ERICSSON

LBI-31539B
REPLACES LBI-31418

MAINTENANCE MANUAL

403-470 MHZ TRANSMITTER/RECEIVER/SYNTHESIZER ASSEMBLY
19D901670G1-G7 (TIN CONNECTORS)
19D901670G13-G19 (GOLD CONNECTORS)

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DESCRIPTION

The transmitter/receiver/synthesizer board (TRS) for DELTA-SX provides all functions necessary for two-way communications. The TRS board is controlled by the control unit and includes the 4 groups identified below. Note that the group 1 and 2 boards operate on the 440-470 MHz range while the group 3 and 4 boards operate from 403-440 MHz. The TRS board group number must be compatible with the desired frequency range.

PART NO. TRS BOARD	FREQUENCY
19D901670G1	440-470 MHz
19D901670G2	440-470 MHz
19D901670G3	403-440 MHz
19D901670G4	403-440 MHz
19D901670G5	440-470 MHz
19D901670G6	403-440 MHz
19D901670G7	403-440 MHz
19D901670G13	440-470 MHz
19D901670G14	440-470 MHz
19D901670G15	403-440 MHz
19D901670G16	403-440 MHz
19D901670G17	440-470 MHz
19D901670G18	403-440 MHz
19D901670G19	403-440 MHz

The TRS board interconnects with the power/control cable from the control unit, the power amplifier board, and the Channel Guard board (optimal).

The TRS board contains the transmitter (less PA) and receiver circuitry, microcomputer and EEPROM frequency synthesizer, audio processor, and voltage regulators. The microcomputer controls all system functions, supplies frequency data to the frequency synthesizer, and tone/code data to the Channel Guard option board. All RF frequencies are generated by the frequency synthesizer.

The transmitter PA is mounted on a separate board located along the side of the radio near the heat sink assembly.

In addition to the normal radio functions, the microcomputer contains self diagnostic maintenance routines to aid in troubleshooting the radio. Included are an internal test of the microcomputer and input/output tests to assure proper operation of the data port and data bus. Details and procedures are included in the Service Section of this manual.

Centralized metering jacks for servicing are accessible from the top of the radio, and provide access for system, RF metering and PA metering.

CIRCUIT ANALYSIS

SYSTEM CONTROL & INTERFACE

The system control and interface circuits consist of the microcomputer, electrically eraseable PROM, interface circuits for voltage shifting and protection and a watchdog timer. The EEPROM gives the user the capability to program the radio's personality as desired. The EEPROM contains the receive and transmit frequency data, Channel Guard tone frequencies/digital codes and the CCT delay on a per channel basis.

NOTE

The EEPROM may be programmed serially through the front connector using the General Electric Universal Radio Programmer Model TQ2310. The TQ2310 permits complete PROM programming information to be programmed through its mini computer. The TRS board also provides access for parallel loading (through program connector J111) on a per channel basis using the General Electric 4EX22A10 Single Channel Programmer.

The microcomputer interfaces with the control unit through J601 and responds to all user commands and control functions originating from the control unit. It provides the transmit and receive frequency data to the frequency synthesizer, switching information for tone and digital Channel Guard, and provides the carrier control timer (CCT) function when the radio is in the transmit mode. A block diagram of the system control functions and frequency synthesizer are shown in Figure 1.

When the microphone is keyed the PTT line from the control unit goes low. This low is applied to the microcomputer through buffer Q701 and inverter Q711. Q701 is controlled by ignition switch A+. The ignition switch must be on and A+ applied to the base of Q701. Q701 must be turned on to permit keying of the transmitter. When Channel Guard is present the release of the PTT signal is delayed by the microcomputer for approximately 160 milliseconds to eliminate any squelch tails.

The microcomputer immediately closes the antenna relay switch on the PA board by applying a low to the DPTT line. The microcomputer then delays 15 milliseconds before the transmit 9V is switched on by applying a low to the TX ENBL line P15. This is done to guarantee the antenna relay contacts are closed before the transmitter is energized. Once DPTT is low the receive audio is muted. Buffers Q716 and Q717 provide DPTT to the audio control circuits, antenna relay, and the option board.

The TX ENBL line is controlled by microcomputer port P15 through inverter Q718 and Tx Enable switch Q723. A low or microcomputer port P15 turns Q718 off and Q723 on applying A+ to the TX ENABLE line. Inverter Q720 is also turned on during this time to inhibit the alert tone PTT.

CHANNEL SELECTION

The microcomputer and EEPROM provides the radio with up to 32 independent transmit and receive frequencies. Each time the PTT switch is operated the microcomputer transfers frequency data from the EEPROM and converts it to frequency data assigned to the selected channel. The frequency data is then loaded serially into the frequency synthesizer.

The microcomputer continually monitors the status of tri-state buffers Q704A-D. These buffers are periodically turned off by a positive 5 volt 1 millisecond pulse. At the same time PROM power switch Q715 is turned on and applies +5 VDC to the EEPROM. When the buffers are on channel select data is loaded into microcomputer input/output ports P20-P23. Power is then applied to the EEPROM and the tri-state buffers are turned off. The microcomputer converts the channel select data into address information, accesses the EEPROM, and receives the frequency data stored in the addressed location. This data then passes through the I/O ports of the EEPROM and P20-P23 of the microcomputer. The conversion process is repeated eight times in succession (eight locations are required for each channel) and the data loaded serially into the frequency synthesizer over the clock and data lines. This data also includes Channel Guard information, if present, and carrier control timer information on a per channel basis. A 4-millisecond channel change pulse from port P16 of the microcomputer is also sent to the frequency synthesizer to speed up channel acquisition.

Also taken into consideration at this time is the status of frequency bit 5 (FB5) and the PTT line U705-38. The status of the PTT line is used to determine if the radio is in the transmit or receive mode to assure the right frequency data is accessed. The status of FB5 determines which EEPROM contains the requested data.

A second EEPROM is required if more than 16 channels are provided. The second EE PROM is plugged piggy back fashion directly into pins extending above the top of the first EEPROM. Programming Jack J711 may be used to program both PROMS (using PROM Programmer 4EX22A10). Diodes D718A and B and D719A and B provide spike protection for the microcomputer. D717A and B provide spike protection for the EEPROMS.

WATCHDOG TIMER

The watchdog timer consisting of a timer, U703-A and Q714, monitors the operation of the microcomputer and U703A

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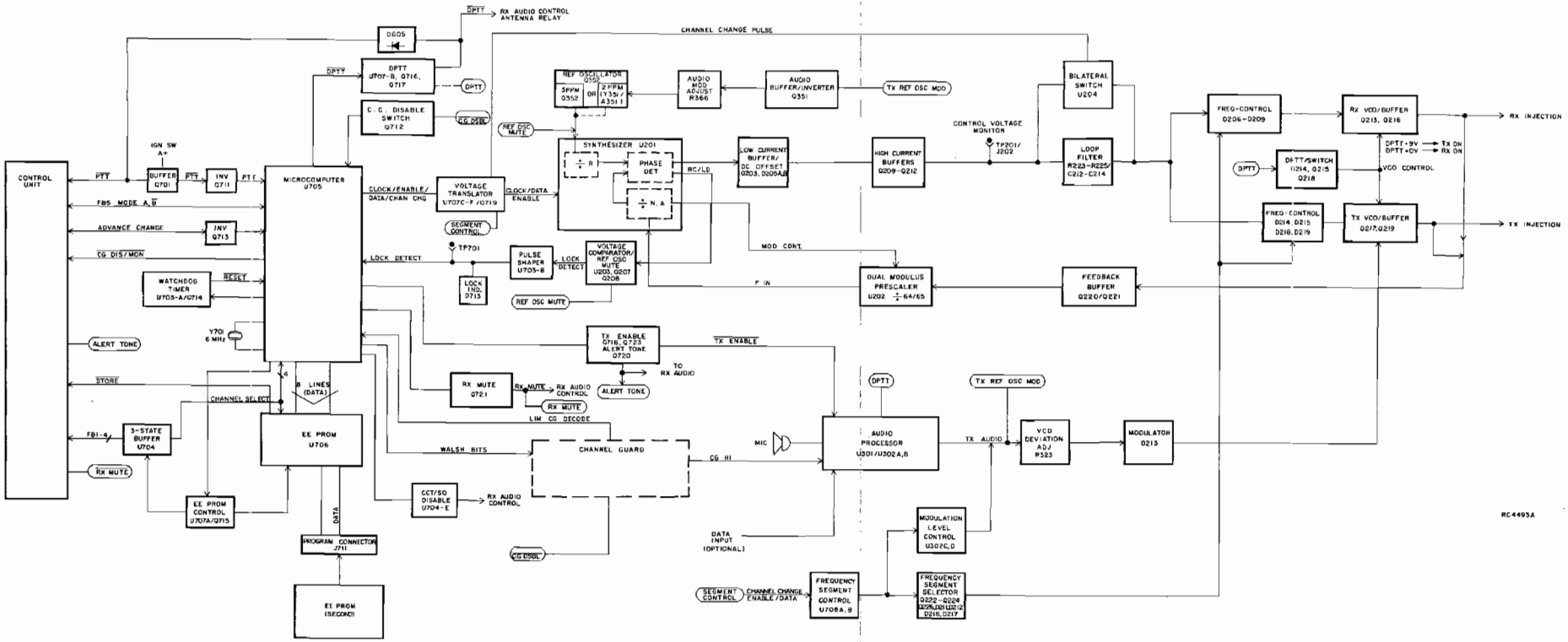


Figure 1 - System Control & Frequency Synthesizer

generates a reset pulse in the unlikely condition that the microcomputer gets lost and does not execute the software properly. A 6 MHz crystal, Y701, steps the microcomputer through the software. As programmed in software a random pulse appears at U705-35 and is applied to the base of inverter Q714, momentarily turning it on and inhibiting any reset pulse from timer U703-A. A voltage discharging circuit consisting of R754 and C719 forces the microcomputer to toggle U703-35. If the timer does not receive any inputs for a specified period of time Q714 turns off and U703-A times out and applies a reset pulse to pin 4 of the microcomputer. The watchdog reset will normally restore the microcomputer to normal operation so that only one pulse will occur. In the event the microcomputer is not restored to normal operation a 6 Hz square wave will appear on the reset line and the frequency unlocked indicator will turn on. Refer to the Service Section of this manual and run the self diagnostics routine to determine the problem.

ADVANCE CHANGE PULSE

The advance change pulse is received from the option board through front connector J601 and applied to the microcomputer interrupt port on pin 6 through inverter Q713. The advance change pulse is active in radios equipped with PSLM. When a call is received on a priority channel the advance change pulse which occurs at each frequency change, interrupts the microcomputer forcing it to service immediately the I/O circuits. The tri- state buffers are turned on and new channel select information read in.

CARRIER CONTROL TIMER

The carrier control timer function is executed by the microcomputer under software control on a per channel basis. When the programmed time has lapsed an alert tone is generated from P13 on the microcomputer, applied to the audio PA, and heard on the speaker. The CCT is programmed for 1 minute or disabled (programmed for no CCT).

VOLTAGE TRANSLATION

Inverter buffers U707B-F and Q721 translate the 5 VDC levels required by the microcomputer to the +9 VDC level used by the frequency synthesizer. Inverter Q719 restores the proper polarity to the clock.

Channel Guard

The Channel Guard encode and decode functions are implemented in the microcomputer under software control. The microcomputer will provide digital and tone Channel Guard with STE.

If the radio is in the receive mode, the Channel Guard tone/code is hard limited and inputted into the microcomputer through port P12 (LIM CG Tone Decode). If the correct tone code is present, the receiver is opened by the RX MUTE line. If the radio is in the transmit mode, the microcomputer generates the Channel Guard tone using WALSH BIT 1 and WALSH BIT 2. Those outputs are summed together and filtered on the optional Channel Guard board to generate a smooth sinewave for tone Channel Guard or a digital waveform for digital Channel Guard.

The Channel Guard Disable signal from the Channel Guard board is applied to system metering jack J602 for service monitoring and to microcomputer port T1 through buffer Q712. A low on the CG DIS line turns Q712 off guarantying a low on T1. When the CG DIS pulse is gone Q712 turns on providing a logic 1 to T2.

FREQUENCY SEGMENT CONTROL

To achieve rapid wideband VCO tuning extending over the 403-470 MHz range each bandsplit is divided into four frequency segments. By selecting 1 segment the operating frequency spread of the VCO is limited. Refer to Figure 2 for details. Each segment is identified by two bits on a per channel basis and programmed into the EEPROM. Capacitors C268, C269, C272, and C273 are switched in and out of the VCO tank circuit to set the VCO tuning range to cover the correct frequency segment.

The frequency segment control circuit consists of a dual 'D' type FF U708, operating under control of the microcomputer. The two frequency segment identification bits appear on the channel change and data lines and are inputted to the dual "D" FF. At the appropriate time the microcomputer applies the enable signal to clock the new segment data change through the FF. The output of the FF's is a binary expression identifying the frequency segment selected. Tables 1 and 2 identify the binary expression and the selected frequency segment.

The output of the frequency segment control circuit is applied to the modulation level control and the frequency segment selector circuits. See Figure 2 for more information.

MODULATION LEVEL CONTROL

The modulation level control circuit automatically sets the Tx audio level applied to the transmit VCO modulator D213 through VCO deviation adjust control R323 and to the reference oscillator. The modulation level control circuit

consists of U302-C and D, R318-R325, R238, D303, varactor D213, C233, and bypass capacitors C274 and C259. The modulation level is controlled by turning bilateral switches U302-C, D on or off (under control of U708) to include attenuators R320 or R321 in the circuit. R318-R321 form an adjustable voltage divider to change the modulation level as required. The Tx ref osc modulation level is also proportioned by the selection of these resistors. Tables 1 and 2 also identify the resistor (if applicable) used for each frequency segment.

FREQUENCY SEGMENT SELECTOR

The frequency segment selector switches capacitance in and out of the Tx and Rx VCO tank circuits to select the frequency segment containing the selected channel. Figure 2 identifies the frequency segments and illustrates their operating characteristics. The frequency segment selector consists of Q222-Q224, Q226, D216, D217, D211 and D212 and operates under control of the microcomputor through FF's U708A & B. Eight capacitors (C270-C273 and C278- C281) are selected or deselected for operation in a given segment. Table 3 identifies the circuit conditions existing for selection of each segment and the capacitors used.

Reverse bias to turn the pin diodes off is provided by the +7.8V filtered supply through R245 and R246. Forward bias for the diodes and power for the switching transistors are provided by the +9V source through R256-R259 and L216 and L217. When segment 3 is selected, transistors Q222 and Q226 are turned on. This applies ground to the anodes and 7,8 v to the cathodes of pin diodes D216 (Tx VCO) and D211 (Rx VCO). D217 and D212 are forward biased causing them to turn on. This effectively places a short across C279 and AC grounds C277 in the Tx VCO and shorts C271 while AC grounding C269 in the Rx VCO.

With Q222 and Q226 still on DC ground is applied to the anodes of D216 and D211 through L217 and L220 while reverse bias is applied to their cathodes (Q223 and Q224 are off). L220 and L217 present a high impedance to RF frequencies therefore the anodes of D216 and D211 are near DC ground and not at AC ground.

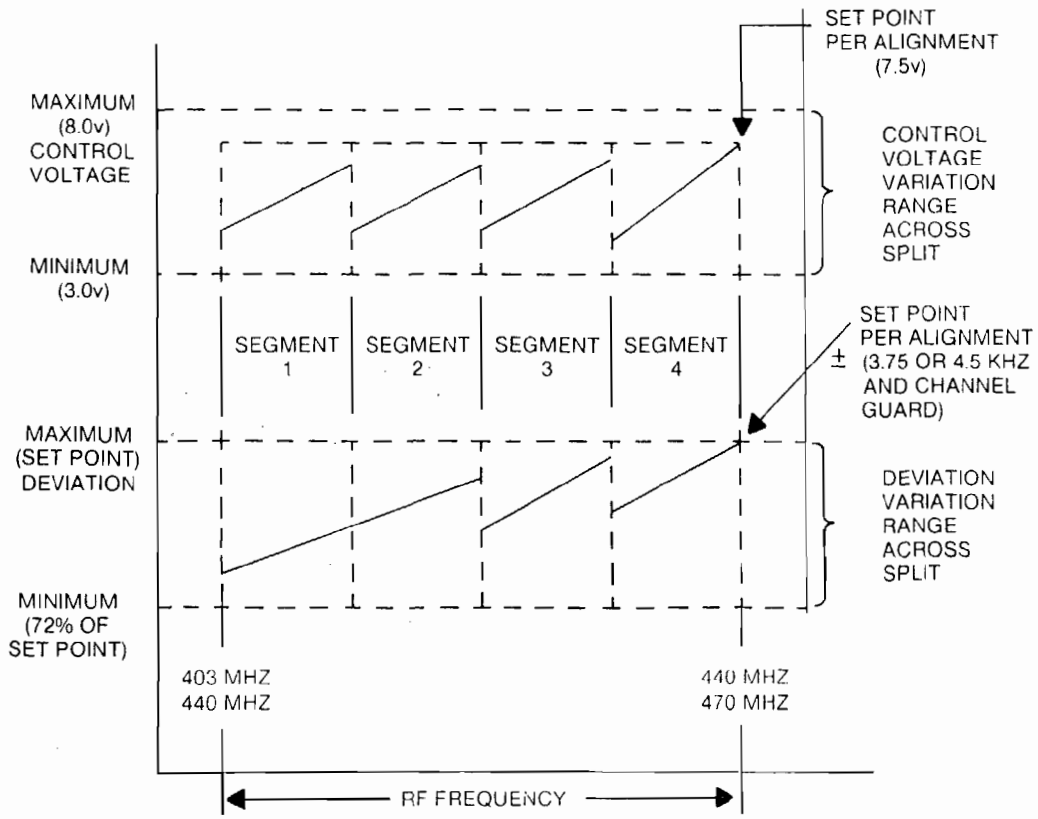


Figure 2 - Frequency Segment Identification & Characteristics

SEGMENT	FF OUTPUT (U708A,B)					
	FREQUENCY SPLIT (MHz)	U708-1 INPUT (Q222)	U708-2 INPUT (Q223)	U708-3 INPUT (Q224)	U708-12 INPUT (Q226)	GROUNDED MODULATION RESISTOR
1	403-408	0	1	0	1	NONE
2	408-417	0	1	1	0	NONE
3	417-426	1	0	0	1	R321
4	426-470	1	0	1	0	R320

TABLE 1 - 403-440 MHz Frequency Segment Selection

SEGMENT	FREQUENCY SPLIT (MHz)	U708-1 INPUT (Q222)	U708-2 INPUT (Q223)	U708-3 INPUT (Q224)	U708-12 INPUT (Q226)	GROUNDED MODULATION RESISTOR
1	440-446	0	1	0	1	NONE
2	446-452	0	1	1	0	NONE
3	452-460	1	0	0	1	R321
4	460-470	1	0	1	0	R320

TABLE 2 - 440-470 MHz Frequency Segment Selection

SEGMENT	TRANSISTOR SWITCH*				PIN DIODES				SHORTED CAPACITORS
	Q222	Q223	Q224	Q226	D211	D212	D216	D217	
1	0	1	0	1	ON	ON	ON	ON	ALL
2	0	1	1	0	ON	OFF	ON	OFF	C278, C270
3	1	0	0	1	OFF	ON	OFF	ON	C279, C271
4	1	0	1	0	OFF	OFF	OFF	OFF	NONE

* '1' indicates transistor is turned on.

TABLE 3 - Capacitor Selection

FREQUENCY SYNTHESIZER

The frequency synthesizer receives clock, data, and control information from the microcomputer and from this generates the Tx/Rx RF frequencies. It also provides frequency lock status to the microcomputer. It consists of synthesizer chip U201, low and high current buffers, loop filter, Tx & Rx voltage controlled oscillators (VCO's), feedback amplifiers, dual modulus prescaler, and the reference oscillator. The VCO's are locked to the reference oscillator by a single direct divide synthesis loop consisting of the feedback buffer, prescaler, and synthesizer.

Reference Oscillator

The reference oscillator consists of a 5 PPM oscillator, audio amplifier with Audio MOD ADJUST Control R366. The standard reference oscillator frequency is 13.2 MHz. The alternate frequency of 13.8 MHz is not required.

The temperature compensation network for the 5 PPM oscillator consists of R351-R356 and D351. R351, R354 and R356 are thermistors having a negative temperature co-efficient. Their resistance increases with a decrease in temperature.

Compensation voltage may be monitored at J352. Typically, this voltage will be 5.55 VDC ±0.1 VDC at 25°C (77°F). The response curve of the temperature compensator is designed to complement the typical "S" curve exhibited by crystals. The "S" curve reflects the way crystal frequency varies with temperature. The output voltage of the temperature compensator then varies the voltage applied to varicap D351 to maintain the oscillator frequency within ±5 PPM.

C353 absorbs any voltage spikes that are present on the line to prevent any sudden changes in voltage and output frequency. Power is provided by the +9V SYN/EXCTR supply.

The 5 PPM oscillator is a modified Colpitts circuit using a FET transistor, Q352, and fundamental crystal Y351. The oscillator frequency is tuned by L352. Oscillator output is typically 0.7 VPP. Audio deviation is set by R366.

An optional 2 PPM oscillator is available for high stability applications. The oscillator is incorporated into the circuit by replacing the 5 PPM crystal Y351 with a 2 PPM crystal and by also removing three resistors - R352, R353, and R355. These three resistors are replaced by a plug-in resistor network A351. A351 plugs into connector J351.

SYNTHESIZER

Synthesizer U201 contains a programmable reference oscillator divider (÷R), phase detector, and programmable VCO dividers (÷N, A). The reference frequency, 13.2 MHz from the reference oscillator is divided by a fixed integer number to obtain a 6.25 (Rx) and 4.166 (Tx) kHz channel reference for the synthesizer. The 2X multiplication in Rx and 3X multiplication in Tx results in a 12.5 kHz channel spacing at the UHF injection frequencies. This divide value can be changed by PROM programming. The internal phase detector compares the output of the reference divider with the output of the internal ÷N, A counter. The ÷N, A counter receives as its input the VCO frequency divided by the dual modulus prescaler and programmed by the microcomputer. This comparison results in a ± error voltage when the phases differ and a constant output voltage when the phase detector inputs compare in frequency and phase.

If a phase error is detected an error voltage is developed and applied to the VCO DC offset and high current buffers and loop filter to reset the VCO frequency. The count of the ÷N, A counters is controlled by the frequency data received on the clock and data lines from the microcomputer. Thus, when a different channel is selected or when changing to the transmit or receive mode an error voltage is generated and appears at the phase detector output, ANO, causing the phase locked loop to acquire the new frequency. The frequency unlocked indicator is turned on when the VCO is unable to lock on frequency.

The enable pulse from the microcomputer enables the synthesizer and allows frequency data to be internally stored.

DC Offset and High Current Buffers

DC offset buffer Q201 and diodes D205A, B receive the error voltage from the synthesizer and increase this level by 1.8 VDC to extend the operating range of the high current buffers. When the PLL is off frequency due to a channel change or frequency drift the error voltage from the synthesizer (ANO) rises or falls turning either Q209 or Q211 on. These two transistors control high current buffers Q210 and Q212. Q210 and Q212 complete a high current rapid charge or discharge path for C212-C214.

If the error voltage decreases Q211 is turned off and Q212 is turned on completing a discharge path for C212-C214 through bilateral switches U204A-D. At the same time Q209 is turned on and Q210 is turned off, blocking the charge path. The opposite conditions exist when the error voltage goes positive. U204 is turned on for 4 milliseconds each time a channel is changed while in the receive mode or when changing from transmit to receive. The time is 20 milliseconds when in transmit.

Loop Filter

The loop filter consists of R223-R225, and C212-C214. This filter controls the bandwidth and stability of the synthesizer loop. Bilateral switch U204 is controlled by the 4 millisecond, 9 volt channel change pulse. When the channel change pulse is present the bilateral switch shorts out the low pass filter greatly increasing the loop bandwidth to achieve the 4 millisecond channel acquisition time required for dual priority scan. The low pass filter removes noise and other extraneous signals internal to the synthesizer chip.

The output of the filter is applied to the varicaps in the transmit and receive VCO's to adjust and maintain the VCO frequency.

The use of two VCO's allows rapid independent selection of transmit and receive frequencies across the frequency split.

