MOBILE RADIO

LBI30802C
(DF9048)
(DF9044, IMTS)

DESCRIPTION AND MAINTENANCE

MASTR® EXECUTIVE II RCC AND IMTS

SYNTHESIZED RADIO COMBINATIONS

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GENERAL ELECTRIC

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ILLUSTRATIONS

WARNING

Although the highest DC voltage in MASTR Executive II Mobile Equipment is supplied by the vehicle battery, high currents may be drawn under short circuit conditions. These currents can possibly heat metal objects such as tools, rings, watchbands, etc., enough to cause burns. Be careful when working near energized circuits! High-level RF energy in the transmitter Power Amplifier assembly can cause RF burns upon contact. Keep away from these circuits when the transmitter is energized!

SYSTEM SPECIFICATIONS*

FREQUENCY RANGE	152.030-158.670 MHz	454.025-459.650 MHz
RCC Channels	1 through 13	21 through 32
TELCO Channels	JL through JR	QC through QF
Power Supply (Negative ground only)	13.8 VDC ±20%	
Transmitter Mode	10.0 Amperes	12.0 Amperes
Receiver Mode	0.6 Amperes	0.6 Amperes
TEMPERATURE RANGE	-30°C to +60°C (-22°F to +140°F)	
DIMENSIONS (HXWXD)	5.15" x 13.5" x 13.4"	
WEIGHT	24 Pounds	
DUTY CAPABILITY	EIA - Continuous	
FCC FILING NUMBERS	KT-173-A	KT-174-A

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

COMBINATION NOMENCLATURE

1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit	6th Digit	7th Digit	8th Digit	9 & 10th Digits	11th Digit
Mechanical Package	System Voltage	Power Output	Channel Spacing	Channel Capacity	Number of Freq.	Control Unit	Control Color	Frequency Range	Oscillator Stability
C IMTS Duplex	**S** 12 Volts Neg. Ground Only Synthesizer	**5** 21-40 Watts	**5** 25 MHz	**S** Up to 32 Channels	**X** 0 Freq. Tx 0 Freq. Rx	**X** None	**X** Binary Freq. Control	**66** VHF	**A** 5 PPM
Y RCC Duplex			**6** 30 MHz		**A** 1 Freq. Tx 1 Freq. Rx	**A** VP-1 (Hi-Band)	**Y** Standard Freq. Control	**88** UHF	**B** 2.5 PPM
X*					**C** 2 Freq. Tx 2 Freq. Rx	**C** VP-2 (UHF)	**A** Black		
					E 3 Freq. Tx 3 Freq. Rx	**H** Telco IMTS (Hi-Band)	**B** Beige		
					F 4 Freq. Tx 4 Freq. Rx	**J** Telco IMTS (UHF)	**C** Black (Rotary Dial)		
					G 5 Freq. Tx 5 Freq. Rx	**K** RCC IMTS (Hi-Band)	**D** Black (Touch Pad)		
					H 6 Freq. Tx 6 Freq. Rx	**L** RCC IMTS (UHF)	**E** Beige (Rotary Dial)		
					J 7 Freq. Tx 7 Freq. Rx		**F** Beige (Touch Pad)		
					K 8 Freq. Tx 8 Freq. Rx				
					L 9 Freq. Tx 9 Freq. Rx				
					M 10 Freq. Tx 10 Freq. Rx				
					N 11 Freq. Tx 11 Freq. Rx				
					P 12 Freq. Tx 12 Freq. Rx				
					R 13 Freq. Tx 13 Freq. Rx				
					S Synthesized Up to 32 Channels				

* Combination shipped without Duplexer or Duplexer selected by special option.

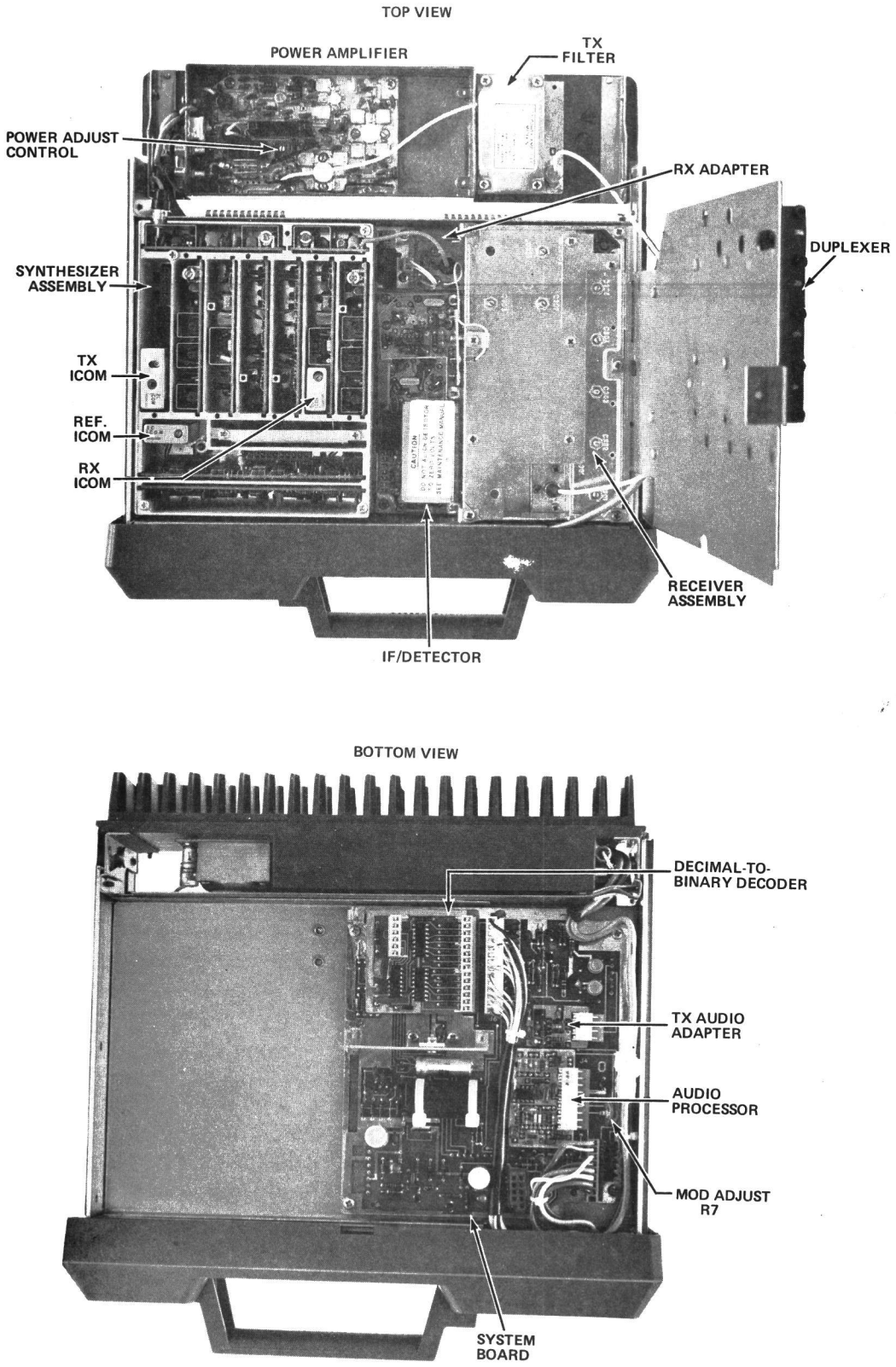


Figure 1 - Module Layout

DESCRIPTION

The General Electric MASTR® Executive II Common Carrier Frequency Synthesized mobile radio operates full simultaneous duplex. The radio is fully transistorized, utilizing both discrete components and integrated circuits for highest reliability. Transmitter PA excitation and receiver mixer injection are derived from two phase lock loops (PLL) which are referenced to a channelization synthesizer. Programming of the synthesizer determines channel selection. The radios are capable of handling up to 32 contiguous frequencies for both transmit and receive; however, the number of channels is limited by the capacity of the control unit selection.

