products).

In the mixer RF from the front end filter is applied to the gate of the mixer. Injection voltage from the multiplier stages is also applied to the gate of the mixer. The 21.4 MHz mixer 1st IF output signal is coupled from the drain of Q2 to crystal filters Z1 and Z2. Tuneable capacitor C12 is used to match the mixer output to the input of Z1.

The highly-selective crystal filter provides the first portion of the receiver IF selectivity. The output of the filter is coupled through R20 to the 1st IF amplifier.

Supply voltage for the RF amplifier and 1st mixer can be metered at J5 (TP3). The meter reading is typically 7.4 volts.

1ST AND 2ND IF AND DETECTOR STAGES

The 21.4 MHz IF output of the crystal filters is applied to the base of IF amplifier Q5. The amplifier provides approximately 12 dB of IF gain. The output of Q5 is coupled through C35 to the input of the 2nd Mixer IC.

U1A and associated circuitry consists of the 2nd oscillator and mixer. The crystal for the oscillator is Y3. The oscillator operates at 20.945 MHz for low side injection of the 2nd IF (standard), or 21.855 MHz for high side injection for those radios determined to be operating on a tweet frequency. This frequency is mixed with the 21.4 MHz input to provide the 455 kHz 2nd IF frequency.

The output of U1A is coupled through ceramic filter Z3 which provides the 455 kHz selectivity. The filter output is applied to U1B.

U1B and associated circuitry consists of an IF amplifier, 455 kHz limiter and a quadrature type FM detector. L10 is the quadrature detector coil. Volume control R38 is used to set the audio output level to the audio amplifier. R37 and C48 provide a low pass filter to remove 455 kHz from the audio.

AUDIO AND SQUELCH CIRCUITS

Audio

Audio from the VOLUME arm is coupled through a twin-T Channel Guard notch filter that consists of Q1 and associated circuitry. The filter attenuates any audio frequency below 211 Hz.

The audio output from the filter is coupled through receiver muting switch Q10 to audio amplifier U1. Q10 is turned on in the receive mode to pass the audio. The 500 milliwatt audio output of U1 is coupled through C10 to the speaker and earphone jack.

A 6 dB/octave de-emphasis is provided by C12, C34, C6 and R10 in the audio feedback path. R7 and C5 provide additional de-emphasis at higher frequencies.

Squelch

The squelch circuit operates on the noise components contained in the FM detector output. The output of U1B is applied to a high-pass filter consisting of U1C, and associated circuitry. The output of U1C is noise in a band around 8 kHz.

With no RF signal present, the noise is rectified by D4 and a negative voltage is applied to the input of U1D, keeping it turned off and the receiver muted.

Pressing the PTT switch also forward biases clamping diode D5, keeping U1D input bias at the correct standby voltage in the transmit mode.

RECEIVER SWITCH

Releasing the PTT switch turns off the transmitter switches and turns on receiver switch Q16. This applies 5.4 volts to the receiver oscillators, IF amplifier, audio and squelch stages.

DISASSEMBLY

To remove the front cover for servicing, first remove the battery. Then remove the two screws at A and lift off the front cover (See Figure 3).

To gain access to the back of the TR board, remove the two screws at A and the screw at B and remove the front and back covers.

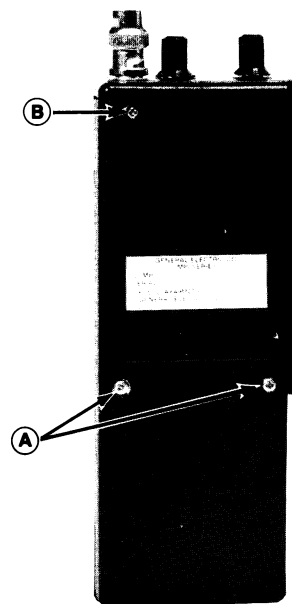


Figure 3 - Disassembly

When an RF signal is received (receiver unsquelches), no noise is rectified by D4 and the input voltage at pin 12 of U1D rises to approximately +1 volt. This positive voltage turns on U1D, causing the output at U1D-14 to go positive, turning on buffer Q6. When turned on, the collector voltage of Q6 goes low, turning on PNP audio board squelch switch Q2. Turning on Q2 applies 7.5 volts to audio amplifier U1. This turns on U1 so that audio is heard at the speaker.

VOLTAGE REGULATOR AND TR SWITCHES

Turning off-on switch to the "on" position applies 7.5 volts to voltage regulator U2. The regulator output is set for 5.4 volts by regulator adjust control R40.

TRANSMITTER SWITCHES

Pressing the PTT switch turns on Q7 and Q8. When Q7 is turned on, 7.5 volts from the battery is applied to the transmitter multipliers and 1st amplifier stages. The 7.5 volts is also applied to the gate of receiver muting FET Q10. The positive voltage on the gate turns Q10 off and mutes the receiver in the transmit mode. The switched 7.5 volts is also applied to the base of RX 5.4 volt switch Q16, turning the switch off in the transmit mode.

CAUTION

Due to the excellent "drive" capability of the miniature TORX®-head screws, it is relatively easy to overtorque and damage the screws. The torque required for the screws is as follows:

1. 4 inch-pounds for the three M2.5 screws in the back cover.
2. 2 1/4 inch-pounds for the three M2 screws holding the accessory area cover plate (under the battery).

DO NOT OVERTORQUE!

If the radio is equipped with an option board, in addition to the above steps, the three screws holding the option cover must be removed.

NOTE

The option board must be slightly raised to clear the option cover mounting boss before removing the back cover.

CAUTION

Do not bend the thin option board material any more than necessary.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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REPLACING CHIP COMPONENTS

Replacement of chip capacitors should always be done with a temperature-controlled soldering iron, using a controlled temperature of 700°F (371°C). However, do NOT touch black metal flim of the resistors or the ceramic body of capacitors with the soldering iron.

NOTE

The metalized end terminations of the parts may be touched with the soldering iron without causing damage.

REMOVING CHIP COMPONENTS

1. Grip the component with tweezers or needle nose pliers.
2. Alternately heat each end of the chip in rapid succession until solder flows, and then remove and discard the chip.
3. Remove excess solder with a vacuum solder extractor or Solder-wick®.
4. Carefully remove the epoxy adhesive and excess flux to prevent damage to the printed board.

REPLACING CHIP COMPONENTS

1. Using as little solder as possible, "tin" one end of the component and one of the pads on the printed wiring board.
2. Place the "tinned" end of the component on the "tinned" pad on the board and simultaneously touch the component and the pad with a well "tinned" soldering iron while pressing the component down on the board.
3. Place the "tinned" soldering iron on the other end of the component and the pad simultaneously. Apply solder to the top of the end of the component until the solder starts to flow. Use as little solder as possible while getting a good joint.
4. After the component has cooled, remove all flux from the component and printed wiring board area with alcohol.

HOLE CHART

HOLE	DESCRIPTION
1	PTT SWITCH GND
2	OPT. GND
3	OPT. SW. GND
4	OPT. +7.5V
5	PTT FROM OPT.
6	OPT. +5.4V REG.
7	DISCRIMINATOR OUTPUT
8	OPT. MUTE
9	PTT OUTPUT TO OPTIONS
10	PTT SWITCH (HOT)
11	CG TONE INPUT TO XMTR
12	FROM OPT. TO OPT. SW. CONN.
13	FROM OPT. SW. TO OPT. CONN.
14	PTT OUTPUT FROM OPTIONS
15	SQUELCH FROM OPTIONS
16	TX +7.5V
0	
18	} JUMPER WIRE
19	
20	GND. FOR RF CHOKE
21	OPTION SW GND FOR MIN LO VOL OPTION

TEST POINT CHART

TP	FUNCTION	TYP. V
1	RX INJ TUNING	5.2
2	RX INJ TUNING	5.2
3	RX INJ TUNING	7.4
4	TX DRIVE TUNING	0.4
5	TX DRIVE TUNING	0.6
6	TX DRIVE TUNING	0.8
7	BATTERY INPUT	7.5
8	GROUND	0

SERVICE TOOLS

4EX12A12 - Personal Radio Test Set
(Does not include any inter-connect cables)

Option 2847 - Internal J4 Interconnect Cable (May be used with any MPI radio)

Option 4990 - External Audio Jacks Interconnect Cable
(Only used on units with remote mic capability)

Option 4120 - (Replaced TS 10 Service Tool Kit)

ST 2513 - Coil and Trim Pot Alignment Tool

ST 2521 - Oscillator Coil Alignment Tool

ST 2519 - Johanson Capacitor Alignment Tool
(0.029" tip)

ST 2520 - Johanson Capacitor Alignment Tool
(0.025" tip)

19A702672P1 - Battery Test Lead (Black)

19A702672P2 - Battery Test Lead (Red)

19B800747P3 - Audio Board Jumper Cable (2 Required)

19A144745G1 - Receiver Audio Test Cable

19B800968G1 - RF Probe Assembly

Option 4121 - 7.5 Volt Dummy Battery Pack (19D900773G1)

Option 4122 - 10 Volt Dummy Battery Pack (19D900773G2)

Mechanical Tools:

ST 2307 - Spanner wrench for audio jacks

ST 2311 - Spanner wrench for volume & squelch controls

ST 0720 - Hex driver & assortment of 8 TORX bits

SYMPTOM	PROCEDURE
No 7.5V Supply	Check power connections and continuity of supply leads, and check fuse. If fuse is blown, check radio for shorts.
Low 7.5V Supply	Check for low or uncharged battery possibly with bad cell.
No 5.4V Regulated Supply	Check the 7.5V supply at pin 4 of regulator U2. Then check adjustment of the voltage adjustment pot, R40. If a large standby current (i.e., >100 mA) is seen, check for a short to ground on the 5.4V output line.
No Rx 5.4V	Check the 5.4V regulated supply. Then check switching transistor Q15.
No Audio Output	Check audio board squelching transistor, Q2. If the audio amplifier U1 is properly biased on, inject a 50 mV RMS, 1 kHz signal into the preceeding stages until the faulty stage is isolated as follows. This signal must be capacitively coupled from the audio generator using a 1 uF electrolytic capacitor to avoid shifting bias voltages. Sequentially inject signal into the following points on the audio board: Pin 3 of U1, emitter of Q1, base of Q1, and P2-5 (volume control dependent). If the problem is not found on the audio board, check for recovered audio on the main board with an oscilloscope. Recovered audio should be seen at Pin 9 of U1, at Hole 7, and at Pin 3 of R38 (as well as the wiper depending upon position).
Low Audio	Measure supply voltage at Pin 6 of audio board IC (U1) and gate voltage of Q10. Verify that at least 150 mV (424 peak-to-peak) is present at Hole 7 when a strong RF signal is applied to the radio with standard test modulation. Check quad coil (L16) setting.
Distorted Audio Output	Apply a strong RF signal with standard test modulation and measure audio distortion into an 8 ohm dummy load (e.g., test adaptor box). Distortion should be less than 5% at 2 volts output at 1 kHz. If there is low electrical distortion and acoustical distortion is still present, listen with test box or swap front covers with another radio to test speaker.
No or Incorrect Detector Output	Verify bias to Pins 4 and 8 of the main board IC, U1. Using a 50 ohm probe, inject a strong 21.4 MHz modulated signal into Pin 16 of U1. Recovered audio should be seen at Pin 9 and the level should vary with the setting of quad coil, L16. If none is seen, check the second oscillator for activity. At least 80 mV of RF should be seen on Pin 1 to ground.
No 2nd Oscillator Activity	Substitute a known good crystal for Y3. Check voltages on U1 pins 1 and 2.
Radio Permanently Squelched	Verify that main board IC, U1, is properly biased at Pins 4 and 8 and that quad coil L16 is correctly adjusted. The voltage at the Schmidt trigger input (U1 Pin 12) should rise and fall with the setting of R32. The output at pin 14 should switch bias on and off to the base of Q6 as the input threshold is crossed. The collector of Q6 should saturate and unsquelch the radio once the input (Pin 12) is above the threshold, approx. 0.8V.
Radio Won't Squelch	Verify that main board IC, U1, is properly biased at Pins 4 and 8 and that quad coil L16 is correctly adjusted. An oscilloscope should see high frequency (approx. 8 kHz) noise at the noise filter output, U1 pin 11. This noise should be seen at the wiper of R32 (dependent upon position) and should be negatively rectified by D4. The remainder of the squelch circuit is described under the "Radio Permanently Squelched" section.

SYMPTOM	PROCEDURE
Poor or No Sensitivity	Verify that proper injection power is present and at the correct frequency, $(f_c - 21.4)/9$. This can be done by 50 ohm probing from the junction of C33 and C103 to ground. The power seen should be approximately 0 dBm. If OK, then use the 50 ohm probe with a signal generator to inject signal into various portions of the radio to isolate the bad section. Set the generator with standard modulation to the level and frequency indicated on the large service schematic and probe those points starting with the IC (U1) and moving forward to the antenna jack. In some cases parts must be adjusted for best sensitivity while probing. This is indicated on the schematic. Once the faulty stage is isolated, measure bias voltages.
No or Low Injection Power	Verify that tuning procedure has been done or tried. The oscillator string can be trouble shot by using a 50 ohm probe connected to a power meter capable of measuring power as low as -20 dBm. Probe the available power points to ground indicated on the large service schematic. The power seen should be approximately that shown on the schematic. Any adjustment needed during probing is indicated on the schematic. Start probing with the oscillator and proceed towards the mixer. Bias voltages are also shown on the schematic for both a running and non-running oscillator. To kill a running oscillator, place a .01 uF ceramic capacitor with short leads from the base to collector of the oscillator transistor Q3.
Frequency Won't Adjust Properly	Check compensator voltage at P3-2 and at varicap (D2, D6, D7 or D9). Check anode voltage of varicap.
No Transmit 5.4V	Check the switching transistor Q8.
Radio Won't Go Into Transmit Mode	Verify that Hole 9 is going to ground when the PTT switch is pushed. If Channel Guard is present, first short Hole 9 and then Hole 5 to ground. Both operations should cause the radio to go into transmit mode unless a problem exists with the Channel Guard circuitry.
Low or No Transmit Power	Check battery voltage when in transmit. Low or uncharged battery or shorted cell will be <7 volts. If the total transmit current is >500 mA, check the low pass filter and T/R switch. 1.6 VDC at C102 indicates that the radio is in the transmit mode. If the total transmit current is >100 mA, measure the base bias of Q10. Check for proper test point readings at TP4, TP5, TP6.
Low TP6	0.5 - 0.8 VDC indicates proper drive into Q11. 0.3 VDC indicates no drive. Check the bias voltages.
Low TP5	0.6 - 0.8 VDC indicates proper drive into Q12. 0 VDC indicates no drive. Check the bias voltages.
High TP4	0.3 - 0.6 VDC indicates proper drive from the oscillator. With no oscillator activity TP4 will be 0.7 VDC.
Oscillator Frequency Will Not Adjust Properly	Check the compensator voltage at P3-2. Check the anode voltage of the varicap.
No Transmitter Deviation	Disconnect the front cover and connect the test box. Apply 600 mV to TX audio. Check the DC and Audio Voltages on the Audio Board as indicated on the service schematic during transmit. If values are as indicated, substitute another front cover to test the microphone.