Receiver Voltage Controlled Oscillator

The Receiver VCO consists of a low noise JFET oscillator, Q213, followed by high gain buffer Q216. Q216 prevents external loading and provides power gain. The VCO is a Colpitts oscillator with the various varactors, capacitors and coil forming the tank circuit.

The VCO is switched on and off under control of the DPTT line. When the DPTT line is low the Receiver VCO is turned on (Q215 is off, Q214 is on). Oscillator output is typically +10 dBm. The output is applied to the feedback buffers for VCO frequency control and as the Rx injection frequency to the receiver 1st mixer through L.O. buffer Q431. The Rx VCO also uses a high Q resonator coil to achieve superior noise performance. The VCO operates over a frequency range of 172.75 MHz to 206.25 MHz determined by

the group number of the TRS board. Each frequency split is divided into four operating segments varying from four to eight MHz wide. Two pin diodes D211 and D212, under control of the microcomputer, switch capacitors in and out of the tank circuit to give a binary type movement through the four ranges in each frequency split. Refer to "FREQUENCY SEGMENT CONTROL" for more information. The VCO voltage need only be set once at the highest frequency of the band split, after which it will operate over the entire split with no additional tuning.

Transmitter (VCO)

The transmit VCO is basically the same as the receiver VCO except that inductor L209 is used to tune the VCO across the band split. The VCO operates over a frequency range of 134.33 MHz to 156.67 MHz determined by the group number of the TRS board. The varactors in conjunction with the frequency segment selector circuitry (Q222-Q224, Q226 and pin diodes D216 and D217) provide a voltage controlled adjustment range that extends across the entire frequency split. Buffer Q219 provides a typical output of +10 dBm to the feedback buffers for VCO frequency control and as the Tx Injection frequency to the exciter.

VCO control switch Q218 turns the Transmit VCO on when DPTT is high. The output of the transmit VCO can be monitored at P102.

Feedback Buffers

The Rx injection and Tx injection voltage output from the Rx VCO and Tx VCO are supplied to the receiver mixer and the exciter respectively and to the feedback buffers. Buffering is provided by Q220 and Q221 and the output applied to dual modulus prescaler U202.

Dual Modulus Prescaler

The dual modulus prescaler completes the PLL feedback path from the synthesizer to loop filter, to the VCO's and feedback buffers and then back to the synthesizer through the prescaler. The prescaler divides the VCO frequency by 64 or 65 under control of MOD C from the synthesizer. The output of the prescaler is applied to the synthesizer where it is divided down to 6.25 kHz in Rx and 4.166 kHz in Tx by an internal $\div N$, A counter and compared in frequency and phase with the divided down frequency from the reference oscillator. The result of this comparison is the error voltage used to maintain frequency lock. The N, A counter is controlled by data received from the microcomputer. Depending on the operating frequency, the DC voltage at J202 should be within the range 3.0 to 8.0 VDC when the PLL is locked.

Lock Detect

The lock detect circuit consists of comparator IC U203, diodes D201 and D203, and reference oscillator mute switch Q207 and Q208. It is used to quickly synchronize the phase relation of the divided down VCO frequency and the reference oscillator if the loop loses lock. It also provides a fast lock detect signal to the microcomputer to turn on the out-of-lock indicator. If a large change in frequency is required the ramp capacitor output (RC) of the synthesizer may increase to near 7.5 VDC and cause the comparator output to decrease. This decrease in voltage turns Q207 off and allows Q208 to be turned on by the positive LD line from the synthesizer. Thus Q208 disables the reference oscillator and allows the PLL loop to be brought back to synchronization rapidly.

If a large frequency error exists the LD positive lead from the synthesizer will carry negative spikes to the microcomputer through D203B to activate the lock indicator circuit turning lock indicator D713 on. Pulse shaper U703 is a one-shot multivibrator which increases the pulse width to span 1 computer cycle. Q207 is turned on, keeping Q208 off thereby preventing Q208 from muting the reference oscillator.

TRANSMITTER

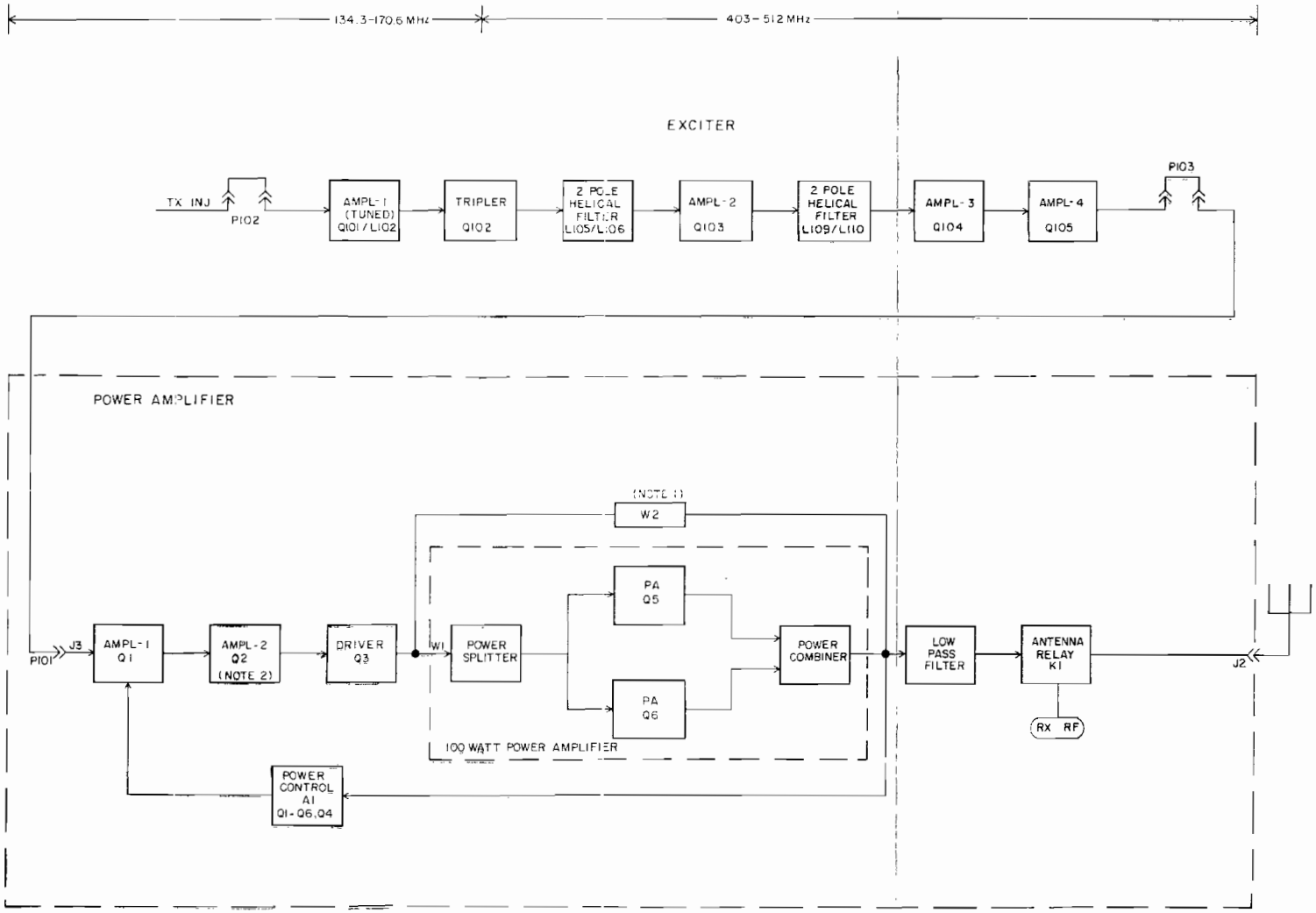
The transmitter section of the TRS board includes the audio processor transmitter VCO and the exciter. The power amplifier is contained on a separate board adjacent to the TRS board and next to the heat sink assembly. Information related to the PA is included in a separate insert. Figure 3 is a block diagram showing the exciter and PA. The audio processor is shown in Figure 1. A block diagram of the receiver is shown in Figure 4.

AUDIO PROCESSOR U301

The audio processor provides audio pre-emphasis with amplitude limiting and post limiter filtering and a total gain of approximately 24 dB. Approximately 20 dB gain is provided by U301B and 4 dB by U301A.

The 9 Volt regulator powers the audio processor and applies regulated 9 volts to a voltage divider consisting of R326 and R327. The +4.5 V output from the voltage divider establishes the operating reference point for operational amplifiers U301B and U301A. C302 and C310 provides an AC ground at the summing input of both operational amplifiers.

Another voltage divider and diodes D301 and D302 provide limiting for U301B. Diodes D301 and D302 are reversed biased



NOTE :
1. W2 PRESENT IN 40-WATT TRANSMITTERS ONLY.
2. AMPL-2 IN THE POWER AMPLIFIER IS NOT PRESENT IN THE 75 WATT TRANSMITTERS.

Figure 3 - Exciter/PA Block Diagram

at +1.7 VDC. Voltage divider network R303, R312, and R313 provides +6.2 VDC at the cathode of D301 and +2.8 VDC at the anode of D302. The voltage junction of D301 and D302 is 4.5 V. C308 and C312 permit a DC level change between U301B-7 and the voltage divider network for diode biasing.

When the input signal to U301B-6 is of a magnitude such that the amplifier output at U301B-7 does not exceed 4 volts PP, the amplifier provides a nominal 20 dB gain. When the audio signal level at U301B-7 exceeds 4 volts PP, diodes D301 and D302 conduct on the positive and negative half cycles providing 100% negative feedback to reduce the amplifier gain to 1. This limits the audio amplitude at U301B-7 to 5 volts PP.

Resistors R309, R310 and R311 and C311 comprise the audio pre-emphasis network that enhances the signal-to-noise ratio. R311 and C311 control the pre-emphasis curve below limiting. R306 and C311 control the cut-off point for high frequency pre-emphasis. As high frequencies are attenuated, the gain of U301 is increased.

Audio from the microphone is coupled to the audio processor through C307 and R307.

The amplified output of U301B is coupled through R305, C306, R314, R315 and bilateral switch U302-A to a second operational amplifier U301A. The bilateral switch is controlled by the DPTT line so that Tx audio is transmitted only when the PTT switch is pressed.

The Channel Guard tone input is applied to U301A-2 through J603-15, R301 and bilateral switch U302A. The CG tone is then combined with the microphone audio at U301A. U301-A provides a signal gain of approximately 4 dB.

A post limiter filter consisting of U301A, R314-R316, C309 and C313 provides 12 dB per octave roll-off. R305 and C305 provide an additional 6 dB per octave roll-off for a total of 18 dB. The output of the post limiter filter is coupled through R318, R319, C316, R322 and deviation control R323 to the transmitter VCO.

SERVICE NOTE

Some resistors in the audio processor have a tolerance of 1%. This tolerance must be maintained to assure proper operation of the post limiter filter. Use exact replacements.

As described under Modulation Level Control bilateral switches U302-C & D, R320 and R321 control the Tx audio level applied to the modulator.

Tx enable switch U302-B shorts out operational amplifier U301-A when the radio is in the receive mode. The TX ENABLE signal is generated by the microcomputer when the PTT switch is released and is less than 2.7 VDC in the receive mode.

EXCITER

The exciter consists of three amplifier stages and a tripler stage. It operates over a frequency range of 403-470 MHz, 20 MHz at a time. A pad at the input of the exciter provides a constant load for the VCO and attenuates the signal from the VCO to approximately 10 milliwatt. The exciter amplifies the 10 milliwatt signal from the VCO to provide 500 milliwatts drive to the power amplifier.

In addition to tripling the input signal and providing approximately 27 dB gain, the exciter contains filtering circuits that determine the bandwidth and spurious response characteristics of the transmitter.

The 134-157 MHz Tx injection output of the VCO is applied to the base of tuned amplifier Q101 through P102, C105 and C106. Collector voltage is supplied through L102 and R108. The impedance matching network matches the output impedance of the VCO to AMPL 1 input.

The 8 to 10 milliwatt output of Q101 is coupled to the base of tripler Q102 through capacitor C111. The 15 to 20 milliwatt output from this stage is coupled through helical resonators L105 and L106 to 50 ohm microstrip Z105.

Following the helical resonators are two class B amplifiers, Q103 and Q104. The output of Q103 is coupled through 50 ohm microstrip Z106 to the second pair of helical resonators (L109 and L110) which provide the final selectivity of the exciter.

The output of these resonators is applied to amplifier Q104 through 50 ohm microstrips Z109 and Z110. A broadband network (L113, L114 and C137) matches the 500 milliwatt output of Q104, and then through coaxial connector P101 to the power amplifier board.

P101 consists of a pin soldered to the end of the microstrip. The outer shield consists of a hole in the casting through which the pin connects to the PA.

Three exciter metering points are accessible at RF metering jack J101. The first metering point at J101-10 monitors the emitter voltage of tripler Q102 through metering network C113 and R111. The meter reading is typically -0.65 VDC.

The second metering point at J101-9 monitors the output power of Amplifier Q103 through C128 and R120. D101 rectifies the RF Signal by bypassing the negative voltages to ground. The meter reading is typically +0.45 VDC.

The third metering point at J101-8 monitors the relative power output of amplifier Q104. The metering network consists of R126, D102, C138 and C139. The meter reading at J101-8 is typically +0.8 VDC.

The relative exciter power output can be read at the test jack on the power amplifier assembly.

SERVICE NOTE

The 50 ohm microstrip and P101 can be used for measuring the RF levels throughout the exciter.

The exciter is energized by pressing the PTT switch. A regulated 9 volts is present on all exciter stages when the radio is turned on. It is normal to have a residual reading of several tenths of a volt at J101-10 when the transmitter is not keyed.

TX ENABLE

To prevent any unwanted RF from passing through the exciter when the radio is in the receive mode, AMPL Q102 is biased off. Bias for Q102 is controlled by 9 volt Tx switch Q105. When the PTT switch is pressed the microcomputer pulls the TX ENABLE line low turning Q105 on. The +9 OSC EXCTR voltage is then applied to the base of Q103 through voltage divider R117 and R118. Q103 is now biased on and the exciter is operational.

Capacitors C140 through C144 isolate the exciter board from vehicle ground for positive or negative ground operation.

RECEIVER

The dual conversion receiver uses intermediate frequencies of 57.5 MHz and 10.7 MHz. For receivers with 25 kHz channel spacing, adjacent channel selectivity (83 dB @ 25 kHz) is obtained by the use of 10 poles of crystal filtering, four poles at 57.5 MHz and six poles at 10.7 MHz. For receivers with 12.5 kHz channel spacing, adjacent channel selectivity (73 dB @ 12.5 kHz) is obtained with 12 poles of crystal filtering, four poles at 57.5 MHz and eight poles at 10.7 MHz.

The nine volt regulator supplies power to all receiver circuits except the audio PA IC's which receive power directly from the A+ supply through the power on/off switch.

An optional preamplifier may be provided for increased sensitivity. A block diagram of the receiver is shown in Figure 4.

All receiver circuitry is mounted on the TRS board and consists of:

- Receiver Front End
- LO Injection Amplifier
- Two Mixers
- 57.5 MHz 1st IF Circuitry
- 10.7 MHz 2nd IF
- Limiter/FM Detector
- Audio PA
- Squelch

RECEIVER FRONT END

An RF signal from the antenna is coupled through six helical resonators (L401-L406 and C1-C6) to the input of doubly balanced diode mixer Z401. Front end selectivity is provided by the resonators.

An optional Ultra High Sensitivity (UHS) preamplifier may be used to increase the front end gain. The preamplifier plugs into J401, which is located ahead of the resonators. When the preamplifier is not used, R402 couples the RF through to the resonators. When the preamplifier is used, R402 is removed.

RF PREAMPLIFIER

The preamplifier is present only in UHS receivers and uses a dual-gate MOS FET transistor to provide an overall gain of 10 dB. Receiver sensitivity is increased by approximately 6 dB.

RF from the low pass filter is coupled to gate 1 of dual-date MOS FET Q1 through P401-2, L1, C3, C5, and L2. L1, L2, and C3-C6 comprise an impedance matching network to match the filter output with the MOS FET input. Bias on gate 2 is set by voltage divider R2-R4. The output is taken from the drain and coupled to the resonators and First Mixer through J401-7.

CIRCUIT ANALYSIS

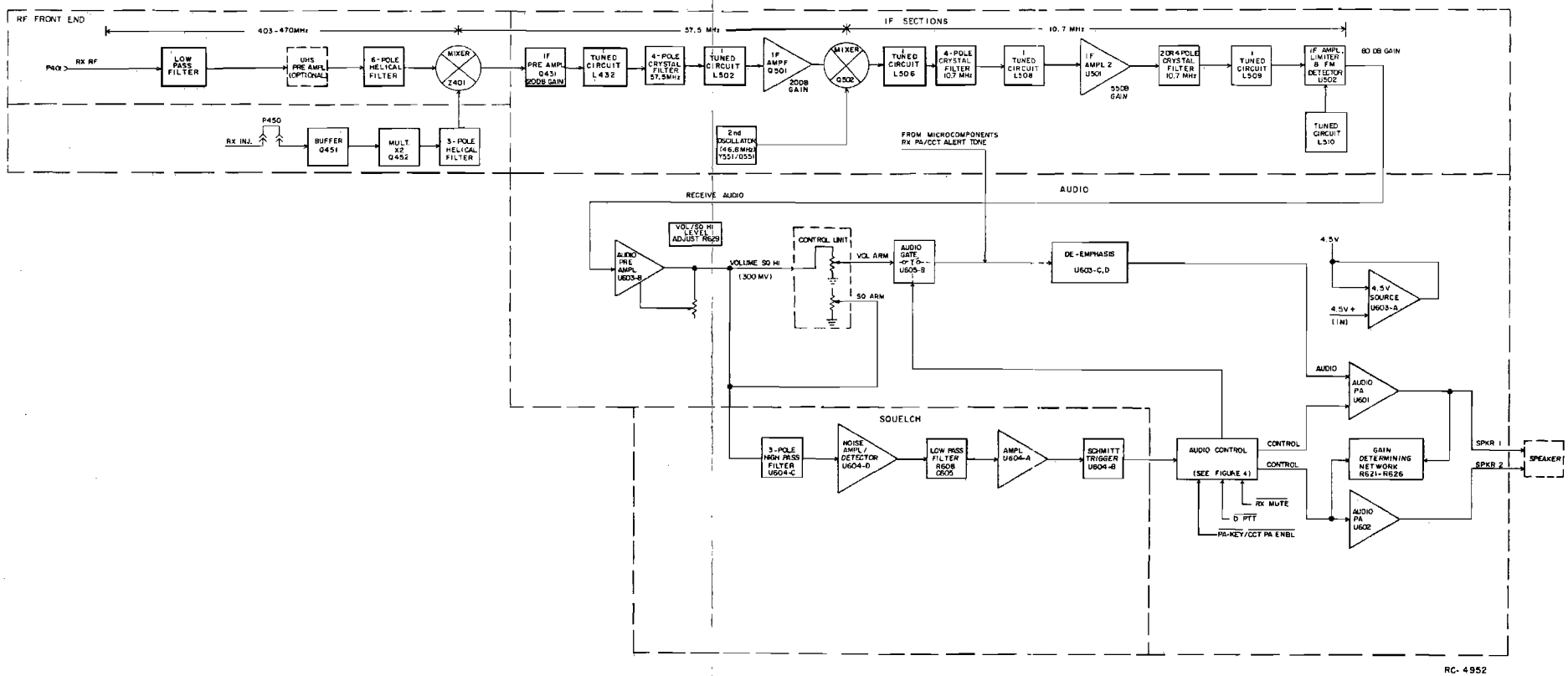


Figure 4 - Receiver Block Diagram

LO INJECTION/MULTIPLIER

The receiver L.O. injection from the synthesizer (approximately 10 dBm) is applied to the base of bipolar buffer Q451 through service plug J450.

SERVICE TIP

Service plug P430 may be removed to isolate the Rx injection signal from the LO buffer.

The output of Q451 is coupled through C454 to the base of frequency doubler Q452. The doubler output is coupled through C455 to three pole helical filter L407-L409 and C7-C9, and applied to diode mixer Z401.

The mixer injection metering (Rx Inj) is taken at the input of mixer Z401 and metered at J101-3 (position H on test set). The reading is typically 0.55 volt with injection 0.05 volt without injection. The L.O. injection frequency may be measured at TP401.

MIXER

The double balanced diode mixer Z401 receives RF input from the helical resonators and Rx injection from the Rx VCO frequency doubler. It provides a 1st IF frequency of 57.5 MHz to gate 1 of a low noise dual gate MOS FET IF PRE AMP, Q431. Bias for gate 2 is established by a voltage divider consisting of R431-R433 and is approximately 1.9 VDC. Q431 provides a gain of approximately 20 dB.

The 1st IF output (57.5 MHz) of the preamplifier is fed through a single tuned circuit to 4-pole crystal filter Z501 and Z502. The 4-pole crystal filter provides the first portion of receiver IF selectivity and attenuates all unwanted frequencies outside the passband. The output of the filter is coupled to a dual-gate low noise MOS FET amplifier through C501 and tuned circuit L502 and C502. The tuned circuit matches the impedance of the 4-pole crystal filter to the dual gate MOS FET amplifier. The amplifier output is applied to a 2nd FET mixer Q502.

2nd OSCILLATOR

Injection frequency for the 2nd mixer is provided by oscillator Q551. The oscillator utilizes a 3rd mode crystal and a JFET transistor for low harmonic distortion. The crystal controlled oscillator consists of Q551, varactor D551, variable inductor L551, Y551, and capacitors C553, C554 and C555. Either high side or low side injection is used, depending on which frequency split the radio is operating. High side injection is used in the 440-470 MHz split with the oscillator frequency set to 68.2 MHz. Low side injection is used in the 403-440 MHz split with 46.8 MHz being the oscillator frequency.

Frequency stability at cold temperatures is enhanced by the temperature compensation network consisting of R551, R556-R560, and D553.

R557 and thermistor R559 in parallel with R558 form a voltage divider. Since R559 has a negative temperature coefficient, the voltage at the divider junction will increase with decreasing temperature. At approximately -10°C the voltage will have increased enough to turn on diode D553 and provide a compensating voltage to varactor D551. This changes the capacitance of D551 and corrects the oscillator injection frequency.

2nd MIXER

The 2nd mixer, Q502, receives as inputs, the 1st IF frequency (57.5 MHz), which is applied to the gate input, and the 2nd oscillator injection frequency (68.2 MHz or 46.8 MHz). These frequencies are converted to the 2nd IF frequency of 10.7 MHz. The output of the 2nd mixer is applied to 2nd IF amplifier U501 through a 4-pole crystal filter (Z503 and Z504) and two impedance matching networks. The 4-pole crystal filter provides additional receiver selectivity at 10.7 MHz. Impedance matching network L506, R508 and C513 match the output impedance of the 2nd mixer to the 4-pole crystal filter. The 2nd impedance matching network consisting of L508, C516, and C517 matches the crystal filter to 2nd IF amplifier U501.

U501 provides approximately 55 dB of gain. Following U501 is a final 2-pole crystal filter (Z505) for 25 kHz channel spaced units. In 12.5 kHz units, a final 9-pole crystal filter (Z505, Z506) follows U501.

IF signal from the final crystal filter is applied to the IF amplifier/limiter/FM detector IC (U502) through impedance matching network L509, C523, C524 and R511. Amplifier U502 provides approximately 80 dB of gain to insure that the signal is well into limiting.

U502 also contains the quadrature FM detector. The single-tuned network, consisting of L510, C534, C535, and R515 provides the 90° phase shift necessary to produce the recovered audio. The low level detected audio is applied to audio preamplifier U603-B.

Metering for the FM detector and IF amplifier is provided by the red systems metering jack J602-4 and 10 respectively. The metered outputs are taken from U502.

AUDIO AND SQUELCH CIRCUITS

Audio

Received audio from the FM detector is applied to the input of audio preamplifier U603-B. The audio output level of the audio preamplifier is adjusted by Volume/Squelch HI level control R629 for 300 millivolts RMS. The audio is then applied to the volume and squelch (optional) controls in the control unit through front connector J601-7.

Audio is returned on VOL ARM through J601-8 and applied to audio gate (bilateral switch) U605-B. The audio gate is controlled by DPTT delayed Push-To-Talk) and PA KEY/CCT PA ENBL and is turned on when the control input (pin 5) exceeds 7 VDC. The gate is turned off when the control input is less than 2 volts. Receipt of an on frequency signal (if present) with sufficient signal to noise level and the correct Channel Guard frequency will cause the audio control circuit to apply +9 volts to U605-B-5 turning the audio gate on.