The radio combination is contained in a "slide-rail" mounting frame and is designed for trunk-mount installation. The radio is tamperproof when locked in the mounting frame. When unlocked, the unit can be easily pulled out of its frame for servicing.

The radio is of modular construction. All major modules and tuning adjustments (except for the system board) are accessible from the top of the radio (see Figure 1).

No power supply is required since the highest supply voltage used in the radio is supplied by the vehicle battery. The radio is shipped for operation in 12 Volt negative ground vehicle systems.

TRANSMITTER

The transmitter consists of the PA excitation circuits of the synthesizer/PLL and the power amplifier assembly. The PA assembly mounts on a hinged heatsink casting that swings down for easy access. A low-pass filter mounts on the heatsink next to the PA assembly.

RECEIVER

The receiver consists of the RF assembly, mixer-IF assembly (MIF) and IF detector assembly (IFD). Local oscillator injection is supplied by the synthesizer/PLL.

SYNTHESIZER/PLL

A mother board, mounted in the center frame of the radio, is used as the major interconnect between the synthesizer printed boards. The radio system board connects to this mother board by means of molex connectors.

DUPLEXER

The Duplexer Assembly consists of a transmitter noise filter and three cavities. No adjustments are required for the Duplexer. The transmitter filter is connected in series with the transmitter output and provides more than 70 dB of isolation at the receive frequency. The receiver cavity is connected between the antenna and receiver and provides more than 20 dB of isolation at the transmitter frequency.

The Duplexer mounting plate is hinged to allow access to the radio modules. The top cover of the radio contains a "bubble" to accomodate the Duplexer.

CONTROL UNITS

The telephone-type control units contain all tone and logic circuits for system communication. The control units are equipped with telephone-type handsets.

SYSTEM BOARD

The System Board contains the 10 Volt regulator, voltage switching circuits, receiver de-emphasis, earpiece audio amplifier, microphone bias, system metering connector and provides interconnection between the front radio connector and the RF modules.

In IMTS applications, the system is compatible with IMTS control unit binary frequency selection. In RCC applications using the VP series control units, an optional decimal-to-binary decoder plug-in module is required which is accommodated at the System Board.

AUDIO PROCESSOR

The transmitter audio processor provides a total gain of approximately 24 dB. This board contains a pre-emphasis circuit with amplitude limiting and a post limiter filter.

INITIAL ADJUSTMENTS

After the MASTR Executive II Synthesized radio has been installed (as described in the INSTALLATION MANUAL), the following adjustments should be made by an electronics technician who hold a 1st or 2nd Class FCC Radiotelephone license.

Make sure that a RADIO TRANSMITTER IDENTIFICATION form (FCC Form 452-C or General Electric Form NP270303) has been filled out and attached to the transmitter.

CAUTION

Before bench testing the radio, make certain the output voltage characteristics of your bench power supply meets the following requirements.

To protect the transmitter power output transistors from possible instant destruction, the following input voltages must not be exceeded:

Transmitter unkeyed: 20 Volts

Transmitter keyed: 18 Volts
(50 ohm resistive load)

Transmitter keyed: 14 Volts
(no load or non-resistive load)

These voltages are specified at the normal vehicle battery terminals of the radio and take the voltage drop of standard cables into account. The voltage limit shown for a non-optimum load is for "worst case" conditions. For antenna mismatches likely to be encountered in practice, the actual limit will approach the 18 Volt figure.

Routine transmitter tests should be performed at EIA Standard Test Voltages (13.6 VDC for loads of 6 to 16 amperes; 13.4 VDC for loads of 16 to 36 amperes). Input voltages must not exceed the limits shown, even for transient peaks of short duration.

Many commonly used bench power supplies cannot meet these requirements for load regulation and transient voltage suppression. Bench supplies which employ "brute force" regulation and filtering (such as Lapp Model 73) may be usable when operated in parallel with a 12 Volt automotive storage battery.

TRANSMITTER ADJUSTMENT

The adjustment for the transmitter includes measuring the forward and reflected power and adjusting the antenna length for optimum ratio, then setting the transmitter to rated power output (or to the specific output or input which may be required by the FCC station authorization). Next, measuring the frequency and modulation and entering these measurements on the FCC-required station records. For the complete transmitter adjustment, refer to the ALIGNMENT PROCEDURE in the MAINTENANCE MANUAL for the transmitter.

RECEIVER ADJUSTMENT

The initial adjustment for the receiver includes tuning the input circuit to match the antenna. For the Receiver Initial Adjustment Procedure, refer to the FRONT END ALIGNMENT PROCEDURES in the MAINTENANCE MANUAL for the receiver.

CONTROL UNIT ADJUSTMENT

Initial adjustment of the control unit includes checking the code strapping, checking volume and the earpiece level. Refer to the CONTROL UNIT ADJUSTMENT PROCEDURE in the Control Unit Maintenance Manual for complete instructions.

OPERATION

Complete operating instructions for the Two-Way Radio are provided in the separate OPERATOR'S MANUAL.

MAINTENANCE

REMOVING IC'S

REMOVING IC's (and all other soldered-in components) can be easily accomplished by using a de-soldering tool such as a SOLDA-PULLT or equivalent. To remove an IC, heat each lead separately on the solder side and remove the old solder with the de-soldering tool.

An alternate method is to use a special soldering tip that heats all of the pins simultaneously.

PREVENTIVE MAINTENANCE

To insure high operating efficiency and to prevent mechanical and electrical failures from interrupting system operations, routine checks should be made of all mechanical and electrical parts at regular intervals. This preventive maintenance should include the checks as listed in the table of Maintenance Checks.

