MAINTENANCE MANUAL
RF BOARD
19D902243G4 (403-440 MHz)
19D902243G5 (440-470 MHz)
19D902243G6 (470-512 MHz)
FOR MVS

TABLE OF CONTENTS

DESCRIPTION

The RF Board for the MVS radio consists of the following circuits:

- A frequency synthesizer for generating the transmit carrier frequency and the receive circuit first mixer injection frequency.
- The transmit exciter, PA and power control stages.
- The receive circuit front end, IF, and FM detector.
- Voltage regulators.

The 403-512 MHz range of UHF frequencies is covered by three groups of RF Boards:

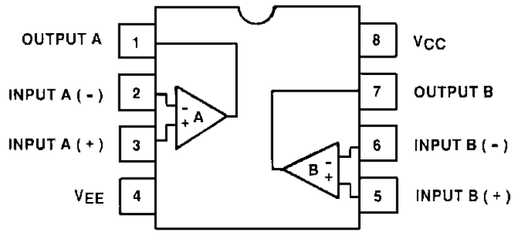
19D902243 G4: 403-440 MHz
19D902243 G5: 440-470 MHz
19D902243 G6: 470-512 MHz

The RF Board is mounted in the bottom of the frame assembly. Refer to Combination Manual for a mechanical layout of the radio. Figure 1 provides a block diagram of the receive and transmit circuits. Figure 2 provides a block diagram of the synthesizer.

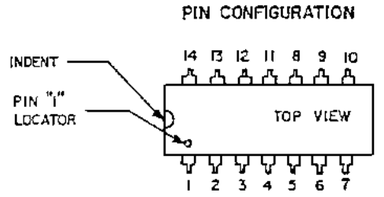
Transmit circuit adjustments for frequency, power and deviation are accessible from the topside of the board, as are IF alignment, second oscillator and audio level adjustments for the receive circuit. Chip components on the bottom of the board provide optimum RF performance, while being accessible for easy servicing by removing the "friction fit" bottom shields.

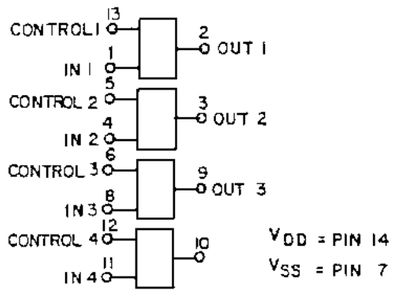
Selected use of sealed modules permits small board size as well as RF and mechanical protection for sensitive circuitry. Modules are not repairable and must be replaced if they are determined to be damaged.

OPERATIONAL AMPLIFIER
19A701789P2

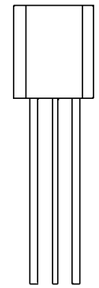


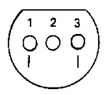
QUAD BILATERAL SWITCH
(U202)
19A700029P44





VOLTAGE REGULATOR
19A704971P1

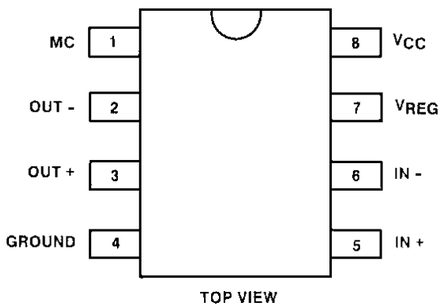




PIN INDENTIFICATION

PIN 1 ADJUST
PIN 2. OUTPUT
PIN 3. INPUT

DIVIDER
(U205)
19A704287P2



ERICSSON
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CIRCUIT ANALYSIS

SYNTHESIZER CIRCUIT

The synthesizer generates all transmit and receive RF frequencies. The circuit uses a phase-locked VCO module U201 feeding a doubler circuit. While transmitting, the VCO operates at 1/2 the actual transmitter frequency (201.5-256.0 MHz to produce 403-512 MHz). While receiving, the VCO operates at 1/2 of the difference between the receiver frequency and the 45 MHz IF (179.0-233.5 MHz for 403-512 MHz).

Q201 doubles the VCO output frequency with input and output filters broadly fixed tuned to allow the VCO second harmonic to pass while rejecting all other frequencies. The doubled signal is amplified by Q201 to a level of +10 dBm. This signal feeds the receiver mixer and is attenuated to +3 dBm by R202 to feed the transmitter exciter module.

The synthesizer frequency is controlled by the microprocessor on the Logic Board (A1). Frequency stability is maintained by a temperature compensated crystal controlled oscillator (TCXO) module. The oscillator has a stability of ±5 PPM (0.0005%) over the temperature range of -30°C to +60°C and determines the overall frequency stability of the radio. An optional high stability ±2.5 PPM oscillator module is available.

The VCO output is also buffered by Q204 to feed the divide by 128/129 dual modulus prescaler U205. The prescaler feeds the FIN input of the PLL U206. Within U206, the prescaled signal is further divided down to 6.25 kHz to be compared with a reference signal. This reference signal is derived from the 12.8 MHz TCXO module U204. U206 divides the 12.8 MHz TCXO down to the 6.25 kHz reference frequency.

Divider circuits in U206 are programmed by three inputs from the Logic Board (A 1), which are buffered and inverted by transistors Q208, Q209, and Q2I0. The S ENABLE pulse (5 milliseconds) activates switch U202 to allow more rapid channel acquisition during channel changes.

A LOCK DET signal from the PLL goes to the microprocessor for processing to prevent transmission when the VCO is not on frequency and to provide an error message to the user. During receive, an unlocked synthesizer is indicated by E0 (Error 0) in the LCD and by a quickly pulsed alert tone. The microprocessor will continually try to reload the frequency information into the PLL until the synthesizer locks. During transmit, only a slower pulsed alert tone will be heard.

Once unlocked in transmit, the synthesizer will not be reloaded. The transmitter PTT must be unkeyed and then rekeyed to attempt to relock.

Audio modulation from Audio Board A3 is applied to the VCO module through DEVIATION ADJUST potentiometer R226. VCO TUNE potentiometer R218 adjusts the operating frequency range of the VCO by varying a negative bias from D202 and D203.

TRANSMITTER CIRCUIT

The transmitter consists of a fixed-tuned exciter module, a 10 Watt PA module, a pin diode switch, a low pass filter, a directional coupler, a power control circuit, and a transmit voltage switch.

Exciter Module

Figure 1 shows the synthesizer driving the receiver mixer at +10 dBm and is attenuated by R202 to +3 dBm for driving the exciter input. The exciter module A102 operates from a switched 8 volt supply. A different exciter module is required for each of the three band splits. No tuning is required. Both input and output ports operate at 50 ohms impedance. The exciter module provides typically 20 dB of gain and 200 mW of output power to drive the power amplifier module.

Power Amplifier Module

The PA module U101 requires a drive of 200 mW from the exciter module to deliver up to 10 Watts power output. The module is mounted to the rear heatsink. The PA module output drives the 25 Watt PA Board through J103. The power control circuit controls the PA module output power.

Pin Diode Switch, Low Pass Filter, and Directional Coupler

The output from the 25 Watt PA Board feeds transmit pin diode switch D104 through J102. In transmit, switched 8 volts is applied through L102, turning on pin diodes D104 and D401. The DC path is completed through R401 and R402 with the bias current set at about 40 mA. D 104 couples the PA Board power from J102 to low pass filter A101. D401 provides a RF path to ground to protect the receiver input.

The low pass filter reduces the harmonic output from the transmitter. The low pass filter feeds the directional coupler, W101 and W102. The directional coupler provides a sample of transmitter power for the power control circuit. The coupler output feeds the antenna jack J101.

Power Control Circuit

The power control circuit samples the output power to the antenna to maintain a constant power level across the band. Also, a thermistor senses the heatsink temperature to throttle the power level down above 70°C. The circuit controls the supply voltage to one of the amplifier stages in the PA module Ul0l.

The directional coupler (Wl01 and W102) provides a sample of transmitter power to diode D101. D101, R106, and Cl04 produce a positive DC voltage proportional to the transmitter output power level. This DC level feeds the (-) input of amplifier U103-B. Power set pot R111 and thermistor R118 determine the DC level to the (+) input of U103-B. U103 -B amplifies the difference between the (-) and (+) inputs, forcing the output power level to equal the power set level by varying the drive to Q102 and Q101. Q101 supplies the control voltage to the PA module U101. For example, if the output power level begins to drop below the power set level, the output of U103-B increases positively, causing Q102 to conduct less. The base of Q101 rises, increasing the control voltage to the PA module, which increases the output power level back to the desired set level.

Q104, C123, and R105 improve the transient stability of the power control loop when the transmitter is keyed.