Audio from the audio gate is applied to the de-emphasis network consisting of a 2-pole low-pass filter (U603D), a 2-pole high pass filter (U603C) and associated circuitry. The low pass filter consisting of R614, R615, C606, C607 and U603-D provides a 6 dB per octave roll-off between 300 and 3000 Hz. C608, C609, R616-R619 and U603-C form a 2-pole high pass filter that attenuates frequencies below 300 Hz.

The audio output from the de-emphasis network is applied to the non-inverting input of the audio power amplifier. The audio power amplifier is comprised of U601, U602, and associated circuitry, and forms a bridge amplifier to provide 12 watts (6.93 VRMS across a 4 ohm load) of audio output power at radio output metering terminals J602-6 and 7. The output of U601 is applied to one side of the speaker and through a voltage divider (R621 and R622) to the inverting input of U602. The output of U602 is equal in amplitude but 180° out of phase with U601 and is applied to the other side of the speaker. U601 and U602 provide a balanced push-pull output to the speaker. The gain of U602 is determined by the value of R623 and R624.

Squelch Circuits

The squelch circuit monitors noise on the VOL/SQ HI input line and allows the receiver to be unmuted when an on frequency signal reduces the noise level below the squelch threshold setting.

The 300 millivolt output of the audio preamplifier is applied to the squelch circuit through the variable squelch control in the control unit or the fixed squelch control. The squelch control sets the noise threshold level required to operate the squelch circuit. When the noise falls below the threshold level, the receiver is unmuted.

The squelch circuit consists of noise Amplifier, Q607, a 3-pole high pass filter, an averaging detector, DC amplifier, and a Schmitt trigger. The high pass filter, consisting of R601-R603, C601-C603, and U604-C, removes all voice signals from the VOL/SQ HI input and couples noise to U604-D.

Recified noise in the 6-8 kHz range is amplified by noise Amplifier Q607, (the noise is rectified by diode D604A) applied to the averaging detector through the 3-pole high pass filter. The averaging detector consists of U604-D and associated circuitry. The noise is filtered by U604-D, R608, and C605 to provide an average DC output level proportional to the noise input.

The average DC level is amplified by U604A to a level ranging from 0 to 6.0 VDC, and applied to the non-inverting input of the Schmitt trigger, U604B. The inverting input of U604B is referenced to 4.5 VDC. U603A provides the stable 4.5 VDC reference voltage.

When the DC level exceeds 4.5 VDC, Schmitt trigger U604B switches and provides a positive voltage to the CAS (Carrier Activity Sensor) and RUS (Receiver Unsquelched Sensor) control transistors in the audio control circuits. The Schmitt trigger will remain on until the threshold level falls below approximately 4.3 VDC. This difference in voltage between the firing point and turn-off point provides sufficient hystersis to eliminate "bubbling" -- i.e., noise popping in the speaker. The "bubbling" would normally be caused by transitional changes in the DC level around the reference point which allows the receiver to be unmuted. The hystersis is provided by R611 and R612.

When an on frequency signal is received, there will be little or no noise present at the squelch input. This results in an absence of voltage at the output of the squelch circuit Schmitt trigger, allowing the receiver to be unmuted.

Audio Control

The audio control circuits shown by Figure 5 control the operation of the

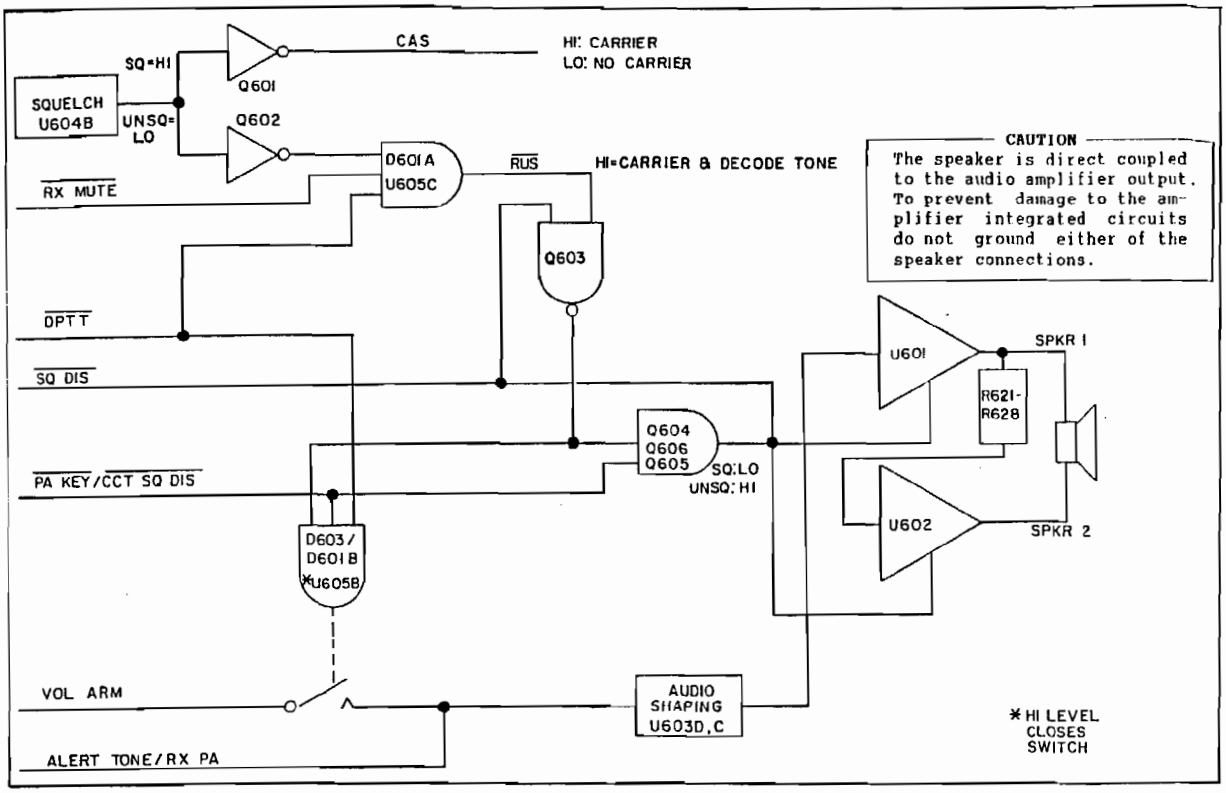


Figure 5 - Audio Control Circuit

audio gate (U605-B) and the final audio PA and consists of Q601-Q606, inverter U605-C and associated circuitry. The audio control circuit inputs consist of DPTT (Delayed Push-To-Talk), RX MUTE (Receiver Mute), PA KEY/CCT PA ENBL (Public Address Key/Carrier Control Timer Squelch Disable), and the output of the squelch circuit.

When an on frequency signal with the correct Channel Guard Tone is received, CAS control transistor Q601 and RUS control transistor Q602 are turned off by the absence of a positive voltage at their bases. The CAS line from the collector of Q601 rises to +9 VDC and is supplied to J601-12 and option connector J603-7.

The collector of RUS Transistor Q602 also rises to +9 VDC and turns on inverter U605-C. A- is then applied to the base of inverter Q603, turning it off and allowing its collector to go high. The positive voltage on the collector is applied to audio gate U605-B, turning it on. Q604 is biased on but has no affect on audio switches Q605 and Q606. The bases of the transistors are parallel connected to the output of audio control switch (U605C-9) which is at A-. Therefore Q605 and Q606 are both turned off, allowing the audio PA's to turn on and complete the audio path to the speaker.

When the microphone is keyed, the PTT/DPTT input is low. This low is applied to audio gate U605-B through D603-B, turning U605-B off. It is also applied to audio control switch U605-C (through D601B) turning it off. Q603 is also off and Q604-Q606 are on. Q605 and Q606 turn off audio PA's U601 and U602.

9-Volt Regulator

The 9 volt regulator receives the 13.8 VDC supply voltage and regulates it down to +9 VDC. The regulated voltage is

then distributed throughout the radio. The 9 volt regulator consists of pass transistor Q705, shunt regulator IC U701, as well as Q703 and Q704. Normally all transistors are turned on except Q704 which turns on only when the 9 volt output is shorted to ground.

As the input voltage increases so does the output of the regulator begin to increase. This increases the voltage on U701 from pin 1 to ground. The shunt regulator IC U701 tries to maintain the voltage at pin 2 to about 2.5 volts by sinking more current into its pin 3. This lowers the voltage at pin 3 and thus reduces the current flowing through D701 and Q703. When this current decreases it causes Q705 to provide less current to the 9 volt output and brings the 9 volt output back down where it belongs. When the input voltage decreases then the opposite occurs.

If the 9 volt output were shorted for any reason then Q704 would forward conduct causing its base voltage to sit around 1.4 VDC. That voltage is low enough to cause D701 in conjunction with Q703 to turn off shutting down the regulator until the short is removed. C701 thru C705 are for RF bypassing.

POWER DISTRIBUTION

Battery supply A+ enters the radio through the front connector at J601-19. A- enters through J601-21. Figure 6 is a block diagram of the power distribution system. Two heavy connections are provided for transmit A+ and transmit A- and connect to two busses. The busses are connected to the PA through a special feed through arrangement. A second set of wires is routed through the control unit and supplies power to the audio amplifier and 9 volt regulator.

CAUTION

The CMOS Integrated Circuit devices used in this equipment can be destroyed by static discharges. Before handling one of these devices, the serviceman should discharge himself by touching the case of a bench test instrument that has a 3-prong power cord connected to an outlet with a known good earth ground. When soldering or de-soldering a CMOS device, the soldering iron should also have a 3-prong power cord connected to an outlet with a known good earth ground. A battery operated soldering iron may be used in place of the regular soldering iron.

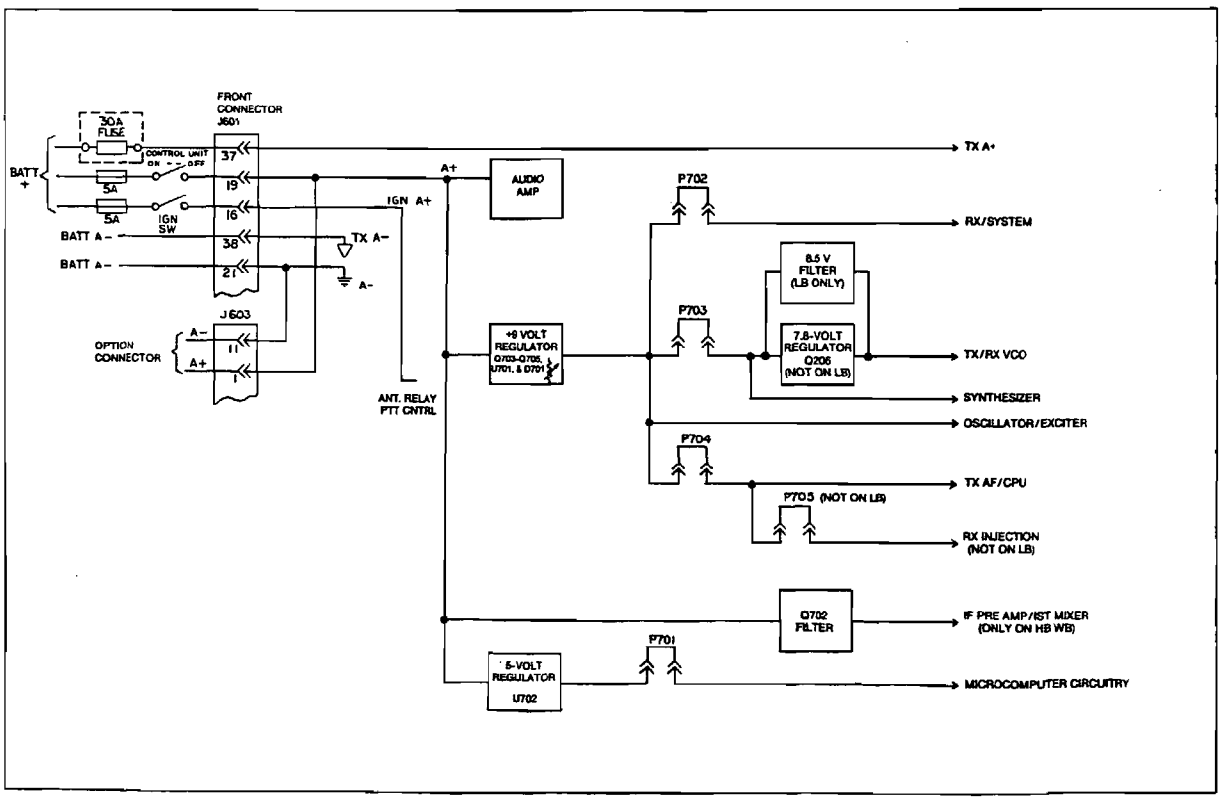


Figure 6 - Power Distribution

CAUTION

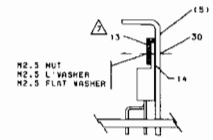
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

LEAD IDENTIFICATION FOR ALL TRANSISTORS NOT OTHERWISE IDENTIFIED

IN-LINE

TOP VIEW

NOTE: CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

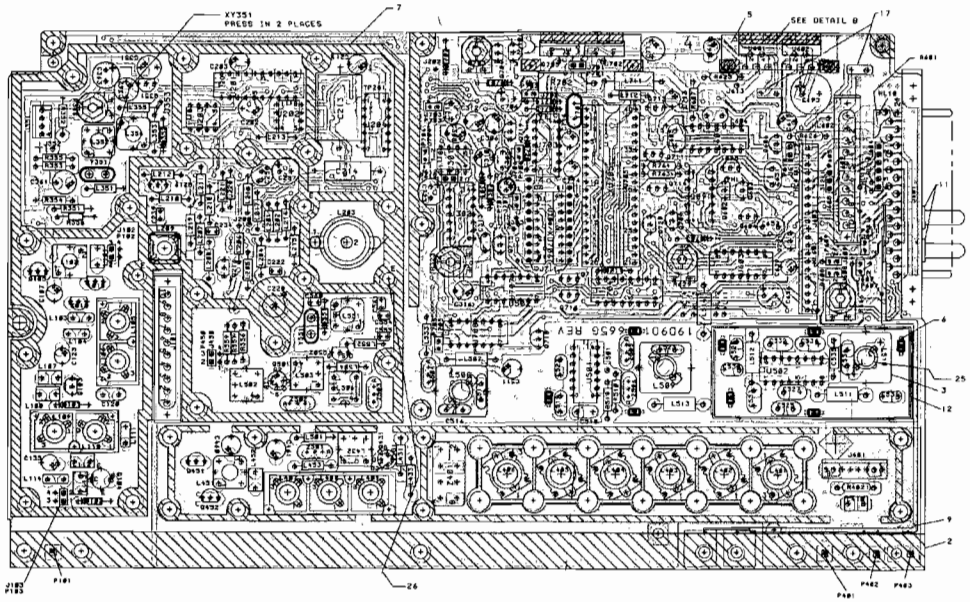


DETAIL 'B'

TYPICAL ASM FOR U401, U402,Q705, AND U702 FORM LEADS OF Q705,U702 PER 19A701294

DETAIL 'D'

CHIP DIODE & TRANSISTOR LOCATION



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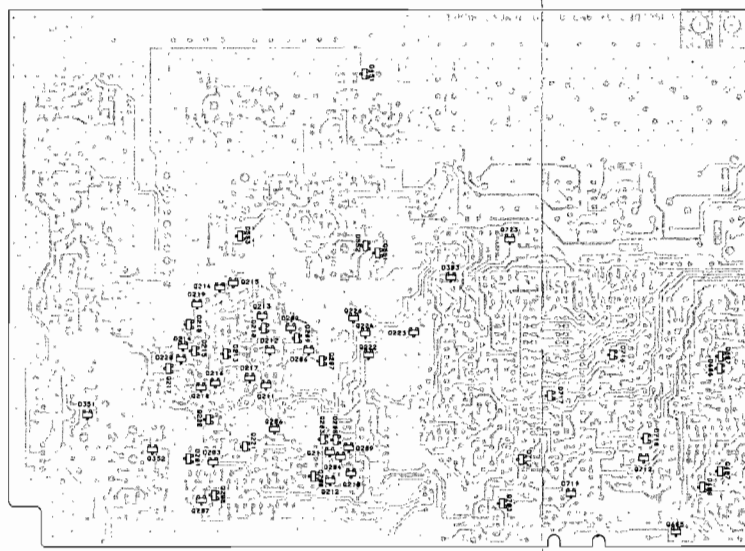
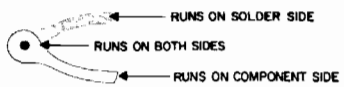
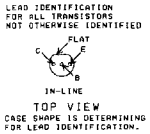
(19A704681, Shts. 1&2, Rev. 4)
(19A704681, Shts. 3&4, Rev. 4)

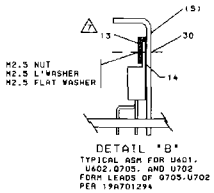


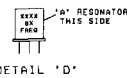
BACK VIEW OF COMPONENT BOARD

(19D901665, Sh. 3, Rev. 1)
(19A704681, Sh. 3, Rev. 4)

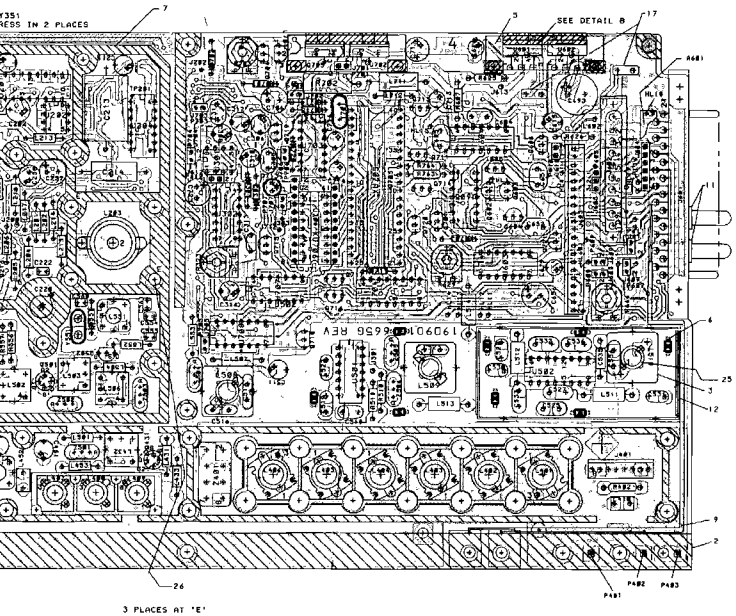








CHIP DIODE & TRANSISTOR LOCATION



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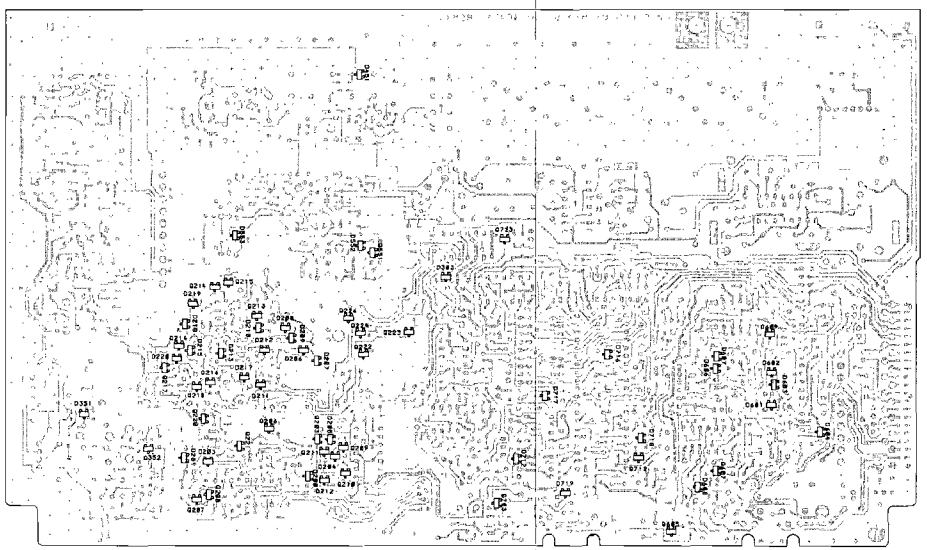
(19A704681, Shts. 3&4, Rev. 4)



BACK VIEW OF COMPONENT BOARD

(19D901665, Sh. 3, Rev. 1)
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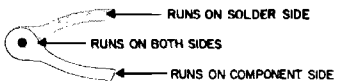
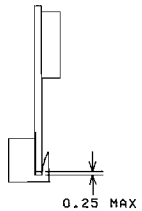
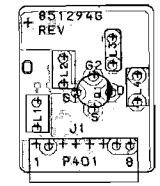


PREAMPLIFIER





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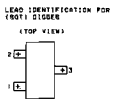
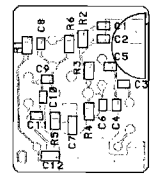
(19A703979, Sh. 2, Rev. 0)





(19C851294, Sh. 1, Rev. 1)
(19A703979, Sh. 2, Rev. 0)

BACK VIEW OF
COMPONENT BOARD

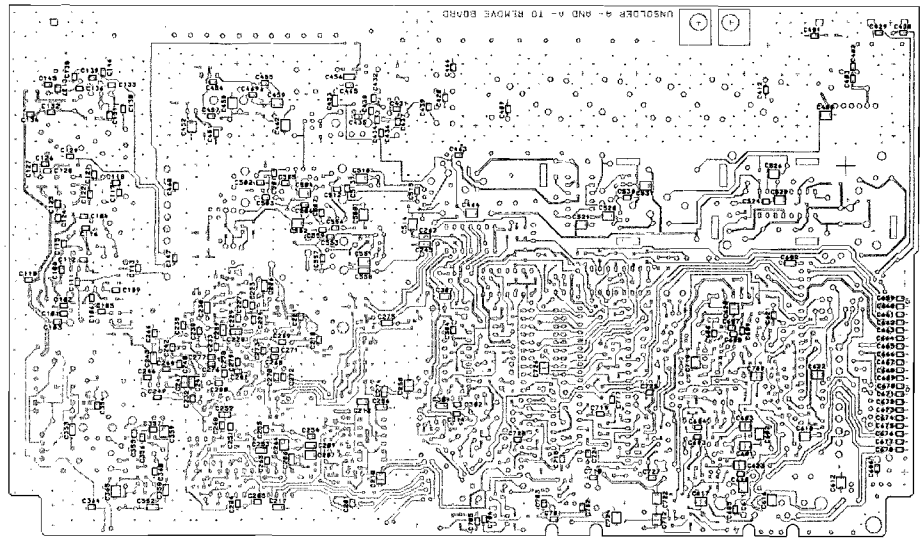
MARK AS SHOWN PLUS APPLICABLE
GROUP NUMBER AND REVISION LETTER
CHARACTERS 2.3 HIGH
COLOR BLACK PER 19A700154P1
FOR LATEST REVISION LETTER
SEE 19C850950 SH.3

OUTLINE DIAGRAMS

403-470 MHz Board

Transmit/Receive/Synthesizer Board

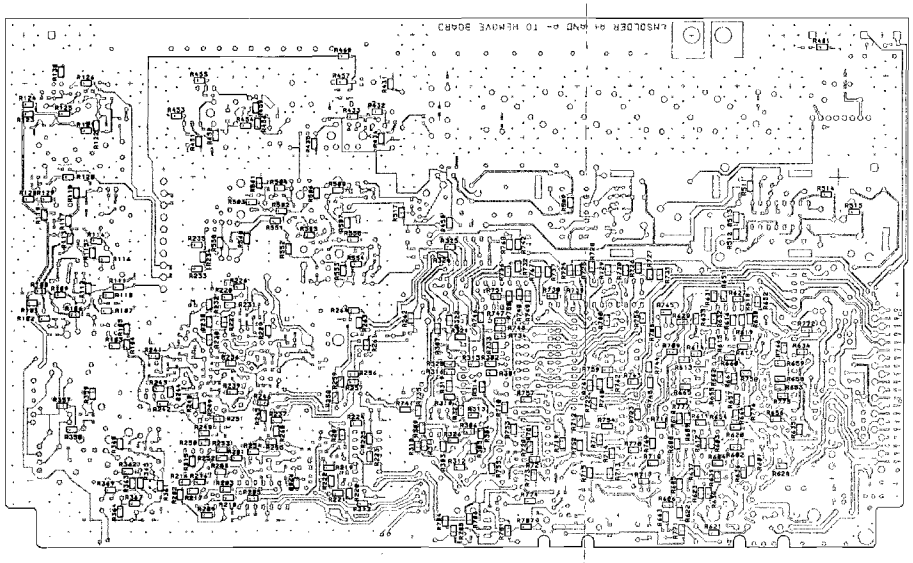
CHIP CAPACITOR LOCATION



BACK VIEW OF COMPONENT BOARD

(19D901665, Sh. 2, Rev. 4)
(19A704681, Sh. 3, Rev. 4)

CHIP RESISTOR LOCATION



BACK VIEW OF COMPONENT BOARD

(19D901665, Sh. 4, Rev. 3)
(19A704681, Sh. 3, Rev. 4)

OUTLINE DIAGRAMS

403-470 MHz Transmit/Receive/ Synthesizer Board

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MICROCOMPUTER SYSTEM	3
MICROCOMPUTER CONTROL	700
RECEIVER	4
AF/1ST MIXER/LO CHAIN 1ST,2ND IF,2ND OSCILLATOR	400 500
TRANSMITTER DRIVER	5
EXCITER AUDIO PROCESSOR	100 300
SYNTHESIZER	6
SYNTHESIZER	200
REFERENCE OSCILLATOR	7
REF OSCILLATOR	350

NOTES:

1. PART OF PWB.
2. PART OF HIGHER ASSEMBLY LEVEL.
3. * IDENTIFIES 'CHIP' COMPONENTS (EXAMPLE:R456*) WHICH ARE LOCATED ON SOLDER SIDE OF PWB.
4. A351 RESISTER NETWORK AND CODED Y351 CRYSTAL MAKE UP 2PPM OSCILLATOR KIT 19C851230. FOR 2PPM OPERATION,REMOVE R352,R353,R355 AND Y351. PLUG IN RESISTOR NETWORK A351 AND NEW CODED CRYSTAL Y351 SUPPLIED IN KIT.
5. ⏚ INDICATES VEHICULAR GROUND.
7. WHEN PREAMP OPTION IS CALLED FOR,REMOVE R402.
8. VOLTAGE READINGS:

   ALL VOLTAGES ARE TYPICAL. VOLTAGES ARE MEASURED WITH A 20,000 OHM PER VOLT METER, REFERENCE TO A- AND NOT CHASSIS GROUND, UNLESS OTHERWISE INDICATED.