TROUBLESHOOTING PROCEDURE

TRANSMITTER ALIGNMENT

EQUIPMENT REQUIRED

- 1. Power Supply (10 Volts, 2 Am-pere).
- 2. 50 ohm Wattmeter with 50 ohm load
- 3. Audio Oscillator
- 4. Deviation Monitor
- 5. Frequency Counter
- 6. Voltmeter
- 7. Tune-up Kit TS10 (contains coil tuning tools, capacitor tuning tools, dummy battery, audio board jumper cables, and a 50 ohm probe).
- 8. Test adaptor 4EX12A12 and cable 19B234242G1 (Option 2847).

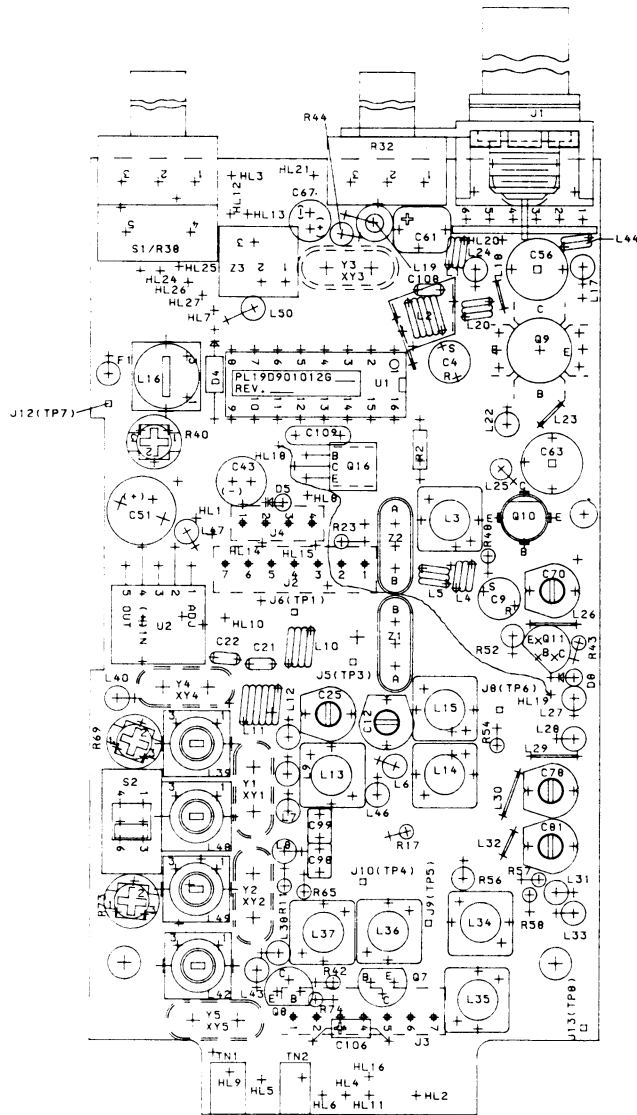
PRELIMINARY STEPS AND ADJUSTMENTS

- 1. In addition to the antenna mounting bracket screw, the radio must be held tight against the back cover at the lower right corner near the negative battery terminal (e.g. use a 4-40 screw and nut).
- 2. Unplug the audio board and front cover from the main board.

- 3. Turn regulator output control R40 fully counterclockwise if voltage hasn't been previously adjusted. Insert the dummy battery into the battery pack area and apply nominal battery voltage (7.5 or 10 Volts as required) to the RED terminal (BLACK terminal is ground) on dummy battery pack.
- 4. Connect multimeter to the output (Pin 5) of U2 (or J2-7) and ground, and adjust R40 for 5.4 Volts \pm 0.05 Volt. Try not to exceed 6 volts during adjustment.
- 5. Pre-set the tuning slugs in L39 (and L42 in two-frequency radios) to the center of their tuning range.
- 6. All adjustments are made with the transmitter keyed and Channel Guard enabled, if present.

NOTE

In two-frequency radios, switch to the highest frequency.



ALIGNMENT PROCEDURE

STEP	METERING POINT	TUNING CONTROL	PROCEDURE
1.	TP4	L37 and L36	Adjust L37 and L36 in that order for a dip in meter reading.
2.	TP5	L35 and L34	Adjust L35 and L34 for a peak in meter reading. Repeat if necessary.
3.	TP6	C81 and C78	Adjust C81 and C78 in that order for a peak meter reading. Repeat if necessary.
4.	Wattmeter	C70, C63 C56	Adjust C70, C63 and C56 in that order for maximum power output.
5.	Wattmeter	C56	Turn C56 in the direction that causes both the power and current to decrease, and adjust C56 for an output of 2.0 Watts or 4.0 watts as applicable. <div>NOTE The transmitter is designed to provide optional radiation efficiency (antenna matching) when the transmitter is adjusted for approximately rated power. Tuning for higher power will degrade both radiated power and battery life.</div>
FREQUENCY ADJUSTMENT			
6.	Frequency Counter	L39 and L42	Plug the audio board onto the main board. In single frequency radios, adjust L39 for the proper frequency. In two frequency radios, switch to Channel 1 and adjust L39 for the proper frequency. Then switch to Channel 2 and adjust L42 for the proper frequency.
MODULATION ADJUSTMENT			
7.	Deviation Monitor	R69 and R73	Connect the test adaptor with cable to J4 and switch to channel 1. Apply 600 millivolts at 1 kHz to the test adaptor and adjust R69 for 4.5 kHz deviation. In two-frequency radios, switch to channel 2 and adjust R73 for 4.5 kHz deviation.

ALIGNMENT PROCEDURE

TRANSMITTER

RECEIVER ALIGNMENT

EQUIPMENT REQUIRED

- 1. 10-Volt Power Supply. (0.5 amps)
- 2. Floating terminal (non-grounded) multimeter with at least 3 1/2 digits and a 200 millivolt DC lowest range.
- 3. RF generator.
- 4. Distortion analyzer.
- 5. MPI Tune-up kit TS10 containing coil tuning tools, trimmer capacitor tuning tools, dummy battery, audio board jumper cables and a 50 ohm probe.
- 6. Test Adaptor 4EX12A12 and MPI Cable 19B234242G1 (Option 2849 for internal jack, or Option 4990 for jacks on side rail.

PRELIMINARY CHECKS AND ADJUSTMENTS

- 1. In addition to the antenna mounting bracket screw, the radio must be held tight against the back cover at the lower right corner near the negative battery terminal (e.g. use a 4-40 screw and nut).
- 2. Remove the front cover and unplug the Audio board from the

main board. Then connect the audio board to the main board with the jumper cables.

- 3. Turn regulator output control R40 fully counterclockwise if voltage hasn't been previously adjusted. Insert the dummy battery into the battery pack area and apply nominal supply voltage (7.5 or 10 Volts as required). Volts to the RED terminal (BLACK terminal is ground) on dummy battery.
- 4. Connect multimeter to the output (Pin 5) of U2 (or J2-7) and ground, and adjust R40 for 5.4 Volts \pm 0.05 Volt. Try not to exceed 6 volts during adjustment.
- 5. Pre-set the tuning slugs in L3, L13, L14, L15, L48 and L49 to the top of the coil form. Next, set the arrow on the rotor of C12 and C25 so that it points towards the rounded end of the capacitor.

- 6. Disable Channel Guard, if present.

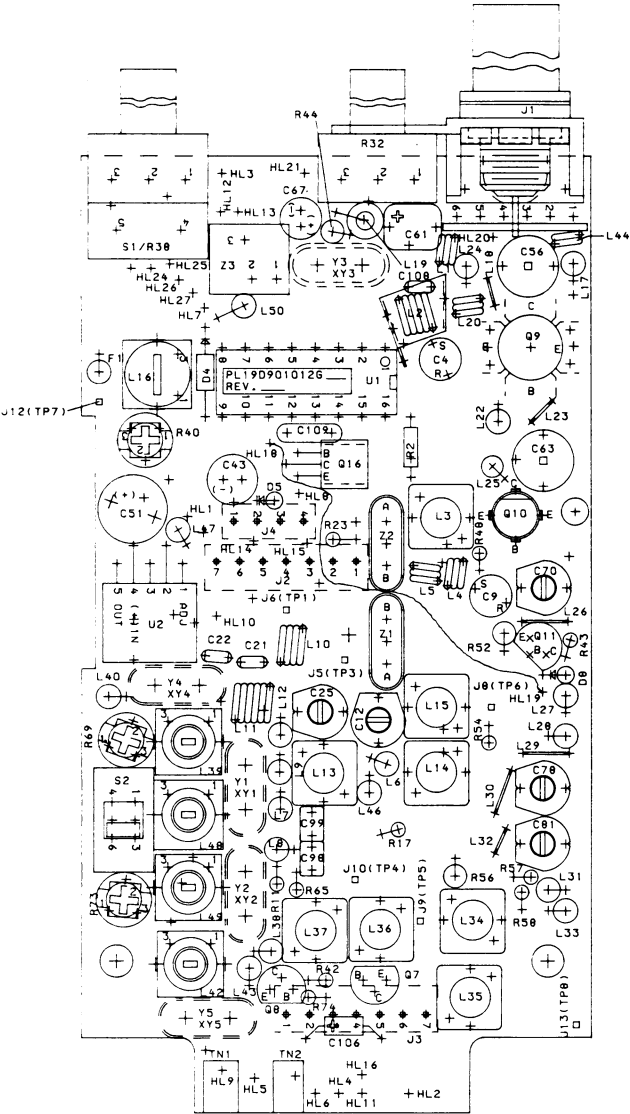
NOTE

In two-frequency radios, all adjustments are made on the lowest frequency except as directed.

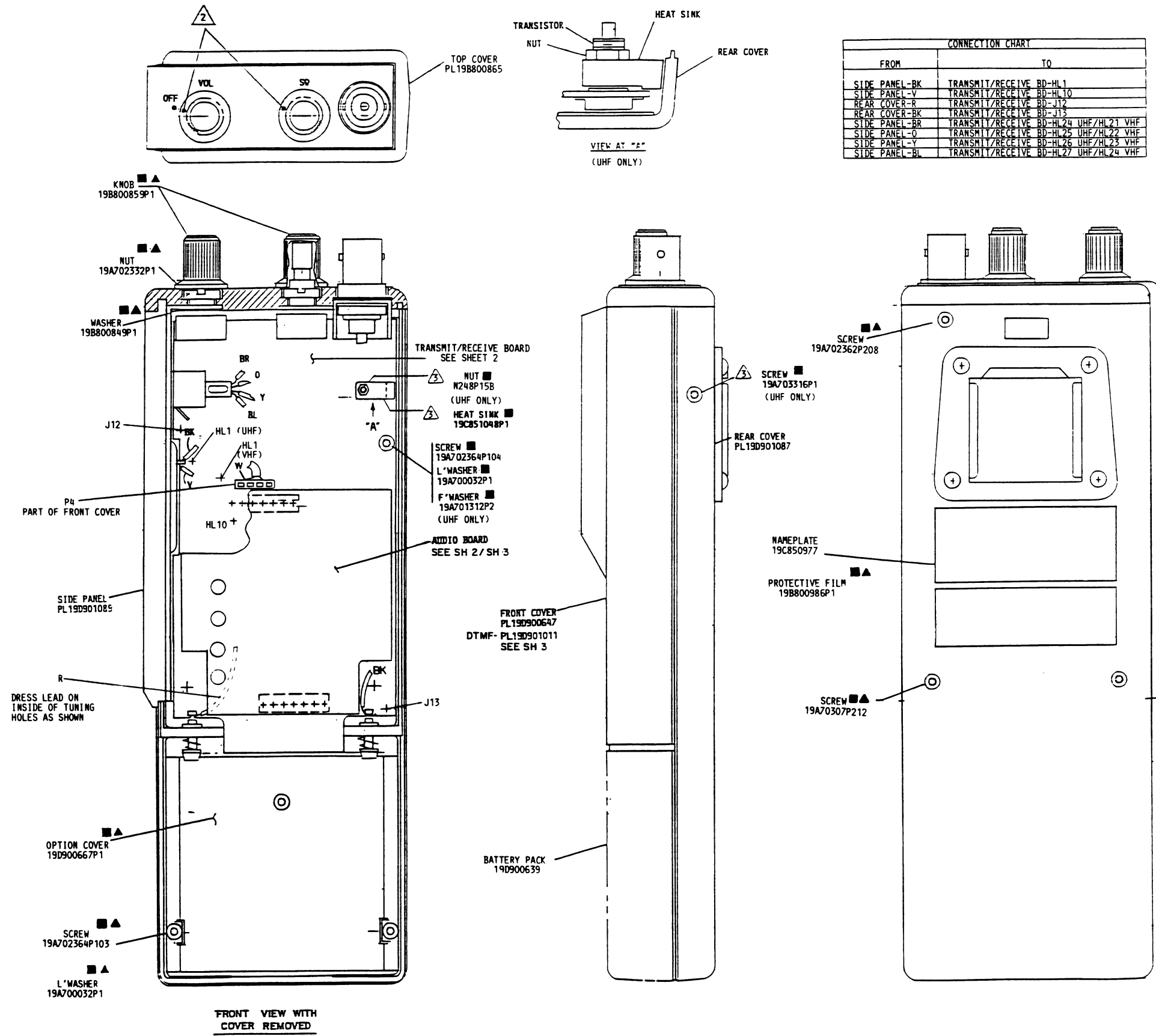
ALIGNMENT PROCEDURE

STEP	METERING POINT	TUNING CONTROL	PROCEDURE
1.	Audio Output Jack (J1 on side panel)	L16	Set the Volume Control an audio level of approximately 1 Volt RMS to keep out of limiting. Using the 50 ohm probe, apply a strong modulated 21.4 MHz signal (>-50 dBm) to U1A-16 on T/R board and adjust L16 for maximum audio output. <div><p>NOTE</p><p>If a 21.4 MHz generator is not available, adjust L16 for maximum noise.</p></div>
2.	J2-7 and TP1	L48 (Chan 1) or L49 (Chan 2)	For two frequency radios, select the lowest frequency. While measuring between J2-7 (regulator voltage) and TP1, adjust L48 or L49 for maximum meter reading (approximately 250 millivolts).
3.	Audio Output Jack (J1 on side panel)	C25, C9 and L13	Apply a strong (0 dBm) signal to the antenna jack. Adjust C25, C9 and L13 for best quieting. C25 will have more than two dips, so use only the stronger one. Then adjust C25 and L13 again for best quieting.
4.	Audio Output Jack (J1 on side panel)	L14, L15, C4, L3 and C9	Adjust L14, L15, C4, L3 and C9 in that order for best quieting.