Transmit Switch

During transmit, the Logic Board (A1) microprocessor pulls the DPTT line low causing the output of U103-A to go low. Q103 turns on to supply SW 8V to the exciter module, the power control circuit and the pin diode switch. During receive, the output of U103-A supplies 12 volts to the receiver RF pre-amp Q40l.

RECEIVER CIRCUIT

The dual conversion receiver circuit consists of a front end section, a 45 MHz first IF, and a 455 kHz second IF with an FM detector. All audio processing and squelch functions are accomplished on the Audio Board (A3).

Front End Section

RF is coupled from antenna jack J101 through the directional coupler and the low pass filter to pin diode D401. In transmit, SW 8V is applied through L102, turning on pin diodes D104 and D401, with the DC path completed through R401 and R402. D401 provides a RF path to ground for the receiver input while in transmit. In receive, D401 is off allowing RF to pass by D401 unattenuated.

Receiver front end filtering is provided by RF filters Z40l and Z402. Both filters are fixed tuned 3-pole helical filters with 20 MHz bandwidths. These filters do not require tuning unless a different 20 MHz segment of the band split is required. RF amplifier transistor Q401 is a common emitter circuit with 15 dB gain. Inductor L402 and capacitors C405 and C406 provide a broadband match from Z401 to the transistor input. Diode D402 protects the amplifier from high input signal levels. Inductors L403 and L404 plus the associated capacitors provide a broadband impedance match from the amplifier output to RF filter Z402.

Test point TP401 is a 50-ohm point for measuring front end gain or to align the receiver to another 20 MHz segment of the band split. The front end gain from antenna jack J101 to TP401 is typically 10 dB.

The mixer, Z403, is a doubly balanced diode mixer. This mixer is driven by a local oscillator signal of +10 dBm or greater to provide good inter-modulation performance, spurious performance, and local oscillator isolation. The mixer conversion loss is typically about 6 dB.

45 MHz IF

The first 45 MHz 1F amplifier transistor Q501 is a junction FET operated in the common gate mode. This configuration offers a typical input impedance of 75 ohms. The output circuitry is tuned by L504 and loaded to provide the proper source termination for the four pole crystal filter which follows.

The output of the crystal filter is matched by second IF amplifier transistor Q502. This port is also tuned by L506 and loaded to provide the proper filter termination. Transistor Q502 is a dual gate FET operating at a bias current of about 10 milliamps. The output of Q502 is tuned by L507 for maximum gain at 45 MHz and is loaded by the 2nd mixer in the U501 chip. This Q502 stage has a relatively high input and output impedance and provides high isolation within the active device.

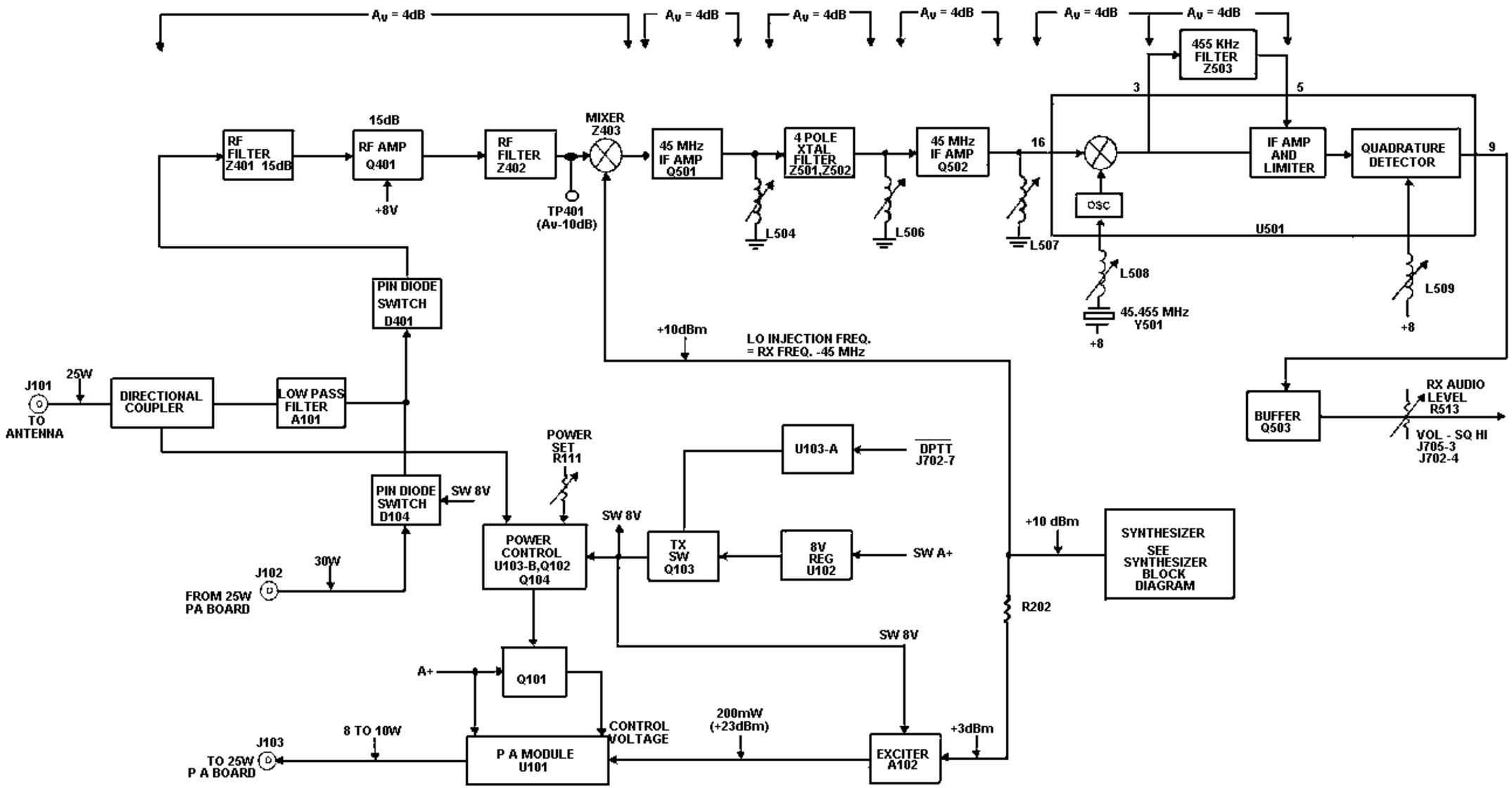
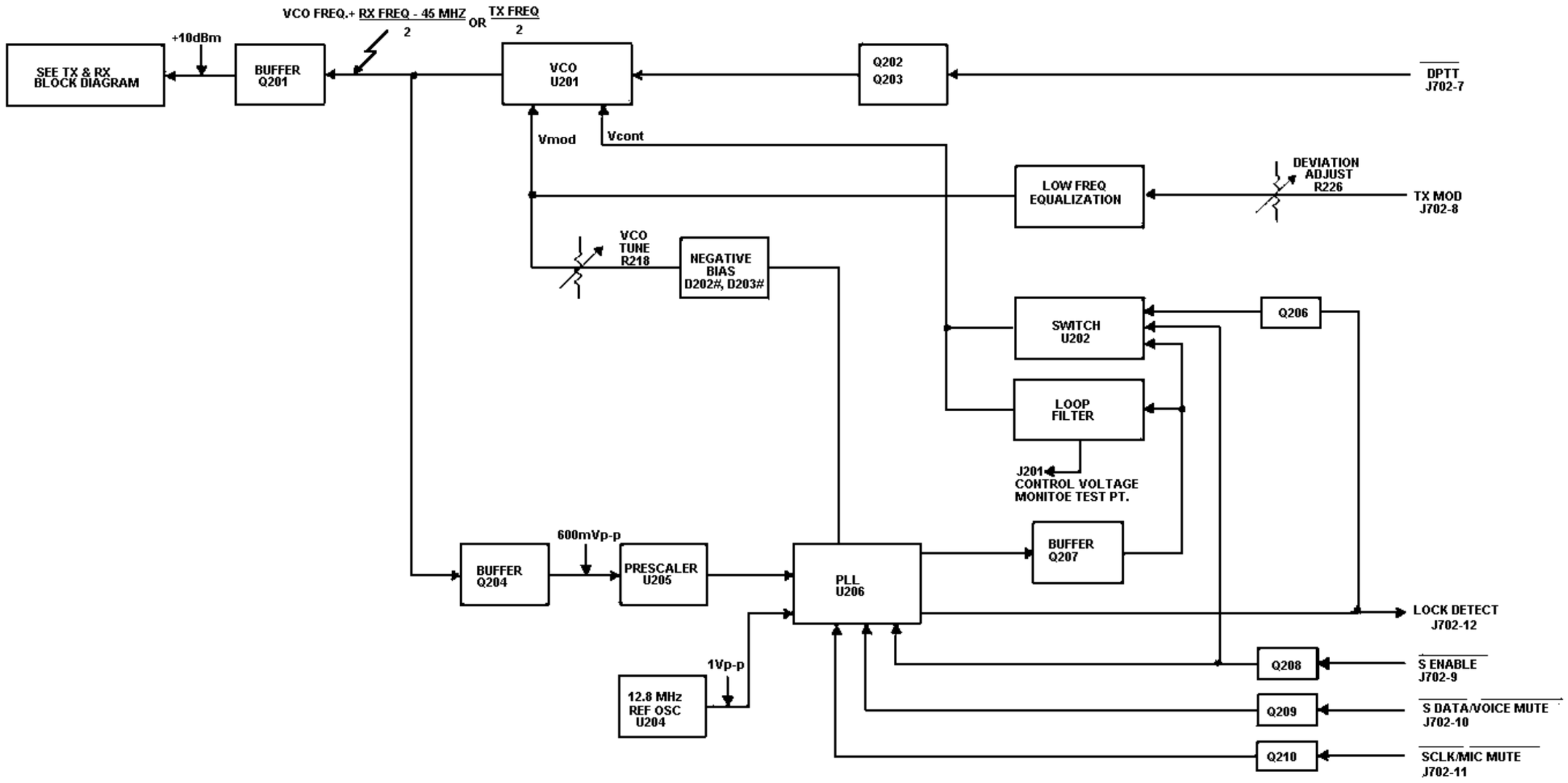