   SHEET 2:
   S = SQUELCHED RECEIVER
   U = UNSQUELCHED RECEIVER
   R = RECEIVER MODE (PTT HIGH)
   T = TRANSMIT MODE (PTT LO)

   SHEET 5,6:
   VOLTAGE READINGS ARE TAKEN WITH THE TRANSMITTER UNKEYED/KEYED. EX:1.45 (UNKEYED)/.65 (KEYED). A 22 uH CHOKE MUST BE USED IN THE HOT METER LEAD TO AVOID DETUNING RF CIRCUITS.

   SHEET 3,4,7:
   VOLTAGE READINGS ARE TAKEN WITH THE TRANSMITTER UNKEYED. INTEGRATED CIRCUIT VOLTAGES ARE MEASURED WITH A HIGH INPUT IMPEDANCE DIGITAL VOLTMETER.
9. JUMPER PLUG CONNECTIONS FOR OPTIONS.

   THE BOARD IS ASSEMBLED WITH ALL JUMPER PLUGS PRESENT.
   FOR FIXED SQUELCH OPTION,MOVE P605 TO J605-1 AND 2 AND ADD R666 (19A700185P4). ADD JUMPER FROM A601-HL2 TO A601-HL10 FOR FIXED SQUELCH WITH S500 OR MII TYPE CONTROL UNITS.
   FOR MII INTERFACE OPTION AND/OR CHANNEL GUARD OPTION,REMOVE P608. WITH BOTH OPTIONS ALSO REMOVE P609.
   FOR FIXED SQUELCH WITH DUAL CONTROL,REMOVE P605.
10. REGULATED +5V AND +9V CAN BE OPENED BY P701 THRU P705 FOR TROUBLESHOOTING.
11. FOR SERIAL LOAD OF EE PROM FROM RADIO FRONT CONNECTOR J601
    - J601-10 SERIAL CONTROL
    - J601-29 STORE
    - J601-30 SERIAL DATA
    - J601-32 SERIAL CLOCK
    - J601-36 RESET
12. FUNCTION INTERFACE POINTS PROVIDED FOR DATA INTERFACE.
13.

FREQ. BAND (MHZ)	TWEET FREQ. (MHZ)	2ND OSC XTAL Y551 (MHZ)	C560	C561	2ND MIXER INJECTION
440-470	NONE	68.2	——	——	HIGH SIDE
403-440 (STD INJ)	421.190 TO 421.210	46.8	6.8P	10P	LOW SIDE
403-440 (ALT INJ)	409.190 TO 409.210	68.2	REMOVE	REMOVE	HIGH SIDE

14. PROVIDED FOR TEST/TROUBLESHOOTING.
15. Z506 IS PRESENT FOR 12.5KHZ CHANNEL SPACING.
16. REMOVE P706 TO USE MINI E^2 PROM PROGRAMMER. REPLACE WHEN PROGRAMMING COMPLETE.
17. P707 DISABLES E^2 PROM PROGRAMMING FUNCTION AND IS RECOMENDED FOR S950 AND S990 CONTROL UNIT APPLICATIONS WITHOUT DOWNLOAD AND ALL OTHER CONTROL UNIT APPLICATIONS.

△ COMPONENT IDENTIFICATION CHART

PART	66581.613 440-470(25 KHZ)	66583.615 440-470(12.5 KHZ)	66565.617 403-440(25 KHZ)	66587.619 403-440(12.5 KHZ)
C112	15P	15P	22P	22P
C131	12P	12P	6.8P	6.8P
C133	4.7P	4.7P	6.8P	6.8P
C145	3.9P	3.9P	6.8P	6.8P
C218	18P	18P	30P	30P
C223	15P	15P	22P	22P
C224	18P	18P	15P	15P
C234	2.2P	2.2P	3.3P	3.3P
C235	24P	24P	39P	39P
C240	27P	27P	33P	33P
C266	8.2P	8.2P	12P	12P
C268	4.7P	4.7P	10P	10P
C269	2.7P	2.7P	5.1P	5.1P
C270	2.7P	2.7P	3.9P	3.9P
C271	1.5P	1.5P	2.7P	2.7P
C276	10P	10P	18P	18P
C277	5.6P	5.6P	10P	10P
C409	3.9P	3.9P	4.7P	4.7P
C412	3.9P	3.9P	4.7P	4.7P
C420	2.7P	2.7P	---	---
C455	10P	10P	4.7P	4.7P
C457	6.8P	6.8P	10P	10P
C465	5.6P	5.6P	8.2P	8.2P
C512	100P	56P	100P	56P
C513	39P	47P	39P	47P
C515	5.6P	10P	5.6P	10P
C516	39P	47P	39P	47P
C517	100P	68P	100P	68P
C538	1.8P	6.8P	1.8P	6.8P
C556	39P	39P	4.7n	4.7n
C557	2.7P	2.7P	1.8P	1.8P
C559	39P	39P	27P	27P
C560	---	---	6.8P	6.8P
C561	---	---	10P	10P
L501	2.7U	1.5U	2.7U	1.5U
R119	180	180	75	75
R128	180	180	75	75
R129	---	---	261	261
R304	4.7K	5.36K	4.7K	5.36K
R305	1.3K	1.47K	1.3K	1.47K
R307	27K	32.4K	27K	32.4K
R309	22K	24.9K	22K	24.9K
R310	332	374	332	374
R311	51.1K	59K	51.1K	59K
R314	20K	22.6K	20K	22.6K
R315	12.4K	13.7K	12.4K	13.7K
R316	32.4K	36.5K	32.4K	36.5K
R320	10.5K	10.5K	7.5K	7.5K
R435	2.7K	3.9K	2.7K	3.9K
R501	2.7K	3.9K	2.7K	3.9K
R509	100	180	100	180
R510	2.43K	---	2.43K	---
R518	---	2.43K	---	2.43K
R601	8.25K	9.09K	8.25K	9.09K
R602	2.26K	2.49K	2.26K	2.49K
R603	113K	124K	113K	124K
R606	10K	5.62K	10K	5.62K
R611	15K	22K	15K	22K
R628	8.2K	4.7K	8.2K	4.7K
R635	100K	147K	100K	147K
R459	----	----	470	470

SPARE GATES			
DEVICE	INPUT	OUTPUT	CONTROL
U605D	11	10	12
U605A	1	2	13
U704F	14	13	

POWER & GROUND CONNECTIONS			
DEVICE	+9V PIN NO.	A- PIN NO.	+5V PIN NO.
U203	8	1,4	
U204	14	7	
U301	8	4	
U302	14	7	
U603	4	11	
U604	4	11	
U605	14	1,7,11,12,13	
U703		7	14
U704		8,14	16
U707		7	14
U708	14	7	

ALL CHIP RESISTORS ARE 1/8 WATT
ALL OTHER RESISTORS ARE 1/4 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,n OR u.

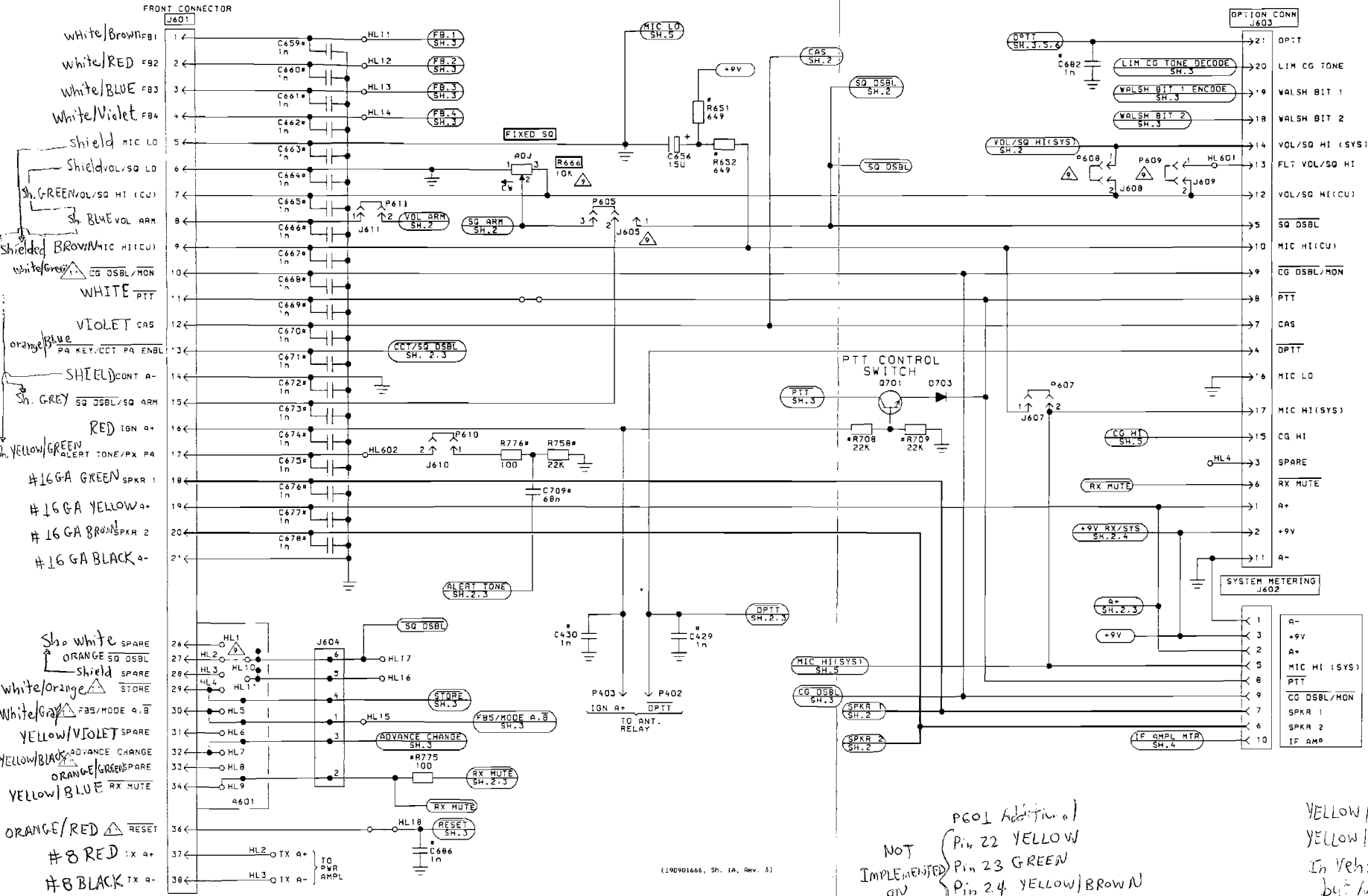
MODEL NO. (GOLD CONNECTORS)	REV. LTR.	MODEL NO. (TIN CONNECTORS)	REV. LTR.	FREQ. RANGE	CHANNEL SPACING	FACTORY SWEEP TUNE RANGE
PLI9D901665G13	D	PLI9D901665G1	E	440-470 MHz	25 KHz	—— ——
PLI9D901670G13		PLI9D901670G1				450-470 MHz
PLI9D901670G17		PLI9D901670G5				440-460 MHz
PLI9D901665G15	D	PLI9D901665G5	E	440-470 MHz	12.5 KHz	—— ——
PLI9D901670G16		PLI9D901670G2				450-470 MHz
PLI9D901665G17	F	PLI9D901665G5	J			—— ——
PLI9D901670G15		PLI9D901670G3		403-440 MHz	25 KHz	403-423 MHz
PLI9D901670G18		PLI9D901670G6				420-440 MHz
PLI9D901670G19		PLI9D901670G7				410-430 MHz
PLI9D901665G19	F	PLI9D901665G7	J	403-440 MHz	12.5 KHz	—— ——
PLI9D901670G16		PLI9D901670G4				403-423 MHz

SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board

Radio Interconnect/Legend

LBI31539



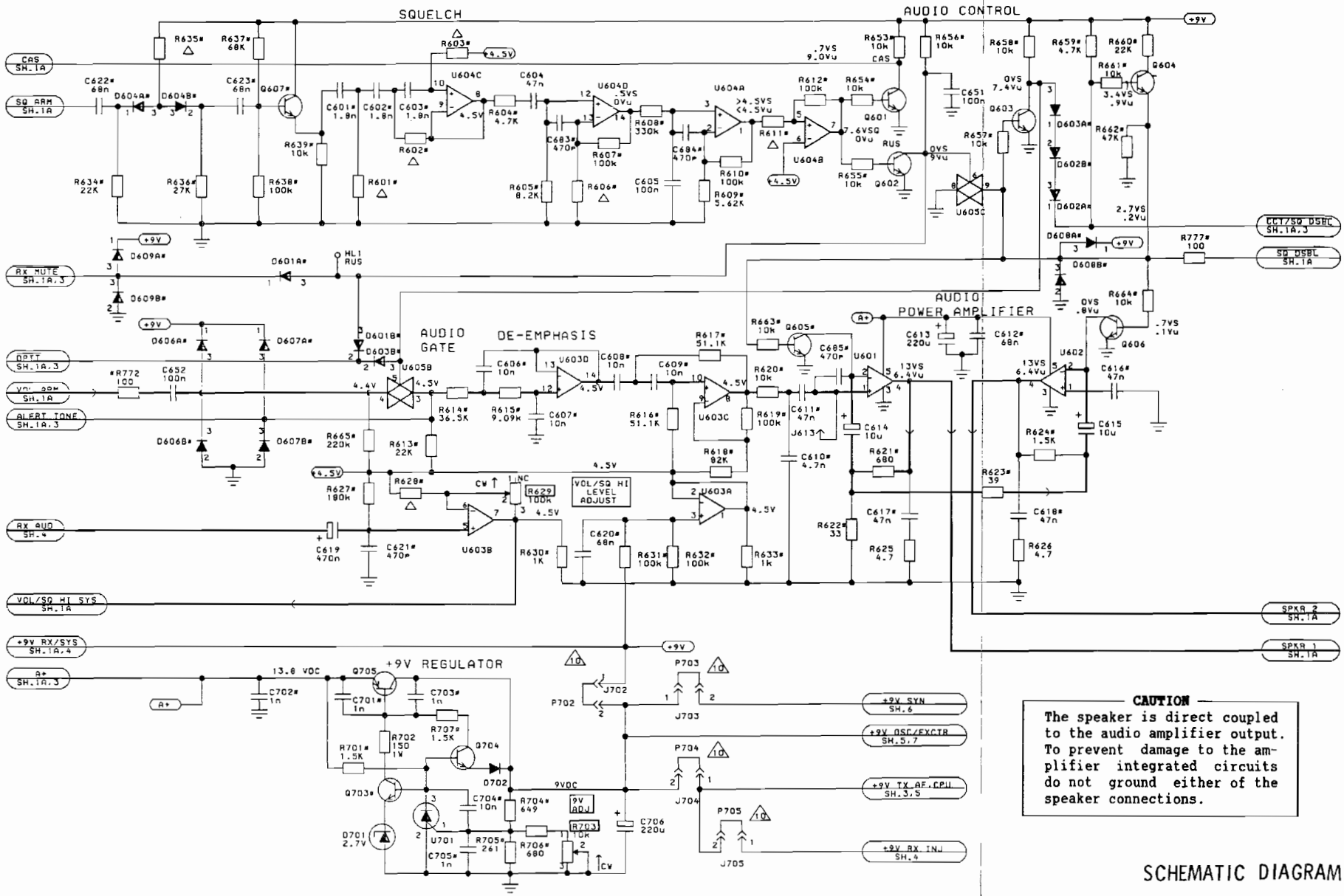
NOT IMPLEMENTED ON RADIO J601

P601 Additional
Pin 22 YELLOW
Pin 23 GREEN
Pin 24 YELLOW/BROWN
Pin 25 WHITE/YELLOW
Pin 35 ORANGE/BROWN

YELLOW/RED
YELLOW/GRAY
In Vehicle Harness Cable but Not Connected to Pins on either Side

SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board



CAUTION

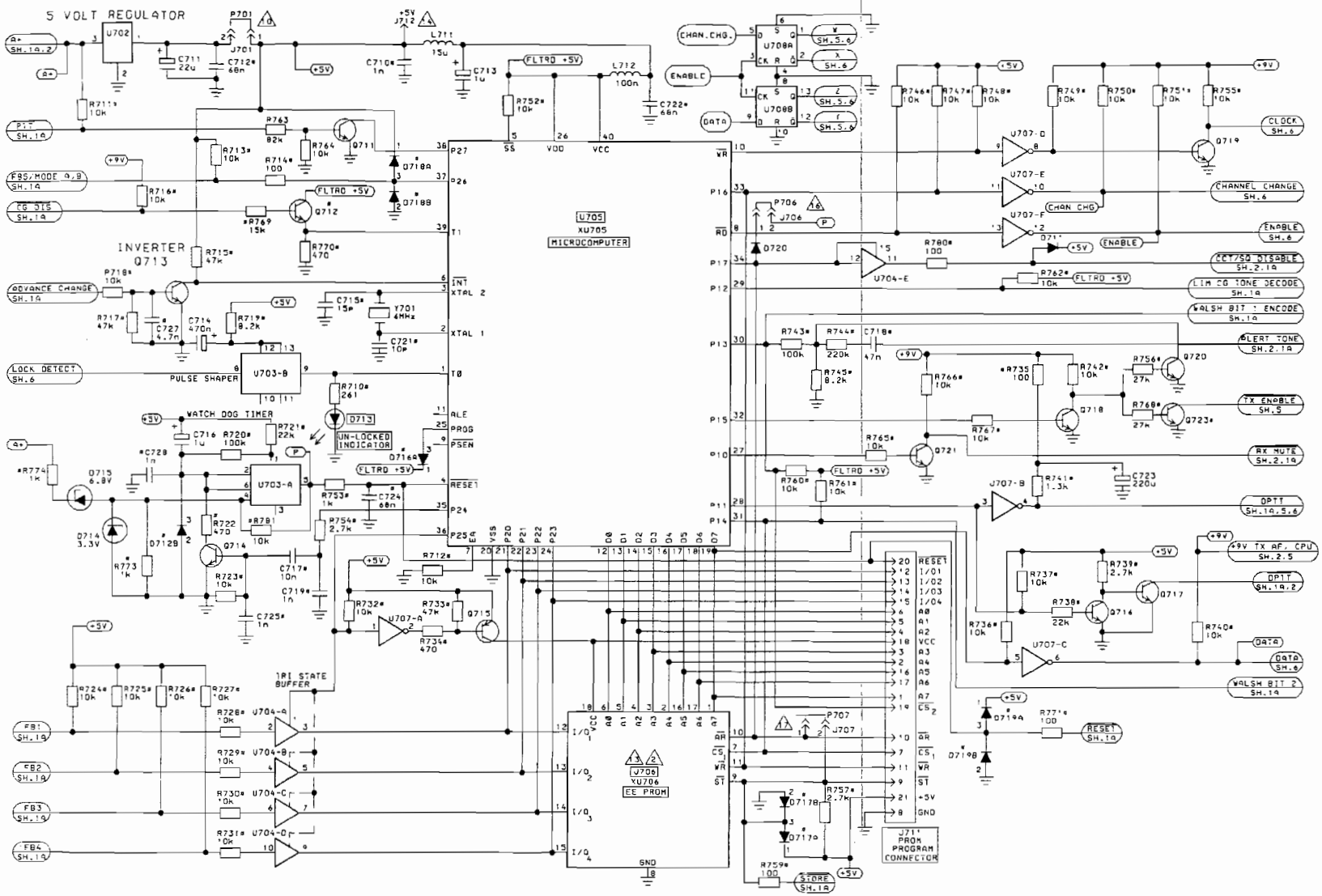
The speaker is direct coupled to the audio amplifier output. To prevent damage to the amplifier integrated circuits do not ground either of the speaker connections.