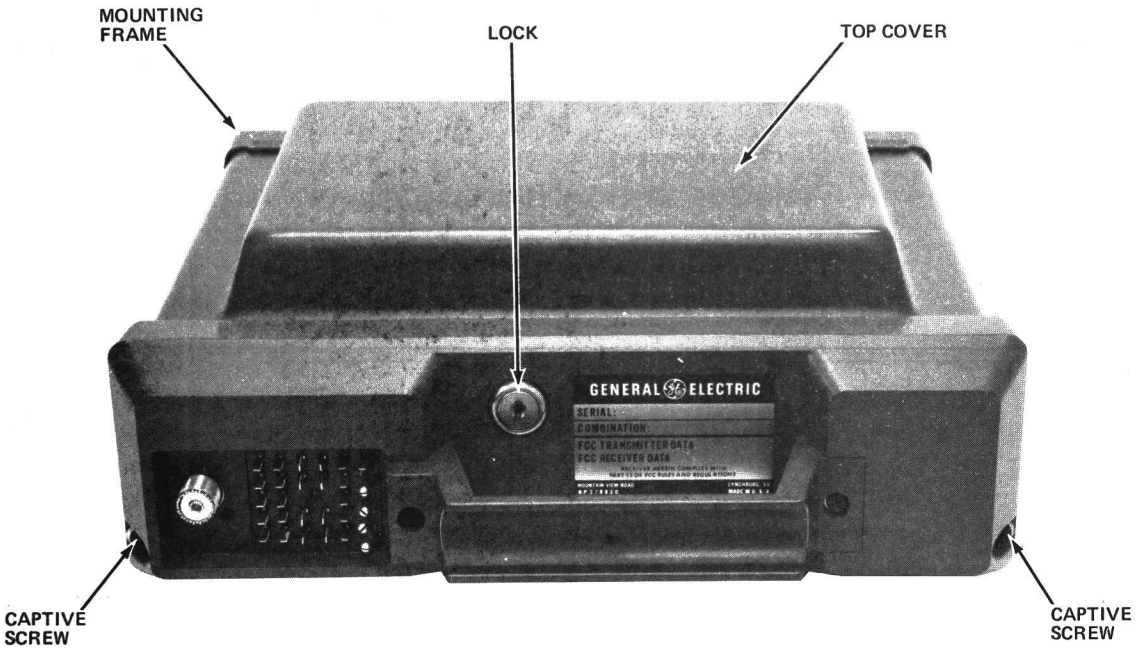
TEST AND TROUBLESHOOTING PROCEDURES

The individual Maintenance Manual for the transmitter and receiver describe standard test procedures which the serviceman can use to compare the actual performance of the transmitter or receiver against the specifications of the unit when shipped from the factory. In addition, specific troubleshooting procedures are available to assist the serviceman in troubleshooting the transmitter and receiver.

DISASSEMBLY

To gain access to the unit for servicing:

1. Unlock the radio (see Figure 2).



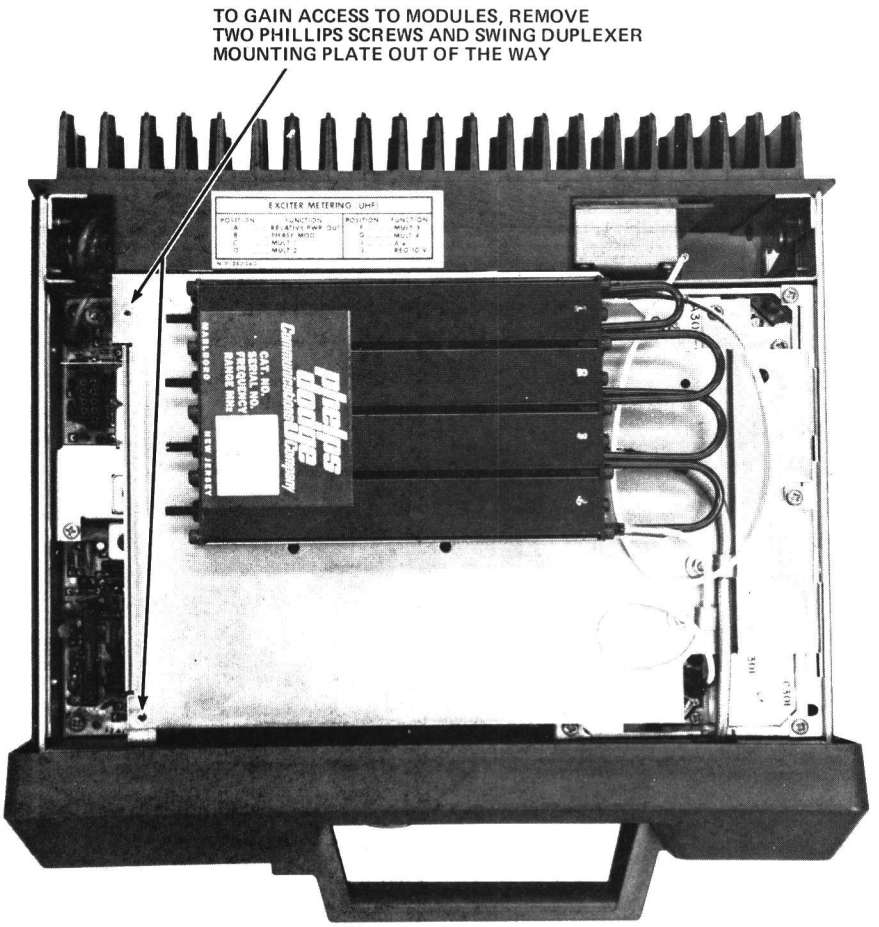


Figure 2 - Disassembly

2. Loosen the two captive screws shown in Figure 2.

3. Pull the radio forward about two inches out of the mounting frame, and lift off top cover.

4. To gain access to the bottom side, pull the radio all the way out of mounting frame.

MECHANICAL PARTS BREAKDOWN

A mechanical parts breakdown diagram of the two-way radio is provided in this manual. The diagram shows the placement and GE Part Number of mechanical items on the two-way radio set (see Table of Contents).

RE-INSTALLATION

If the mobile combination is ever moved to a different vehicle, always check the battery polarity of the new system. If necessary, install the optional polarity converter in positive ground vehicles to maintain current polarity.

NOISE SUPPRESSION

After completing the initial adjustment of the transmitter and receiver, the serviceman should determine whether additional noise suppression is required. The following information should assist the serviceman in identifying and eliminating undesirable noise interference.

Ignition Noise

Ignition noise sounds like a "popping" sound in the speaker, whose frequency varies with engine speed while a weak signal is being received. This type of interference is generated by the spark plugs, distributor and any poor connections in the high-voltage system which might cause arcing. Ignition noise may be identified by noting that the noise disappears as soon as the ignition switch is turned off.

1. If the vehicle does not have a resistance lead from the coil to the center of the distributor cap, disconnect the lead at the distributor and cut the lead so that a Cable-Type Suppressor may be inserted in it close to the distributor. Screw the cut ends of the lead into the suppressor.

NOTE

A resistance lead operates as a very effective noise suppressor as long as there are no breaks anywhere along its length. Never cut a resistance lead to insert a suppressor. A loose knot is often tied in the lead to prevent excess flexing, which might break the conductor.