STEP	METERING POINT	TUNING CONTROL	PROCEDURE
5.	Distortion Analyzer	L48, L49 and C12	Add 1 kHz tone modulation at 5 kHz deviation to the carrier. Leave the Volume control as in Step 1. Alternately adjust lowest frequency warp coil (L48 or L49) and C12 until no improvement in SINAD is seen. This will insure that the match to the crystal filters is properly adjusted, and that the carrier is centered in the pass band (zero beating isn't required). On 2 frequency radios switch to the other channel and adjust the other warp coil (L48 or L49) for best SINAD.
6.	Distortion Analyzer	C4	On two-frequency radios, switch to the lowest frequency. Set the signal generator to the image frequency (42.8 MHz below the carrier frequency) and increase the RF level to approximately -60 dBm. Then adjust C4 for the amount of image rejection desired by degrading the quieting on SINAD. Then reset the signal generator to 3 kHz before doing any standard measurements.






ALIGNMENT PROCEDURE




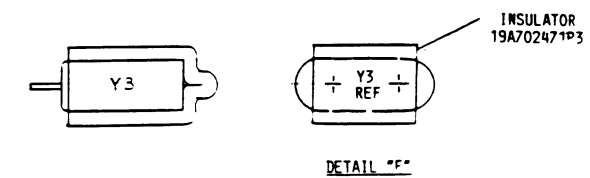
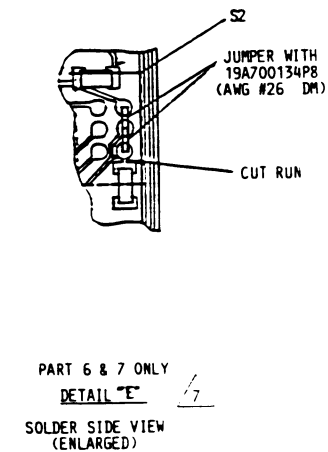
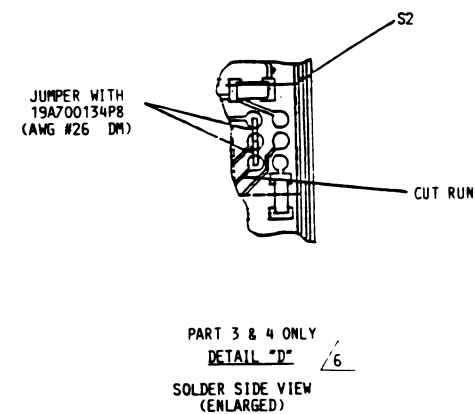
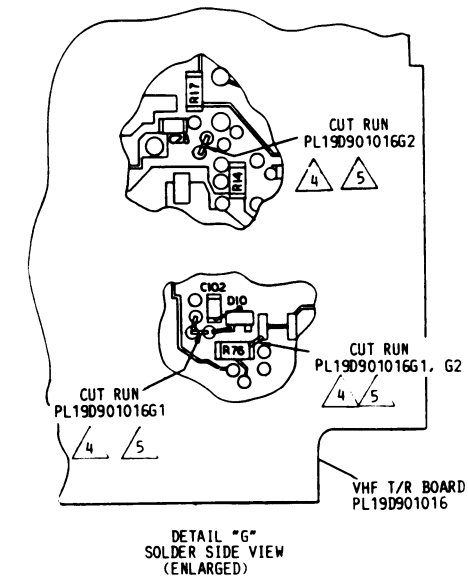
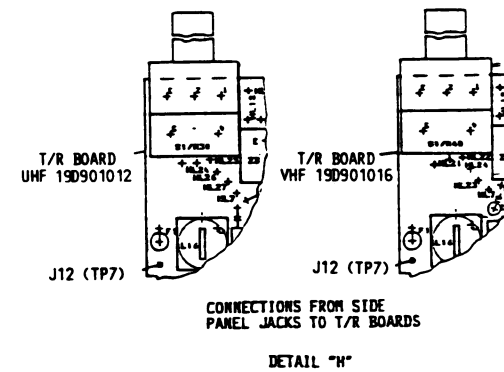
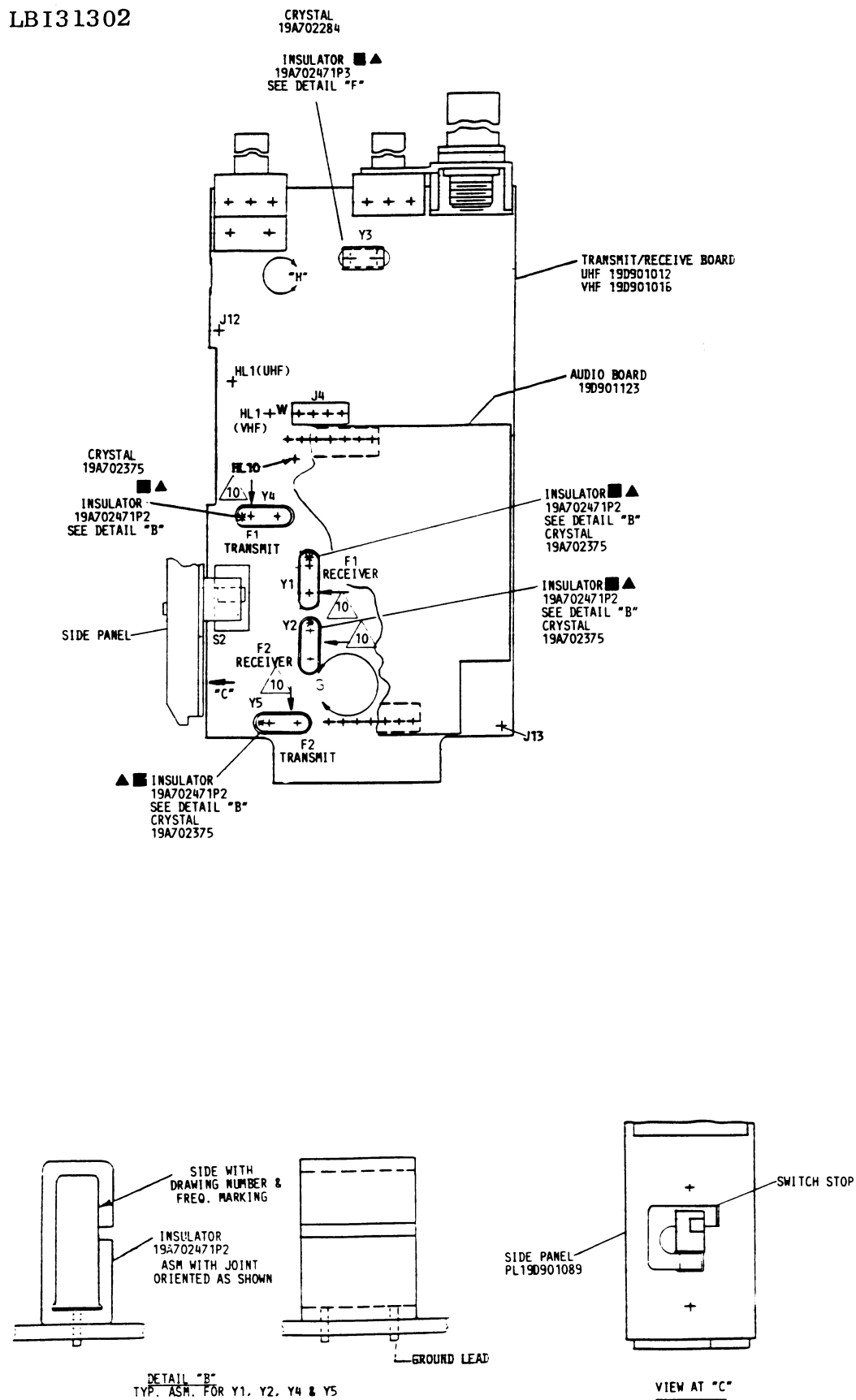
- 1 VHF
SEE NOTES 4 5 8
- 2 UHF
SEE NOTE 8
- 3 VHF - TWO FREQ TX & SINGLE FREQ RX
SEE NOTES 4 6
- 4 UHF - TWO FREQ TX & SINGLE FREQ RX
SEE NOTE 6
- 5 DTMF
SEE SH. #3
- 6 VHF - SINGLE FREQ TX & TWO FREQ RX
SEE NOTES 4 7
- 7 UHF - SINGLE FREQ TX & TWO FREQ RX
SEE NOTE 7

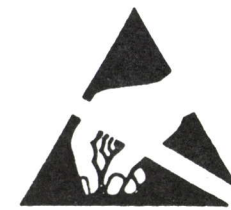
NOTES:

1. ITEMS MARKED  ARE PART OF HARDWARE KIT PL19A70237962 (UHF).
ITEMS MARKED  ARE PART OF HARDWARE KIT PL19A70237963 (VHF).
2. ROTATE OFF/ON-VOL POT TO EXTREME COUNTER CLOCKWISE (OFF) POSITION.
ASSEMBLE KNOB WITH INDICATOR MARK ALIGNED WITH MARK ON TOP COVER.
ROTATE SQUELCH POT TO EXTREME COUNTER CLOCKWISE POSITION. ASSEMBLE
KNOB WITH INDICATOR MARK IN APPROXIMATELY SAME POSITION AS THE
OFF/ON-VOL KNOB.
3. APPLY SILICON GREASE (19A701337P)  UPPER 19A701431 WHEN MATING
SURFACES OF HEAT SINK, NUT, TRANSISTOR AND REAR COVER. SCREW MUST
BE TIGHTENED BEFORE NUT. NUT TIGHTENING TORQUE TO BE 0.6±0.1 N-M.
4. CUT RUNS ON SOLDER SIDE OF TX/RX BOARD 19D90101661 WHEN LOWEST TX
FREQ SPECIFIED IS BELOW 142 MHZ OR ON TX/RX BOARD 19D90101662 WHEN
LOWEST TX FREQ SPECIFIED IS BELOW 162 MHZ AS SHOWN IN DETAIL "G"
(SH. #2).
5. WHEN NO TX CRYSTALS ARE SPECIFIED ON PRODUCTION TAG DO NOT CUT
RUNS SHOWN IN DETAIL "G" (SH. #2).
6. CUT RUN ON SOLDER SIDE OF TX/RX BOARD AND ADD JUMPERS AS SHOWN IN
DETAIL "D" (SH. #2).
7. CUT RUN ON SOLDER SIDE OF TX/RX BOARD AND ADD JUMPERS AS SHOWN IN
DETAIL "E" (SH. #2).
8. REFER TO PRODUCTION TAG TO DETERMINE WHICH OF THE FOLLOWING APPLY

OPTIONS	INSTRUCTIONS
AO,BO	TX & RX CRYSTALS OMITTED DO NOT REMOVE SWITCH STOP SHOWN IN DETAIL "C" (SH. #2)
AA,BA	SINGLE FREQ. TX & RX DO NOT REMOVE SWITCH STOP SHOWN IN DETAIL "C" (SH. #2)
AB,BB	TWO FREQ. TX & RX REMOVE SWITCH STOP SHOWN IN DETAIL "C" (SH. #2)
AA,BA WITH ONE OR MORE REQ'S LISTED AS OPEN	TWO FREQ. TX & RX WITH ONE SET OF CRYSTALS OMITTED. REMOVE SWITCH STOP SHOWN IN DETAIL "C" (SH. #2)

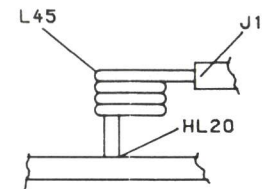
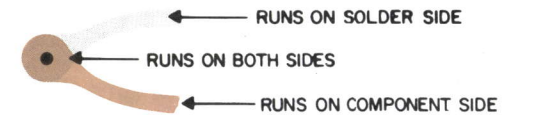
9. SOLDER ALL ELECTRICAL CONNECTIONS.
-  ORIENT Y1, Y2, Y4 AND Y5 SO THAT DWG. NO. & FREQ. MARKING IS AT SIDE INDICATED. GROUND LEAD MUST BE IN POSITION AS INDICATED BY • (SH. #2)





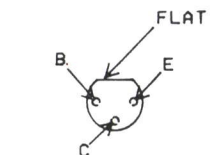
CAUTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES

Q1 & Q2 on Main Board
Q10 on Audio Board



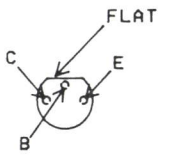
DETAIL "C"