(19D901666, Sh. 2, Rev. 2)

SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board

Rx Audio PA, Squelch, +9V Regulator



SCHEMATIC DIAGRAM

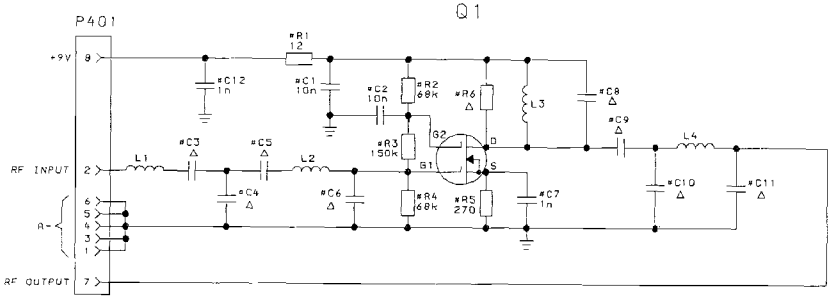
(19D901666, Sh. 3, Rev.1)

403-470 MHz Transmit/Receive/Synthesizer Board

MODEL NO.	REV. LETTER	FREQ	COMMENTS
19C85129461		440-470 MHZ	TIN CONNECTOR
19C85129463		403-440 MHZ	TIN CONNECTOR
19C85129465		440-470 MHz	GOLD CONNECTOR
19C85129466		403-440 MHZ	GOLD CONNECTOR

RECEIVER PREAMP

Q1



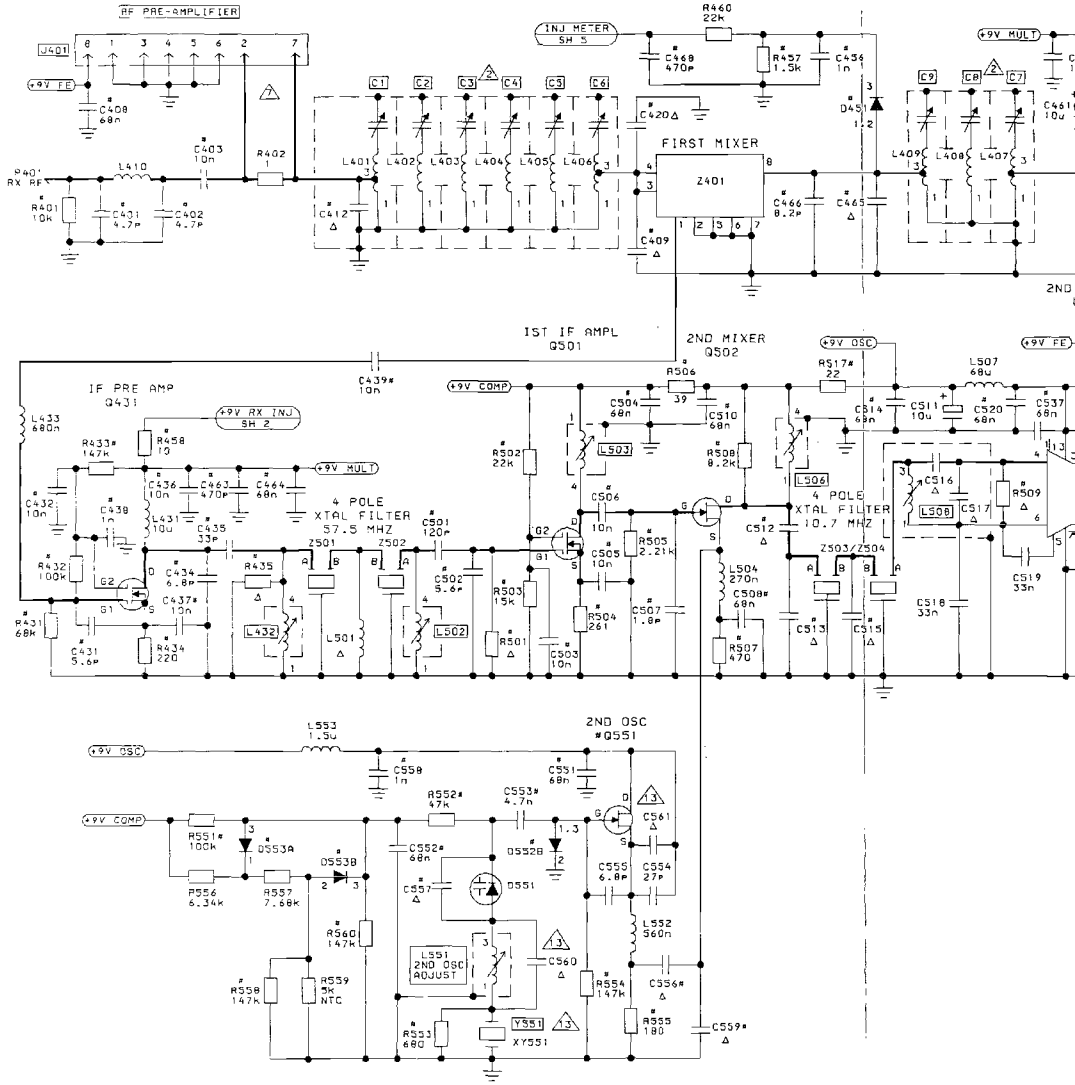
ALL RESISTORS ARE 1/8 WATT UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER K OR M.
CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER μ,n OR p.
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER m,n OR μ.

NOTES:
1. # DENOTES CHIP COMPONENT ON SOLDER SIDE OF BOARD

Δ COMPONENT IDENTIFICATION CHART

PART	29461.5 440-470	29463.6 403-440
C3	1.2p	2.2p
C4	6.8p	8.2p
C5	180p	56p
C6	2.2p	3.3p
C8	4.7p	6.8p
C9	1.5p	3.3p
C10	5.6p	1.0p
C11	12p	
R6	470	560

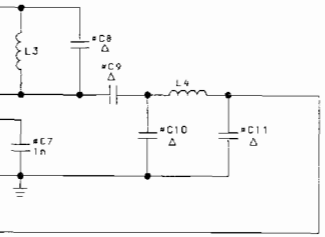
(19C851375, Sh. 1, Rev. 3)



(19D901666, Sh. 4, Rev. 3)

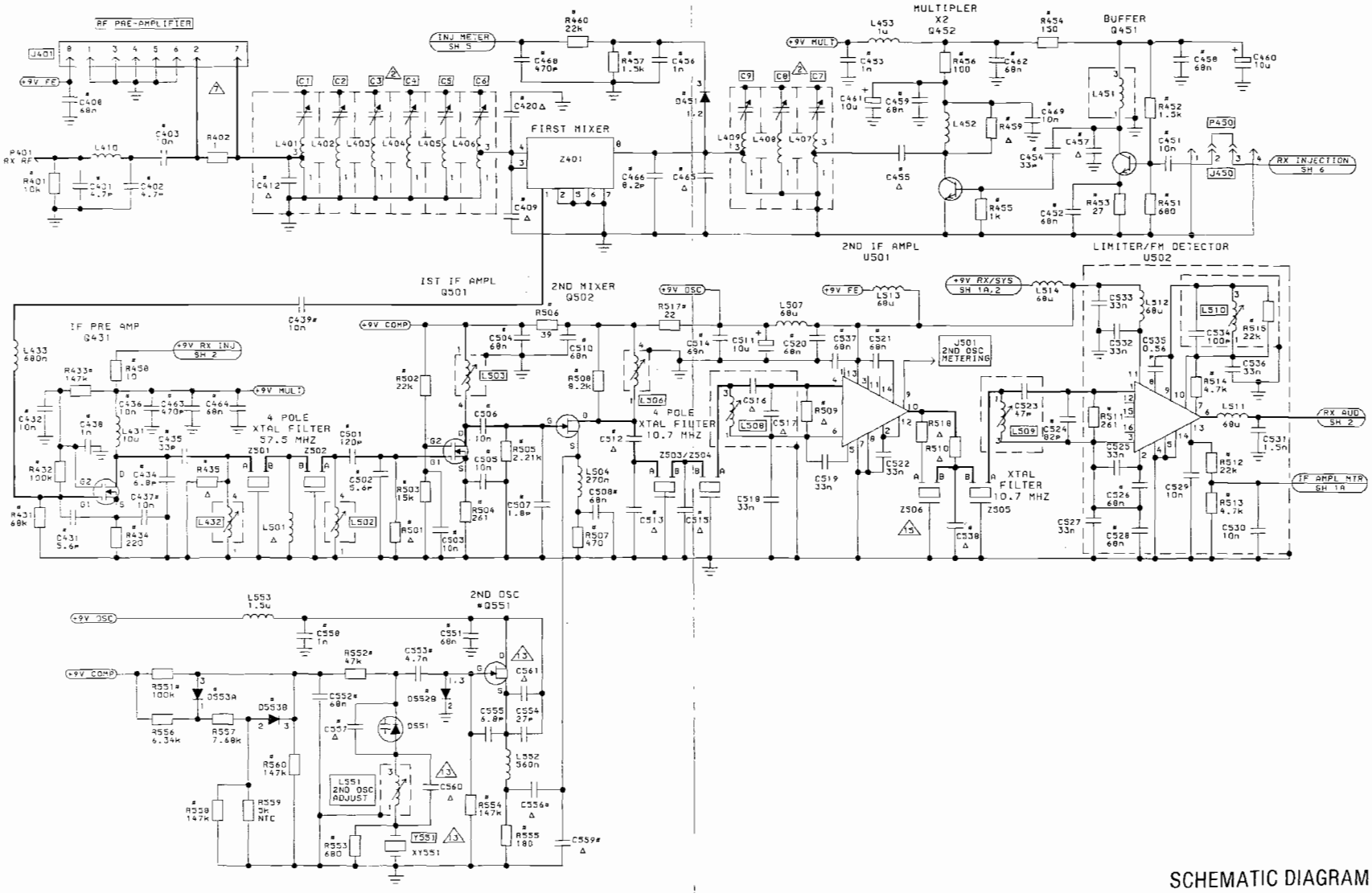
.	REV. LETTER	FREQ	COMMENTS
461		440-470 MHZ	TIN CONNECTOR
463		403-440 MHZ	TIN CONNECTOR
465		440-470 MHz	GOLD CONNECTOR
466		403-440 MHZ	GOLD CONNECTOR

REAMP



DENTIFICATION CHART

29461,5	29463,6
440-470	403-440
1.2p	2.2p
6.8p	8.2p
180p	56p
2.2p	3.3p
4.7p	6.8p
1.5p	3.3p
5.6p	1.0p
12p	
470	560

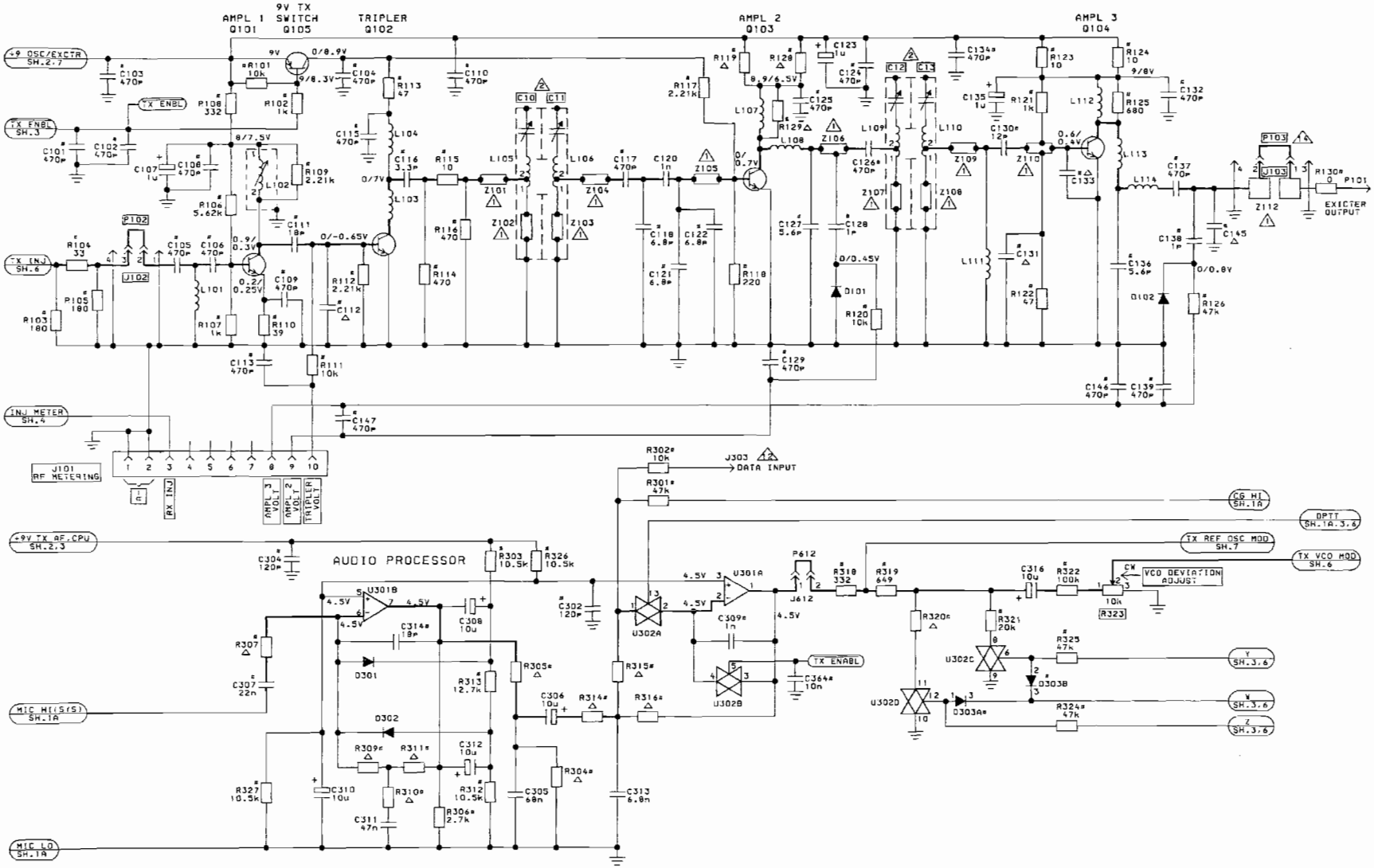


(190901666, Sh. 4, Rev. 3)

SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board

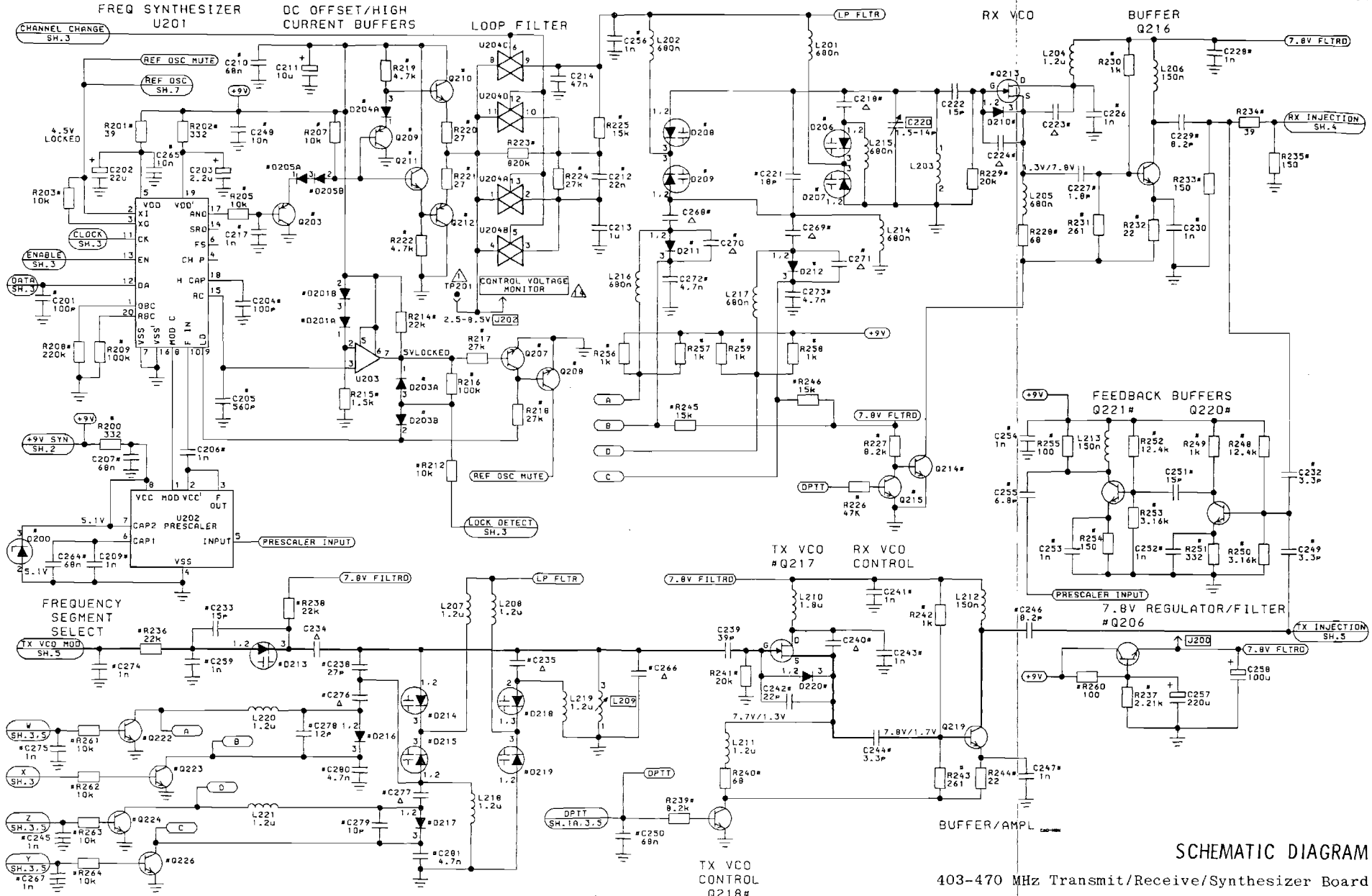
Receiver/Receiver Preamplifier
and UHF Preamplifier



(19D901666, Sh. 5, Rev. 4)

SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board
Exciter/Transmit Audio Processor

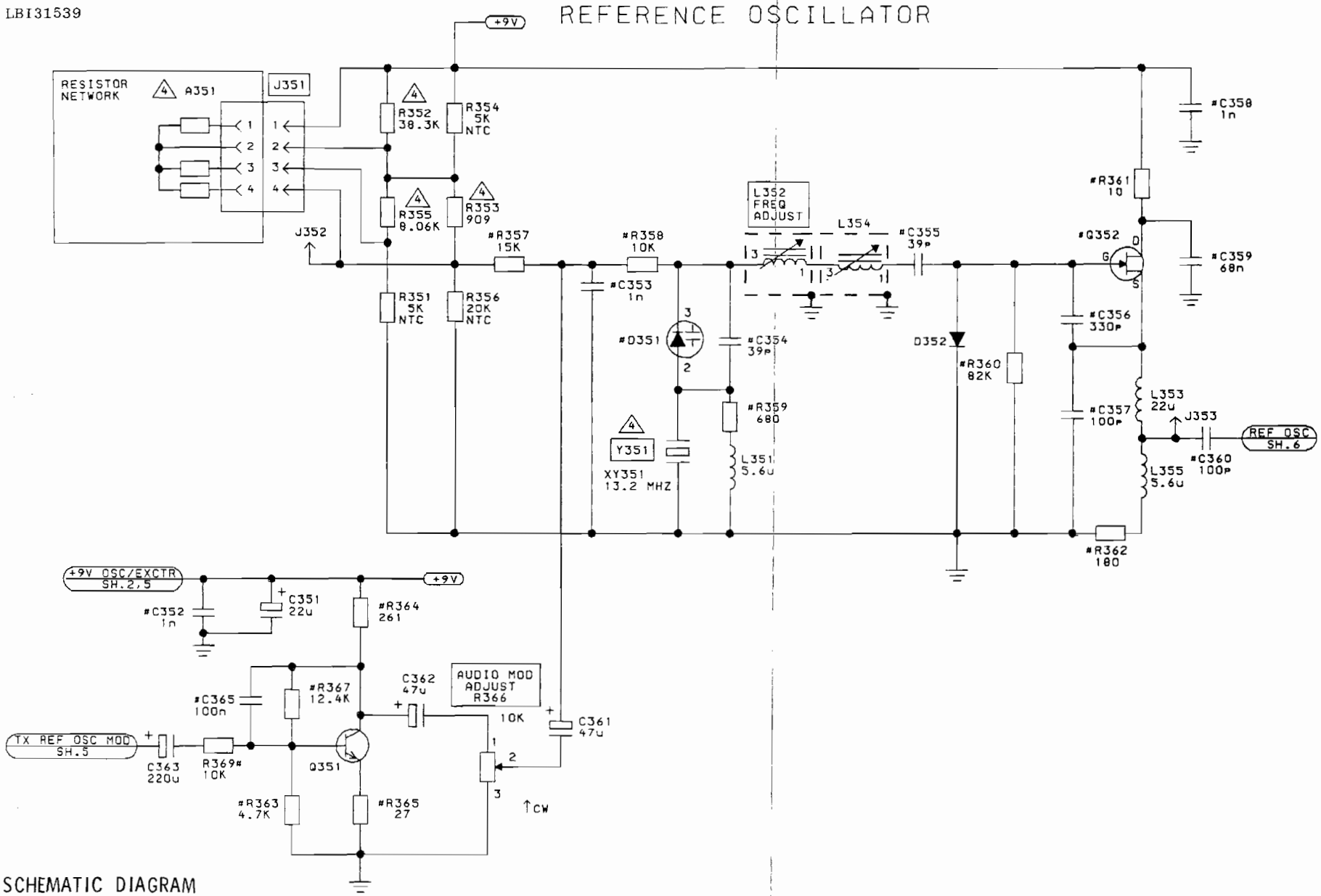


SCHEMATIC DIAGRAM

403-470 MHz Transmit/Receive/Synthesizer Board

Frequency Synthesizer

(19D901666, Sh. 6, Rev 2)



SCHEMATIC DIAGRAM

407-470 MHz Tranmit/Receive/Synthesizer Board
Reference Oscillator

(19D901666, Sh. 7, Rev. 1)