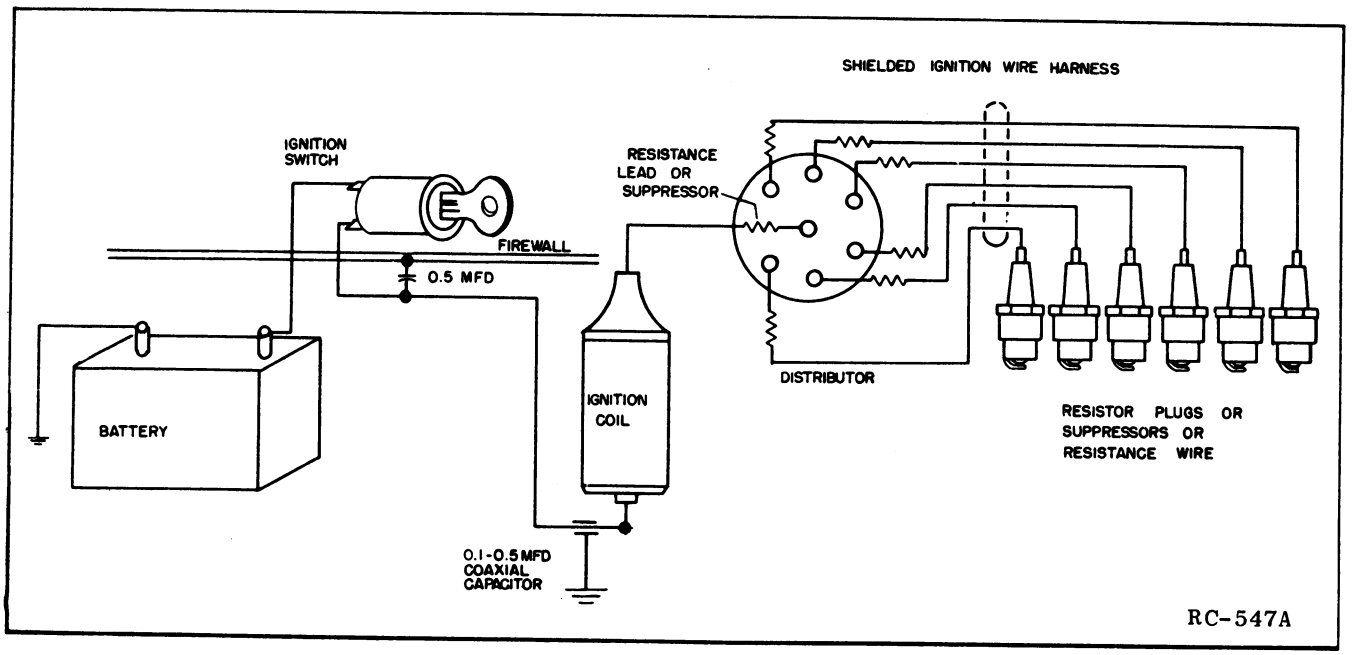


Figure 3 - Ignition Circuit with Noise Suppression Components

MAINTENANCE CHECKS	INTERVAL	
	6 Months	As Required
CONNECTIONS - Ground connections and connections to the voltage source should be periodically checked for tightness. Loose or poor connections to the power source will cause excessive voltage drops and fault operation. When ground connections are not made directly to the battery, the connection from the battery to vehicle chassis must be checked for low impedance. A high impedance may cause excessive voltage drops and alternator noise problems.	X	
ELECTRICAL SYSTEM - Check the voltage regulator and alternator or generator periodically to keep the electrical system within safe and ecomonical operating limits. Over-voltage is indicated when the battery loses water rapidly. Usage of 1 or 2 ounces of water per cell per week is acceptable for batteries in continuous operation. A weak battery will often cause excessive noise or faulty operation.		X
MECHANICAL INSPECTION - Since mobile units are subject to constant shock and vibration, check for loose plugs, nuts, screws and parts to make sure that nothing is working loose.	X	
ANTENNA - The antenna, antenna base and all contacts should be kept clean and free from dirt or corrosion. If the antennas or its base should become coated or poorly grounded, loss of radiation and a weak signal will result.	X	
ALIGNMENT - The transmitter and receiver meter readings should be checked periodically, and the alignment "touched up" when necessary. Refer to the applicable ALIGNMENT PROCEDURE and troubleshooting sheet for typical voltage readings.		X
FREQUENCY CHECK - Check transmitter frequency and deviation as required by FCC. Normally, these checks are made when the unit is first put into operation, after the first six months and once a year thereafter.		X

2. Check to see that:

   -- the distributor points and condenser are in good condition.

   -- the high-voltage leads from the distributor are not broken and are making good contact at each end.

   -- the spark plugs have clean, dry insulators and their electrodes are clean and properly adjusted.

   -- the timing has been properly adjusted.

3. Use a 0.5 mFd by-pass capacitor to by-pass the battery lead to the ignition coil. Mount the capacitor under a screw which will provide a good ground and connect the capacitor lead to the terminal of the coil which is connected to the ignition.

4. Remove the ignition coil and its mounting bracket. Clean paint from coil (where the bracket mounts), from the bracket and from the engine block. Remount the coil so as to obtain a good ground for the coil case.

5. If the vehicle has been driven 30,000 or 40,000 miles or more, the cap and rotor of the distributor will probably need replacing. This will not only reduce ignition noise, but also improve the overall performance of the engine.

6. High-voltage ignition wires can become capacitively coupled to the low-voltage systems, causing ignition noise to appear in the low-voltage system. This coupling can be minimized by separating the high- and low-voltage leads, or if necessary, separately shielding the leads.

7. If one of the ignition leads happens to have the critical length for radiating at the receiver's frequency, the noise can be reduced

by changing the length of the lead. A noise source of this type is not common and can only be found by using a noise meter or by trial and error.

8. If the preceding steps fail to reduce ignition noise to a satisfactory level, it may be necessary to install resistance-type spark plugs, individual suppressors on each spark plug, or a shielded ignition wire harness.

Alternator Noise

Alternator noise shows up as a high-pitched "whine", whose pitch varies with engine speed. To check for this type of noise, run the engine at a moderate speed and then shut off the engine, while listening to the noise on the receiver. Alternator noise will continue as long as the engine turns, lowering in pitch as the engine slows down.

It may be nesessary to install a coaxial type, 0.5 mFd filter capacitor from the ungrounded alternator terminal to ground.

CAUTION

Do not install this capacitor on alternators that are equipped with a factory-supplied capacitor for protecting the rectifiers and suppressing noise.

NOTE

In certain vehicles, the alternator noise level is excessive at the ignition switch terminal. In these cases, connections should be made directly to the battery.

Generator Noise

Generator noise shows up as a high-pitched "whine", whose pitch varies with engine speed. To check for this type of noise, run the engine at a moderate speed and then shut off the engine, while listening to the noise on the receiver. Generator noise will continue as long as the engine turns, lowering in pitch as the engine slows down.

By-pass the armature terminal on the generator to ground with a 0.5 mFd, 40 or 50 amp coaxial capacitor. Be sure to scrape the area where the capacitor is to be mounted, so that its case will be well grounded.

CAUTION

Do not by-pass the field terminal (F), as this will damage the voltage regulator contacts.