LEAD IDENTIFICATION
FOR Q7, Q8 & Q16



TOP VIEW

LEAD IDENTIFICATION
FOR Q11



TOP VIEW

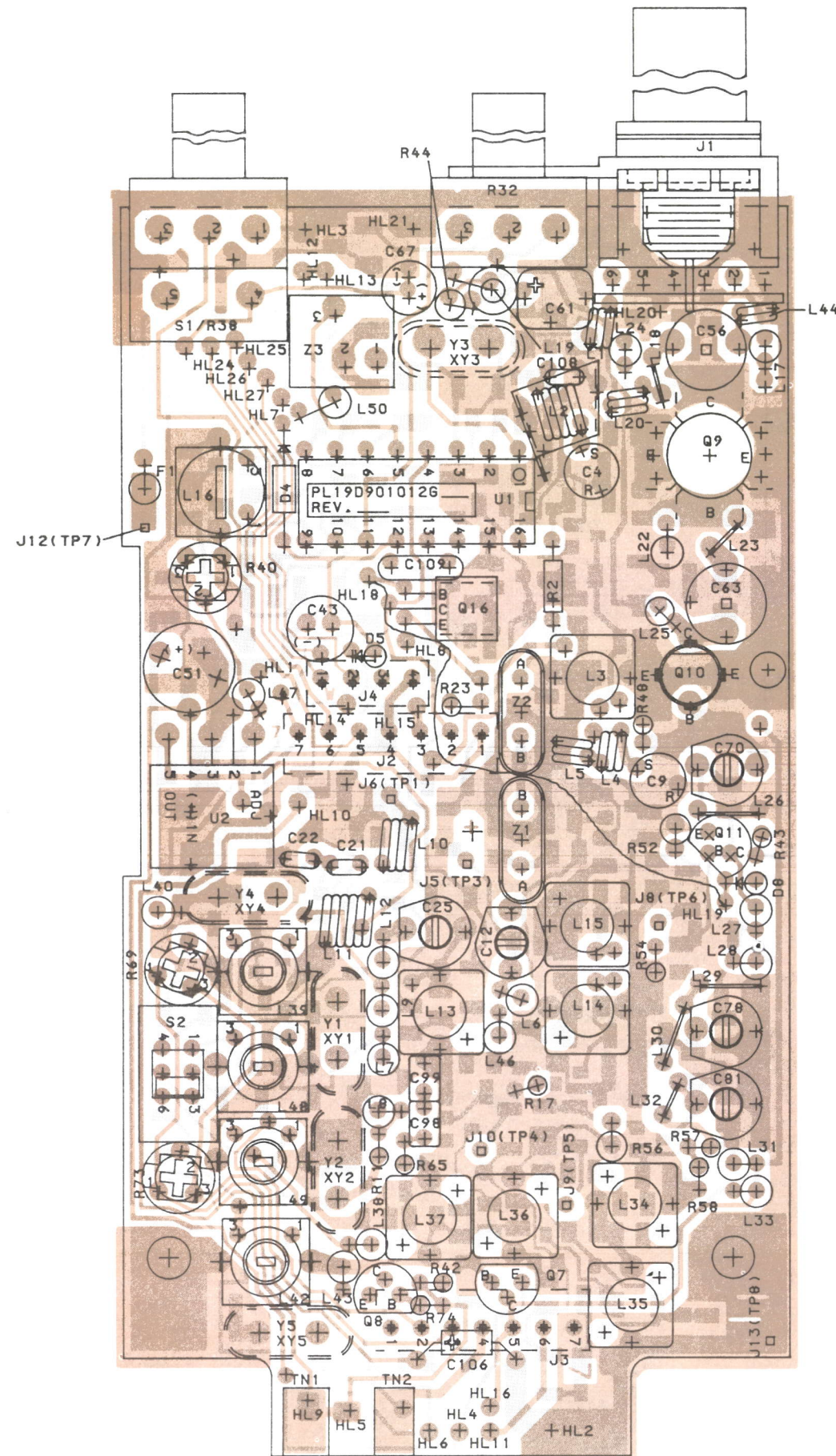
NOTE: CASE SHAPE IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION.

OUTLINE DIAGRAM

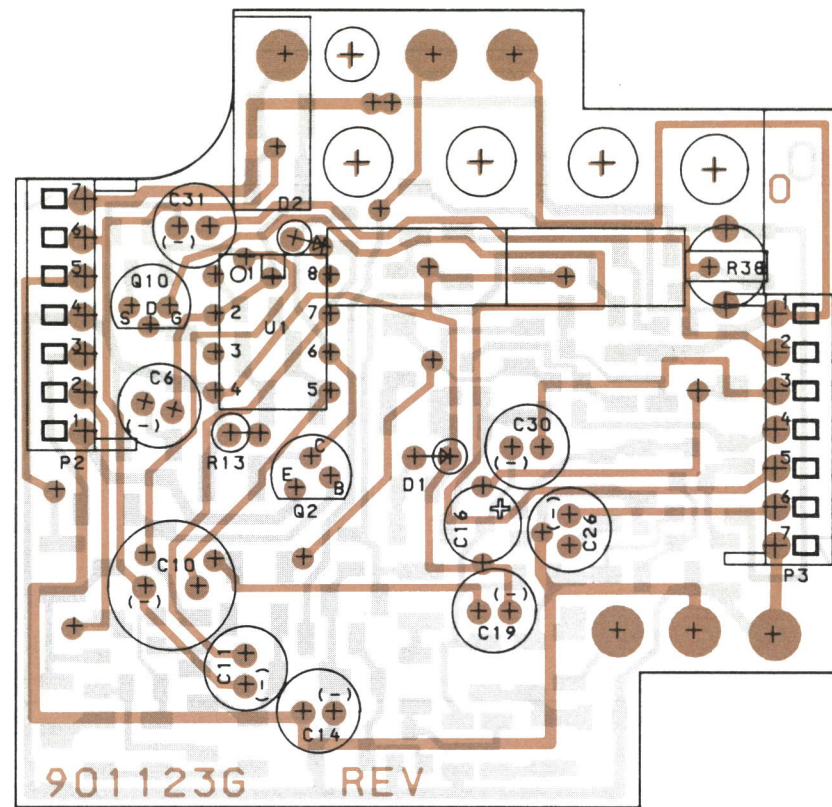
TRANSMITTER/RECEIVER BOARD

Issue 1

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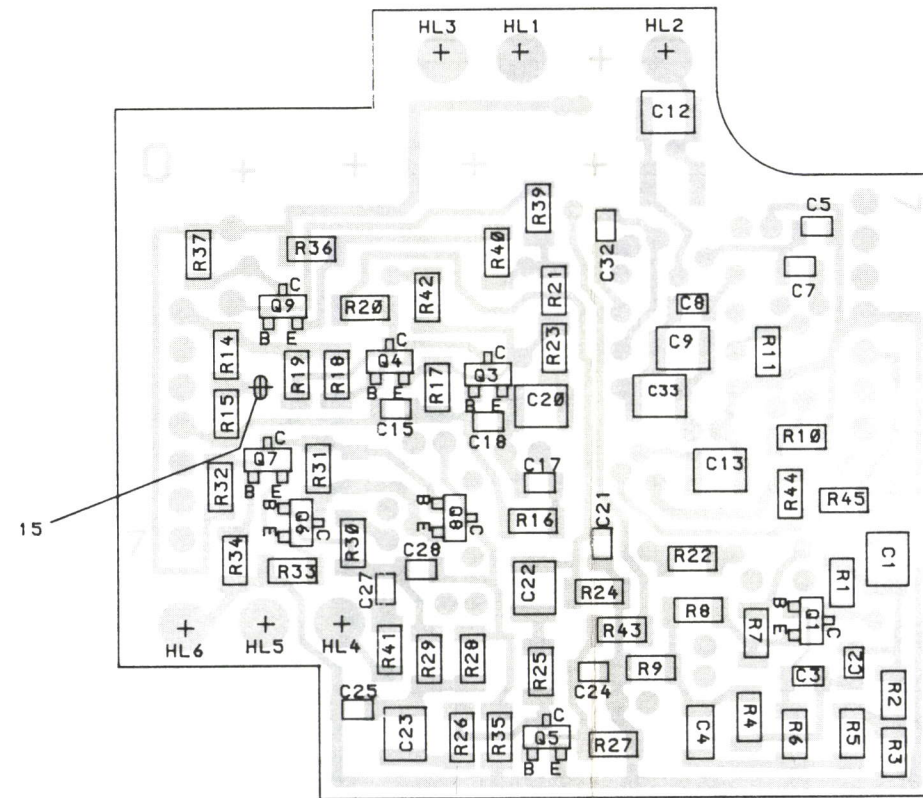


OUTLINE DIAGRAM



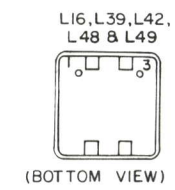
FRONT SIDE

(19D901124, Rev. 0)
(19A703568, Sh. 1, Rev. 0)
(19A703568, Sh. 2, Rev. 0)



BACK SIDE

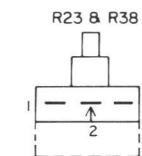
(19D901123, Rev. 1)
(19A703568, Sh. 2, Rev. 0)



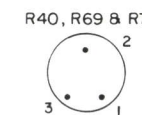
(BOTTOM VIEW)



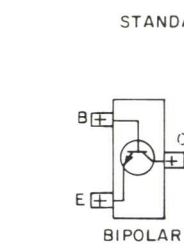
(REAR VIEW)



(BOTTOM VIEW)

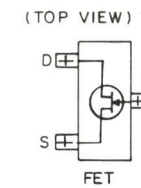


(BOTTOM VIEW)



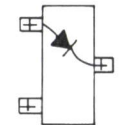
STANDARD OUTLINE TRANSISTORS (SOTS)

BIPOLAR



(TOP VIEW)

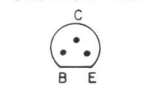
FET



DIODES & VARACTORS



NPN

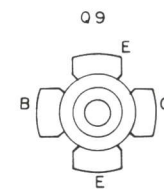


TO - 92
(BOTTOM VIEW)

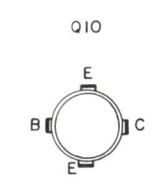
PNP



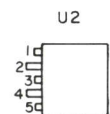
FET



LEADS ON BOTTOM
OF BOARD

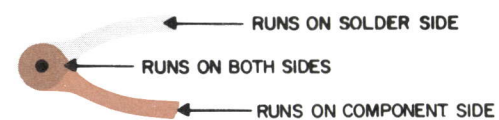


TOP OF BOARD



TOP OF
BOARD

RC 4372B



VOLTAGE READINGS:

VOL IAGE READINGS ARE TYPICAL VALUES MEASURED WITH A HIGH IMPEDANCE (10MΩ) MULTIMETER FROM THE INDICATED POINT TO GROUND. CONDITIONS FOR READINGS ARE INDICATED BY THE FOLLOWING KEY:

- R INDICATES VOLTAGES ARE TO BE MEASURED DURING RECEIVE MODE
- T INDICATES MEASUREMENT DURING TRANSMIT
- C INDICATES CONTINUOUS VOLTAGE ALWAYS PRESENT WHEN RADIO IS ON

VOLTAGE READINGS ARE FOR 4 WATT MPI UNITS UNLESS ENCLOSED IN BRACKETS WHICH INDICATES VOLTAGES MEASURED ON 2 WATT MPI UNITS. (EXAMPLE: [+7.5V])

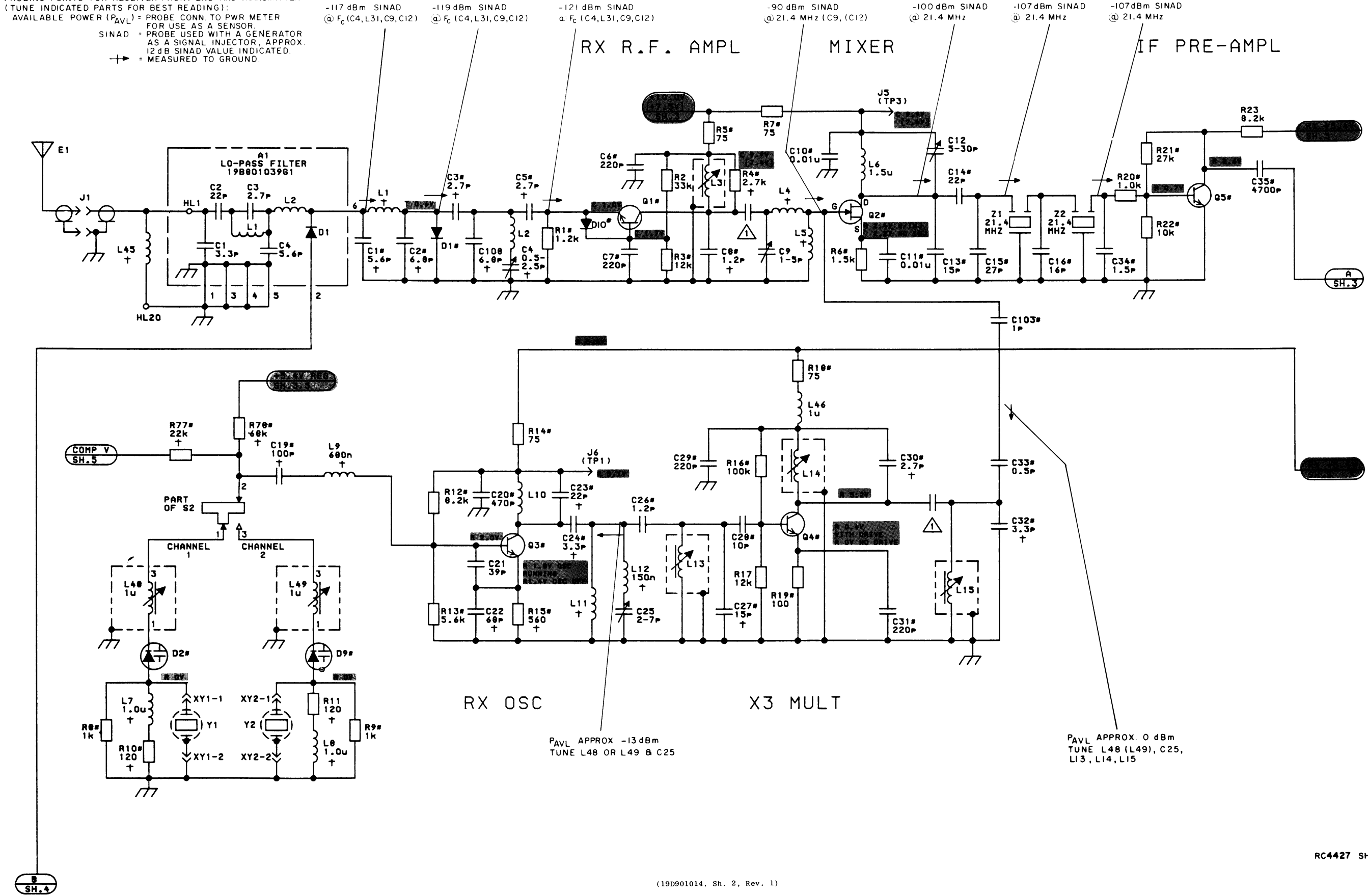
NOTES:

- △ PART OF PWB.
- 3. # IDENTIFIES "CHIP" COMPONENTS (EXAMPLE C57#) WHICH ARE LOCATED ON SOLDER SIDE OF PWB.
- 4. † FREQUENCY SENSITIVE COMPONENTS,SEE COMPONENT IDENTIFICATION CHART OR PARTS LIST. G1 PART VALUE SHOWN.
- 5. ALL CHIP RESISTORS ARE 1/8 WATT. ALL OTHER RESISTORS ARE 1/8 WATT UNLESS OTHERWISE SPECIFIED. RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER k OR M. CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER u,n OR p. INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER m,u OR n.
- △ CUT THIS RUN FOR CG/CCT OPTION.