Figure 1 - TX And RX Block Diagram



RF BOARD

Figure 2 - Frequency Synthesizer Block Diagram

Converter/IF/Detector IC

IF IC U501 is a MC3361 chip. Pins 1 and 2 connect to an internally biased oscillator transistor. The external circuitry of this oscillator transistor includes crystal Y501 and forms an oscillator circuit operating at 45.455 MHz. The frequency of this third mode oscillator is adjusted by inductor L508. The oscillator drives the internal balanced mixer. The 45 MHz IF signal is translated to 455 kHz and appears at Pin 3 of U501. This IF signal is filtered by 6 pole ceramic filter Z503 and drives the internal 455 kHz amplifier and limiter. The limited 455 kHz in turn drives an internal quadrature detector. The phase shift network needed by the quadrature detector is provided by inductor L509. The audio output port is Pin 9 on U501. Inductor L509 is adjusted for maximum audio output level. The audio signal at Pin 9 is filtered by resistor R512 and capacitor C519 to reduce IF feedthrough. Buffer amplifier Q503, drives audio potentiometer R513. This allows a VOL/SQ Hl signal whose amplitude may be set for proper system operation using R513.

Power Distribution

Unswitched 13.8 Volts (A+) is supplied to the RF Board through connector J704 and feeds the power control transistor Q101, the PA module U101, and 20V transient suppressor Dl05. D105 protects the radio from noise spikes and other overvoltage transients appearing on the input power cable.

Switched 13.6 Volts (SW A+) is supplied to the RF Board through J702 and J705 and feeds regulators U102, U207, and U502. U102 supplies 8 Volts to the transmitter switch, the synthesizer 5 Volt regulator U203, and the Logic Board (Al) through J702. U207 supplies 8.3 Volts to the synthesizer. U502 supplies 8 Volts to the receiver.

SERVICE NOTES

TRANSMITTER CIRCUIT

Most transmitter circuit problems can be isolated by checking the TX power gains shown in Figure 1 - RX and TX Block Diagram. The 25 watt PA Board may be bypassed by placing a jumper cable between J103 and J102 on the RF Board. The PA module U101 is capable of producing 10 watts output.

Transmitter DC measurements

1. First ensure that DPTT is low when the mic PTT is keyed low.
2. Check for approximately 8 volts at L105 feeding the Exciter Module. If not present, troubleshoot the TX switch circuitry, Q103 and U103.
3. Check for approximately 7 volts across resistors R401 and R402. If not present, check the pin diodes D104 and D401 and the conduction path from R401 to the TX switch Q103.
4. Check for an adjustable voltage of 0 to 12 volts on pin 2 of the PA module U101. At maximum power, with Power Set adjustment R111 fully clockwise, pin 2 should be at I2 volts. lf not present, check the power control circuitry: U103, Q101, Q102, and QI04.
5. Check for 13.6 volts on pins 3 and 4 of the PA module U101, and ensure a good mechanical and electrical ground from the PA module to the bracket and casting.

RECEIVER CIRCUIT

To isolate a receiver circuit problem refer to the Receiver Circuit Symptoms and Checks chart.

RECEIVER FRONT END TUNING

Each receiver front end has been preset to a fixed 20 MHz segment of each split. To adjust the front end for another 20 MHz segment of the split, a sweep tuning procedure will be required to maintain the necessary bandwidth.

1. Apply a sweep signal generator (or tracking generator) with markers set for the desired 20 MHz bandwidth at the antenna jack J101.
2. Measure the RF signal at TP401 with a high impedance RF probe. A 50-ohm RF probe may be used at TP401 if coupling capacitor C415 is removed (if damaged, C415 may be replaced by a short piece of hookup wire).
3. Connect the RF sweep detector/display (or spectrum analyzer) to the RF probe.
4. Tune the slugs of Z401 and Z402 for the required 20 MHz bandwidth. Ripple will be 1 dB to 2 dB typical. Reduce the RF input level, if necessary, to keep Q401 out of saturation and protection diode D402 off. The filter response will not change at lower RF input levels if the front end has been tuned up correctly.

SYNTHESIZER CIRCUIT

Synthesizer troubleshooting consists of first checking for the proper DC levels, then determining if the proper waveforms are present and checking individual modules.

RECEIVER CIRCUIT SYMPTOMS AND CHECKS

SYMPTOMS	CHECKS
• No Audio	1. U502 regulator 2. The level and frequency of the first mixer injection frequency 3. The level and frequency of the second mixer injection frequency 4. Quadrature detector circuit 5. Quadrature detector coil tuning
• Poor SINAD	1. Consult Figure 1 - RX and TX Block Diagram for RX stage gains and troubleshoot. NOTE: Use high a impedance RF probe when measuring gain at TP401. A 50-ohm probe may be used if C415 is removed. DO NOT adjust Z401 or Z402 without sweep equipment or the 20 MHz sensitivity bandwidth will be sharply reduced. 2. Input cable 3. PIN Diode switch is shorted
• Distorted Audio	1. Both mixer injection frequencies 2 Quadrature detector coil tuning 3. Crystal filter source and load tuning 4. Z503-455 kHz ceramic filter

DC Analysis

8.3 Vdc is supplied by regulator U207 and serves as the biasing voltage for transistor circuits Q204, Q206, Q207, Q208, Q209, and Q210. Resistor R207 decouples the 8.3 volts for use in the VCO module U201. The 10 milliamp current drain of this module results in approximately 6.5 volts DC on Pin 4. Transistor Q20l also draws approximately 25 milliamps, resulting in a collector voltage of 3.7 volts DC at the junction of resistor R204 and capacitor C201. Lack of VCO RF output will modify this voltage.

Regulator U203 uses the 8 volts from transmitter regulator U102 to generate 5 volts for U204 and U205.

Waveforms

Waveforms associated with the synthesizer were measured with a 10 megohm, 30 pF probe. Use DC coupling (see Figures 3-8).

Module Isolation

Reference Oscillator U204:

Look for a waveform similar to the reference (Figure 3) on Pin 2. If waveform is not present, the oscillator module is probably defective.

VCO U201:

Connect a DC power supply to Pin 3. With 2.5 volts DC on pin 3, the output of U201 (pin 5) should be approximately 197 MHz. With 6.5 volts DC on pin 3, the output should be approximately 212 MHz. These values are correct for the 440-470 MHz split, with the ranges 179-197 MHz and 212-233 MHz being correct for the lower and upper split, respectively.

Power output of the VCO can be measured by connecting a coax directly to the module, between pin 5 and ground. The output should be approximately 0 dBm with C237 still connected in the circuit. In transmit, a negative bias should exist on pin 1. If not present, check Q202, Q203, and C206 before removing the VCO.

Prescaler U205:

Connect pin 3 of the VCO to 4.5 volts DC. With the radio in receive, monitor the frequencies of the VCO at the connection of capacitor C210 and resistor R211. DC short pin 1 of U205 to ground to cause divide by I29 to occur. The frequency output at pin 3 should be the VCO frequency divided by 129. Tie pin I to pin 7 (5 volts) to cause divide by 128 to occur. Check pin 3 to verify that this occurs. Improper division may indicate a defective prescaler.