Generator Regulator Noise

Generator regulator noise shows up as a "rapsy" sound which is generated by the

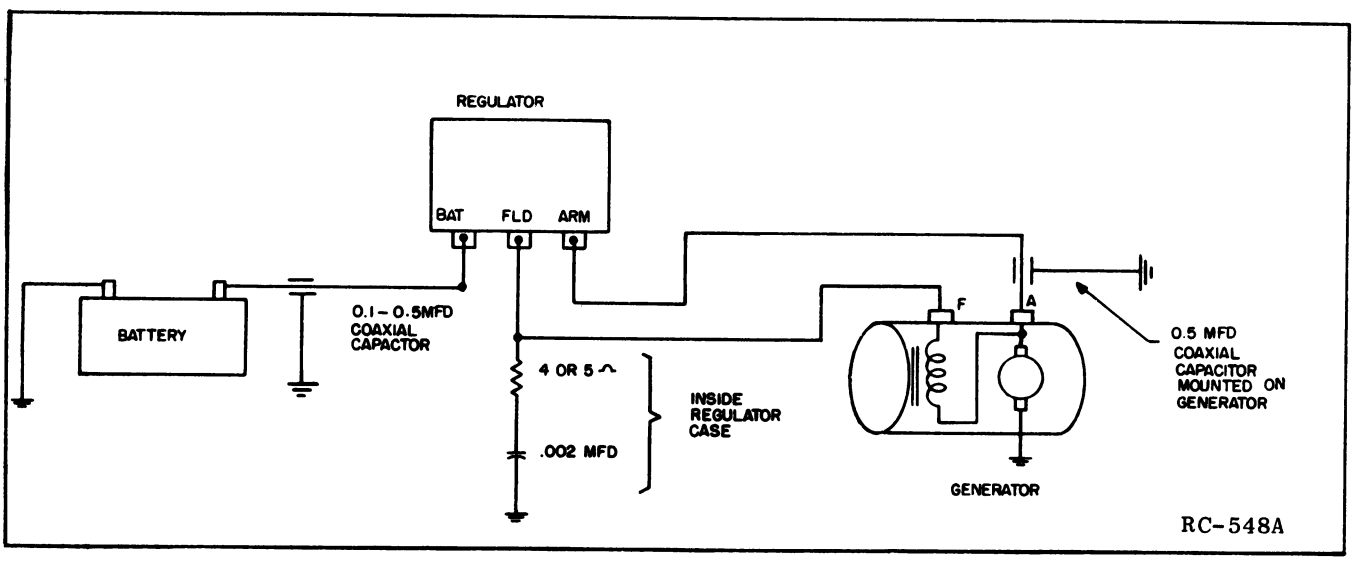


Figure 4 - Generator Circuit with Noise Suppression Components

contacts in the regulator and radiated by the leads coming out to the regulator. If suppression of regulator noise is necessary, connect a 5 ohm resistor in series with a .002 mFd capacitor from the field, terminal (F) of the regulator to ground. If possible, these components should be mounted inside regulator case. The battery terminal (BAT) and armature terminal (ARM) can be by-passed to ground with 0.5 mFd capacitors.

CAUTION

If the regulator is opened to install the capacitor or resistor, remember that one wrong connection or shorted wire can damage the regulator or generator.

Gauge noise produces a "hissing" or "crackling" sound. Tapping the face of each gauge while the engine is running usually shows up which gauge is at fault. By-pass the gauge lead to ground with a 0.5 mFd capacitor, connected close to the sensing element.

Static and Arcing Noise

The following suggestions may help to cure other unusual types of interference:

1. Use bonding braid to electrically bond the hood and each corner of the engine block to the vehicle's frame. Scrape paint and dirt from bonding points to obtain a good ground.
2. Treat noisy tires with anti-static powder.
3. Use front-wheel static collectors for irregulator "popping" noise which disappears when the brakes are applied.
4. Use heavily graphited penetrating oil on the exhaust pipe and muffler supports if they are producing noise.

CIRCUIT ANALYSIS

+10 VOLT REGULATOR (SYSTEM BOARD)

The +10 Volt Regulator provides a closely-controlled supply voltage for the synthesizer, the receiver and audio circuits. The 13.8 VDC input is applied to choke input filter L901, C922 and C935. The output of the filter is applied to the regulator circuit which consists of Q901, Q902, Q903 and zener diode VR901.

When the output of the regulator starts to increase, Q903 conducts harder and Q902 conducts less, causing Q901 to conduct less. This increases the voltage drop across Q901, keeping the output constant. Potentiometer R911 is used to set the base voltage of Q903 for the desired 10 Volt output.

Diodes CR901 and CR902 provide reverse battery polarity protection and will cause the in-line fuse to blow if the polarity reverses.

SYSTEM PTT SWITCH (SYSTEM BOARD)

Operating the PTT switch on the handset forward biases diodes CR905 and CR906, connecting the emitter of Q904 to A-. Conduction of Q904 turns on transmitter oscillator control switch Q905. Conduction of Q905 applies voltage to the transmitter regulator switch in the synthesizer via P902-2. Conduction of Q905 also operates Q906 which, in turn, operates Q907. Conduction of Q907 enables the transmitter regulator in the synthesizer via P902-6.

Q910 and Q911, in conjunction with R939 and R940, serve as current sensing circuits. If the collector of Q905 or the collector of Q907 become shorted, or partially shorted to ground, the voltage drop across R939 or 940 will turn on Q910 or Q911 which will tend to shut off Q905 or Q907. This limits the current to 500 mA supplied by Q905 and Q907 to the synthesizer.

If the synthesizer is not locked on the proper frequency, the TX LOCK-OUT function from P901-9, which is connected to the base of Q906, will inhibit the output voltage of Q906 and prevent an erroneous output from the synthesizer to the power amplifier.

AUDIO AMPLIFIER (SYSTEM BOARD)

The audio signal from the receiver (VOL/SQ HI) is fed through the de-emphasis network (C928, C929, R930, R931) to audio amplifiers Q908 and Q909. The output of emitter-follower Q908 is coupled to the base of Q909 by C931. The amplified audio is fed to the earpiece of the handset. The 15 mA required for operating the carbon microphone in the handset is supplied through R903 and R904 from the 10 Volt Regulator to the MIC HI lead. C920 provides the necessary filtering.

AUDIO PROCESSOR BOARD

The transmitter audio processor contains audio circuitry consisting of two operational amplifiers, AR101-A and -B, a pre-emphasis circuit with amplitude limiting and a post limiter filter. A total gain of approximately 24 dB is realized through the audio processor. Twenty dB is provided by AR101-B and 4 dB by AR101-A.

The 10 Volt regulator powers the audio processor and applies regulated +10 V thru P102-6 to a voltage divider consisting of R108 and R110. The +5 V output from the voltage divider establishes the operating reference point for both operational amplifiers. C107 filters noise from the voltage supply to the operational amplifiers.

Resistors R105, R106, and R107 and diodes CR101 and CR102 provide limiting for AR101-B. Diodes CR101 and CR102 are reverse biased by +5 VDC on AR101B-6 and voltage divider network R105, R106 and R107. The voltage divider network provides +7 VDC at the cathode of CR101 and +3 VDC at the anode of CR102. C102 and C103 permit a DC level change between AR101B-7 and the voltage divider network for diode biasing.

When the input signal to AR101B-6 is of a magnitude such that the amplifier output at AR101B-7 does not exceed 4 volts P-P, the amplifier provides a nominal 20 dB gain. When the audio signal level at AR101B-7 exceeds 4 volts PP, diodes CR101 and CR102 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 AR101B-7 to 5 volts PP.