FREQUENCY SENSITIVE COMPONENTS					
REF. NO.	G1 450-470 MHZ	G2 470-494 MHZ	G3 489-512 MHZ	G4 403-425 MHZ	G5 420-450 MHZ
C1#	5.6p	5.6p	5.6p	6.8p	5.6p
C2#	6.8p	6.8p	3.9p	8.2p	6.8p
C3#	2.7p	2.7p	2.7p	3.3p	3.3p
C4	0.5-2.5p	0.5-2.5p	0.5-2.5p	1-5p	1-5p
C5#	2.7p	2.7p	2.7p	3.3p	3.3p
C8#	1.2p	0.9p	0.5p	1.8p	1.8p
C19#	100p	100p	100p	68p	150p
C22	68p	68p	68p	120p	120p
C23#	22p	15p	15p	30p	24p
C24#	3.3p	4.7p	4.7p	1.7p	4.7p
C27#	15p	12p	13p	22p	8p
C30#	2.7p	1.8p	1.8p	3.3p	2.7p
C32#	3.3p	2.7p	2.7p	4.3p	3.9p
C54#	10p	8.2p	6.2p	12p	12p
C55#	3.9p	NONE	NONE	8.2p	5.6p
C58#	12p	10p	8.2p	15p	15p
C59#	39p	36p	33p	47p	43p
C60#	39p	36p	33p	47p	43p
C65#	12p	12p	12p	24p	22p
C71#	10p	10p	8.2p	15p	10p
C85#	39p	39p	39p	43p	39p
C86#	22p	22p	22p	24p	24p
C87#	39p	33p	33p	51p	43p
C89#	10p	10p	8.2p	12p	12p
C93#	39p	39p	39p	43p	39p
C94#	18p	18p	18p	27p	22p
C95#	47p	47p	47p	56p	47p
C96#	2.7p	2.7p	2.2p	3.3p	2.7p
C97#	30p	27p	27p	39p	36p
C108	6.8p	4.7p	4.7p	6.8p	6.8p
C110#	10p	10p	8.2p	15p	10p
L1	2 1/2 TURNS 2.0mm ID	2 1/2 TURNS 1.78mm ID	2 1/2 TURNS 1.78mm ID	2 1/2 TURNS 2.2mm ID	2 1/2 TURNS 2.2mm ID
L4 & L5	2 1/2 TURNS 2.0mm ID	2 1/2 TURNS 2.0mm ID	2 1/2 TURNS 1.78mm ID	2 1/2 TURNS 2.0mm ID	2 1/2 TURNS 2.0mm ID
L7 & L8	1u	1u	1u	1.2u	1.2u
L9	680n	680n	560n	1u	820n
L11	5 1/2 TURNS 3.04mm ID	4 1/2 TURNS 3.04mm ID	4 1/2 TURNS 3.04mm ID	5 1/2 TURNS 3.04mm ID	5 1/2 TURNS 3.04mm ID
L12	150n	120n	120n	150n	150n
L38	270n	270n	220n	470n	390n
L44	1 1/2 TURNS 2.0mm ID	1 1/2 TURNS 1.52mm ID	1 1/2 TURNS 1.52mm ID	1 1/2 TURNS 2.0mm ID	1 1/2 TURNS 2.0mm ID
L45	3 3/4 TURNS 2.54mm ID	3 3/4 TURNS 2.54mm ID	3 3/4 TURNS 2.03mm ID	3 3/4 TURNS 2.54mm ID	3 3/4 TURNS 2.54mm ID
R4#	2.7k	2.2k	2.2k	3.3k	3.3k
R10#	120	20	120	180	180
R11	120	120	120	180	180
R15#	560	560	560	390	390
R77#	22k	22k	22k	18k	18k
R78#	68k	68k	68k	82k	82k
R79#	47k	47k	47k	27k	27k
R80#	82k	82k	82k	100k	100k

DESCRIPTION	MODEL NO.	REV LTR
UHF 2W/4W MAIN BD 450-470 MHZ	PL19D90101261	
UHF 2W/4W MAIN BD 470-494 MHZ	PL19D90101262	
UHF 2W/4W MAIN BD 489-512 MHZ	PL19D90101263	
UHF 2W/4W MAIN BD 403-425 MHZ	PL19D90101264	
UHF 2W/4W MAIN BD 420-450 MHZ	PL19D90101265	
AUDIO BOARD (STANDARD)	PL19D90112361	
AUDIO BOARD (W/DTMF PARTS)	PL19D90112362	
BATTERY (7.5V)	PL19D90063962	
BATTERY (10V)	PL19D90063963	
REAR COVER (2 WATT)	PL19D90108764	
REAR COVER (4 WATT)	PL19D90108762	
SIDE PANEL	PL19D90108961	
FRONT COVER (STANDARD)	PL19D90064761	
FRONT COVER (LICENSEE)	PL19D90064762	
FRONT COVER (STANDARD W/O METAL)	PL19D90064764	
FRONT COVER (STANDARD/DTMF)	PL19D90101161	
FRONT COVER (LICENSEE/DTMF)	PL19D90101162	

PROBING POINTS FOR RECEIVER FRONT END AND TRANSMITTER
(TUNE INDICATED PARTS FOR BEST READING):
AVAILABLE POWER (PAVL) = PROBE CONN. TO PWR METER
FOR USE AS A SENSOR.
SINAD = PROBE USED WITH A GENERATOR
AS A SIGNAL INJECTOR. APPROX.
12 dB SINAD VALUE INDICATED.
+ = MEASURED TO GROUND.