PARTS LIST

TRANSMIT/RECEIVE/SYNTHESIZER BOARD

19D901670G1 440-470 MHz (TUNED 450-470), 25 KHz CHAN SPAC, (TIN CONN)
19D901670G2 440-470 MHz, 12.5 KHz CHAN SPAC, (TIN CONN)
19D901670G3 403-440 MHz (TUNED 403-423), 25 KHz CHAN SPAC, (TIN CONN)
19D901670G4 403-440 MHz, 12.5 KHz CHAN SPAC, (TIN CONN)
19D901670G5 440-470 MHz (TUNED 440-460), 25 KHz CHAN SPAC, (TIN CONN)
19D901670G6 403-440 MHz (TUNED 420-440), 25 KHz CHAN SPAC, (TIN CONN)
19D901670G7 403-440 MHz (TUNED 410-430), 25 KHz CHAN SPAC, (TIN CONN)
19D901670G13 440-470 MHz (TUNED 450-470), 25 KHz CHAN SPAC, (GOLD CONN)
19D901670G14 440-470 MHz, 12.5 KHz CHAN SPAC, (GOLD CONN)
19D901670G15 403-440 MHz (TUNED 403-423), 25 KHz CHAN SPAC, (GOLD CONN)
19D901670G16 403-440 MHz, 12.5 KHz CHAN SPAC, (GOLD CONN)
19D901670G17 440-470 MHz (TUNED 440-460), 25 KHz CHAN SPAC, (GOLD CONN)
19D901670G18 403-440 MHz (TUNED 420-440), 25 KHz CHAN SPAC, (GOLD CONN)
19D901670G19 403-440 MHz (TUNED 410-430), 25 KHz CHAN SPAC, (GOLD CONN)
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
		NOTE: WHEN REPLACING BOARDS, CARE SHOULD BE TAKEN TO ASSURE THAT BOARDS WITH GOLD CONTACTS ARE NOT INTERMIXED WITH BOARDS HAVING TIN CONTACTS. REPLACE THE BOARD ONLY WITH ONE HAVING THE SAME GROUP NUMBER AS THE ORIGINAL.
A1		19D901665G1 440-470 MHz, 25 KHz (TIN) 19D901665G13 440-470 MHz, 12.5 KHz (TIN) 19D901665G5 403-440 MHz, 25 KHz (TIN) 19D901665G7 403-440 MHz, 12.5 KHz (TIN) 19D901665G13 440-470 MHz, 25 KHz (GOLD) 19D901665G15 440-470 MHz, 12.5 KHz (GOLD) 19D901665G17 403-440 MHz, 25 KHz (GOLD) 19D901665G19 403-440 MHz, 12.5 KHz (GOLD)
		EXCITER
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C101 thru C106	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C107	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C108 thru C110	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C111	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM
C112	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C112	19A702236P34	Ceramic: 22 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
C113	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C115	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C116	19A702236P13	Ceramic: 3.3 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
C117	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C118	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM.
C120	19A701602P20	Ceramic: 1000 pF + or -10%, 1000 VDCW.
C121 and C122	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM.
C123	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C124 thru C126	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C127	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C128	19A702061P901	Ceramic: 1 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -250 PPM/°C.
C129	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C130	19A702236P28	Ceramic: 12 pF + or - 5%, 50 VDCW, temp coef 0 + or -30 PPM.
C131	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G5, G7, G17 and G19).
C131	19A702236P28	Ceramic: 12 pF + or - 5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
C132	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C133	19A702236P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
C133	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G5, G7, G17 and G19).
C134	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C135	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C136	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C137	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C138	19A702061P901	Ceramic: 1 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -250 PPM/°C.
C139	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C145	19A702236P15	Ceramic: 3.9 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C145	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G5, G7, G17 and G19).
C146 and C147	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
		- - - - - - - - - - DIODES - - - - - - - - - -
D101 and D102	19A700047P3	Silicon: 100 mW; sim to 1N6263.
		- - - - - - - - - - JACKS - - - - - - - - - -
J101	19B800555G3	Connector: metering, block Includes:
	19A700237P1	Contact, electrical: sim to Malco Q03-0132-001.
J102	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J102	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J103	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J103	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L101	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L102	19B800965P223	Coil, RF: variable; sim to Paul Smith SK767-2. (Used in G1, G3, G13 and G15).
L102	19B800962P323	Coil, RF: sim to Paul Smith SK767-1. (Used in G5, G7, G17 and G19).
L103	19B800890P5	Coil, RF: sim to Paul Smith SK-891-1. (Used in G1, G3, G13 and G15).
L103	19B800890P7	Coil, RF: 15.8 nH + or -5%; sim to Paul Smith SK-891-1. (Used in G5, G7, G17 and G19).
L104	19B800890P6	Coil, RF: 14.7 nH + or -5%, sim to Paul Smith SK-891-1. (Used in G1, G3, G13 and G15).
L104	19B800890P8	Coil, RF: sim to Paul Smith SK-891-1. (Used in G5, G7, G17 and G19).
L105	19J706154P17	RF Coil: sim to Paul Smith SK802-1. (Used in G1, G3, G13 and G15).
L105	19J706154P21	Coil, RF, fixed: sim to Paul Smith SK802-1. (Used in G5, G7, G17 and G19).
L106	19J706154P17	RF Coil: sim to Paul Smith SK802-1. (Used in G1, G3, G13 and G15).
L106	19J706154P21	Coil, RF, fixed: sim to Paul Smith SK802-1. (Used in G5, G7, G17 and G19).
L107	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L108	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1.
L109	19J706154P17	RF Coil: sim to Paul Smith SK802-1. (Used in G1, G3, G13 and G15).
L109	19J706154P21	Coil, RF, fixed: sim to Paul Smith SK802-1. (Used in G5, G7, G17 and G19).
L110	19J706154P17	RF Coil: sim to Paul Smith SK802-1. (Used in G1, G3, G13 and G15).
L110	19J706154P21	Coil, RF, fixed: sim to Paul Smith SK802-1. (Used in G5, G7, G17 and G19).
L111	19B800890P5	Coil, RF: sim to Paul Smith SK-891-1. (Used in G1, G3, G13 and G15).
L111	19B800890P8	Coil, RF: sim to Paul Smith SK-891-1. (Used in G5, G7, G17 and G19).
L112	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L113	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1.
L114	19B800890P7	Coil, RF: 15.8 nH + or -5%; sim to Paul Smith SK-891-1.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P101	19A701785P3	Contact, electrical.
P102	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P102	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P103	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P103	19A702104P2	Connector: gold plated, two position shorting: sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q101	19A702084P2	Silicon, NPN: sim to MPS 2369.
Q102 and Q103	19A703027P2	Silicon, NPN: sim to MPS 3866.
Q104	19A701940P1	Silicon, NPN: sim to MRF-559. (Used in G1, G3, G13 and G15).
Q104	19A701940P5	Silicon, NPN: sim to MRF 559, SGS Thompson only (Used in G5, G7, G17 and G19).
Q105	19A702504P2	Silicon, PNP: sim to 2N4403.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R101	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R102	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R103	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w.
R104	19B800607P330	Metal film: 33 ohms + or - 5%, 200 VDCW, 1/8 w.
R105	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w.
R106	19A702931P273	Metal film: 5620 ohms + or -1%, 200 VDCW, 1/8 w.
R107	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R108	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w.
R109	19A702931P234	Metal film: 2210 ohms + or -1%, 200 VDCW, 1/8 w.
R110	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w.
R111	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R112	19A702931P234	Metal film: 2210 ohms + or -1%, 200 VDCW, 1/8 w.
R113	19B800607P470	Metal film: 47 ohms + or - 5%, 200 VDCW, 1/8 w.
R114	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R115	19B800607P100	Metal film: 10 ohms + or -5%, 1/8 w.
R116	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R117	19A702931P234	Metal film: 2210 ohms + or -1%, 200 VDCW, 1/8 w.
R118	19B800607P221	Metal film: 220 ohms + or - 5%, 200 VDCW, 1/8 w.
R119	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G3, G13 and G15).
R119	19B800607P750	Metal film: 75 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G5, G7, G17 and G19).
R120	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R121	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R122	19B800607P470	Metal film: 47 ohms + or - 5%, 200 VDCW, 1/8 w.
R123 and R124	19B800607P100	Metal film: 10 ohms + or -5%, 1/8 w.
R125	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R126	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R128	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G3, G13 and G15).
R128	19B800607P750	Metal film: 75 ohms + or - 5%, 200 VDCW, 1/8 (Used in G5, G7, G17 and G19).
R129	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 (Used in G5, G7, G17 and G19).
R130	19B800607P1	Metal Film: Jumper.
		- - - - - - - - - - FILTER - - - - - - - - - -
Z101 thru Z110		Part of printed wire board 19D901664P1.
Z112		Part of printed wire board 19D901664P1.
		SYNTHESIZER
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C201	19A702061P61	Ceramic: 100 pF + or - 5%, 50 VDCW, temp coe + or - 30 PPM.
C202	19A701534P8	Tantalum: 22 uF + or -20%, 16 VDCW.
C203	19A701534P5	Tantalum: 2.2 uF, + or -20%, 35 VDCW.
C204	19A702061P61	Ceramic: 100 pF + or - 5%, 50 VDCW, temp coe + or - 30 PPM
C205	19A702061P79	Ceramic: 560 pF + or - 5%, 50 VDCW, temp coe + or - 30 PPM.
C206	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coe + or -30 PPM/°C.
C207	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C209	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coe + or -30 PPM/°C.
C210	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C211	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C212	19A702052P28	Ceramic: 0.022 uF + or -10%, 50 VDCW.
C213	19A703778P3	Metallized Polypropylene: 1.0 uF + or -10%, VDCW; sim to Sprague Type 735 P.
C214	19A703778P1	Metallized Polypropylene: 0.047 uF + or -10 100 VDCW; sim to Sprague Type 735P.
C217	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp co + or -30 PPM/°C.
C218	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coef or -30 PPM (Used in G1, G3, G13 and G15).
C218	19A702236P37	Ceramic: 30 pF + or -5%, 50 VDCW. (Used in G7, G17 and G19).
C220	19A134227P5	Variable: 1.5 to 14 pF, 100 VDCW.
C221	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coef or -30 PPM
C222	19A700226P33	Ceramic: 15 pF + or -5%, 100 VDCW, temp co -750 PPM.
C223	19A702236P34	Ceramic: 22 pF + or -5%, 50 VDCW, temp coe or -30 PPM. (Used in G5, G7, G17 and G19).
C223	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coe or -30 PPM/°C. (Used in G1, G3, G13 and G15
C224	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coe or -30 PPM (Used in G1, G3, G13 and G15).
C224	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coe or -30 PPM/°C. (Used in G5, G7, G17 and G19
C226	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp c + or -30 PPM/°C.
C227	19A702236P9	Ceramic: 1.8 pF + or -0.25 pF, 50 VDCW, te coef 0 + or -30 PPM.
C228	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp + or -30 PPM/°C.
C229	19A702236P23	Ceramic: 8.2 pF + or -.25 pF, 50 VDCW, te coef 0 + or -30 PPM.
C230	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp + or -30 PPM/°C.
C232	19A702236P13	Ceramic: 3.3 pF + or -5%, 50 VDCW, temp c + or -30 PPM.
C233	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp co or -30 PPM/°C.
C234	19A700219P10	Ceramic: 2.2 pF + or -5%, 100 VDCW, temp PPM. (Used in G1, G3, G13 and G15).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
432	19A703311P1	Coil, RF: sim to TOKO American KON-K6572BA.
433	19A700024P11	Coil, RF: 680 nH + or -10%.
451	19B801196P2A0	Coil, RF, variable: sim to Paul Smith SK910.
452	19B800891P4	Coil, RF Choke: sim to Paul Smith SK-890-1.
453	19A700024P13	Coil, RF: 1.0 uH + or -10%.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
401 thru 403	19A701785P3	Contact, electrical.
450	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
450	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
31	19A116818P3	N Channel, field effect; sim to Type 3N187?.
51	19A701808P2	Silicon, NPN; sim to MPS 6595.
52	19A701808P4	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
01	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
2	H212CRP910C	Deposited carbon: 1 ohm + or -5%, 1/4 w.
1	19B800607P683	Metal film: 68K ohms + or - 5%, 200 VDCW, 1/8 w.
2	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
3	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w.
4	19B800607P221	Metal film: 220 ohms + or - 5%, 200 VDCW, 1/8 w.
5	19B800607P392	Metal film: 3.9K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
5	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
1	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
2	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P270	Metal film: 27 ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P151	Metal film: 150 ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
	19B800607P100	Metal film: 10 ohms + or -5%, 1/8 w.
	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G5, G7, G17 and G19).
	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
		- - - - - - - - - - FILTER - - - - - - - - - -
	19B801025P2	Balanced Mixer. sim to Mini-Circuits SBL-1X.
		1 & 2 IF/2ND OSCILLATOR
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
	19A702061P63	Ceramic: 120 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
	19A702236P9	Ceramic: 1.8 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM.
	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.

SYMBOL	GE PART NO.	DESCRIPTION
C512	19A702061P61	Ceramic: 100 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM. (Used in G1, G5, G13 and G17).
C512	19A702061P49	Ceramic: 56 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM. (Used in G3, G7, G15 and G19).
C513	19A702236P40	Ceramic: 39 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G5, G13 and G17).
C513	19A702061P45	Ceramic: 47 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G3, G7, G15 and G19).
C514	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C515	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G5, G13 and G17).
C515	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G3, G7, G15 and G19).
C516	19A700235P20	Ceramic: 39 pF + or -5%, 50 VDCW. (Used in G1, G5, G13 and G17).
C516	19A700235P21	Ceramic: 47 pF + or -5%, 50 VDCW. (Used in G3, G7, G15 and G19).
C517	19A700235P25	Ceramic: 100 pF + or -5%, 50 VDCW. (Used in G1, G5, G13 and G17).
C517	19A700235P23	Ceramic: 68 pF + or -5%, 50 VDCW. (Used in G3, G7, G15 and G19).
C518 and C519	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C520 and C521	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C522	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C523	19A700235P21	Ceramic: 47 pF + or -5%, 50 VDCW.
C524	19A702061P57	Ceramic: 82 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C525	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C526	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C527	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C528	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C529 and C530	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.
C531	T644ACP215K	Polyester: .0015 uF + or -10%, 50 VDCW.
C532 and C533	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C534	19A701624P132	Ceramic: 100 pF + or -5%, 500 VDCW, temp coef 0 + or -30 PPM.
C535	19A700013P10	Phenolic: 0.56 pF + or - 5%, 500 VDCW.
C536	T644ACP333K	Polyester: .033 uF + or -10%, 50 VDCW.
C537	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C538	19A702236P9	Ceramic: 1.8 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G5, G13 and G17).
C538	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G3, G7, G15 and G19).
C551 and C552	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C553	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
C554	19A700227P44	Ceramic: 27 pF + or -5%, 100 VDCW, temp coef -1500 PPM.
C555	19A700227P22	Ceramic: 6.8 pF + or -5%, 100 VDCW, temp coef 1500 _ or -250 PPM.
C556	19A702236P40	Ceramic: 39 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
C556	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW. (Used in G5, G7, G17 and G19).
C557	19A702236P11	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
C557	19A702236P9	Ceramic: 1.8 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
C558	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C559	19A702236P40	Ceramic: 39 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).

SYMBOL	GE PART NO.	DESCRIPTION
C559	19A702236P36	Ceramic: 27 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
C560	19A700219P22	Ceramic: 6.8 pF + or -5%, 100 VDCW, temp coef 0 PPM. (Used in G5, G7, G17 and G19).
C561	19A700227P26	Ceramic: 10 pF + or -5%, 100 VDCW, temp coef 1500 + or -250 PPM. (Used in G5, G7, G17 and G19).
		- - - - - - - - - - DIODES - - - - - - - - - -
D551	19A116785P2	Silicon, capactive.
D552	19A703561P2	Silicon, fast recovery (2 diodes in series).
D553	19A700053P2	Silicon, fast recovery (2 diodes in series).
		- - - - - - - - - - JACKS - - - - - - - - - -
J501	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J501	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L501	19B209420P15	Coil, RF, fixed: 1.5 uH + or -5%; sim to Jeffers 4436-2J. (Used in G3, G7, G15 and G19).
L501	19A700024P18	Coil, RF: 2.7 uH + or - 10%. (Used in G1, G5, G13 and G17).
L502 and L503	19A703311P1	Coil, RF: sim to TOKO American KON-K6572BA.
L504	19A700024P6	Coil, RF: 270 nH + or - 10%.
L506	19A703311P3	Coil, RF: sim to TOKO American KRNA-K6571BA.
L507	19A701761P45	Coil, RF: 68 uh + or -10%, 3.30 ohms DC res max.
L508 and L509	19C850701P101	Coil, RF: variable, wire size No. 34 AWG.
L510	19C850701P102	Coil, RF: variable, wire size No. 34 AWG.
L511 thru L514	19A701761P45	Coil, RF: 68 uh + or -10%, 3.30 ohms DC res max.
L551	19B801161P5	Coil, RF, variable: sim to Standex SK950-2.
L552	19A700024P10	Coil, RF: 560 nH + or - 10%.
L553	19A700024P15	Coil, RF: 1.5 uH + or - 10%.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q501	19A116818P3	N Channel, field effect; sim to Type 3N187?.
Q502	19A700060P3	N-Type, field effect; sim to J310.
Q551	19A702524P2	N-Type, field effect; sim to MMBFU310.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R501	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R501	19B800607P392	Metal film: 3.9K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R502	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R503	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
R504	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R505	19A702931P234	Metal film: 2210 ohms + or -1%, 200 VDCW, 1/8 w.
R506	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w
R507	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R508	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R509	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R509	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R510	19A701250P238	Metal film: 2.4K ohms + or -1%, 1/4 w. (Used in G1, G5, G13 and G17).
R511	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R512	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R513 and R514	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R515	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R517	19B800607P220	Metal film: 22 ohms + or - 5%, 200 VDCW, 1/8 w.
R518	19A701250P238	Metal film: 2.4K ohms + or -1%, 1/4 w. (Used in G3, G7, G15 and G19).
R551	19A702931P401	Metal film: 100K ohms + or -1%, 200 VDCW, 1/8 w.
R552	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R553	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R554	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w.
R555	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w.
R556	19A701250P278	Metal film: 6.34K ohms + or -1%, 1/4 w.
R557	19A701250P286	Metal film: 7680 ohms + or -1%, 250 VDCW, 1/4 w.
R558	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w.
R559	19A703813P1	Thermal: 5K ohms + or -2%; sim to Midwest Components P1H-502.
R560	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U501	19A700044P1	Linear, IF Amplifier & Detector; sim to ULN2111A.
U502	19A700091P1	Linear, IF Amplifier & Detector; sim to CA3089E.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XY551	19A702742P1	Crystal socket.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y551	19A701562G9	Quartz: 68.200 MHz + or-10 PPM. (Used in G1, G3, G13 and G15).
Y551	19A701562G7	Quartz: 46.800 MHz. (Used in G5, G7, G17 and G19).
		- - - - - - - - - - FILTER - - - - - - - - - -
Z501	19A702166G6	Filter crystal: matched pair. 57.50 MHz, 13 kHz, minimum bandwidth. (Used in G1, G5, G13 and G17).
Z501	19A703692G4	Filter crystal: matched pair. 57.500 MHz bandwidth. (Used in G3, G7, G15 and G19).
Z502		Part of Z501.
Z503	19A702068G3	Crystal filter. (Used in G1, G5, G13 and G17).
Z503	19A704110G4	Filter crystal: 10.7 MHz bandwidth. (Used in G3, G7, G15 and G19).
Z504		Part of Z503.
Z505	19A702068G2	Crystal, filter: 2 pole. (Used in G1, G5, G13 and G17).
Z505	19A702068G3	Crystal filter. (Used in G3, G7, G15 and G19).
Z506		Part of Z505 (Used in G3, G7, G15 and G19).
		SYSTEM/AUDIO/SQUELCH
A601	19C851003P1	Printed Wire Board.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C601 thru C603	19A702061P91	Ceramic: 1800 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C604	19A702250P211	Polyester: 0.47 uF + or -5%, 50 VDCW.
C605	19A702250P113	Polyester: 0.1 uF + or -10%, 50 VDCW.
C606 thru C609	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C610	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
C611	19A702052P22	Ceramic: 0.047 uF + or - 10%, 50 VDCW.
C612	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C613	19A701225P3	Electrolytic: 220 uF, -10+50%, 25 VDCW.
C614 and C615	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C616 thru C618	19A702052P22	Ceramic: 0.047 uF + or - 10%, 50 VDCW.

ART NO.	DESCRIPTION
219P14	Ceramic: 3.3 pF + or -5%, 100 VDCW, temp coef 0 PPM. (Used in G5, G7, G17 and G19).
236P35	Ceramic: 24 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
236P40	Ceramic: 39 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
36P36	Ceramic: 27 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
26P50	Ceramic: 39 pF + or -5%, 100 VDCW, temp coef -750 PPM.
36P36	Ceramic: 27 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
36P38	Ceramic: 33 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C
36P34	Ceramic: 22 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
36P13	Ceramic: 3.3 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
36P23	Ceramic: 8.2 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
52P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
36P13	Ceramic: 3.3 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
52P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
36P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
52P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
36P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
93P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
93P9	Electrolytic: 100 uF -10+50%, 10 VDCW.
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
52P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
52P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
36P23	Ceramic: 8.2 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
36P28	Ceramic: 12 pF + or - 5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
61P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
36P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
36P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
36P11	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
36P18	Ceramic: 5.1 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G5, G7, G17 and G19).
36P11	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
36P15	Ceramic: 3.9 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
36P8	Ceramic: 1.5 pF + or -.25 pF, 50 VDCW. (Used in G1, G3, G13 and G15).
36P11	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).

SYMBOL	GE PART NO.	DESCRIPTION
C272 and C273	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
C274 and C275	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C276	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C276	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM (Used in G5, G7, G17 and G19).
C277	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C277	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
C278	19A702236P28	Ceramic: 12 pF + or - 5%, 50 VDCW, temp coef 0 + or -30 PPM.
C279	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C280 and C281	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D200	19A700083P22	Diode, silicon, zener: 5.1 Volt, sim to C5V1LT1.
D201	19A700053P2	Silicon, fast recovery (2 diodes in series).
D203	19A703561P2	Silicon, fast recovery (2 diodes in series).
D204 and D205	19A700053P2	Silicon, fast recovery (2 diodes in series).
D206 thru D209	19A700085P4	Diode, silicon, capacitive: sim to Motorola MMBV409.
D210	19A702526P2	Silicon: Schottky Barrier; sim to BAT 17.
D211 and D212	19A702525P2	Silicon.
D213 thru D215	19A700085P4	Diode, silicon, capacitive: sim to Motorola MMBV409.
D216 and D217	19A702525P2	Silicon.
D218 and D219	19A700085P4	Diode, silicon, capacitive: sim to Motorola MMBV409.
D220	19A702526P2	Silicon: Schottky Barrier; sim to BAT 17.
		- - - - - - - - - - JACKS - - - - - - - - - -
J200	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J200	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J202	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J202	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L201 and L202	19A700024P11	Coil, RF 680 nH + or -10%.
L203	19C851001P1	Coil, RF: sim to Paul Smith SK901-1.
L204	19A700024P14	Coil, RF: 1.2 uH + or - 10%.
L205	19A700024P11	Coil, RF: 680 nH + or -10%.
L206	19A700024P3	Coil, RF: 1.0 uH + or -10%.
L207 and L208	19A700024P14	Coil, RF: 1.2 uH + or - 10%.
L209	19B800956P1	Coil, RF, variable: sim to Paul Smith SK919.
L210	19A700024P16	Coil, RF: 1.8 uH + or - 10%.
L211	19A700024P14	Coil, RF: 1.2 uH + or - 10%.
L212 and L213	19A700024P3	Coil, RF: 1.0 uH + or -10%.
L214 thru L217	19A700024P11	Coil, RF: 680 nH + or -10%.

SYMBOL	GE PART NO.	DESCRIPTION
L218 thru L221	19A700024P14	Coil, RF: 1.2 uH + or - 10%.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q203	19A700059P2	Silicon, PNP.
Q206 thru Q208	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q209	19A700059P2	Silicon, PNP.
Q210 and Q211	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q212	19A700059P2	Silicon, PNP.
Q213	19A702524P2	N-Type, field effect; sim to MMBFU310.
Q214 and Q215	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q216	19A701808P2	Silicon, NPN; sim to MPS 6595.
Q217	19A702524P2	N-Type, field effect; sim to MMBFU310.
Q218	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q219	19A701808P2	Silicon, NPN; sim to MPS 6595.
Q220 thru Q224	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q226	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R200	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w.
R201	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w.
R202	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w.
R203	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R205	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R207	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R208	19B800607P224	Metal film: 220K ohms + or - 5%, 200 VDCW, 1/8 w.
R209	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R212	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R214	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R215	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
R216	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R217 and R218	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R219	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R220 and R221	19B800607P270	Metal film: 27 ohms + or - 5%, 200 VDCW, 1/8 w.
R222	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R223	19B800607P824	Metal film: 820K ohms + or - 5%, 200 VDCW, 1/8 w.
R224	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R225	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
R226	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R227	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R228	19B800607P680	Metal film: 68 ohms + or - 5%, 200 VDCW, 1/8 w.
R229	19A702931P330	Metal film: 20K ohms + or -1%, 200 VDCW, 1/8 w.
R230	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R231	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R232	19B800607P220	Metal film: 22 ohms + or - 5%, 200 VDCW, 1/8 w.
R233	19B800607P151	Metal film: 150 ohms + or - 5%, 200 VDCW, 1/8 w.
R234	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w.
R235	19B800607P151	Metal film: 150 ohms + or - 5%, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R236	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R237	19A702931P234	Metal film: 2210 ohms + or -1%, 200 VDCW, 1/8 w.
R238	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R239	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R240	19B800607P680	Metal film: 68 ohms + or - 5%, 200 VDCW, 1/8 w.
R241	19A702931P330	Metal film: 20K ohms + or -1%, 200 VDCW, 1/8 w.
R242	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R243	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R244	19B800607P220	Metal film: 22 ohms + or - 5%, 200 VDCW, 1/8 w.
R245 and R246	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
R248	19A702931P310	Metal film: 12.4K ohms + or -1%, 200 VDCW, 1/8 w.
R249	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R250	19A702931P249	Metal film: 3160 ohms + or -1%, 200 VDCW, 1/8 w.
R251	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w.
R252	19A702931P310	Metal film: 12.4K ohms + or -1%, 200 VDCW, 1/8 w.
R253	19A702931P249	Metal film: 3160 ohms + or -1%, 200 VDCW, 1/8 w.
R254	19B800607P151	Metal film: 150 ohms + or - 5%, 200 VDCW, 1/8 w.
R255	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R256 thru R259	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R260	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R261 thru R264	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
		- - - - - - - - - - TEST POINTS - - - - - - - - - -
TP201		Part of printed wire board 19D901664P1.
		- - - - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U201	19B800902P4	Digital: Synthesizer, CMOS Serial Input.
U202	19A703091P1	Digital: /64, /65 Prescaler; sim to MC12017P.
U203	19J706579P2	Comparator. Sim to LM311.
U204	19A700029P44	Digital: BILATERAL SWITCH.
		AUDIO PROCESSOR
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C302	19A702061P63	Ceramic: 120 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
C304	19A702061P63	Ceramic: 120 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
C305	19A70225OP212	Polyester: 0.68 uF + or -5%, 50 VDCW.
C306	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C307	19A702052P28	Ceramic: 0.022 uF + or -10%, 50 VDCW.
C308	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C309	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C310	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C311	19A70225OP211	Polyester: 0.47 uF + or -5%, 50 VDCW.
C312	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
C313	T644ACP268J	Polyester: .0068 uF + or -5%, 50 VDCW.
C314	19A702236P32	Ceramic: 18 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM
C316	19A701534P7	Tantalum: 10 uF + or -20%, 16 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D301 and D302	19A702015P1	Silicon; sim to IN458A.
D303	19A134587P2	Silicon: 2 diodes, Common Cathode; sim to BAV 70.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - JACKS - - - - - - - - - -
J303	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J303	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R301	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R302	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R303	19A702931P303	Metal film: 10.5K ohms + or -1%, 200 VDCW, 1/8 w.
R304	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R304	19A702931P271	Metal film: 5360 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R305	19A702931P212	Metal film: 1300 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R305	19A702931P217	Metal film: 1470 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R306	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R307	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R307	19A702931P350	Metal film: 32.4K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R309	19A702931P339	Metal film: 24.9K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R309	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R310	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R310	19A702931P156	Metal film: 374 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R311	19A702931P369	Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R311	19A702931P375	Metal film: 59K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R312	19A702931P303	Metal film: 10.5K ohms + or -1%, 200 VDCW, 1/8 w.
R313	19A702931P311	Metal film: 12.7K ohms + or -1%, 200 VDCW, 1/8 w.
R314	19A702931P330	Metal film: 20K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R314	19A702931P335	Metal film: 22.6K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R315	19A702931P310	Metal film: 12.4K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R315	19A702931P314	Metal film: 13.7K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R316	19A702931P350	Metal film: 32.4K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R316	19A702931P355	Metal film: 36.5K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R318	19A702931P151	Metal film: 332 ohms + or -1%, 250 VDCW, 1/8 w.
R319	19A702931P179	Metal film: 649 ohms + or -1%, 200 VDCW, 1/8 w.
R320	19A702931P303	Metal film: 10.5K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G3, G13 and G15).
R320	19A702931P285	Metal film: 7500 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G5, G7, G17 and G19).
R321	19A702931P330	Metal film: 20K ohms + or -1%, 200 VDCW, 1/8 w.
R322	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R323	19B800784P108	Variable: 10K ohms + or -20%, 1/2 w.
R324 and R325	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R326 and R327	19A702931P303	Metal film: 10.5K ohms + or -1%, 200 VDCW, 1/8 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U301	19A700086P4	Linear: Dual Op Amp; sim to 4558.
U302	19A700029P44	Digital: BILATERAL SWITCH.