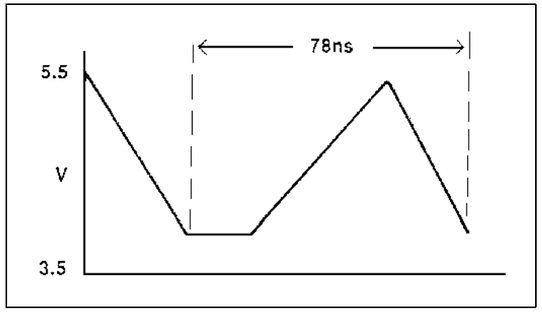


Figure 3 - REFERENCE OSCILLATOR (Input to U206, Pin 2)

Select a channel in the center of the band.

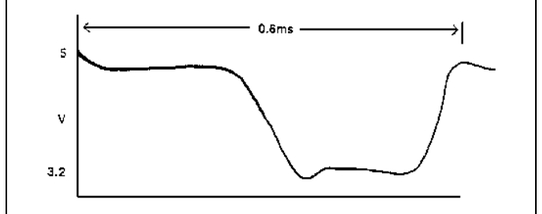


Figure 4 - F_{IN} (input to U206, Pin 10)

The top of the ramp is approximately 0.8 Volt DC greater than the control voltage on PD out, Pin 17. A channel in the center of the band is shown.

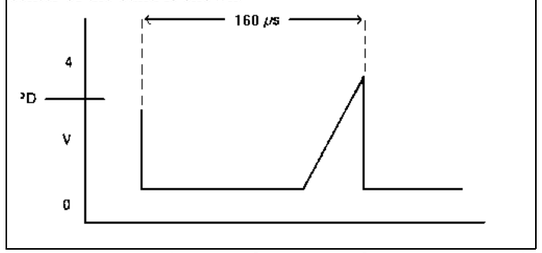


Figure 5 - RAMP (Generated in U206 and appears on Pin 15)

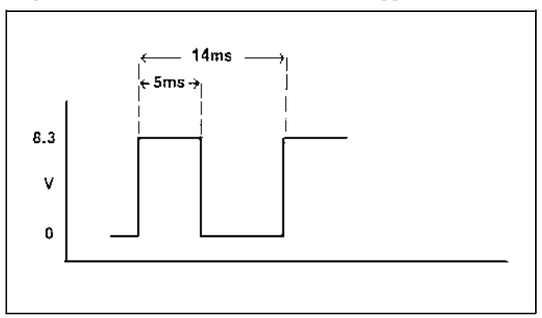


Figure 6 - S ENABLE (Input to U206, Pin 13) (Radio in

Clock pulses (32 appear as jitter on trailing edge of the waveform.

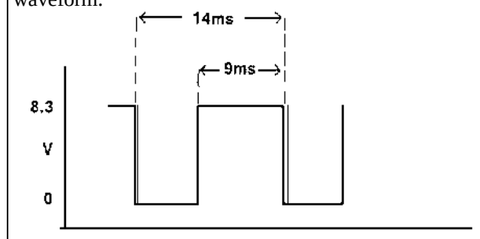


Figure 7 - S CLOCK (Input to U206, Pin 11) (Radio in SCAN on a single channel)

When expanded, data can be seen to be changing as two different bit patterns are loaded.

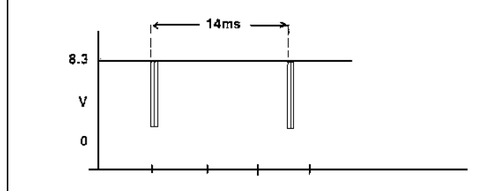


Figure 8 - S DATA (Input to U206, Pin 12) (Radio in SCAN on a single channel)

Bilateral Switch U202:

The bilateral switch is used to short around parts of the loop filter during channel scan. A shorted (to ground or adjacent gate) gate may be isolated by comparing voltages through the loop filter to those of a functioning radio. Defective gates might be suspected when the radio does not change frequency quickly enough.

Phase-Lock-Loop U206:

There are no other specific checks which aid in evaluation of U206. Usually, it is suspected only if all other checks are OK. Before changing, inspect chip components for mechanical damage and check resistances through the loop filter.

Transistor Q201:

After checking for proper DC operation, measure the frequency and gain from the VCO, pin 5 to R202/C203. The gain should be approximately 10 dB at 2 times the VCO frequency.

PA MODULE REPLACEMENT

To Remove PA Module U101

1. Unsolder the five leads from U101, using either solder removal braid, or a mechanical de-soldering tool. These leads are fragile and can be bent very easily. Do NOT unsolder the shield that wraps around the module.

2. Remove the RF Board from the radio chassis assembly. Refer to the disassembly procedure provided in the Service Section. Carefully slide the module out of the shield, and away from the board.

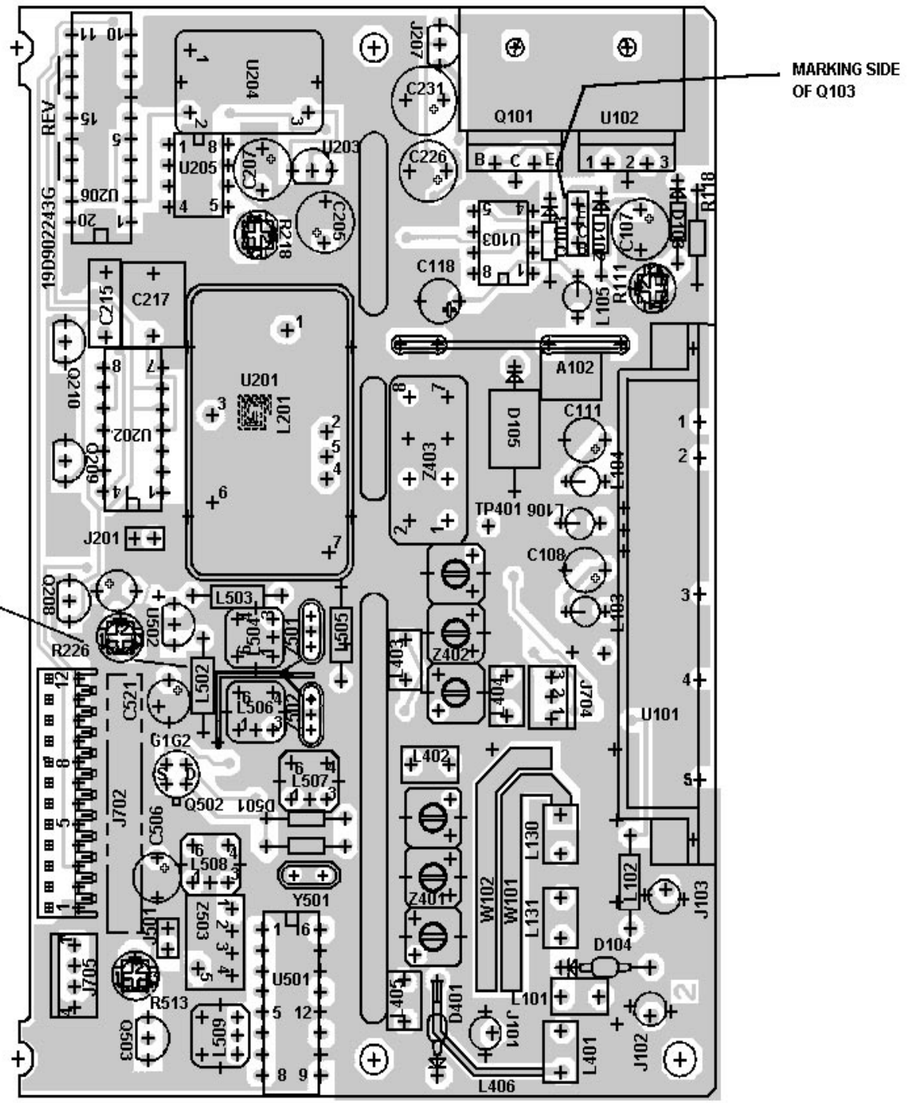
To install PA Module U101

1. Apply some silicone grease to the metal side of the replacement module.

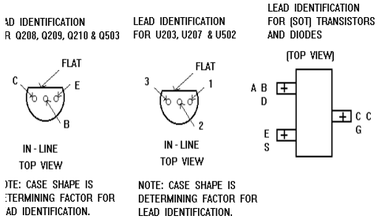
2. Carefully insert the five leads from the module into the five corresponding PWB holes, and slide the module into the shield. Do NOT solder the leads yet.