SCHEMATIC DIAGRAM

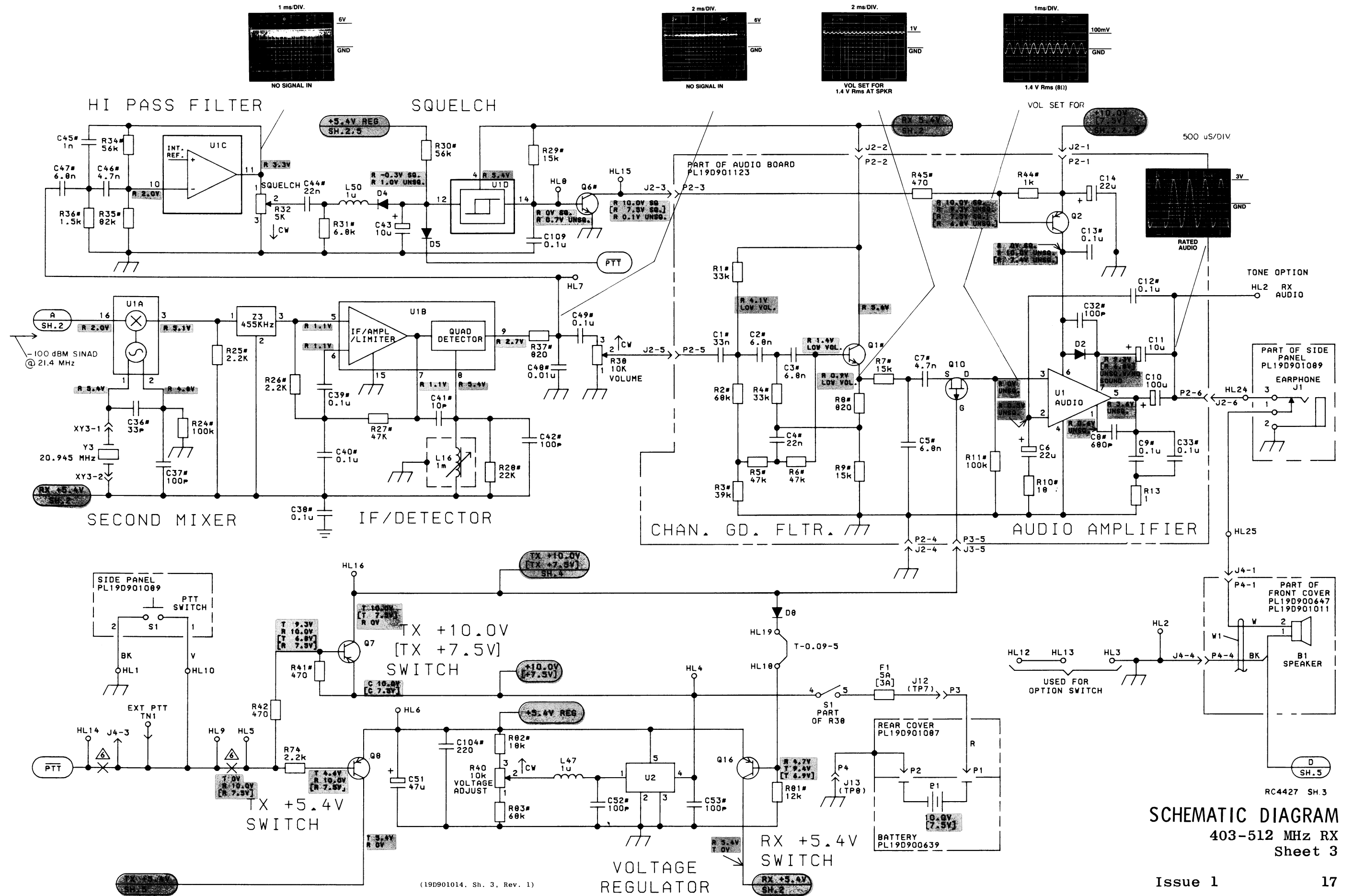
403-512 MHz RX

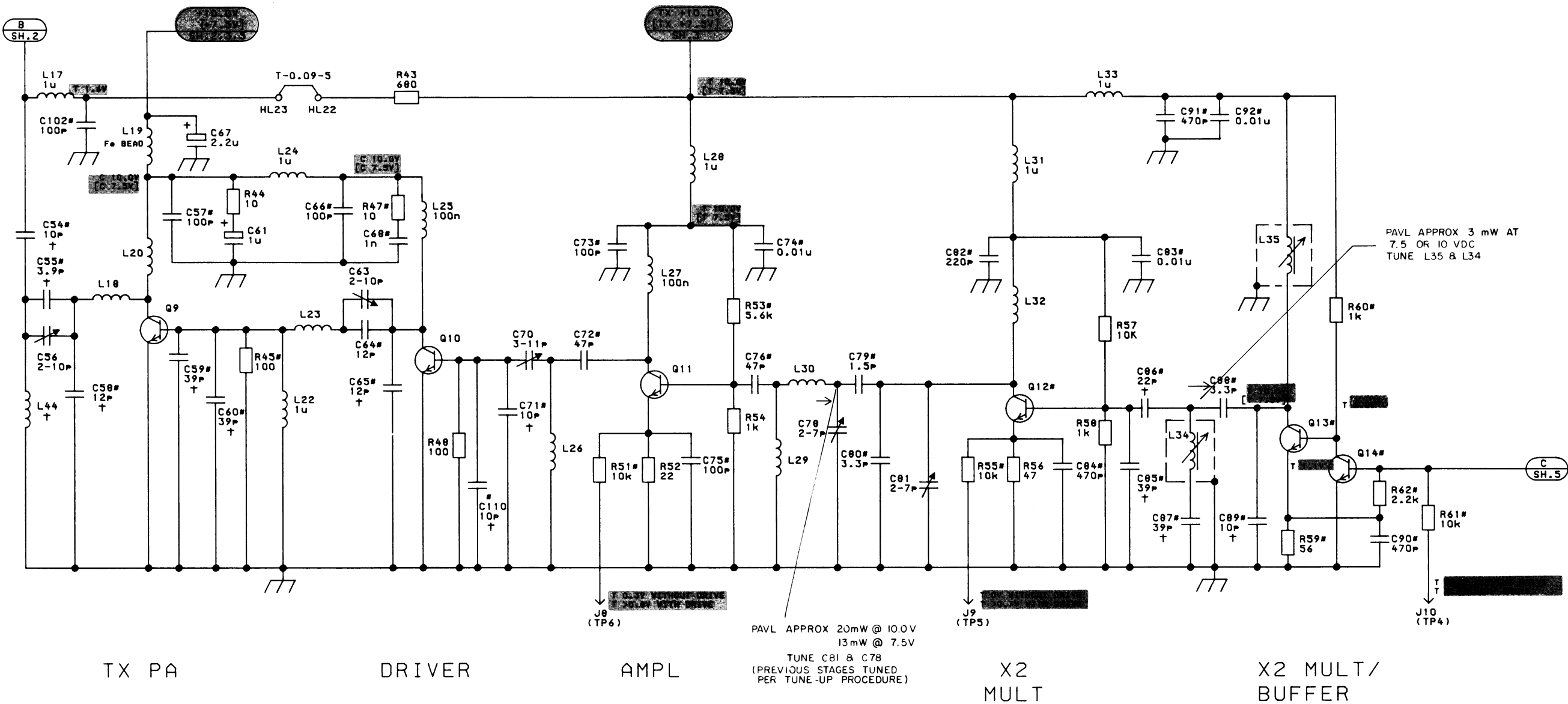
Sheet 2

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Issue 1

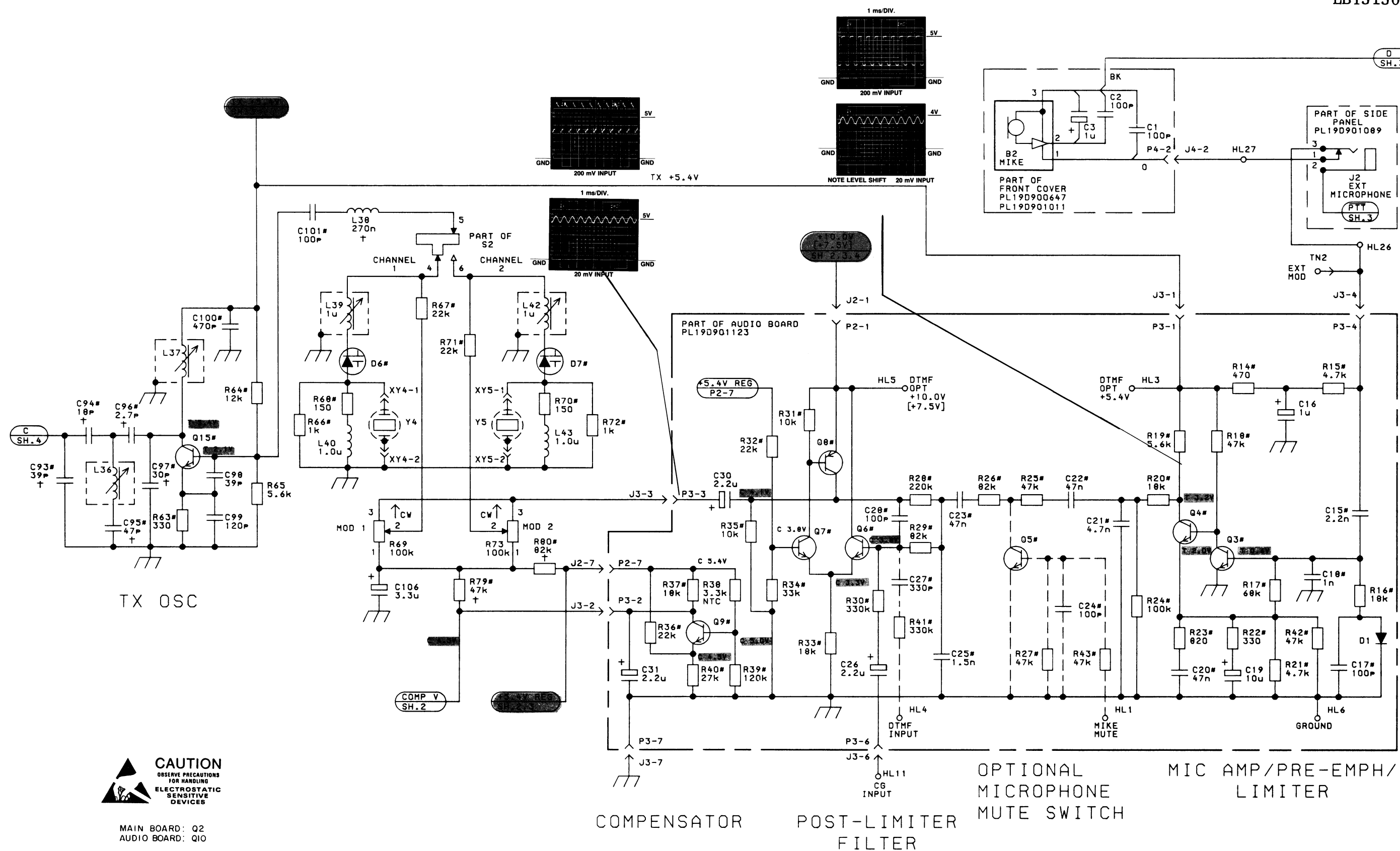
RC4427 SH.2





(19D901014, Sh. 4, Rev. 0)

RC4427 SH 4



RC 4427 SH. 5

SCHEMATIC DIAGRAM

403-512 MHz TX

Sheet 5

Issue 1

19

PARTS LIST

2/4 WATT TRANSMIT/RECEIVE BOARD
19D901012G1 450-470 MHz
19D901012G2 470-494 MHz
19D901012G3 489-512 MHz
19D901012G4 403-425 MHz
19D901012G5 420-450 MHz
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
A1		FILTER BOARD 19B801039G1
		- - - - - CAPACITORS - - - - -
C1	19A700219P14	Ceramic: 3.3 pF $\pm 5\%$, 100 VDCW, temp coef 0 PPM.
C2	19A700219P40	Ceramic: 22 pF $\pm 10\%$, 100 VDCW, temp coef 0 PPM.
C3	19A700219P12	Ceramic: 2.7 pF $\pm 5\%$, 100 VDCW, NPO.
C4	19A700219P20	Ceramic: 5.6 pF $\pm 5\%$, 100 VDCW, temp coef 0 PPM.
		- - - - - DIODES - - - - -
D1	19A702411P1	Silicon; sim to Hewlett Packard 5082-3188.
		- - - - - INDUCTORS - - - - -
L1	19A702472P3	Coil.
L2	19A702472P1	Coil.
		- - - - - CAPACITORS - - - - -
C1	19A702061P11	Ceramic: 6.8 pF ± 0.5 pF, 50 VDCW, temp coef 0 ± 60 PPM. (Used in G4).
C1	19A702061P10	Ceramic: 5.6 pF ± 0.5 pF, 50 VDCW, temp coef 0 ± 60 PPM. (Used in G1-G3, G5).
C2	19A702061P11	Ceramic: 6.8 pF ± 0.5 pF, 50 VDCW, temp coef 0 ± 60 PPM. (Used in G1, G2, G5).
C2	19A702061P12	Ceramic: 8.2 pF ± 0.5 pF, 50 VDCW, temp coef 0 ± 60 PPM. (Used in G4).
C2	19A702061P908	Ceramic: 3.9 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G3).
C3	19A702061P906	Ceramic: 2.7 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G1-G3).
C3	19A702061P907	Ceramic: 3.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G4 & G5).
C4	19B800873P7	Variable, ceramic: 0.5 to 2.5 pF, 150 VDCW; sim to Johanson 9620. (Used in G1-G3).
C4	19B800873P8	Variable, ceramic: 1 to 5 pF, 150 VDCW; sim to Johanson 9621. (Used in G4 & G5).
C5	19A702061P906	Ceramic: 2.7 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G1-G3).
C5	19A702061P907	Ceramic: 3.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G4 & G5).
C6 and C7	19A702061P69	Ceramic: 220 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C8	19A702061P902	Ceramic: 1.2 pF $\pm .25$ pF, 50 VDCW, 0 ± 250 PPM. (Used in G1).
C8	19A702236P5	Ceramic: 0.9 pF $\pm .1$ pF, 50 VDCW, 0 ± 30 PPM. (Used in G2).
C8	19A702236P1	Ceramic: 0.5 pF $\pm .1$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C8	19A702061P904	Ceramic: 1.8 pF $\pm .25$ pF, 50 VDCW, 0 ± 250 PPM. (Used in G4 & G5).
C9	19B800873P8	Variable, ceramic: 1 to 5 pF, 150 VDCW; sim to Johanson 9621.
C10 and C11	19A702052P14	Ceramic: 0.01 uF $\pm 10\%$, 50 VDCW.
C12	19A702168P4	Variable, ceramic: 5.2 to 30 pF, 100 VDCW, temp coef N750+300 PPM; sim to JFD DV2SN30D.
C13	19A702061P21	Ceramic: 15 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C14	19A702061P29	Ceramic: 22 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
C15	19A702061P33	Ceramic: 27 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C16	19A702061P23	Ceramic: 16 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C19	19A702061P61	Ceramic: 100 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1 - G3).
C19	19A702061P53	Ceramic: 68 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C19	19A702061P65	Ceramic: 150 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C20	19A702061P77	Ceramic: 470 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C21	19A700226P50	Ceramic: 39 pF $\pm 5\%$, 100 VDCW, temp coef 0 ± 750 PPM. (Used in G1-G3, G5).
C21	19A700227P50	Ceramic: 39 pF $\pm 5\%$, 100 VDCW, temp coef 0 ± 1500 PPM. (Used in G4).
C22	19A700229P68	Ceramic: 120 pF $\pm 5\%$, 100 VDCW, temp coef 0 ± 3300 PPM. (Used in G5).
C22	19A700228P59	Ceramic: 68 pF $\pm 5\%$, 100 VDCW, temp coef 0 ± 2200 PPM. (Used in G1-G3).
C22	19A700228P68	Ceramic: 120 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 2200 PPM. (Used in G4).
C23	19A702061P29	Ceramic: 22 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C23	19A702061P21	Ceramic: 15 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2 & G3).
C23	19A702061P35	Ceramic: 30 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C23	19A702061P31	Ceramic: 24 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C24	19A702061P907	Ceramic: 3.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G1).
C24	19A702061P909	Ceramic: 4.7 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 60 PPM. (Used in G2-G5).
C25	19A702168P1	Variable, ceramic: 2 to 7 pF, 100 VDCW; sim to JFD DV2SN7A.
C26	19A702061P902	Ceramic: 1.2 pF $\pm .25$ pF, 50 VDCW, 0 ± 250 PPM.
C27	19A702061P21	Ceramic: 15 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C27	19A702061P17	Ceramic: 12 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2).
C27	19A702061P19	Ceramic: 13 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C27	19A702061P29	Ceramic: 22 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C27	19A702061P25	Ceramic: 18 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C28	19A702061P13	Ceramic: 10 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C29	19A702061P69	Ceramic: 220 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C30	19A702061P906	Ceramic: 2.7 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G1 & G5).
C30	19A702061P904	Ceramic: 1.8 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 250 PPM. (Used in G2 & G3).
C30	19A702061P907	Ceramic: 3.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G4).
C31	19A702061P69	Ceramic: 220 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C32	19A702061P907	Ceramic: 3.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G1).
C32	19A702061P906	Ceramic: 2.7 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G2 & G3).
C32	19A702236P16	Ceramic: 4.3 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C32	19A702061P908	Ceramic: 3.9 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 120 PPM. (Used in G5).
C33	19A702236P1	Ceramic: 0.5 pF $\pm .1$ pF, 50 VDCW, temp coef 0 ± 30 PPM.
C34	19A702061P903	Ceramic: 1.5 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 250 PPM.
C35	19A702052P10	Ceramic: 4700 pF $\pm 10\%$, 50 VDCW.