SYMBOL	GE PART NO.	DESCRIPTION
		OSCILLATOR
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C351	19A701534P8	Tantalum: 22 uF + or -20%, 16 VDCW.
C352 and C353	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C354	19A702248P304	Ceramic: 39 pF + or -5%, 50 VDCW, N470 + or -60 PPM.
C355	19A702236P40	Ceramic: 39 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
C356	19A702061P73	Ceramic: 330 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C357	19A702061P61	Ceramic: 100 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C358	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C359	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C360	19A702061P61	Ceramic: 100 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C361 and C362	19A701534P8	Tantalum: 47 uF + or -20%, 6.3 VDCW.
C363	19A703893P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
C364	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C365	19A702052P26	Ceramic: 0.1 uF + or - 10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D351	19A700085P3	Silicon, capacitive.
D352	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
		- - - - - - - - - - JACKS - - - - - - - - - -
J351	19A700072P30	Printed wire: 4 contacts rated at 2.5 amps; sim to Molex 22-27-2041. (Used in G1, G3, G5 and G7).
J351	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041. (Used in G13, G15, G17 and G19).
J352	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J352	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J353	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J353	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L351	19A700024P22	Coil, RF: 5.6 uH + or - 10%.
L352	19B801161P3	Coil, RF: sim to Standex SK950-2.
L353	19A700024P29	Coil, RF: 22 uH + or - 10%.
L354	19B801161P6	Coil, RF, variable: sim to Standex SK950-2.
L355	19A700024P22	Coil, RF: 5.6 uH + or - 10%.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q351	19A700023P2	Silicon: NPN; sim to 2N3904.
Q352	19A702524P2	N-Type, field effect; sim to MMBF0310.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R351	19A703813P1	Thermal: 5K ohms + or -2%; sim to Midwest Components P1H-502.
R352	19A701250P357	Metal film: 38.3K ohms + or -1%, 250 VDCW, 1/4 w.
R353	19A701250P193	Metal film: 909 ohms + or -1%, 250 VDCW, 1/4.
R354	19A703813P1	Thermal: 5K ohms + or -2%; sim to Midwest Components P1H-502.
R355	19A701250P288	Metal film: 8060 ohms + or -1%, 250 VDCW, 1/4 w.
R356	19A703813P2	Thermal: 20K ohms + or -2%; sim to Midwest Components P1H-203.
R357	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
R358	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R359	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R360	19B800607P823	Metal film: 82K ohms + or -5%, 200 VDCW, 1/8 w.
R361	19B800607P100	Metal film: 10 ohms + or -5%, 1/8 w.
R362	19B800607P181	Metal film: 180 ohms + or - 5%, 200 VDCW, 1/8 w.
R363	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R364	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R365	19B800607P270	Metal film: 27 ohms + or - 5%, 200 VDCW, 1/8 w.
R366	19B800784P108	Variable: 10K ohms + or -20%, 1/2 w.
R367	19A702931P310	Metal film: 12.4K ohms + or -1%, 200 VDCW, 1/8 w.
R369	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XY351	19A702742P1	Crystal socket.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y351	19A703049G1	Quartz: 13.200 MHz.
		FRONT END/1ST MIXER/LOCAL OSCILLATOR CHAIN
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C401 and C402	19A702236P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.
C403	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C408	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C409	19A702236P15	Ceramic: 3.9 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM/ C. (Used in G1, G3, G13 and G15).
C409	19A702236P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
C412	19A702236P15	Ceramic: 3.9 pF + or -.25 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C412	19A702236P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
C420	19A702236P11	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G1, G3, G13 and G15).
C429 and C430	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C431	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C432	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C434	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM.
C435	19A702236P38	Ceramic: 33 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C436 and C437	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C438	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C439	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C451	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C452	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C453	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C454	19A702236P38	Ceramic: 33 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C455	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G1, G3, G13 and G15).
C455	19A702236P17	Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. (Used in G5, G7, G17 and G19).
C456	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C457	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C. (Used in G5, G7, G17 and G19).
C457	19A702236P21	Ceramic: 6.8 pF + or -0.5 pF, 50 VDCW, temp coef 0 + or -60 PPM. (Used in G1, G3, G13 and G15).

SYMBOL	GE PART NO.	DESCRIPTION
C458 and C459	19A702052P24	Ceramic: 0.068 uF + or - 10%,
C460 and C461	19A701534P7	Tantalum: 10 uF + or -20%, 16
C462	19A702052P24	Ceramic: 0.068 uF + or - 10%,
C463	19A702061P77	Ceramic: 470 pF + or - 5%, 50 + or - 30 PPM.
C464	19A702052P24	Ceramic: 0.068 uF + or - 10%,
C465	19A702236P19	Ceramic: 5.6 pF + or -.5 pF, 0 + or -30 PPM/°C. (Used in G1
C465	19A702236P23	Ceramic: 8.2 pF + or -.25 pF, coef 0 + or -30 PPM. (Used in G19)
C466	19A702236P23	Ceramic: 8.2 pF + or -.25 pF, coef 0 + or -30 PPM.
C468	19A702061P77	Ceramic: 470 pF + or - 5%, 50 + or - 30 PPM.
C469	19A702052P14	Ceramic: 0.01 uF + or - 10%,
		- - - - - - - - - - DIODES
D451	19A702526P2	Silicon: Schottky Barrier; s
		- - - - - - - - - - JACKS -
J401	19A700072P34	Printed wire: 8 contacts rate to Molex 22-27-2081. (Used in
J401	19A704852P34	Printed wire: 8 contacts rate sim to Molex 22-29-2081. (Used and G19).
J450	19A703248P1	Post: Tin Plated, 10 mm length G3, G5 and G7).
J450	19A703248P11	Post: Gold Plated, 10 mm leng G15, G17 and G19).
		- - - - - - - - - - INDUCTORS -
L401	19C851317P1	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L401	19C851317P4	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L402	19C851317P2	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L402	19C851317P3	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L403	19C851317P2	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L403	19C851317P3	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L404	19C851317P2	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L404	19C851317P3	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L405	19C851317P2	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L405	19C851317P3	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L406	19C851317P4	Coil, RF, fixed: sim to Paul in G5, G7, G17 and G19).
L406	19C851317P1	Coil, RF, fixed: sim to Paul in G1, G3, G13 and G15).
L407	19B209728P14	Coil, RF, fixed: sim to Paul (Used in G1, G3, G13 and G15).
L407	19B209728P15	Coil, RF, fixed: sim to Paul (Used in G5, G7, G17 and G19).
L408	19J706154P22	Coil, RF, fixed: sim to Paul (Used in G1, G3, G13 and G15).
L408	19J706154P20	Coil, RF, fixed: sim to Paul (Used in G5, G7, G17 and G19).
L409	19B209728P14	Coil, RF, fixed: sim to Paul (Used in G1, G3, G13 and G15).
L409	19B209728P15	Coil, RF, fixed: sim to Paul (Used in G5, G7, G17 and G19).
L410	19B800891P1	Coil, RF Choke: sim to Paul Sm
L431	19A700024P25	Coil, RF: 10.0 uH + or - 10%, max.

SYMBOL	GE PART NO.	DESCRIPTION
C619	19A701534P3	Tantalum: 0.47 uF + or - 20%, 35 VDCW.
C620	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C621	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C622 and C623	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C651 and C652	19A702250P113	Polyester: 0.1 uF + or -10%, 50 VDCW.
C656	19A701225P1	Electrolytic: 15 uF -10 +75%, 25 VDCW; sim to Sprague 5010156-0025BB1C.
C659 thru C678	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C682	19A702061P99	Ceramic: 1000 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C683 thru C685	19A702061P77	Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.
C686	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D601	19A703561P2	Silicon, fast recovery (2 diodes in series).
D602	19A700053P2	Silicon, fast recovery (2 diodes in series).
D603 and D604	19A703561P2	Silicon, fast recovery (2 diodes in series).
D606 thru D609	19A700053P2	Silicon, fast recovery (2 diodes in series).
		- - - - - - - - - - JACKS - - - - - - - - - -
J601	19C850591G4	Connector. Includes:
	19A701246G2	Shell.
	19A701254P1	Contact, electrical: sim to Malco 009-0191-002.
J602	19B800555Q4	Connector: metering, red. Includes:
	19A700237P1	Contact, electrical: sim to Malco 003-0132-001.
J603	19A700072P47	Printed wire: 21 contacts rated at 2 1/2 amps per contact; sim to Molex 22-27-2211. (Used in G1, G3, G5 and G7).
J603	19A704852P47	Printed wire: 21 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2211. (Used in G13, G15, G17 and G19).
J604	19B801421P1	Cable, flat: 6 contacts, sim to UL Style 2651.
J605	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J605	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J607	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J607	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J608	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J608	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J609	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J609	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J610	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J610	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J611	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J611	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J612	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J612	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J613	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).

SYMBOL	GE PART NO.	DESCRIPTION
J613	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - PLUGS - - - - - - - - - -
P605	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P605	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P607	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P607	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P608	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P608	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P609	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P609	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P610	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P610	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P611	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P611	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P612	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P612	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q601 thru Q604	19A700023P2	Silicon: NPN; sim to 2N3904.
Q605	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q606	19A700023P2	Silicon: NPN; sim to 2N3904.
Q607	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R601	19A702931P289	Metal film: 8250 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R601	19A702931P293	Metal film: 9090 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R602	19A702931P235	Metal film: 2260 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R602	19A702931P239	Metal film: 2490 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R603	19A702931P406	Metal film: 113K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R603	19A702931P410	Metal film: 124K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R604	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R605	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R606	19A702931P301	Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R606	19A702931P273	Metal film: 5620 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R607	19A701250P401	Metal film: 100K ohms + or -1%, 1/4 w.
R608	19B800607P334	Metal film: 330K ohms + or - 5%, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R609	19A702931P273	Metal film: 5620 ohms + or -1%, 200 VDCW, 1/8 w.
R610	19A702931P401	Metal film: 100K ohms + or -1%, 200 VDCW, 1/8 w.
R611	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R611	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R612	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R613	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R614	19A702931P355	Metal film: 36.5K ohms + or -1%, 200 VDCW, 1/8 w.
R615	19A702931P293	Metal film: 9090 ohms + or -1%, 200 VDCW, 1/8 w.
R616 and R617	19A702931P369	Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w.
R618	19B800607P823	Metal film: 82K ohms + or -5%, 200 VDCW, 1/8 w.
R619	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R620	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R621	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R622	19B800607P330	Metal film: 33 ohms + or - 5%, 200 VDCW, 1/8 w.
R623	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w.
R624	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
R625 and R626	H212CRF547C	Deposited carbon: 4.7 ohms + or -5%, 1/4 w.
R627	19B800607P184	Metal film: 180K ohms + or - 5%, 200 VDCW, 1/8 w.
R628	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R628	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R629	19B800784P111	Variable, conductive: 100K ohms + or -20%, 0.33 w max.
R630	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R631 and R632	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R633	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R634	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R635	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R635	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R636	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R637	19B800607P683	Metal film: 68K ohms + or - 5%, 200 VDCW, 1/8 w.
R638	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R639	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R651 and R652	19A702931P179	Metal film: 649 ohms + or -1%, 200 VDCW, 1/8 w.
R653 thru R658	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R659	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R660	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R661	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R662	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R663 and R664	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R665	19B800607P224	Metal film: 220K ohms + or - 5%, 200 VDCW, 1/8 w.
R666	19B800784P108	Variable: 10K ohms + or -20%, 1/2 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U601 and U602	19A701830P1	Linear, Audio AMPLIFIER; sim to TDA 2003.

SYMBOL	GE PART NO.	DESCRIPTION
U603 and U604	19A701789P1	Linear: Quad Op Amp; sim to LM324.
U605	19A700029P44	Digital: BILATERAL SWITCH.
		REGULATOR-MICROCOMPUTER SYTEM
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C701 thru C703	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C704	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C705	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C706	19A703893P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
C709	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C710	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C711	19A701534P8	Tantalum: 22 uF + or -20%, 16 VDCW.
C712	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C713	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C714	19A701534P3	Tantalum: 0.47 uF + or - 20%, 35 VDCW.
C715	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C716	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C717	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C718	19A702052P22	Ceramic: 0.047 uF + or - 10%, 50 VDCW.
C719	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C721	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C722	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C723	19A703893P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
C724	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C725	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C727	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
C728	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D701	19A700025P2	Silicon, zener: 400 mW max; sim to BZX55-C2V7.
D702 and D703	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
D711	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15.
D712	19A700053P2	Silicon, fast recovery (2 diodes in series).
D713	162B3011P0002	Light Emitting Diode: Red; sim to GE 22L-2.
D714	19A700025P3	Silicon, zener: 400 mW max; sim to BZX55-C3V3.
D715	19A700025P8	Silicon, zener: 400 mW max; sim to BZX55-C6V8.
D716 thru D719	19A700053P2	Silicon, fast recovery (2 diodes in series).
D720	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15.
		- - - - - - - - - - JACKS - - - - - - - - - -
J701	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J701	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J702	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J702	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J703	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J703	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J704	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).

MBOL	GE PART NO.	DESCRIPTION
758	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
759	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
760 thru 762	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
763	H212CRP382C	Deposited carbon: 82K ohms + or -5%, 1/4 w.
764	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
765 thru 767	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
768	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
769	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
770	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
771 and 772	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
773 and 774	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
775 thru 777	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
780	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
781	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - -
701	19A702939P2	Linear: Adjustable Shunt Regulator; sim to TL431CLP.
702	19A134717P1	Linear: 5 Volt Regulator; sim to MC7805CT.
703	19A116968P3	Linear, timer: DUAL IN-LINE 14 Pin Dip Package; sim to Signetics SA556N.
704	19A700029P229	Digital: HEX 3-STATE BUFFER.
705	19A703244P23	Digital: MICROCOMPUTER, HMOS, 8-bit.
706	19A703072P2	Digital: sim to XICOR X2212DI.
707	19A116180P33	Digital: HEX INVERTER BUFFER/DRIVER (OPEN COLLECTOR).
708	19A700029P9	Digital: Dual Data Flip-Flop; sim to 4013B.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
705	19A700156P5	Integrated circuit: 40 contacts; sim to Augat 340-AG39D.
706	19A700156P11	Integrated circuit.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
01	19A702511G3	Quartz: 6.000000 MHz.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19C850719P1	IF Cover.
	19B801022P2	Tuning screw. (Used with C1-C6).
	19D900133P30	Casting, front end. (Used in G1, G2, G5, G13, G14, & G17).
	19D900133P31	Casting, front end. (Used in G3, G4, G6, G7, G15, G16, G18 & G19).
	19D900299P3	Spacer, front end.
	19B800647G1	Shield.
	19B800655P1	Gasket. (Used with J601).
	19D900777P1	Bottom cover, casting.
	19A702381P510	Screw, thread forming: TORX DRIVE No. M3.5 - 0.6 x 10. (Quantity 39).
	19A701886P1	Spring. (Used with C7-C13).
	19A701905P2	Tuning screw. (Used with C7-C13).
	19A702364P106	Machine screw: TORX Drive, No. M2 - 0.4 x 6. (Used to secure casting, quantity 10).
	19C850619G19	Casting. (Used with C10-C13, quantity 2).
	19C850619G24	Casting. (Used in G1, G2, G5, G13, G14 & G17, used with C7-C9).
	19C850619G25	Casting. (Used in G3, G4, G6, G7, 15, 16, 18 & 19, used with C7-C9).

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
		NOTE: Refer to the outline diagram (pg 17) for the location of the following parts:
3	19A701544P9	Can. (Used with L508, L509 & L510).
5	19B800583P1	Heat sink. (Used with Q601, Q602, Q705 & U702).
6	19A701883P4	Contact, electrical; sim to AMP 86444-1. (Quantity of 8).
7	19D900765P1	Casting.
9	19D901654P1	Wire bus.
11	19A701289P1	Retaining ring: 3/16 inches; sim to National Lockwasher WA 510. (Located at J601).
12	19C850674G1	Can.
13	19A700068P1	Insulator, bushing. (Used Q601, Q602, Q705 & U702).
14	19A705469P1	Insulator plate. (Used Q601, Q602, Q705 & U702).
17	19B800890P1	Coil, RF: 9.5 nH + or -5%; sim to Paul Smith SK-896-1.
25	19A701538P2	Gasket. (Used with L508, L509 & L510).
26	19A702381P508	Screw, thd. form: No. 3.5-0.6 x 8. (Quantity 3).
30	19A702362P208	Machine screw, Torx drive: M2.5-.45 x 8. (Used to secure Q601, Q602, Q705 & U702).

PARTS LIST

2PPM OSCILLATOR KIT
19C851230G1 (TIN CONTACTS)
19C851230G2 (GOLD CONTACTS)
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	19A700041P78	Printed wire, 4 contacts rated @ 2 1/2 amps; sim to Molex 22-15-2046. (Used in G1).
P1	19A704779P78	Printed wire, 4 contacts rated @ 2 1/2 amps. (Used in G2).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1A	19A701250P353	Metal film: 34.8K ohms ±1%, 250 VDCW, 1/4 w.
R1B	19A701250P357	Metal film: 38.3K ohms ±1%, 250 VDCW, 1/4 w.
R1C	19A701250P360	Metal film: 41.2K ohms ±1%, 250 VDCW, 1/4 w.
R1D	19A701250P344	Metal film: 28K ohms ±1%, 250 VDCW, 1/4 w.
R1E	19A701250P346	Metal film: 29.4K ohms ±1%, 250 VDCW, 1/4 w.
R1F	19A701250P349	Metal film: 31.6K ohms ±1%, 250 VDCW, 1/4 w.
R1G	19A701250P351	Metal film: 33.2K ohms ±1%, 250 VDCW, 1/4 w.
R1H	19A701250P358	Metal film: 2.7 ohms ±5%, 1/4 w.
R1J	19A701250P359	Metal film: 40.2K ohms ±1%, 250 VDCW, 1/4 w.
R1K	19A701250P361	Metal film: 42.2K ohms ± 1%, 250 VDCW, 1/4 w.
R1L	19A701250P347	Metal film: 30.1K ohms ±1%, 250 VDCW, 1/4 w.
R1M	19A701250P365	Metal film: 46.4K ohms ±1%, 250 VDCW, 1/4 w.
R2A	19A701250P288	Metal film: 8060 ohms ±1%, 250 VDCW, 1/4 w.
R2B	19A701250P285	Metal film: 7.5K ohms ±1%, 250 VDCW, 1/4 w.
R2C	19A701250P286	Metal film: 7680 ohms ±1%, 250 VDCW, 1/4 w.
R2D	19A701250P273	Metal film: 5.6K ohms ±1%, 250 VDCW, 1/4 w.
R3A	19A701250P188	Metal film: 806 ohms ±1%, 250 VDCW, 1/4 w.
R3B	19A701250P190	Metal film: 845 ohms ±1%, 250 VDCW, 1/4 w.
R3C	19A701250P192	Metal film: 887 ohms ±1%, 250 VDCW, 1/4 w.
R3D	19A701250P193	Metal film: 909 ohms ±1%, 250 VDCW, 1/4.
R3E	19A701250P194	Metal film: 931 ohms ±1%, 250 VDCW, 1/4 w.
R3F	19A701250P191	Metal film: 866 ohms ±1%, 250 VDCW, 1/4 w.
R3G	19A701250P184	Metal film: 732 ohms ±1%, 250 VDCW, 1/4 w.
R3H	19A701250P185	Metal film: 750 ohms ±1%, 250 VDCW, 1/4 w.
R3J	19A701250P186	Metal film: 768 ohms ±1%, 250 VDCW, 1/4 w.
R3K	19A701250P187	Metal film: 787 ohms ±1%, 250 VDCW, 1/4 w.
R3L	19A701250P196	Metal film: 1150 ohms ±1%, 250 VDCW, 1/4 w.
R3M	19A701250P201	Metal film: 1K ohms ±1%, 250 VDCW, 1/4 w.
R3N	19A701250P203	Metal film: 1050 ohms ±1%, 250 VDCW, 1/4 w.
R3P	19A701250P204	Metal film: 1070 ohms ±1%, 250 VDCW, 1/4 w.
R3Q	19A701250P207	Metal film: 1150 ohms ±1%, 250 VDCW, 1/4 w.
R3R	19A701250P182	Metal film: 698 ohms ±1%, 250 VDCW, 1/4 w.
R3S	19A701250P179	Metal film: 649 ohms ±1%, 250 VDCW, 1/4 w.
R3T	19A701250P217	Metal film: 1.47K ohms ±1%, 250 VDCW, 1/4 w.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y351	19A703049G6	Crystal unit, quartz, 13.200 MHz.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

403-470 MHz
WIDEBAND PREAMP
19C851294G1
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C3	19A702236P7	Ceramic: 1.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM.
C4	19A702236P21	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C5	19A702061P67	Ceramic: 180 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C6	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM.
C7	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C8	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C9	19A702236P8	Ceramic: 1.5 pF ±.25 pF, 50 VDCW.
C10	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM.
C11	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C12	19A702061P99	Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
		- - - - - - - - - - COILS - - - - - - - - - -
L1	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L2	19B800891P3	Coil, RF Choke; sim to Paul Smith SK890-1.
L3	19B800890P6	Coil, RF: 14.7 nH ±5%, sim to Paul Smith SK-891-1.
L4	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P401	19A700041P82	Printed wiring: 8 circuits; sim to Molex 22-01-2085.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19J706019P1	N-Channel, field effect (MOS DUAL GATE); sim to BF960.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19B800607P120	Metal film: 12 ohms ±5%, 200 VDCW, 1/8 w.
R2	19B800607P683	Metal film: 68K ohms ±5%, 200 VDCW, 1/8 w.
R3	19B800607P154	Metal film: 150K ohms ±5%, 200 VDCW, 1/8 w.
R4	19B800607P683	Metal film: 68K ohms ±5%, 200 VDCW, 1/8 w.
R5	19B800607P471	Metal film: 470 ohms ±5%, 200 VDCW, 1/8 w.
R6	19B800607P561	Metal film: 560 ohms ±5%, 200 VDCW, 1/8 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
J613	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P605	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P605	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P607	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P607	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P608	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P608	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P609	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P609	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P610	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P610	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P611	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P611	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P612	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P612	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q601 thru Q604	19A700023P2	Silicon: NPN; sim to 2N3904.
Q605	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q606	19A700023P2	Silicon: NPN; sim to 2N3904.
Q607	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R601	19A702931P289	Metal film: 8250 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R601	19A702931P293	Metal film: 9090 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R602	19A702931P235	Metal film: 2260 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R602	19A702931P239	Metal film: 2490 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R603	19A702931P406	Metal film: 113K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R603	19A702931P410	Metal film: 124K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R604	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R605	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R606	19A702931P301	Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R606	19A702931P273	Metal film: 5620 ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R607	19A701250P401	Metal film: 100K ohms + or -1%, 1/4 w.
R608	19B800607P334	Metal film: 330K ohms + or - 5%, 200 VDCW, 1/8 w.