Resistors R102, R103, and R104 and C104 comprise the audio pre-emphasis network that enhances the overall system signal to noise ratio. R104 and C104 control the pre-emphasis curve below limiting. R103 and C104 control the cut-off point for high frequency pre-emphasis. As high frequencies are attenuated, the gain of AR101 is increased.

Audio from the microphone is applied to the audio processor at P102-1 and coupled to the input of operational amplifier AR101-B through R101 and C101.

The amplified output of AR101-B is coupled through P102-4, audio MOD ADJ control R907 (on the System Board), C106, R112 and R113 to a second operational amplifier AR101-A. Audio MOD ADJ control is set for a deviation of 4.5 kHz.

An active post limiter filter consisting of AR101A, R112-R114, C108, and C109 provide 12 dB per octave roll off. R109 and C111 provide an additional 6 dB per octave roll off for a total of 18 dB per octave.

SERVICE NOTE

R112-R114 are 1% resistors. This tolerance must be maintained to assure proper operation of the post limiter filter. Use exact replacements.

The output of the post-limiter filter is coupled through C110 to P102-9 and to the TX Audio Adapter Board.

TX AUDIO ADAPTER BOARD

The output of the Audio Processor Board is connected to the Audio Adapter Board via J905-4 on the System Board and P1-4 on the Adapter Board. A temperature compensation network consisting of RT1, R1 and R9 maintains a constant modulation index over the normal operating temperature range.

The temperature compensated audio is applied to pin 3 of the FM ICOM. A varactor within the ICOM is used to modulate the carrier frequency at the audio rate.

FREQUENCY SELECTION (SYSTEM BOARD)

In IMTS systems, selection of the desired frequency at the control unit produces Binary Coded Decimal (BCD) bits (FBO-FB3) at J906, pins 1-4 on the System Board. For example, selecting channel F1 at the control unit results in BCD bits 0000. These bits forward bias all four diodes (CR908, CR910, CR912, CR914), applying ground to the Channel Synthesizer via P901, pins 1, 2, 3 and 5. Table 1 shows the BCD equivalents for each channel selected.

TABLE 1 - BCD DECODING

Channel	FB3	FB2	FB1	FB0
F1	0	0	0	0
F2	0	0	0	1
F3	0	0	1	0
F4	0	0	1	1
F5	0	1	0	0
F6	0	1	0	1
F7	0	1	1	0
F8	0	1	1	1
F9	1	0	0	0
F10	1	0	0	1
F11	1	0	1	0
F12	1	0	1	1
F13	1	1	0	0

When the VP series of control units are used with the radio, frequency selection is accomplished by grounding the lead corresponding to the desired channel at the control unit. The selected grounded lead is connected through P907 (pins 1 through 13) on the System Board to the Decimal-to-Binary Decoder board.

DECIMAL-TO-BINARY DECODER BOARD

The selected frequency lead from the control unit is connected through the radio System Board to P1907 of the Decimal-to-Binary Decoder Board. For example, if channel F1 is selected, the lead to P1907-1 is grounded. This ground is connected to input pin 0 of decoder U1902. The decoders (U1901 and U1902) derive the BCD equivalent of Channel 1, applying all binary ones to the input of the NAND gates U1903-A through U1903-D. The inverted outputs of the NAND gates (0000) are applied to P1908, pins 1 through 4. This BCD equivalent of Channel 1 is then connected through J908, pins 1 through 4 to P901, pins 1, 2, 3 and 5 on the System Board and then to the Channel Synthesizer.

Plus 10 Volts from the System Board at P1908-5 is dropped across R1901, providing +5 VDC for operation of the IC devices on the decoder. VR1901 holds the +5 VDC constant and filtering is accomplished by C1901, C1902 and C1903. Compensation voltage (5 VDC) for the reference ICOM in the synthesizer is developed at R927 and R928.

SYSTEM METERING

Centralized metering jacks are provided for use with General Electric Test Set 4EX3A11. The red metering jack provides continuous access to the regulated 10 Volts, A+, transmitter and receiver audio and PTT. The black metering jack is used for metering the transmitter and receiver circuits.

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

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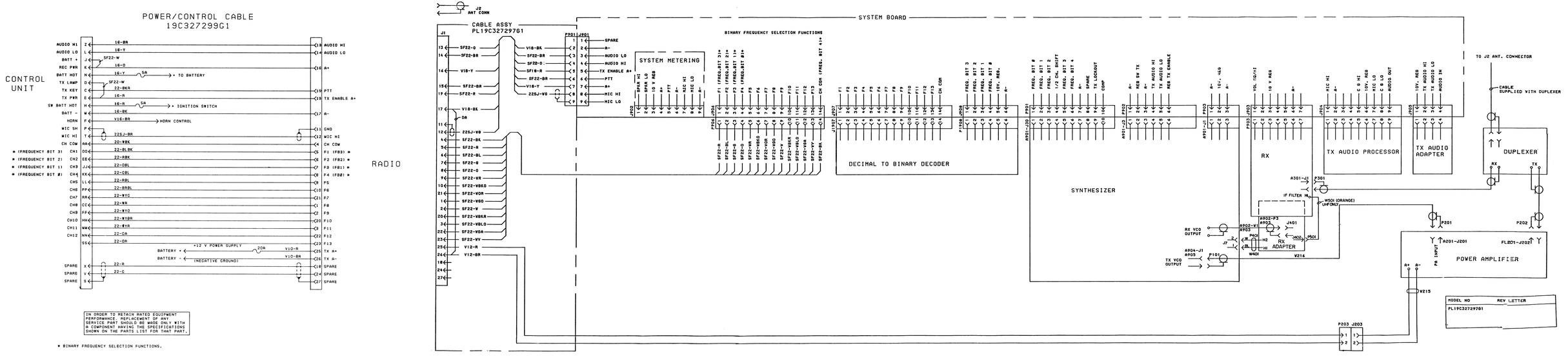