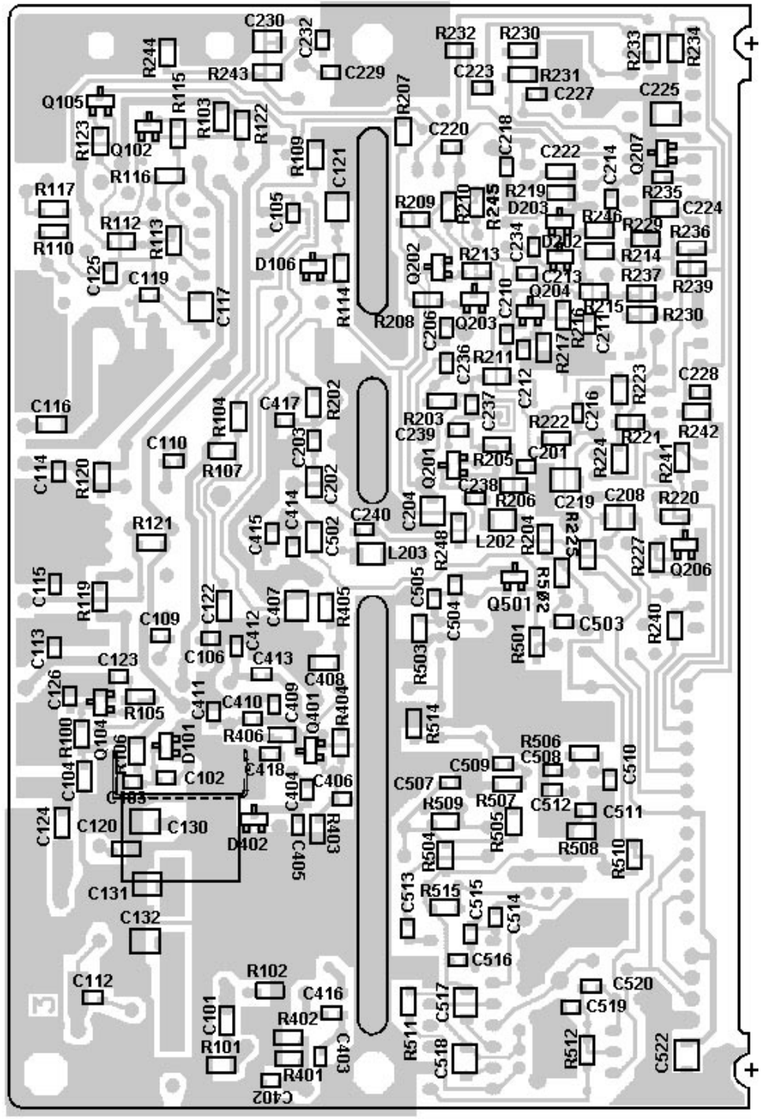
3. Slide the RF Board assembly back into the radio frame. Reinstall all hardware, harnesses, cables, etc. Replace all screws.

4. Install the two PA bracket screws before soldering the four module leads. Trim excess wire.



COMPONENT SIDE
(19D902443, Sh. 1, Rev. 5)
(19D902244, Component Side, Rev. 2)



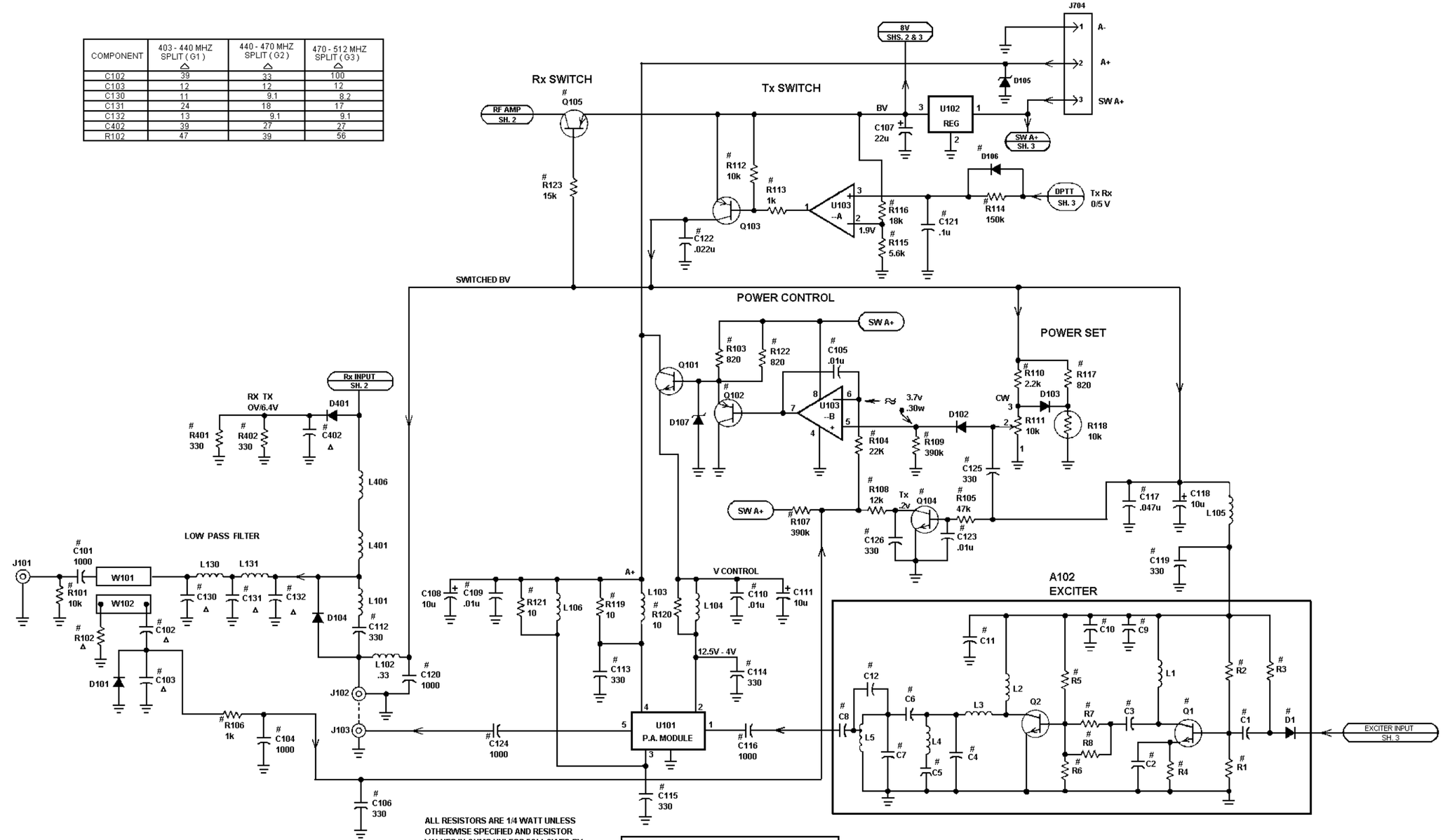


SOLDER SIDE
(19D902243, Sh. 1, Rev. 5)
(19D902244, Solder Side, Rev. 2)

4 THE FOLLOWING ITEMS ARE MOS DEVICES REQUIRING SPECIAL CARE PER 19A7-1294, U202, U205, U206, & Q502.

5 Z501 AND Z502 ARE A MATCHED PAIR OF CRYSTAL FILTERS WHICH MUST BE ORIENTATED WITH "B" RESONATOR AS SHOWN. "B" RESONATOR IS IDENTIFIED BY DOT ON CAN.

COMPONENT	403 - 440 MHZ SPLIT (G1) △	440 - 470 MHZ SPLIT (G2) △	470 - 512 MHZ SPLIT (G3) △
C102	39	33	100
C103	12	12	12
C130	11	9.1	8.2
C131	24	18	17
C132	13	9.1	9.1
C402	39	27	27
R102	47	39	56