SYMBOL	GE PART NO.	DESCRIPTION
C36	19A702061P37	Ceramic: 33 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C37	19A702061P61	Ceramic: 100 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C38 thru C40	19A702052P26	Ceramic: 0.1 uF $\pm 10\%$, 50 VDCW.
C41	19A702061P13	Ceramic: 10 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C42	19A702061P61	Ceramic: 100 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C43	19B800755P4	Electrolytic: 10 uF $\pm 20\%$, 16 VDCW.
C44	19A702052P28	Ceramic: 0.022 uF $\pm 10\%$, 50 VDCW.
C45	19A702052P105	Ceramic: 1000 pF $\pm 5\%$, 50 VDCW.
C46	19A702052P110	Ceramic: 4700 pF $\pm 5\%$, 50 VDCW.
C47	19A702052P112	Ceramic: 6800 pF $\pm 5\%$, 50 VDCW.
C48	19A702052P14	Ceramic: 0.01 uF $\pm 10\%$, 50 VDCW.
C49	19A702052P26	Ceramic: 0.1 uF $\pm 10\%$, 50 VDCW.
C51	19A700003P9	Tantalum: 47 uF $\pm 20\%$, 6.3 VDCW.
C52 and C53	19A702061P61	Ceramic: 100 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C54	19A702236P25	Ceramic: 10 pF $\pm .5$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C54	19A702236P23	Ceramic: 8.2 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2).
C54	19A702236P20	Ceramic: 6.2 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C54	19A702236P28	Ceramic: 12 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4 & G5).
C55	19A702236P15	Ceramic: 3.9 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C55	19A702236P23	Ceramic: 8.2 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C55	19A702236P19	Ceramic: 5.6 pF $\pm .5$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C56	19B800873P3	Variable, ceramic: 2.5 to 10 pF, 150 VDCW; sim to Johanson 9611.
C57	19A702236P50	Ceramic: 100 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM.
C58	19A702236P28	Ceramic: 12 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C58	19A702236P25	Ceramic: 10 pF $\pm .5$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2).
C58	19A702236P23	Ceramic: 8.2 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C58	19A702236P30	Ceramic: 15 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4 & G5).
C59	19A702236P40	Ceramic: 39 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C59	19A702236P39	Ceramic: 36 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2).
C59	19A702236P38	Ceramic: 33 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C59	19A702236P42	Ceramic: 47 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C59	19A702236P41	Ceramic: 43 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C60	19A702236P41	Ceramic: 43 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G5).
C60	19A702236P40	Ceramic: 39 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G1).
C60	19A702236P38	Ceramic: 33 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G3).
C60	19A702236P39	Ceramic: 36 pF $\pm .25$ pF, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G2).
C60	19A702236P42	Ceramic: 47 pF $\pm 5\%$, 50 VDCW, temp coef 0 ± 30 PPM. (Used in G4).
C61	19A700003P4	Tantalum: 1 uF $\pm 20\%$, 35 VDCW.
C63	19B800873P3	Variable, ceramic: 2.5 to 10 pF, 150 VDCW; sim to Johanson 9611.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION
C65	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2-G3).	C93	19A702061P43	Ceramic: 43 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	D8	19A702015P3	Silicon; sim to IN458A.	L25	19A700024P1	Coil, RF: 100 nH ±10%, 0.08 ohms DC res max, 100 v.
C65	19A702236P35	Ceramic: 24 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	C94	19A702061P25	Ceramic: 18 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1-G3).	D9	19A700079P1	Silicon; sim to BBY 31.	L26	19A702474P4	Coil.
C65	19A702236P34	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5).	C94	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	D10	19A700155P1	Silicon; sim to Bat 18.	L27	19A700024P1	Coil, RF: 100 nH ±10%, 0.08 ohms DC res max, 100 v.
C65	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).	C94	19A702061P29	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5).	F1	19A702169P9	Enclosed link: rated 3 amps @ 125 v; sim to Littelfuse 255003.	L28	19A700024P13	Coil, RF: 1.0 uH ±10%.
C66	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C95	19A702061P45	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1-G3, G5).	J1	19B801108G1	Connector, coax: BNC Series, 500 VRMS.	L29 and L30	19A702474P5	Coil.
C67	19A703324P2	Electrolytic: 2.2 uF ±20%, 50 VDCW.	C95	19A702061P49	Ceramic: 56 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	J2 and J3	19A703248P4	Contact, electrical. (Quantity 7 each).	L31	19A700024P13	Coil, RF: 1.0 uH ±10%.
C68	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.	C96	19A702061P906	Ceramic: 2.7 pF ±.25 pF, 50 VDCW, temp coef 0 ±120 PPM. (Used in G1, G2, G5).	J4	19A703248P1	Contact, electrical. (Quantity 4).	L32	19A702474P1	Coil.
C70	19A702168P2	Variable, ceramic: 3 to 11 pF 100 VDCW, temp coef N450+300 PPM; sim to JFD DV2SN11C.	C96	19A702061P905	Ceramic: 2.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±250 PPM. (Used in G3).	J5 and J6	19A703248P1	Contact, electrical.	L33	19A700024P13	Coil, RF: 1.0 uH ±10%.
C71	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1, G2, & G5).	C96	19A702061P907	Ceramic: 3.3 pF ±.25 pF, 50 VDCW, temp coef 0 ±120 PPM. (Used in G4).	J8	19A703248P1	Contact, electrical.	L34 and L35	19C850826P212	Coil, RF: sim to Paul Smith SK-800-1.
C71	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	C97	19A702061P35	Ceramic: 30 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).	J9	19A703248P4	Contact, electrical.	L36	19C850826P612	Coil, RF; sim to Paul Smith SK-800-1.
C71	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).	C97	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2, G3).	J10	19A703248P1	Contact, electrical.	L37	19C850826P312	Coil, RF: sim to Paul Smith SK-800-1.
C72	19A702061P45	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C97	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	J12 and J13	19A703248P1	Contact, electrical.	L38	19A700024P6	Coil. (Used in G1, G2)
C73	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C97	19A702061P39	Ceramic: 36 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5).	L1	19A702472P32	Coil. (Used in G2, G3).	L38	19A700024P5	Coil, RF: 220 nH ±10%. (Used in G3)
C74	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.	C98	19A700227P50	Ceramic: 39 pF ±5%, 100 VDCW, temp coef 0 ~1500 PPM. (Used in G1, G4).	L1	19A702472P33	Coil. (Used in G4, G5).	L38	19A700024P9	Coil, RF: 470 nH ±10%. (Used in G4)
C75	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C98	19A700226P50	Ceramic: 39 pF ±5%, 100 VDCW, temp coef 0 ~750 PPM. (Used in G2, G5).	L2	19A702472P30	Coil.	L38	19A700024P8	Coil, RF: 390 nH ±10%. (Used in G5)
C76	19A702061P45	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C98	19A700228P50	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ~2200 PPM. (Used in G3).	L3	19C850826P211	Coil, RF: sim to Paul Smith SK-800-1.	L39	19A703602G1	Coil, RF. Includes 19B800827P24 tuning slug.
C78	19A702168P1	Variable, ceramic: 2 to 7 pF, 100 VDCW; sim to JFD DV2SN7A.	C99	19A700229P68	Ceramic: 120 pF ±5%, 100 VDCW, temp coef 0 ~3300 PPM. (Used in G1, G2).	L4 and L5	19A702472P3	Coil. (Used in G1, G2, G4, G5).	L40	19A700024P13	Coil, RF: 1.0 uH ±10%.
C79	19A702061P3	Ceramic: 1.5 pF ±0.5 pF, 50 VDCW, temp coef 0 ±250 PPM.	C99	19A700227P68	Ceramic: 120 pF ±5%, 50 VDCW, temp coef 0 ~1500 PPM. (Used in G3).	L4 and L5	19A702472P32	Coil. (Used in G3).	L42	19A703602G1	Coil, RF. Includes 19B800827P24 tuning slug.
C80	19A702061P7	Ceramic: 3.3 pF ±0.5 pF, 50 VDCW, temp coef 0 ±120 PPM.	C99	19A700228P68	Ceramic: 120 pF ±5%, 50 VDCW, temp coef 0 ~2200 PPM. (Used in G4).	L6	19A700024P15	Coil, RF: 1.5 uH ±10%.	L43	19A700024P13	Coil, RF: 1.0 uH ±10%.
C81	19A702168P1	Variable, ceramic: 2 to 7 pF, 100 VDCW; sim to JFD DV2SN7A.	C99	19A700230P68	Ceramic: 120 pF ±5%, 50 VDCW, temp coef 0 ~4200 PPM. (Used in G5).	L7 and L8	19A700024P13	Coil, RF: 1.0 uH ±10%. (Used in G1-G3).	L44	19A702472P34	Coil. (Used in G2, G3).
C82	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C100	19A702052P3	Ceramic: 470 pF ±10%, 50 VDCW.	L7 and L8	19A700024P14	Coil, RF: 1.2 uH ±10%. (Used in G4, G5).	L44	19A702472P7	Coil. (Used in G1, G4, G5).
C83	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.	C101 and C102	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	L9	19A700024P11	Coil, RF: 680 nH ±10%. (Used in G1, G2).	L45	19A703161P2	Coil. (Used in G1, G2, G4, G5).
C84	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	C103	19A702236P6	Ceramic: 1.0 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM.	L10	19A702472P24	Coil.	L45	19A703161P1	Coil. (Used in G3).
C85	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1-G3, G5).	C104	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	L11	19A702472P26	Coil. (Used in G1, G4, G5).	L46	19A700024P13	Coil, RF: 1.0 uH ±10%.
C85	19A702061P43	Ceramic: 43 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	C106	19B800650P15	Tantalum: 3.3 uF ±20%, 10 VDCW.	L11	19A702472P25	Coil. (Used in G2 & G3).	L47	19A700024P13	Coil, RF: 1.0 uH ±10%.
C86	19A702061P29	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1-G3).	C108	19A700219P18	Ceramic: 4.7 pF ±5%, 100 VDCW, temp coef 0 PPM. (Used in G2, G3).	L12	19A700024P3	Coil, RF: 150 nH ±10%. (Used in G1, G4, G5).	L48 and L49	19A703602G1	Coil, RF. Includes 19B800827P24 tuning slug.
C86	19A702061P31	Ceramic: 24 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4 & G5).	C108	19A700219P22	Ceramic: 6.8 pF ±5%, 100 VDCW, temp coef 0 PPM. (Used in G1, G4, G5).	L13	19A700024P10	Coil, RF: 560 nH ±10%. (Used in G3).	L50	19A700024P13	Coil, RF: 1.0 uH ±10%.
C87	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).	C109	19A116192P14	Ceramic: 0.1 uF ±20%, 50 VDCW; sim to Erie USCC CW20C104-M2.	L14	19C850826P221	Coil, RF: sim to Paul Smith SK-800-1.	- - - - - TRANSISTORS - - - - -		
C87	19A702061P37	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2 & G3).	C110	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1, G2, G5).	L15	19C850826P211	Coil, RF: sim to Paul Smith SK-800-1.	Q1	19A702413P1	Silicon, NPN; sim to Phillips BFR92.
C87	19A702061P47	Ceramic: 51 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	C110	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).	L16	19A702213P1	Coil, RF: 1.0 mH ±6%; sim to TOKO 126AN-A5318HM.	Q2	19A703795P1	N Type: field effect; sim to MMBF4416.
C87	19A702061P43	Ceramic: 43 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5).	C110	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).	L17	19A700024P13	Coil, RF: 1.0 uH ±10%.	Q3	19A700092P2	Silicon, NPN.
C88	19A702061P7	Ceramic: 3.3 pF ±0.5 pF, 50 VDCW, temp coef 0 ±120 PPM.	- - - - - DIODES - - - - -			L18	19A702988P1	Coil.	Q4	19A700236P2	Silicon, NPN; sim to BFS17.
C89	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1 & G2).	D1	19A700155P1	Silicon; sim to Bat 18.	L19	19A702473G1	Coil.	Q5	19A700092P2	Silicon, NPN.
C89	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G3).	D2	19A700079P3	Silicon; sim to BBY 31.	L20	19A702472P8	Coil.	Q6	19A700076P2	Silicon, NPN.
C89	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4 & G5).	D4 and D5	19A702015P1	Silicon; sim to IN458A.	L22	19A700024P13	Coil, RF: 1.0 uH ±10%.	Q7 and Q8	19A700026P1	Silicon, PNP.
C90 and C91	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.	D6 and D7	19A700079P3	Silicon; sim to BBY 31.	L23	19A702472P3	Coil.	Q9	19A702448P1	Silicon, NPN; sim to 2N5945.
C92	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.				L24	19A700024P13	Coil, RF: 1.0 uH ±10%.	Q10	19A701940P3	Silicon, NPN; sim to SRF-516.
C93	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1-G3, G5).							Q11	19A701808P1	Silicon, NPN; sim to MPS 6595.

SYMBOL	GE PART NO.	DESCRIPTION
R4	19B800607P332	Metal film: 3.3K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R5	19B800607P750	Metal film: 75 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R6	19B800607P152	Metal film: 1.5K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R7	19B800607P750	Metal film: 75 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R8 and R9	19B800607P102	Metal film: 1K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R10	19B800607P121	Metal film: 120 ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R10	19B800607P181	Metal film: 180 ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R11	19A702585P41	Composition: 120 ohms $\pm 5\%$, 150 VDCW. (Used in G1-G3).
R11	19A702585P45	Composition: 180 ohms $\pm 5\%$, 150 VDCW, 1/8 w. (Used in G4, G5).
R12	19B800607P822	Metal film: 8.2K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R13	19B800607P562	Metal film: 5.6K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R14	19B800607P750	Metal film: 75 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R15	19B800607P561	Metal film: 560 ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R15	19B800607P391	Metal film: 390 ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R16	19B800607P104	Metal film: 100K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R17	19A702585P89	Composition: 12K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R18	19B800607P750	Metal film: 75 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R19	19B800607P101	Metal film: 100 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R20	19B800607P102	Metal film: 1K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R21	19B800607P273	Metal film: 27K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R22	19B800607P103	Metal film: 10K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R23	19A702585P85	Composition: 8.2K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R24	19B800607P104	Metal film: 100K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R25 and R26	19B800607P222	Metal film: 2.2K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R27	19B800607P473	Metal film: 47K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R28	19B800607P223	Metal film: 22K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R29	19B800607P153	Metal film: 15K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R30	19B800607P563	Metal film: 56K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R31	19B800607P682	Metal film: 6.8K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R32	19B800762P1	Variable, carbon film: 5K ohms $\pm 20\%$, 150 VDCW, .1 w; sim to TOCOS RPR124.
R34	19B800607P563	Metal film: 56K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R35	19B800607P823	Metal film: 82K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R36	19B800607P152	Metal film: 1.5K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R37	19B800607P821	Metal film: 820 ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Part of S1).
R40	19B800779P10	Variable: 10K ohms $\pm 25\%$, 100 VDCW, .3 watt.
R41	19B800607P471	Metal film: 470 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R42	19A702585P55	Composition: 470 ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R43	19A702585P59	Composition: 680 ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R44	19A702289P4	Metal film: 10 ohms $\pm 5\%$, 1/4 w; sim to Corning FP55.
R45	19B800607P101	Metal film: 100 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R47	19B800607P100	Metal film: 10 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R48	19A702585P39	Composition: 100 ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R51	19B800607P103	Metal film: 10K ohms $\pm 5\%$, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R52	19A702289P7	Metal film: 22 ohms $\pm 5\%$, 1/4 w.
R53	19A702289P7	Metal film: 22 ohms $\pm 5\%$, 1/4 w; sim to Corning FP55.
R53	19B800607P562	Metal film: 5.6K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R54	19A702585P63	Composition: 1K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R55	19B800607P103	Metal film: 10K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R56	19A702289P11	Metal film: 47 ohms $\pm 5\%$, 1/4 w; sim to Corning FP55.
R57	19A702585P87	Composition: 10K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R58	19A702585P63	Composition: 1K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R59	19B800607P560	Metal film: 56 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R60	19B800607P102	Metal film: 1K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R61	19B800607P103	Metal film: 10K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R62	19B800607P222	Metal film: 2.2K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R63	19B800607P331	Metal film: 330 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R64	19B800607P123	Metal film: 12K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R65	19A702585P81	Composition: 5.6K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R66	19B800607P102	Metal film: 1K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R67	19B800607P223	Metal film: 22K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R68	19B800607P151	Metal film: 150 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R69	19B800751P16	Variable, solid carbon: 100K ohms $\pm 25\%$, 0.05 w; sim to ALSP H0651A.
R70	19B800607P151	Metal film: 150 ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R71	19B800607P223	Metal film: 22K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R72	19B800607P102	Metal film: 1K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R73	19B800751P16	Variable, solid carbon: 100K ohms $\pm 25\%$, 0.05 w; sim to ALSP H0651A.
R74	19A702585P71	Composition: 2.2K ohms $\pm 5\%$, 150 VDCW, 1/8 w.
R77	19B800607P223	Metal film: 22K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R77	19B800607P183	Metal film: 18K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R78	19B800607P823	Metal film: 82K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R78	19B800607P683	Metal film: 68K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R79	19B800607P473	Metal film: 47K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R79	19B800607P273	Metal film: 27K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R80	19B800607P823	Metal film: 82K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G1-G3).
R80	19B800607P104	Metal film: 100K ohms $\pm 5\%$, 200 VDCW, 1/8 w. (Used in G4, G5).
R81	19B800607P123	Metal film: 12K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R82	19B800607P183	Metal film: 18K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
R83	19B800607P683	Metal film: 68K ohms $\pm 5\%$, 200 VDCW, 1/8 w.
S1	19B800762P3	Variable, carbon film: 10K ohms $\pm 20\%$, 150 VDCW, .1 w; sim to TOCOS PRP124S65.
S2	19A702244P1	Slide switch: DPDT, contact rating 1 mA @ 10 VDC; sim to Alps SSS02200.
U1	19A701780P1	Linear: IF AMPLIFIER AND DETECTOR.
U2	19A702536P2	Linear. POSITIVE VOLTAGE REGULATOR; sim to LM2931T.
XY1 and XY2	19A115834P1	Contact, electrical: sim to AMP 2-330808-8.