SYMBOL	GE PART NO.	DESCRIPTION
R609	19A702931P273	Metal film: 5620 ohms + or -1%, 200 VDCW, 1/8 w.
R610	19A702931P401	Metal film: 100K ohms + or -1%, 200 VDCW, 1/8 w.
R611	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R611	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R612	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R613	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R614	19A702931P355	Metal film: 35.5K ohms + or -1%, 200 VDCW, 1/8 w.
R615	19A702931P293	Metal film: 9090 ohms + or -1%, 200 VDCW, 1/8 w.
R616 and R617	19A702931P369	Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w.
R618	19B800607P823	Metal film: 82K ohms + or -5%, 200 VDCW, 1/8 w.
R619	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R620	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R621	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R622	19B800607P330	Metal film: 33 ohms + or - 5%, 200 VDCW, 1/8 w.
R623	19B800607P390	Metal film: 39 ohms + or - 5%, 200 VDCW, 1/8 w.
R624	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
R625 and R626	H212CRP947C	Deposited carbon: 4.7 ohms + or -5%, 1/4 w.
R627	19B800607P184	Metal film: 180K ohms + or - 5%, 200 VDCW, 1/8 w.
R628	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R628	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R629	19B800784P111	Variable, conductive: 100K ohms + or -20%, 0.33 w max.
R630	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R631 and R632	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R633	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R634	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R635	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w. (Used in G1, G5, G13 and G17).
R635	19A702931P417	Metal film: 147K ohms + or -1%, 200 VDCW, 1/8 w. (Used in G3, G7, G15 and G19).
R636	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R637	19B800607P683	Metal film: 68K ohms + or - 5%, 200 VDCW, 1/8 w.
R638	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R639	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R651 and R652	19A702931P179	Metal film: 649 ohms + or -1%, 200 VDCW, 1/8 w.
R653 thru R658	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R659	19B800607P472	Metal film: 4.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R660	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R661	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R662	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R663 and R664	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R665	19B800607P224	Metal film: 220K ohms + or - 5%, 200 VDCW, 1/8 w.
R666	19B800784P108	Variable: 10K ohms + or -20%, 1/2 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U601 and U602	19A701830P1	Linear, Audio AMPLIFIER; sim to TDA 2003.

SYMBOL	GE PART NO.	DESCRIPTION
U603 and U604	19A701789P1	Linear: Quad Op Amp; sim to LM324.
U605	19A700029P44	Digital: BILATERAL SWITCH.
		REGULATOR-MICROCOMPUTER SYTEM
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C701 thru C703	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C704	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C705	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C706	19A703893P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
C709	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C710	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C711	19A701534P8	Tantalum: 22 uF + or -20%, 16 VDCW.
C712	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C713	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C714	19A701534P3	Tantalum: 0.47 uF + or - 20%, 35 VDCW.
C715	19A702236P30	Ceramic: 15 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C716	19A701534P4	Tantalum: 1 uF + or - 20%, 35 VDCW.
C717	19A702052P14	Ceramic: 0.01 uF + or - 10%, 50 VDCW.
C718	19A702052P22	Ceramic: 0.047 uF + or - 10%, 50 VDCW.
C719	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C721	19A702236P25	Ceramic: 10 pF + or -.5 pF, 50 VDCW, temp coef 0 + or -30 PPM/°C.
C722	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C723	19A703893P10	Electrolytic: 200 uF -10+50%, 10 VDCW.
C724	19A702052P24	Ceramic: 0.068 uF + or - 10%, 50 VDCW.
C725	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
C727	19A702052P10	Ceramic: 4700 pF + or - 10%, 50 VDCW.
C728	19A702052P5	Ceramic: 1000 pF + or -10%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
D701	19A700025P2	Silicon, zener: 400 mW max; sim to BZX55-C2V7.
D702 and D703	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
D711	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15.
D712	19A700053P2	Silicon, fast recovery (2 diodes in series).
D713	162B3011P0002	Light Emitting Diode: Red; sim to GE 22L-2.
D714	19A700025P3	Silicon, zener: 400 mW max; sim to BZX55-C3V3.
D715	19A700025P8	Silicon, zener: 400 mW max; sim to BZX55-C6V8.
D716 thru D719	19A700053P2	Silicon, fast recovery (2 diodes in series).
D720	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15.
		- - - - - - - - - - JACKS - - - - - - - - - -
J701	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J701	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J702	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J702	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J703	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J703	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J704	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).

SYMBOL	GE PART NO.	DESCRIPTION
J704	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J705	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J705	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J706	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J706	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J707	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J707	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
J711	19A703248P4	Post: Tin Plated, 19 mm length. (Used in G1, G3, G5 and G7).
J711	19A703248P14	Post: Gold Plated, 19 mm length. (Used in G13, G15, G17 and G19).
J712	19A703248P1	Post: Tin Plated, 10 mm length. (Used in G1, G3, G5 and G7).
J712	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L711	19A700000P25	Coil, RF: 15 uH + or -10%; sim to Jeffers 4421-9K.
L712	19A700024P1	Coil, RF: 100 nH + or -10%, 0.08 ohms DC res max, 100 v.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P701	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P701	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P702	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P702	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P703	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P703	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P704	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P704	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P705	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P705	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P706	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P706	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
P707	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002. (Used in G1, G3, G5 and G7).
P707	19A702104P2	Connector: gold plated, two position shorting; sim to: Berg 65474-003. (Used in G13, G15, G17 and G19).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q701	19A700023P2	Silicon: NPN; sim to 2N3904.
Q703	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q704	19A702503P2	Silicon, NPN.
Q705	19A116375P1	Silicon, PNP.
Q711	19A700023P2	Silicon: NPN; sim to 2N3904.

SYMBOL	GE PART NO.	DESCRIPTION
Q712	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q713 and Q714	19A700023P2	Silicon: NPN; sim to 2N3904.
Q715	19A700022P2	Silicon, PNP: sim to 2N3906.
Q716 thru Q721	19A700023P2	Silicon: NPN; sim to 2N3904.
Q723	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R701	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
R702	19A700112P43	Composition: 150 ohms + or - 5%, 1 w.
R703	19B800784P108	Variable: 10K ohms + or -20%, 1/2 w.
R704	19A702931P179	Metal film: 649 ohms + or -1%, 200 VDCW, 1/8 w.
R705	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R706	19B800607P681	Metal film: 680 ohms + or - 5%, 200 VDCW, 1/8 w.
R707	19B800607P152	Metal film: 1.5K ohms + or - 5%, 200 VDCW, 1/8 w.
R708 and R709	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R710	19A702931P141	Metal film: 261 ohms + or -1%, 200 VDCW, 1/8 w.
R711 thru R713	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R714	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R715	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R716	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R717	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R718	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R719	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R720	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R721	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R722	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R723 thru R732	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R733	19B800607P473	Metal film: 47K ohms + or - 5%, 200 VDCW, 1/8 w.
R734	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R735	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R736 and R737	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R738	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R739	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R740	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R741	19A702931P212	Metal film: 1300 ohms + or -1%, 200 VDCW, 1/8 w.
R742	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R743	19B800607P104	Metal film: 100K ohms + or - 5%, 200 VDCW, 1/8 w.
R744	19B800607P224	Metal film: 220K ohms + or - 5%, 200 VDCW, 1/8 w.
R745	19B800607P822	Metal film: 8.2K ohms + or - 5%, 200 VDCW, 1/8 w.
R746 thru R752	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R753	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R754	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R755	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R756	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R757	19B800607P272	Metal film: 2.7K ohms + or - 5%, 200 VDCW, 1/8 w.
R758	19B800607P223	Metal film: 22K ohms + or - 5%, 200 VDCW, 1/8 w.
R759	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R760 thru R762	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R763	H212CRP382C	Deposited carbon: 82K ohms + or -5%, 1/4 w.
R764	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
R765 thru R767	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
R768	19B800607P273	Metal film: 27K ohms + or - 5%, 200 VDCW, 1/8 w.
R769	19B800607P153	Metal film: 15K ohms + or - 5%, 200 VDCW, 1/8 w.
R770	19B800607P471	Metal film: 470 ohms + or - 5%, 200 VDCW, 1/8 w.
R771 and R772	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R773 and R774	19B800607P102	Metal film: 1K ohms + or - 5%, 200 VDCW, 1/8 w.
R775 thru R777	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R780	19B800607P101	Metal film: 100 ohms + or - 5%, 200 VDCW, 1/8 w.
R781	19B800607P103	Metal film: 10K ohms + or - 5%, 200 VDCW, 1/8 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U701	19A702939P2	Linear: Adjustable Shunt Regulator; sim to TL431CLP.
U702	19A134717P1	Linear: 5 Volt Regulator; sim to MC7805CT.
U703	19A116968P3	Linear, timer: DUAL IN-LINE 14 Pin Dip Package; sim to Signetics SA556N.
U704	19A700029P229	Digital: HEX 3-STATE BUFFER.
U705	19A703244P23	Digital: MICROCOMPUTER, HMOS, 8-bit.
U706	19A703072P2	Digital: sim to XICOR X2212DI.
U707	19A116180P33	Digital: *HEX INVERTER BUFFER/DRIVER (OPEN* COLLECTOR).
U708	19A700029P9	Digital: Dual Data Flip-Flop; sim to 4013B.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XU705	19A700156P5	Integrated circuit: 40 contacts; sim to Augat 340-AG39D.
XU706	19A700156P11	Integrated circuit.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y701	19A702511G3	Quartz: 5.000000 MHz.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19C850719P1	IF Cover.
	19B801022P2	Tuning screw. (Used with C1-C6).
	19D900133P30	Casting, front end. (Used in G1, G2, G5, G13, G14, & G17).
	19D900133P31	Casting, front end. (Used in G3, G4, G6, G7, G15, G16, G18 & G19).
	19D900299P3	Spacer, front end.
	19B800647G1	Shield.
	19B800655P1	Gasket. (Used with J601).
	19D900777P1	Bottom cover, casting.
	19A702381P510	Screw, thread forming: TORX DRIVE No. M3.5 - 0.6 x 10. (Quantity 39).
	19A701886P1	Spring. (Used with C7-C13).
	19A7019O5P2	Tuning screw. (Used with C7-C13).
	19A702364P106	Machine screw: TORX Drive, No. M2 - 0.4 x 6. (Used to secure casting, quantity 10).
	19C850619G19	Casting. (Used with C10-C13, quantity 2).
	19C850619G24	Casting. (Used in G1, G2, G5, G13, G14 & G17, used with C7-C9).
	19C850619G25	Casting. (Used in G3, G4, G6, G7, 15, 16, 18 & 19, used with C7-C9).

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
		NOTE: Refer to the outline diagram (pg 17) for the location of the following parts:
3	19A701544P9	Can. (Used with L508, L509 & L510).
5	19B800583P1	Heat sink. (Used with Q601, Q602, Q705 & U702).
6	19A701883P4	Contact, electrical; sim to AMP 86444-1. (Quantity of 8).
7	19D900765P1	Casting.
9	19D901654P1	Wire bus.
11	19A701289P1	Retaining ring: 3/16 inches; sim to National Lockwasher WA 510. (Located at J601).
12	19C850674G1	Can.
13	19A700068P1	Insulator, bushing. (Used Q601, Q602, Q705 & U702).
14	19A705469P1	Insulator plate. (Used Q601, Q602, Q705 & U702).
17	19B800890P1	Coil, RF: 9.5 nH + or -5%; sim to Paul Smith SK-896-1.
25	19A701538P2	Gasket. (Used with L508, L509 & L510).
26	19A702381P508	Screw, thd. form: No. 3.5-0.6 x 8. (Quantity 3).
30	19A702362P208	Machine screw, Torx drive: M2.5-.45 x 8. (Used to secure Q601, Q602, Q705 & U702).

PARTS LIST

2PPM OSCILLATOR KIT
19C851230G1 (TIN CONTACTS)
19C851230G2 (GOLD CONTACTS)
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	19A700041P78	Printed wire, 4 contacts rated @ 2 1/2 amps; sim to Molex 22-15-2046. (Used in G1).
P1	19A704779P78	Printed wire, 4 contacts rated @ 2 1/2 amps. (Used in G2).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1A	19A701250P353	Metal film: 34.8K ohms ±1%, 250 VDCW, 1/4 w.
R1B	19A701250P357	Metal film: 38.3K ohms ±1%, 250 VDCW, 1/4 w.
R1C	19A701250P360	Metal film: 41.2K ohms ±1%, 250 VDCW, 1/4 w.
R1D	19A701250P344	Metal film: 28K ohms ±1%, 250 VDCW, 1/4 w.
R1E	19A701250P346	Metal film: 29.4K ohms ±1%, 250 VDCW, 1/4 w.
R1F	19A701250P349	Metal film: 31.6K ohms ±1%, 250 VDCW, 1/4 w.
R1G	19A701250P351	Metal film: 33.2K ohms ±1%, 250 VDCW, 1/4 w.
R1H	19A701250P358	Metal film: 2.7 ohms ±5%, 1/4 w.
R1J	19A701250P359	Metal film: 40.2K ohms ±1%, 250 VDCW, 1/4 w.
R1K	19A701250P361	Metal film: 42.2K ohms ± 1%, 250 VDCW, 1/4 w.
R1L	19A701250P347	Metal film: 30.1K ohms ±1%, 250 VDCW, 1/4 w.
R1M	19A701250P365	Metal film: 46.4K ohms ±1%, 250 VDCW, 1/4 w.
R2A	19A701250P288	Metal film: 8060 ohms ±1%, 250 VDCW, 1/4 w.
R2B	19A701250P285	Metal film: 7.5K ohms ±1%, 250 VDCW, 1/4 w.
R2C	19A701250P286	Metal film: 7680 ohms ±1%, 250 VDCW, 1/4 w.
R2D	19A701250P273	Metal film: 5.6K ohms ±1%, 250 VDCW, 1/4 w.
R3A	19A701250P188	Metal film: 806 ohms ±1%, 250 VDCW, 1/4 w.
R3B	19A701250P190	Metal film: 845 ohms ±1%, 250 VDCW, 1/4 w.
R3C	19A701250P192	Metal film: 887 ohms ±1%, 250 VDCW, 1/4 w.
R3D	19A701250P193	Metal film: 909 ohms ±1%, 250 VDCW, 1/4.
R3E	19A701250P194	Metal film: 931 ohms ±1%, 250 VDCW, 1/4 w.
R3F	19A701250P191	Metal film: 866 ohms ±1%, 250 VDCW, 1/4 w.
R3G	19A701250P184	Metal film: 732 ohms ±1%, 250 VDCW, 1/4 w.
R3H	19A701250P185	Metal film: 750 ohms ±1%, 250 VDCW, 1/4 w.
R3J	19A701250P186	Metal film: 768 ohms ±1%, 250 VDCW, 1/4 w.
R3K	19A701250P187	Metal film: 787 ohms ±1%, 250 VDCW, 1/4 w.
R3L	19A701250P196	Metal film: 1150 ohms ±1%, 250 VDCW, 1/4 w.
R3M	19A701250P201	Metal film: 1K ohms ±1%, 250 VDCW, 1/4 w.
R3N	19A701250P203	Metal film: 1050 ohms ±1%, 250 VDCW, 1/4 w.
R3P	19A701250P204	Metal film: 1070 ohms ±1%, 250 VDCW, 1/4 w.
R3Q	19A701250P207	Metal film: 1150 ohms ±1%, 250 VDCW, 1/4 w.
R3R	19A701250P182	Metal film: 698 ohms ±1%, 250 VDCW, 1/4 w.
R3S	19A701250P179	Metal film: 649 ohms ±1%, 250 VDCW, 1/4 w.
R3T	19A701250P217	Metal film: 1.47K ohms ±1%, 250 VDCW, 1/4 w.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y351	19A703049G6	Crystal unit, quartz, 13.200 MHz.

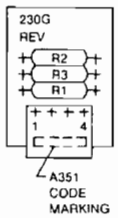
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMB

C1 and C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
L1
L2
L3
L4
P401
Q1
R1
R2
R3
R4
R5
R6

*COM

A351 BOARD LAYOUT



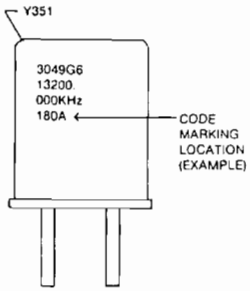


TABLE 1
(19C851230)
RESISTOR IDENTIFICATION FOR 2 PPM OSCILLATOR KIT

A351 BOARD CODE MARKING	Y351 CRYSTAL MARKING	R1/VALUE		R2/VALUE		R3/VALUE	
090B	090B-099B	L	30.1K	D	5.62K	T	1.47K
110B	110B-119B	D	28.0K	B	7.50K	Q	1.15K
120A	120A-129A	E	29.4K	B	7.50K	P	1.07K
120B	120B-129B	D	28.0K	B	7.50K	Q	1.15K
130A	130A-139A	F	31.6K	B	7.50K	N	1.05K
130B	130B-139B	E	29.4K	B	7.50K	P	1.07K
140A	140A-149A	G	33.2K	A	8.06K	M	1K
140B	140B-149B	F	31.6K	A	8.06K	M	1K
150A	150A-159A	A	34.8K	A	8.06K	L	976
150B	150B-159B	G	33.2K	A	8.06K	D	909
160A	160A-169A	B	38.3K	A	8.06K	F	866
160B	160B-169B	A	34.8K	A	8.06K	D	909
170A	170A-179A	C	41.2K	A	8.06K	C	887
170B	170B-179B	A	34.8K	A	8.06K	E	931
180A	180A-189A	B	38.3K	A	8.06K	A	806
180B	180B-189B	B	38.3K	A	8.06K	B	845
190A	190A-199A	H	39.2K	A	8.06K	K	787
190B	190B-199B	J	40.2K	A	8.06K	J	768
200A	200A-209A	J	40.2K	A	8.06K	J	768
200B	200B-209B	K	42.2K	C	7.68K	J	768
210A	210A-219A	K	42.2K	C	7.68K	H	750
210B	210B-219B	D	42.2K	C	7.68K	H	750
220A	220A-229A	K	42.2K	C	7.68K	G	732
220B	220B-229B	K	42.2K	C	7.68K	R	698
230B	230B-239B	M	46.4K	C	7.68K	S	649

Resistors R1 thru R3 shall be selected from Table to agree with the code marked on Crystal Y351

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a Revision Letter which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV. A - SYSTEM BOARD 19D901665G1,3,5,7
To increase gain in the first RX IF. Changed C434, C435 and R505.

C434 was 19A702236P32 - Ceramic: 18 pF ±5%, 50 VDCW.
C435 was 19A702236P32 - Ceramic: 18 pF ±5%, 50 VDCW.
R505 was 19B800607P102 - Metal film: 1K ohms ±5%, 1/8 w.

REV. B - SYSTEM BOARD 19D901665G5 & 7
To improve TX spur performance. Changed C112, C130, R119 and R128. Added R129 and R130.

C112 was 19A702236P32 - Ceramic: 18 pF ±5%, 50 VDCW.
C130 was 19A702236P30 - Ceramic: 15 pF ±5%, 50 VDCW.
R119 was 19B800607P181 - Metal film: 180 ohms, 1/8 w.
R128 was 19B800607P181 - Metal film: 180 ohms, 1/8 w.

REV. C - SYSTEM BOARD 19D901665G5 & 7
To improve test yield on TX VCO. Changed C235.

C235 was 19A702236P39 - Ceramic: 39 pF ±.25 pF, 50 VDCW.

REV. A - SYSTEM BOARD 19D901665G13,15,17,19
REV. B - SYSTEM BOARD 19D901665G1 & 3
REV. D - SYSTEM BOARD 19D901665G5 & 7
To improve operation of the EEPROM. Deleted C726.

C726 was 19A702052P24 - Ceramic: 0.068 uF ±10%, 50 VDCW.

REV. B - SYSTEM BOARD 19D901665G13,15,17,19
REV. C - SYSTEM BOARD 19D901665G1 & 3
REV. E - SYSTEM BOARD 19D901665G5 & 7
To improve operation of VCO, changed C276. To increase exciter output power and to improve TX spur performance, changed C133. To improve operation, relocated C431.

C276 was 19A702236P30 - Ceramic: 15 pF ±5%, 50 VDCW.
C133 was 19A702236P21 - Ceramic: 6.8 pF ±.5 pF, 50 VDCW.

REV. C - SYSTEM BOARD 19D901665G17 & 19
REV. F - SYSTEM BOARD 19D901665G5 & 7
To improve factory yield of RX VCO voltage at 400 MHz. Changed C268.

C268 was 19A702236P23 - Ceramic: 8.2 pF ±.25 pF, 50 VDCW.

REV. C - SYSTEM BOARD 19D901665G13 & 15
REV. D - SYSTEM BOARD 19D901665G1 & 3
REV. D - SYSTEM BOARD 19D901665G17 & 19
REV. G - SYSTEM BOARD 19D901665G5 & 7
To add external voltage regulator to accomodate 19A703091P7 prescaler replacement. Deleted C208, added R265 and D221.

C208 was 19A702052P24 - Ceramic: 0.068 uF ±10%, 50 VDCW.

REV. E - SYSTEM BOARD 19D901665G17 & 19
REV. H - SYSTEM BOARD 19D901665G5 & 7
To prevent TX spurs by improving the operation of Q104. Changed C131.

C131 was 19A702236P28 - Ceramic: 12 pF ±5%, 50 VDCW.

REV. D - SYSTEM BOARD 19D901665G13 & 15
REV. E - SYSTEM BOARD 19D901665G1 & 3
To improve operation of Q452. Deleted R459, added C457 and changed C455.

R459 was 19B800607P471 - Metal film: 470 ohms ±5%, 1/8 w.
C455 was 19A702236P15 - Ceramic: 3.9 pF ±5% pF, 50 VDCW.

REV. F - SYSTEM BOARD 19D901665G17 & 19
REV. J - SYSTEM BOARD 19D901665G5 & 7
To improve exciter output power. Changed R130.

R130 was 19B800607P100 - 10 ohms.

MODIFICATION INSTRUCTION

This Modification Instruction covers the installation of Mod Kit 19A704915G1 along with shielded Power/Control cable and modified radio bottom cover 19B800686G4 to a Delta S/SX Mobile Radio to provide improved RFI performance where antenna is in close proximity to Power/Control cable.

PARTS REQUIRED

- Shielded Power/Control Cable
- Modified Radio Bottom Cover 19B800686G4
- Modification Kit 19A704915G1 consisting of:
  - Filter Board ASM.----------19B801399G1
  - Modified Plastic Spacer----------19B801402G1
  - #12-24 Sloted Head Machine Screw----------N37P19012B
  - #12 # Fxternal Tooth Lock Washer----------N403P21C6
  - Aluminum Offset Spacer----------19A704893P2
  - M3.5 x 10 Thread Forming Screw----------19A702381P510

TOOLS REQUIRED

- #12-24 NC Fluted Taper Tap and Tap Handle
- #15 & #30 TORX Screwdrivers
- Flat Blade Screwdriver

PROCEDURE

Step 1 - Remove radio from vehicle to a convenient work area. Tap existing hole on right front corner of radio frame using #12-24 NC fluted taper tap.

Step 2 - Remove radio top cover and plug in filter board ASM. 19B801399G1 to top row of J601 pins 26 thru 34 taking care to align connector correctly with rubber pad positioned towards front of radio. Mount GND lead as shown using M3.5 x 10 thread forming screw supplied or under screw retaining channel guard board. (See Figure 7) Replace top cover.

Step 3 - Remove and discard radio bottom cover. Remove and discard plastic block at J601 front connector and replace with modified plastic block 19B801402G1. Install modified radio bottom cover 19B800686G4 with notch in gasket towards front of radio (cover is marked on outside "This End To Front").

Step 4 - Remove Power/Control cable from vehicle if installed and install new shielded Power/Control cable. Connect shield to hole tapped in radio frame using #12-24 slotted head screw N37P19012B, external tooth lock washer N403P21C6 and spacer 19A704893P2. See Figure 7.

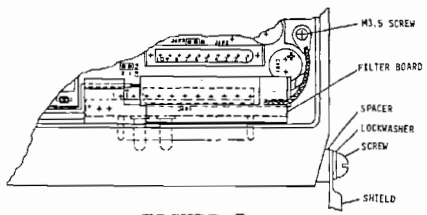


FIGURE 7

ERICSSON

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