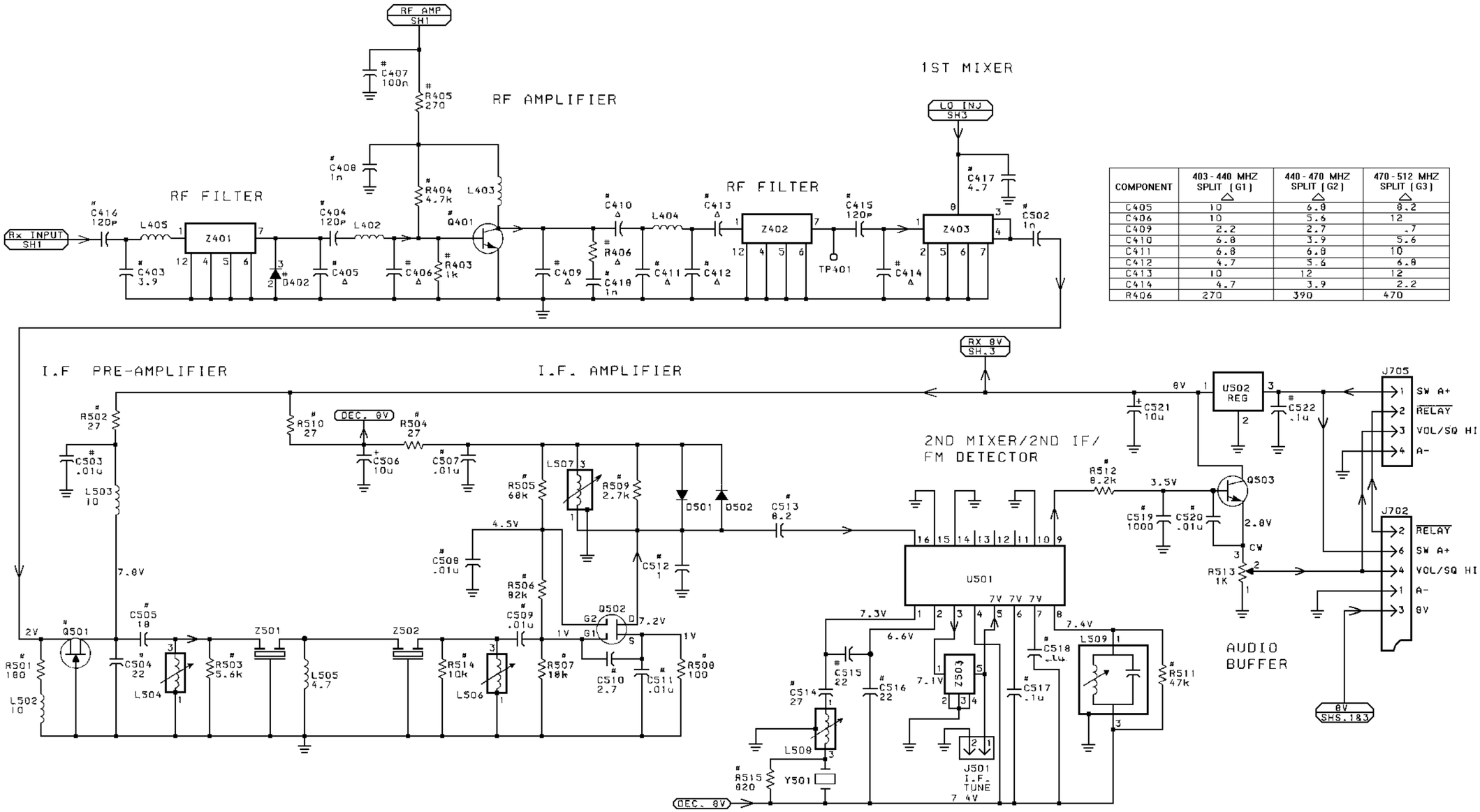


ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K-1000 OHMS OR M-1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL) TO MICROMICROFARADS) UNLESS FOLLOWED BY u-MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH-MILLIHENRYS, NH-NANOHENRYS OR H-HENRYS.

MODEL NO.	REV. LETTER
19D902243G1	C
19D902243G2	B
19D902243G3	B

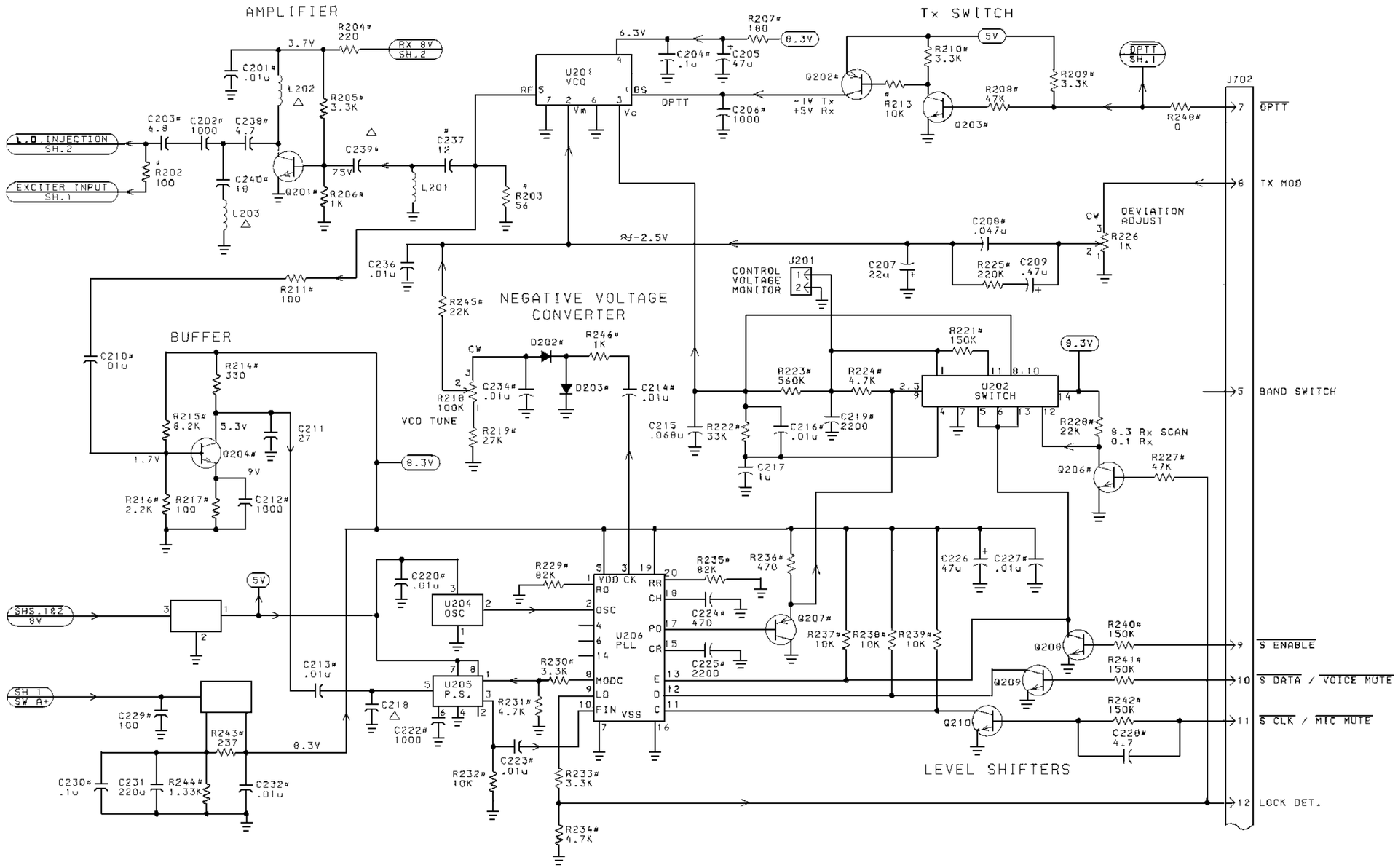
(19D902245, Sh. 1, Rev. 5)

RF BOARD



COMPONENT	403 - 440 MHZ SPLIT (G1) △	440 - 470 MHZ SPLIT (G2) △	470 - 512 MHZ SPLIT (G3) △
C405	10	6.8	8.2
C406	10	5.6	12
C409	2.2	2.7	.7
C410	6.8	3.9	5.6
C411	6.8	6.8	10
C412	4.7	5.6	6.8
C413	10	12	12
C414	4.7	3.9	2.2
R406	270	390	470

(19D902245, Sh. 2, Rev. 2)



COMPONENT	403-440 MHZ SPLIT (G1) △	440-470 MHZ SPLIT (G2) △	470-512 MHZ SPLIT (G3) △
L202	27NH	27NH	22NH
L203	27NH	27NH	22NH
C239	8.2	8.2	6.8
C218	27	22	22

(19D902245, Sh. 3, Rev.1)