SYMBOL	GE PART NO.	DESCRIPTION
XY3	19A700042P3	Contact, electrical: sim to AMP 2-332070-2.
XY4 and XY5	19A115834P1	Contact, electrical: sim to AMP 2-330808-8.
Z1	19A702522G11	Crystal pair. (Includes Z2).
Z2		(Part of Z1).
Z3	19A702171P1	Bandpass filter: 455 ± 1.5 kHz; sim to Murata CFU455D2.
	19A702471P2	Crystal pad. (Used in Z1 & Z2).
	19A134793P1805	Screw, thread forming: No. 1-64 x 7/32. (Secures J1 mounting).
	19A702945P1	Shield.
	19D900639G2	Battery Pack. 7.5 volt
	19D900639G3	Battery Pack. 10 Volt.
		ASSOCIATED PARTS
		CRYSTALS
		NOTE: when reordering specify GE part number and exact frequency needed.
		$F_x = \frac{F_o - 21.4}{9}$
Y1 and Y2	19A702375G2	Quartz.
		$F_x = \frac{F_o}{8}$
Y3	19A702284G3	Quartz: 20945.000 kHz
Y4 and Y5	19A702375G1	Quartz.
		MISCELLANEOUS
	19B800886P3	Whip antenna. (403-470 MHz).
	19B800886P4	Whip antenna. (470-494 MHz).
	19B800886P5	Whip antenna. (489-512 MHz).
	19B800763P11	Helical antenna (403-425 MHz).
	19B800763P12	Helical antenna (420-450 MHz).
	19B800763P13	Helical antenna (450-470 MHz).
	19B800763P14	Helical antenna (470-494 MHz).
	19B800763P15	Helical antenna (489-512 MHz).
		SWITCHES
		Variable, carbon film: 10K ohms $\pm 20\%$, 150 VDCW, .1 w; sim to TOCOS PRP124S65.
		Slide switch: DPDT, contact rating 1 mA @ 10 VDC; sim to Alps SSS02200.
		INTEGRATED CIRCUITS
		Linear: IF AMPLIFIER AND DETECTOR.
		Linear. POSITIVE VOLTAGE REGULATOR; sim to LM2931T.
		SOCKETS
		Contact, electrical: sim to AMP 2-330808-8.

PARTS LIST

FRONT COVER
19D900647G1 STANDARD
19D900647G2 LICENSEE
19D900647G4 CGE OPTION
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
B1	19A134460P1	----- SPEAKERS AND MIKES ----- Loudspeaker, permanent magnet: 2 inches, 8 ohms ±10%, coil imp., 450 ±100 Hz resonance, 500 mW; sim to Pioneer A50AP13-01F.
		Microphone cartridge: 200-850 ohms output imp., 1.5 to 10 VDC; sim to Primo EM-60.
B2	19J706041P1	----- CAPACITORS ----- Ceramic: 100 pF ±10%, 100 VDCW, -5600 PPM temp coef.
C1 and C2	19A700232P64	Tantalum: 1 uF -20+40%, 10 VDCW.
C3	19B800650P13	----- PLUGS ----- Connector. Includes: Shell.
P4	19A702405P4	Contact, electrical.
W1	19A702405P28	Cable assembly. (Includes P4).
	19B800860G1	----- MISCELLANEOUS ----- Nameplate. (GENERAL ELECTRIC).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

HARDWARE KIT
19A702379G1 SINGLE/MULTI FREQ
19A702379G2 UHF
19A702379G3 HIGH BAND
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
	19A702471P3	Crystal pad. (Used with Y3).
	19A702471P2	Crystal pad. (Used with Y1, Y2, Y4, Y5).
	19A702332P1	Nut, slotted: M7 x .75. (Secures R32 & S1).
	19B800849P1	Washer, rectangular. (Located between ON-OFF switch and housing).
	19A702314P2	Knurled nut. (Secures J11).
	19A703007P212	Machine screw, Torx drive: M2.5-.45 x 12. (Secures rear cover below nameplates).
	19A702362P208	Machine screw, Torx drive: M2.5-.45 x 8. (Secures rear cover at top).
	19B800859P1	Knob, push on.
	19A702364P103	Machine screw, Torx drive: M2-.4 x 3. (Secures option cover).
	19A700032P1	Lockwasher, internal tooth: No. 2. (Secures option cover).
	19D900667P1	Option Cover.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

AUDIO BOARD
19D901123G1 STANDARD
19D901123G2 DTMF
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
	19A702052P120	----- CAPACITORS ----- Ceramic: 0.033 uF ±5%, 50 VDCW.
	19A702052P112	Ceramic: 6800 pF ±5%, 50 VDCW.
C1	19A702052P128	Ceramic: 0.022 uF ±5%, 50 VDCW.
C2 and C3	19A702052P12	Ceramic: 6800 pF ±10%, 50 VDCW.
C4	19A702844P1	Tantalum: 22 uF ±20%, 6.3 VDCW.
C5	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C6	19A702052P4	Ceramic: 680 pF ±10%, 50 VDCW.
C7	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDC.
C8	19B800755P7	Electrolytic: 100 uF ±20%, 10 VDCW.
C9	19B800755P4	Electrolytic: 10 uF ±20%, 16 VDCW.
C10	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C11	19A703324P1	Electrolytic: 22 uF ±20%, 16 VDCW.
C12 and C13	19A702052P107	Ceramic: 2200 pF ±5%, 50 VDCW.
C14	19A700003P4	Tantalum: 1 uF ±20%, 35 VDCW.
C15	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C16	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C17	19B800755P4	Electrolytic: 10 uF ±20%, 16 VDCW.
C18	19A702052P122	Ceramic: 0.047 uF ±5%, 50 VDCW.
C19	19A702052P110	Ceramic: 4700 pF ±5%, 50 VDCW.
C20	19A702052P122	Ceramic: 0.047 uF ±5%, 50 VDCW.
C21	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C22 and C23	19B800755P2	Electrolytic: 2.2 uF ±20%, 50 VDCW.
C24	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C25	19A702052P106	Ceramic: 1500 pF ±5%, 50 VDCW.
C26	19B800755P2	Electrolytic: 2.2 uF ±20%, 50 VDCW.
C27	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C28	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C30 and C31	19B800755P2	Electrolytic: 2.2 uF ±20%, 50 VDCW.
C32	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C33	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
	19A700028P1	----- DIODES ----- Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1N4148.
	19A700041P56	----- PLUGS ----- Printed wire: 7 contacts rated @ 2.5 amps; sim to Molex 22-02-2075.
D1 and D2	19A134739P2	----- TRANSISTORS ----- Silicon, NPN.
P2 and P3	19A700026P1	Silicon, PNP.
Q1	19A700076P2	Silicon, NPN.
Q2		
Q3 thru Q7		

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
Q8	19A700059P2	Silicon, PNP.
Q9	19A700076P2	Silicon, NPN.
Q10	19A702760P1	P type, field effect.
----- RESISTORS -----		
R1	19B800607P333	Metal film: 33K ohms ±5%, 200 VDCW, 1/8 w.
R2	19B800607P683	Metal film: 68K ohms ±5%, 200 VDCW, 1/8 w.
R3	19B800607P393	Metal film: 39K ohms ±5%, 200 VDCW, 1/8 w.
R4	19B800607P333	Metal film: 33K ohms ±5%, 200 VDCW, 1/8 w.
R5 and R6	19B800607P473	Metal film: 47K ohms ±5%, 200 VDCW, 1/8 w.
R7	19B800607P153	Metal film: 15K ohms ±5%, 200 VDCW, 1/8 w.
R8	19B800607P821	Metal film: 820 ohms ±5%, 200 VDCW, 1/8 w.
R9	19B800607P153	Metal film: 15K ohms ±5%, 200 VDCW, 1/8 w.
R10	19B800607P180	Metal film: 18 ohms ±5%, 200 VDCW, 1/8 w.
R11	19B800607P104	Metal film: 100K ohms ±5%, 200 VDCW, 1/8 w.
R13	19A702289P1	Metal film: 1 ohms ±5%, 1/4 w; sim to Corning FL55.
R14	19B800607P471	Metal film: 470 ohms ±5%, 200 VDCW, 1/8 w.
R15	19B800607P472	Metal film: 4.7K ohms ±5%, 200 VDCW, 1/8 w.
R16	19B800607P183	Metal film: 18K ohms ±5%, 200 VDCW, 1/8 w.
R17	19B800607P683	Metal film: 68K ohms ±5%, 200 VDCW, 1/8 w.
R18	19B800607P473	Metal film: 47K ohms ±5%, 200 VDCW, 1/8 w.
R19	19B800607P562	Metal film: 5.6K ohms ±5%, 200 VDCW, 1/8 w.
R20	19B800607P183	Metal film: 18K ohms ±5%, 200 VDCW, 1/8 w.
R21	19B800607P472	Metal film: 4.7K ohms ±5%, 200 VDCW, 1/8 w.
R22	19B800607P331	Metal film: 330 ohms ±5%, 200 VDCW, 1/8 w.
R23	19B800607P821	Metal film: 820 ohms ±5%, 200 VDCW, 1/8 w.
R24	19B800607P104	Metal film: 100K ohms ±5%, 200 VDCW, 1/8 w.
R25	19B800607P473	Metal film: 47K ohms ±5%, 200 VDCW, 1/8 w.
R26	19B800607P823	Metal film: 82K ohms ±5%, 200 VDCW, 1/8 w.
R27	19B800607P473	Metal film: 47K ohms ±5%, 200 VDCW, 1/8 w.
R28	19B800607P224	Metal film: 220K ohms ±5%, 200 VDCW, 1/8 w.
R29	19B800607P823	Metal film: 82K ohms ±5%, 200 VDCW, 1/8 w.
R30	19B800607P334	Metal film: 330K ohms ±5%, 200 VDCW, 1/8 w.
R31	19B800607P103	Metal film: 10K ohms ±5%, 200 VDCW, 1/8 w.
R32	19B800607P223	Metal film: 22K ohms ±5%, 200 VDCW, 1/8 w.
R33	19B800607P183	Metal film: 18K ohms ±5%, 200 VDCW, 1/8 w.
R34	19B800607P333	Metal film: 33K ohms ±5%, 200 VDCW, 1/8 w.
R35	19B800607P103	Metal film: 10K ohms ±5%, 200 VDCW, 1/8 w.
R36	19B800607P223	Metal film: 22K ohms ±5%, 200 VDCW, 1/8 w.
R37	19B800607P183	Metal film: 18K ohms ±5%, 200 VDCW, 1/8 w.
R38	19A701828P1	Thermistor: 3.3K ohms ±5%; sim to Philips 2322-642-63332.
R39	19B800607P124	Metal film: 120K ohms ±5%, 200 VDCW, 1/8 w.
R40	19B800607P273	Metal film: 27K ohms ±5%, 200 VDCW, 1/8 w.
R41	19B800607P334	Metal film: 330K ohms ±5%, 200 VDCW, 1/8 w.
R42 and R43	19B800607P473	Metal film: 47K ohms ±5%, 200 VDCW, 1/8 w.
R44	19B800607P102	Metal film: 1K ohms ±5%, 200 VDCW, 1/8 w.
R45	19B800607P471	Metal film: 470 ohms ±5%, 200 VDCW, 1/8 w.
----- INTEGRATED CIRCUITS -----		
U1	19A702410P1	Linear: Audio Amplifier; sim to TBA-820M.
----- MISCELLANEOUS -----		
	19A701622P1	Cotter pin. (Located between R15 & R19 - G2 only).
	19B232682P11	Ensolite pad.

PARTS LIST

SIDE PANEL
19D900646G1 1 FREQ
19D900646G3 2 FREQ
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
S1	19B800847P1	----- SWITCHES ----- Push switch: contacts rated 25 mA @ 9 VDC; sim to Bowmar KB3256-1D.
	19B800864G1	----- MISCELLANEOUS ----- Pushbutton.
	19C850854P1	Slide button.
	19A702460P1	Contact, electrical. (Quantity 2).
	19A702471P6	Crystal Pad.
	19A703672P1	Switch stop. (G1 only).

PARTS LIST

REAR COVER
19D901087G1 HB HIGH POWER
19D901087G2 UHF HIGH POWER
19D901087G3 HB LOW POWER
19D901087G4 UHF LOW POWER
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
P1	19B800852P1	----- PLUGS ----- Connector. Includes: Contact, electrical.
	19A701728P2	Washer, non-metallic.
	19A701488P2	Retaining ring.
	19B216401P5	Spring.
	19B800851P1	Insulator.
P2	19B800852P1	Connector. Includes: Contact, electrical.
	19A701728P2	Washer, non-metallic;
	19A701488P2	Retaining ring.
	19B216401P5	Spring.
	19A702405P26	Contact, electrical: rated @ 3 amps.
P3 and P4	19C850865P1	----- MISCELLANEOUS ----- Option receptacle.
	N327P9008E	Rivet, tubular.
	19A702471P6	Foam pad.
	19C850861P2	Insulator, glass epoxy

PARTS LIST

SIDE PANEL
19D901089G1 1 FREQ
19D901089G2 2 FREQ
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
J1 and J2	19A703304P1	----- JACKS ----- Telephone jack: rated 1/8 amp @ 125 VAC; sim to Switchcraft MDSL-280.
S1	19B800847P1	----- SWITCHES ----- Push switch: contacts rated 25 mA @ 9 VDC; sim to Bowmar KB3256-1D.
	19A702461P1	----- MISCELLANEOUS ----- Screw, thread forming: No. 0-40 x 1/4. (Secures slide button).
	19B800864G1	Pushbutton.
	19C850854P1	Slide button.
	19A702460P1	Contact, electrical. (Used with S1).
	19B232415P1	Bushing.
	19A702918P1	Support, slide button.
	19A702471P6	Crystal pad.
	19A703459P1	Spacer. (Located under slide button).

ADDENDUM NO.1 TO LBI31302

This addendum describes Revision Letter changes that are not yet included in the publication.

REV.A- Audio Board 19D901123G1,2

Incorporated in initial shipment.

REV.B-Audio Board 19D901123G1,2

To improve operation. Changed printed wiring.

REV.C-Audio Board 19D901123G1,2

To improve modulation balance on DTMF port, and to improve deviation symmetry.Changed R41,R42 and C27.

Components are:

R41; 19B800607P224,Metal film,220K ohms + 5%,200 VDCW,1/8 w.

R42; 19B800607P223,Metal film,22K ohms + 5%,200 VDCW, 1/8 w.

C27; 19A702061P77,Ceramic, 100 pF + 5%,50 VDCW, temp coef
0 +30 PPM.