POWER/CONTROL CABLE
19C327299G1
CONTROL UNIT
RADIO
AUDIO HI
AUDIO LO
BATT +
REC PWR
BATT HOT
TX LAMP
TX KEY
TX PWR
SW BATT HOT
BATT −
HORN
MIC SH
MIC HI
CH COM
* (FREQUENCY BIT 3)
* (FREQUENCY BIT 2)
* (FREQUENCY BIT 1)
* (FREQUENCY BIT 0)
16-BR
16-Y
SF22-W
16-O
16-Y
5A
+ TO BATTERY
22-W
22-BKR
16-R
16-R
5A
+ IGNITION SWITCH
16-BK
V16-BR
HORN CONTROL
22GJ-BR
20-WBK
22-BLBK
22-RBK
22-OBL
22-GBL
22-RBL
22-BRBL
22-WYG
22-WR
22-WYO
22-WYBR
22-WYR
22-GR
22-CR
+12 V POWER SUPPLY
20A
V10-R
BATTERY +
V10-BR
BATTERY −
(NEGATIVE GROUND)
SPARE
22-R
22-G
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.
* BINARY FREQUENCY SELECTION FUNCTIONS.
(190424097, Rev. 3)
J2
ANT CONN
CABLE ASSY
PL19C327297G1
J1
P201 J201
SYSTEM BOARD
BINARY FREQUENCY SELECTION FUNCTIONS
SYSTEM METERING
SPARE
A-
AUDIO LO
AUDIO HI
TX ENABLE A+
PTT
A+
MIC HI
MIC LO
SPARE
SPARE
10 V REG
PTT
A-
MIC HI
MIC LO
A-
SF22-O
SF22-BR
SF22-O
SF18-R
SF22-BR
V18-Y
SF22-BR
SF22-R
V18-BK
DA
226J-V8
SF22-BK
SF22-R
SF22-BL
SF22-G
SF22-O
SF22-VR
SF22-VBKO
SF22-VOR
SF22-VBO
SF22-V
SF22-VBKR
SF22-VBLO
SF22-VGR
SF22-VV
V12-R
V12-BR
V18-BK
SF22-BR
V18-Y
226J-V8
DECIMAL TO BINARY DECODER
FREQ. BIT 8
FREQ. BIT 7
FREQ. BIT 6
FREQ. BIT 5
FREQ. BIT 4
FREQ. BIT 3
FREQ. BIT 2
FREQ. BIT 1
FREQ. BIT 0
10V. REG.
A-
CH COM
SYNTHESIZER
A-
REM SW TX
A+
TX AUDIO HI
TX AUDIO LO
REM TX ENABLE
RX
A-
10V. -REG
A-
VOL (SQ)HI
10 V REG
A-
MIC HI
A-
C O HI
10V. REG
MIC LO
C O LO
AUDIO OUT
TX AUDIO PROCESSOR
10V. REG
TX AUDIO HI
TX AUDIO LO
AUDIO IN
TX AUDIO ADAPTER
TO J2 ANT. CONNECTOR
CABLE SUPPLIED WITH DUPLEXER
DUPLEXER
RX
TX
A201-J1
P301
IF FILTER HI
W5CH (ORANGE) (NOT ONLY)
P201
P202
RX VCO OUTPUT
A902-P3
A903
J401
A902-J1
A903
J402
P401
RX ADAPTER
W4CH
W4DH
W216
A904-J1
A903
TX VCO OUTPUT
P101
A201-J201
FL201-J202
PA INPUT
POWER AMPLIFIER
A+
A-
W215
P203 J203
MODEL NO
REV. LETTER
PL19C327297G1
(19B628330, Rev. 2)

PARTS LIST

LBI-30364

CABLE ASSEMBLY
19C32729701

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	19C303775P1	Connector, plug: 28 terminals.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P203		Connector. Includes:
	19A134281P1	Shell.
	19A134282P2	Contact, electrical: wire size No. 10-14 AWG; sim to AMP 350300-3.
P901		Connector. Includes:
	19A136644G1	Shell.
	19A116781P5	Contact, electrical: wire range No. 16-20 AWG; sim to Molex 08-50-0109. (P901-2, P901-3, P901-4, P901-5, P901-7, P901-8).
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108. (P901-6, P901-8).
P906		Connector. Includes:
	19A130712G1	Shell.
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19B201074P606	Tap screw, Phillips POZIDRIV®: No. 4-40 x 3/8. (Secures J1 to connector support).
	19B226892P1	Support. (J1).
	19A115185P5	Retaining strap: sim to Panduit Corp. SST-1. (Secures wires from J1 to P203, P901, P906).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

LBI-30361

CONTROL CABLE
19C32729901

SYMBOL	GE PART NO.	DESCRIPTION
	19C311409P1	Connector, audio, 28 contacts: Contacts 1-24, 4.5 amps, Contacts 25-28, 25 amps.
	19C311411G1	Thumbscrew. (Used with 28 pin connector).
	19B226473G1	Cover, connector. (Used with 28 pin connector).
	MS6P0020C13	Machine screw: No. 4-40 x 1-1/4. (Secures 28 pin connector together).
	MS6P0020C13	Hexnut: No. 4-40. (Secures 28 pin connector together).
	19A129233G1	Connector, Audio, 38 contacts.
	19B209227P5	Contact. (Used with 38 pin connector- Quantity 30).
	MS4P0006C6	Machine screw: No. 4-40 x 3/8. (Secures 38 pin connector together).
	7139880P11	Cable, 23 conductor: approx 20 feet long.
	19A122111G1	Fused lead, red. (Includes 2 19A115776P3 contacts, 1 402946P2P2 contact, 1 749182399 terminal, 1 749182397 terminal).
	19A122111G2	Fused lead, yellow. (Includes 2 19A115776P9 contacts, 1 402946P2P2 contact, 1 749182399 terminal, 1 749182397 terminal).
	1816P8	Fuse, cartridge, quick blowing: 5 amps at 250 v; sim to Littelfuse 313005 or Bussmann MTH-5. (Used with fused lead assemblies- Battery and ignition switch).
	19B209260P27	Terminal, solderless: wire range No. 12-10; sim to AMP 31828 LOOSE PC. (Terminates 12 volt power supply wire - V10-R wire).
	19B209260P18	Terminal, solderless. wire range No. 12-10; sim to AMP 61125. (Terminates negative ground wire-V10-BR wire).
	19C301208P6	Insulated sleeving, electrical. (Used with red 12 volt power supply wire and brown negative ground wire).
	402946P2	Contact, electrical: sim to AMP 41274. (Terminates V16 -BR wire out of 38 pin connector).
	403334TG1	Splice conductor. (Used with 402946P2 contact).
		FUSE ASSEMBLY 19B216021G6 (Fuses must be ordered separately)
	1811P5	Fuse, quick blowing: 20 amps, 250 v; sim to Bussman BOK20.

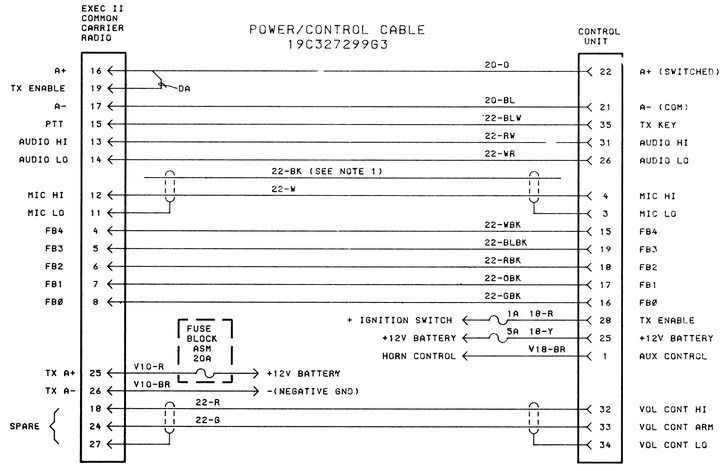
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