RF BOARD

PARTS LIST

RF BOARD
19D902243G4 - 403-440 MHz
19D902243G5 - 440-470 MHz
19D902243G6 - 470-512 MHz
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - ASSEMBLIES - - - - - - - - - -
A102		TRANSMIT EXCITER BOARD 19C851643G1 - 403-440 MHz 19C851643G2 - 440-470 MHz 19C851643G3 - 470-512 MHz
		- - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	19A702061P77	Ceramic: 470 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C3	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C3	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C3	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G3).
C4	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C4	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G2 and G3).
C5	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C5	19A702061P45	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2 and G3).
C6	19A702061P10	Ceramic: 5.6 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G1).
C6	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G2 and G3).
C7	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G1).
C7	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G2 and G3).
C8 thru C10	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C11	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C12	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G1).
		- - - - - - - - - - DIODES - - - - - - - - - -
D1	19A702525P2	Silicon, PIN: sim to MMBV3401.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1		Part of printed wiring board 19C851644P1.
L2	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L3 thru L5		Part of printed wiring board 19C851644P1.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q2	19A701940P1	Silicon, NPN: sim to MRF-559.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R2	19B800607P222	Metal film: 2.2K ohms ±5%, 1/8 w.
R3	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R4	19B800607P330	Metal film: 33 ohms ±5%, 1/8 w.
R5	19B800607P272	Metal film: 2.7K ohms ±5%, 1/8 w.
R6	19B800607P331	Metal film: 330 ohms ±5%, 1/8 w.
R7 and R8	19B800607P100	Metal film: 10 ohms ±5%, 1/8 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C101	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C102	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).
C102	19A702061P37	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G5).
C102	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G6).
C103	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C104	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C105	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C106	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C107	19A701534P8	Tantalum: 22 uF ±20%, 16 VDCW.
C108	19A703314P10	Electrolytic: 10 uF -10+50%, 50 VDCW; sim to Panasonic LS Series.
C109 and C110	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C111	19A703314P10	Electrolytic: 10 uF -10+50%, 50 VDCW; sim to Panasonic LS Series.
C112 thru C114	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C115	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G5).
C116	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C117	19A702052P22	Ceramic: 0.047 uF ±10%, 50 VDCW.
C118	19A703314P10	Electrolytic: 10 uF -10+50%, 50 VDCW; sim to Panasonic LS Series.
C119	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C120	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C121	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C122	19A702052P28	Ceramic: 0.022 uF ±10%, 50 VDCW.
C123	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C124	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C125 and C126	19A702061P73	Ceramic: 330 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C130	19A705108P14	Mica Chip: 11 pF ±5%, 500 VDCW, temp coef 0 + 100 PPM/°C. (Used in G4).
C130	19A705108P12	Mica: 9.1 pF ±5%, 500 VDCW. (Used in G5).
C130	19A705108P11	Mica: 8.2 pF ±5%, 500 VDCW. (Used in G6).
C131	19A705108P22	Mica: 24 pF ±5%, 500 VDCW. (Used in G4).
C131	19A705108P19	Mica: 18 pF ±5%, 500 VDCW. (Used in G5).
C131	19A705108P200	Mica Chip: 17 pF ±5%, 500 VDCW, temp coef 0 + 100 PPM/°C. (Used in G6).
C132	19A705108P16	Mica Chip: 13 pF ±5%, 500 VDCW, temp coef 0 + 100 PPM/°C. (Used in G4).
C132	19A705108P12	Mica: 9.1 pF ±5%, 500 VDCW. (Used in G5 and G6).
C201	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C202	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C203	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C204	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C205	19A701534P17	Tantalum: 47 uF ±20%, 10 VDCW.
C206	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C207	19A701534P8	Tantalum: 22 uF ±20%, 16 VDCW.
C208	19A702052P22	Ceramic: 0.047 uF ±10%, 50 VDCW.
C209	19A701534P3	Tantalum: 0.47 uF ±20%, 35 VDCW.
C210	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C211	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C212	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C213 and C214	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C215	19A700004P1	Metallized polyester: 0.068 uF ±10%, 63 VDCW.
C216	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C217	19A700004P11	Metallized Polyester: 1.0 uF ±10%, 63 VDCW.
C218	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G4).
C218	19A702061P29	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5 and G6).
C219	19A702061P93	Ceramic: 2200 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C220	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C222	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C223	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C224	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C225	19A702061P93	Ceramic: 2200 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C226	19A701534P17	Tantalum: 47 uF ±20%, 10 VDCW.
C227	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C228	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C229	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C230	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C231	19A703314P2	Tantalum: 220 uF, -10+50%, 10 VDCW.
C232	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C234	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C236	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C237	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C238	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C239	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G4 and G5).
C239	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G6).
C240	19A702061P25	Ceramic: 18 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C402	19A702061P41	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).
C402	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G5 and G6).
C403	19A702236P15	Ceramic: 3.9 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C.
C404	19A702061P63	Ceramic: 120 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C405	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).
C405	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G5).
C405	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G6).
C406	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).
C406	19A702061P10	Ceramic: 5.6 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G5).
C406	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G6).
C407	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C408	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C409	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G4).
C409	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5).
C409	19A702236P3	Ceramic: 0.7 pF ±0.1 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G6).
C410	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G4).
C410	19A702236P15	Ceramic: 3.9 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G5).
C410	19A702061P10	Ceramic: 5.6 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G6).
C411	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G4 and G5).
C411	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G6).
C412	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G4).
C412	19A702061P10	Ceramic: 5.6 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G5).
C412	19A702061P11	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G6).
C413	19A702061P13	Ceramic: 10 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G4).
C413	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G5 and G6).
C414	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G4).
C414	19A702236P15	Ceramic: 3.9 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G5).
C414	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G6).
C415 and C416	19A702061P63	Ceramic: 120 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C417	19A702061P9	Ceramic: 4.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C418	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C502	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C503	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C504	19A702061P29	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C505	19A702061P25	Ceramic: 18 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C506	19A701534P7	Tantalum: 10 uF ±20%, 16 VDCW.
C507 thru C509	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C510	19A702061P6	Ceramic: 2.7 pF ±0.5 pF, 50 VDCW, temp coef 0 ±120 PPM.
C511	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C512	19A702061P1	Ceramic: 1 pF ±0.5 pF, 50 VDCW.
C513	19A702061P12	Ceramic: 8.2 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C514	19A702061P33	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C515 and C516	19A702061P29	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C517 and C518	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C519	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C520	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C521	19A703314P10	Electrolytic: 10 uF -10+50%, 50 VDCW; sim to Panasonic LS Series.
C522	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D101	19A705377P1	Silicon, Hot Carrier: sim to HSM80201.
D102 and D103	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
D104	19J706892P2	Silicon, PIN: sim to UM9401.
D105	19A700588P3	Zener, transient suppressor: sim to 1N6278A.
D106	19A702526P2	Silicon: Schottky Barrier; sim to BAT 17.

SYMBOL	GE PART NO.	DESCRIPTION
D107	19A700025P8	Silicon, zener: 400 mW max; sim to BZX55-C6V8. (Used in G4).
D202 and D203	19A702526P2	Silicon: Schottky Barrier: sim to BAT 17.
D401	19J706892P2	Silicon, PIN: sim to UM9401.
D402	19A700155P2	Silicon, fwd current: 100 mA, 35 VIP.
D501 and D502	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
		- - - - - - - - - - - JACKS - - - - - - - - - - -
J101 thru J103	19B801341P1	RF Jack.
J201	19A700072P1	Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-03-2021.
J501	19A700072P1	Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-03-2021.
J702	19A704779P11	Connector; sim to Molex 22-17-2122.
J704	19A700072P29	Printed wire: 3 contacts rated at 2.5 amps; sim to Molex 22-27-2031.
J705	19A700072P30	Printed wire: 4 contacts rated at 2.5 amps; sim to Molex 22-27-2041.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L101	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L102	19A700024P7	Coil, RF: 330 nH ±10%.
L103 thru L106	19A704921P1	Coil.
L130 and L131	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1.
L201		Part of printed wiring board.
L202	19A705470P6	Coil: sim to Toko 380NB-27nM. (Used in G4 and G5).
L202	19A705470P5	Coil, Fixed: 22 nH; sim to Toko 380NB-22nM. (Used in G6).
L203	19A705470P6	Coil: sim to Toko 380NB-27nM. (Used in G4 and G5).
L203	19A705470P5	Coil, Fixed: 22 nH; sim to Toko 380NB-22nM. (Used in G6).
L401	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1.
L402	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G4 and G5).
L402	19B800890P6	Coil, RF: 14.7 nH ±5%, sim to Paul Smith SK-891-1. (Used in G6).
L403	19B800890P3	Coil, RF: 11.7 uH ±5%, sim to Paul Smith SK-896-1. (Used in G4 and G5).
L403	19B800890P2	RF: sim to Paul Smith SK-891-1. (Used in G6).
L404	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G4 and G5).
L404	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G6).
L405	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1.
L406		Part of printed wiring board.
L502 and L503	H343CLP10022	Coil, Fixed: 10 uH ±10%.
L504	19B801413P4	Coil, 39 MHz.
L505	19B209420P21	Coil, RF: 4.7 uH ±5%, 1.20 ohms DC res max; sim to Jeffers 4436-82.
L506 thru L508	19B801413P4	Coil, 39 MHz.
L509	19B801415P2	Transformer, 455 KHz.: sim to AEPD 162B3277P17.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q101	344A3225P1	Silicon, NPN: sim to Motorola MJF3055.
Q102	19A703197P2	Silicon, PNP: sim to MMBT4403 Low Profile Pkg.
Q103	19A704972P1	Silicon, PNP: sim to Motorola 2N4918.

SYMBOL	GE PART NO.	DESCRIPTION
Q104	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q105	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q201	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q202	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q203	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q204	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q206	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q207	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q208	19A700023P2	Silicon, NPN: sim to 2N3904.
Q209 and Q210	19A702084P2	Silicon, NPN: sim to MPS 2369.
Q401	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q501	19A702524P2	N-Type, field effect; sim to MMBFU310.
Q502	19A116818P3	N Channel, field effect; sim to Type 3N187.
Q503	19A700023P2	Silicon, NPN: sim to 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R101	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R102	19B800607P390	Metal film: 39 ohms ±5%, 1/8 w. (Used in G5).
R102	19B800607P470	Metal film: 47 ohms ±5%, 1/8 w. (Used in G4).
R102	19B800607P560	Metal film: 56 ohms ±5%, 1/8 w. (Used in G6).
R103	19B800607P821	Metal film: 820 ohms ±5%, 1/8 w.
R104	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R105	19B800607P473	Metal film: 47K ohms ±5%, 1/8 w.
R106	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R107	19B800607P394	Metal film: 390K ohms ±5%, 1/8 w.
R108	19B800607P123	Metal film: 12K ohms ±5%, 1/8 w.
R109	19B800607P394	Metal film: 390K ohms ±5%, 1/8 w.
R110	19B800607P222	Metal film: 2.2K ohms ±5%, 1/8 w.
R111	19B800779P10	Variable: 10K ohms ±25%, 100 VDCW, .3 watt.
R112	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R113	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R114	19B800607P154	Metal film: 150K ohms ±5%, 1/8 w.
R115	19B800607P562	Metal film: 5.6K ohms ±5%, 1/8 w.
R116	19B800607P183	Metal film: 18K ohms ±5%, 1/8 w.
R117	19B800607P821	Metal film: 820 ohms ±5%, 1/8 w.
R118	19A701864P4	Thermal 10K ohms ±10%, sim to Midwest Components 2H-103.
R119 thru R121	19B800607P100	Metal film: 10 ohms ±5%, 1/8 w.
R122	19B800607P821	Metal film: 820 ohms ±5%, 1/8 w.
R123	19B800607P153	Metal film: 15K ohms ±5%, 1/8 w.
R202	19B800607P101	Metal film: 100 ohms ±5%, 1/8 w.
R203	19B800607P560	Metal film: 56 ohms ±5%, 1/8 w.
R204	19B800607P221	Metal film: 220 ohms ±5%, 1/8 w.
R205	19B800607P332	Metal film: 3.3K ohms ±5%, 1/8 w.
R206	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R207	19B800607P181	Metal film: 180 ohms ±5%, 1/8 w.
R208	19B800607P473	Metal film: 47K ohms ±5%, 1/8 w.
R209 and R210	19B800607P332	Metal film: 3.3K ohms ±5%, 1/8 w.
R211	19B800607P101	Metal film: 100 ohms ±5%, 1/8 w.
R213	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R214	19B800607P331	Metal film: 330 ohms ±5%, 1/8 w.
R215	19B800607P822	Metal film: 8.2K ohms ±5%, 1/8 w.
R216	19B800607P222	Metal film: 2.2K ohms ±5%, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R217	19B800607P101	Metal film: 100 ohms ±5%, 1/8 w.
R218	19B800779P16	Variable: 100K ohms ±25%, 100 VDCW, .3 watt.
R219	19B800607P273	Metal film: 27K ohms ±5%, 1/8 w.
R221	19B800607P154	Metal film: 150K ohms ±5%, 1/8 w.
R222	19B800607P333	Metal film: 33K ohms ±5%, 1/8 w.
R223	19B800607P564	Metal film: 560K ohms ±5%, 1/8 w.
R224	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R225	19B800607P224	Metal film: 220K ohms ±5%, 1/8 w.
R226	19B800779P4	Variable: 1K ohms ±25%, 100VDCW, .3 w.
R227	19B800607P473	Metal film: 47K ohms ±5%, 1/8 w.
R228	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R229	19B800607P823	Metal film: 82K ohms ±5%, 1/8 w.
R230	19B800607P332	Metal film: 3.3K ohms ±5%, 1/8 w.
R231	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R232	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R233	19B800607P332	Metal film: 3.3K ohms ±5%, 1/8 w.
R234	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R235	19B800607P823	Metal film: 82K ohms ±5%, 1/8 w.
R236	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R237 thru R239	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R240 thru R242	19B800607P154	Metal film: 150K ohms ±5%, 1/8 w.
R243	19A702931P137	Metal film: 237 ohms ±1%, 200 VDCW, 1/8 w.
R244	19A702931P213	Metal film: 1330 ohms ±1%, 200 VDCW, 1/8 w.
R245	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R246	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R248	19B800607P1	Metal film: Jumper.
R401 and R402	19B800607P331	Metal film: 330 ohms ±5%, 1/8 w.
R403	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R404	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R405	19B800607P271	Metal film: 270 ohms ±5%, 1/8 w.
R406	19B800607P271	Metal film: 270 ohms ±5%, 1/8 w. (Used in G4).
R406	19B800607P391	Metal film: 390 ohms ±5%, 1/8 w. (Used in G5).
R406	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w. (Used in G6).
R501	19B800607P181	Metal film: 180 ohms ±5%, 1/8 w.
R502	19B800607P270	Metal film: 27 ohms ±5%, 1/8 w.
R503	19B800607P562	Metal film: 5.6K ohms ±5%, 1/8 w.
R504	19B800607P270	Metal film: 27 ohms ±5%, 1/8 w.
R505	19B800607P683	Metal film: 68K ohms ±5%, 1/8 w.
R506	19B800607P823	Metal film: 82K ohms ±5%, 1/8 w.
R507	19B800607P183	Metal film: 18K ohms ±5%, 1/8 w.
R508	19B800607P101	Metal film: 100 ohms ±5%, 1/8 w.
R509	19B800607P272	Metal film: 2.7K ohms ±5%, 1/8 w.
R510	19B800607P270	Metal film: 27 ohms ±5%, 1/8 w.
R511	19B800607P473	Metal film: 47K ohms ±5%, 1/8 w.
R512	19B800607P822	Metal film: 8.2K ohms ±5%, 1/8 w.
R513	19B800779P4	Variable: 1K ohms ±25%, 100VDCW, .3 w.
R514	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R515	19B800607P821	Metal film: 820 ohms ±5%, 1/8 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - -
U101	19A705457P1	RF Power Amplifier Module. Part of next higher assembly. (Used in G4).
U101	19A705457P2	RF Power Amplifier Module. Part of next higher assembly. (Used in G5).

SYMBOL	GE PART NO.	DESCRIPTION
U101	19A705457P3	RF Power Amplifier Module. Part of next higher assembly. (Used in G6).
U102	19A134717P3	Linear: 8 Volt Regulator; sim to MC7808CT.
U103	19A701789P2	Linear: Dual Op Amp; sim to LM358.
U201	19D901958G3	Voltage Controlled Oscillator. (Used in G4).
U201	19D901958G4	Voltage Controlled Oscillator. (Used in G5).
U201	19D901958G5	Voltage Controlled Oscillator. (Used in G6).
U202	19A700029P44	Digital: BILATERAL SWITCH.
U203	19A704971P1	Linear: +5 Volt Regulator; sim to MC78L05ACP.
U204	19B801351P6	Crystal Oscillator, temperature compensated: 12.80 MHz. ±5 PPM.
U205	19A704287P2	Prescaler: /128, /129; sim to MC12018.
U206	19B800902P4	Digital: Synthesizer, CMOS Serial Input.
U207	19A701999P4	Linear, (Positive Voltage Regulator): sim to LM317LZ.
U501	19A704619P1	Linear: Osc/Mixer/IF/Det/Amp; sim to MC3361AP.
U502	19A704073P2	Linear: 8 Volt Regulator; sim to MC78L08CP.
		- - - - - - - - - - CABLES - - - - - - - - - -
W101 and W102		Part of printed wiring board.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y501	19A705376P5	Crystal, Fixed Frequency: 45.455 MHz ±10 PPM.
		- - - - - - - - - - FILTER - - - - - - - - - -
Z401	19A705458P4	Helical, UHF: 403-425 MHz. (Used in G4).
Z401	19A705458P1	Helical, UHF: 450-470 MHz. (Used in G5).
Z401	19A705458P2	Helical, UHF: 470-492 MHz. (Used in G6).
Z402	19A705458P4	Helical, UHF: 403-425 MHz. (Used in G4).
Z402	19A705458P1	Helical, UHF: 450-470 MHz. (Used in G5).
Z402	19A705458P2	Helical, UHF: 470-492 MHz. (Used in G6).
Z403	19B801025P1	Balanced Mixer (Double); sim to Mini-Circuits SBL-1.
Z501	19A705328P1	Monolithic Crystal: 45.000 MHz; sim to Toyocom 45E2B2.
Z502		Part of Z501.
Z503	19B801021P2	Bandpass filter: 455 kHz ±1.5; sim to Murata CFW-455E.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19B801490P1	Ground Strap.
	19B801566P1	Shield.
	19B801566P2	Shield.

RF BOARD