CONTROL CABLE
19C32729903

SYMBOL	GE PART NO.	DESCRIPTION
	19C311409P1	Connector, audio, 28 contacts: Contacts 1-24, 4.5 amps, Contacts 25-28, 25 amps.
	19C311411G1	Thumbscrew. (Used with 28 pin connector).
	19B226473G1	Cover, connector. (Used with 28 pin connector).
	MS6P0020C13	Machine screw: No. 4-40 x 1-1/4. (Secures 28 pin connector together).
	MS2109C13	Hex nut: No. 4-40. (Secures 28 pin connector together).
	19B209684P6	Connector, shell.
	19A116764P8	Connector, receptacle: sim to Cannon DCC-378-P0.
	19A116764P23	Contact. (Quantity 15 pins 3,4, 15-19,21,22,26, 31-35).
	19A116764P27	Contact. (Quantity 3 pins 1, 25, & 28).
	19A116290P1	Clip, spring tension: sim to Cinch D20419-16.
	19A115185P10	Retainer strap: sim to Panduit Corp. PLT 1MC8.
	7139868P3	Cable: 14 conductor.
	19A122111G1	Fused lead, red. (Includes (2) 19A115776P3 contacts, (1) 402946P2P2 contact, (1) 749182398 terminal, (1) 749182397 terminal).
	19A122111G2	Fused lead, yellow. (Includes (2) 19A115776P3 contacts, (1) 402946P2P2 contact, (1) 749182398 terminal, (1) 749182397 terminal).
	1816P8	Fuse, quick blowing: 5 amps at 250 v; sim to Littelfuse 312005 or Bussmann MTH-5. (Used with fused lead assemblies- Battery & ignition switch).
	1816P3	Fuse, quick blowing: 1 amps at 250 v; sim to Littelfuse 312001 or Bussmann AMC-1.
	19B209260P27	Terminal, solderless: wire range No. 12-10; sim to AMP 31828 LOOSE PC. (Terminates 12 volt power supply wire - V10-R wire).
	19B209260P18	Terminal, solderless: wire range No. 12-10; sim to AMP 61125. (Terminates negative ground wire-V10-BR wire).
	19C301208P6	Insulated sleeving, electrical. (Used with red 12 volt power supply wire and brown negative ground wire).
	402946P2	Contact, electrical: sim to AMP 41274. (Terminates V16 -BR wire out of 38 pin connector).
	403334TG1	Splice conductor. (Used with 402946P2 contact).
		FUSE ASSEMBLY 19B216021G6 (Fuses must be ordered separately)
	1811P5	Fuse, quick blowing: 20 amps, 250 v; sim to Bussman BOK20.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

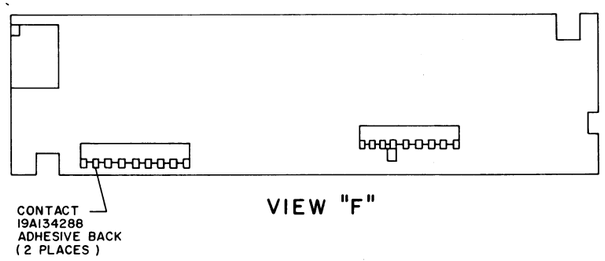


NOTE:
1. BLACK WIRE NOT CONNECTED AT EITHER END.

(19C328802, Rev. 1)

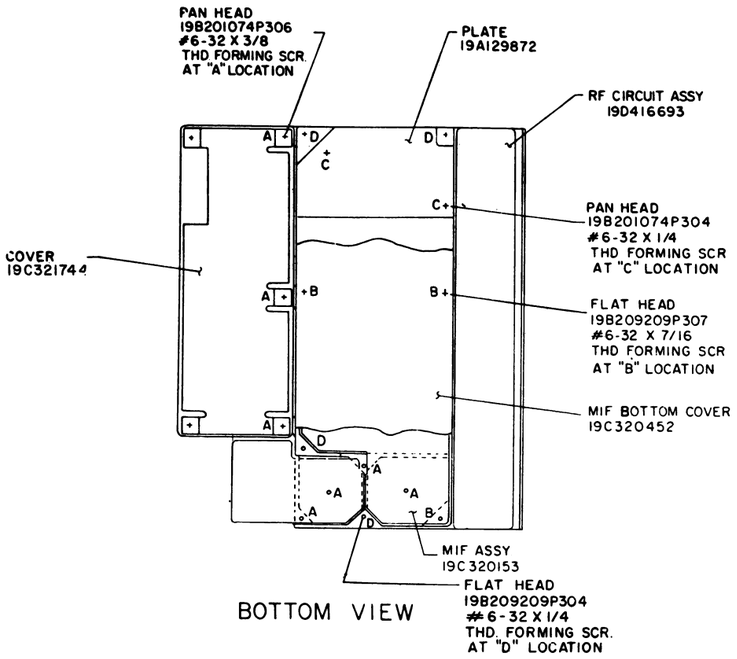
SYSTEM INTERCONNECTION DIAGRAM

Issue 1

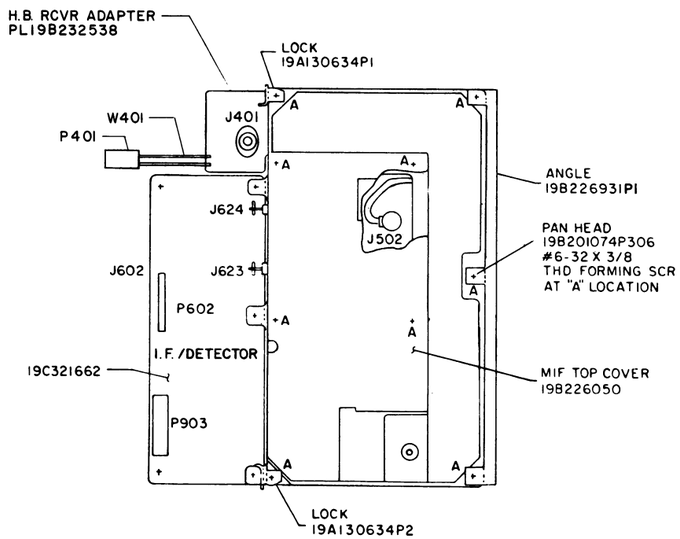


MECHANICAL PARTS BREAKDOWN

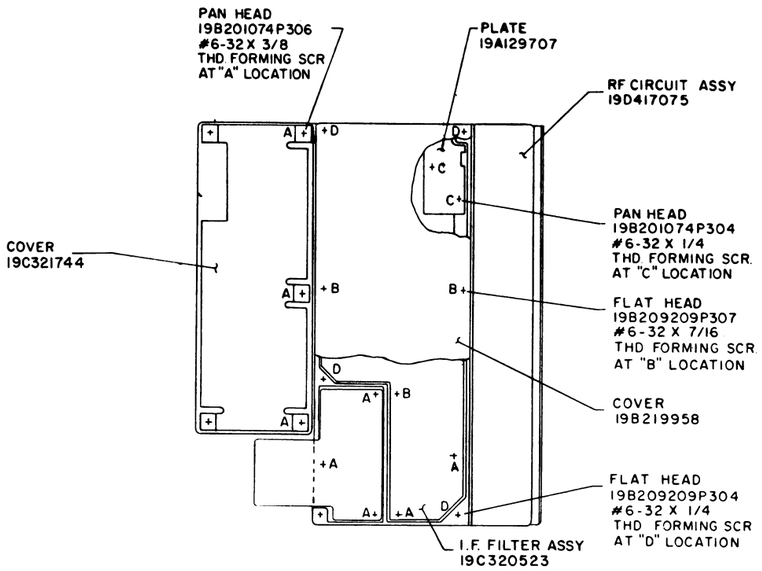
MAIN CHASSIS



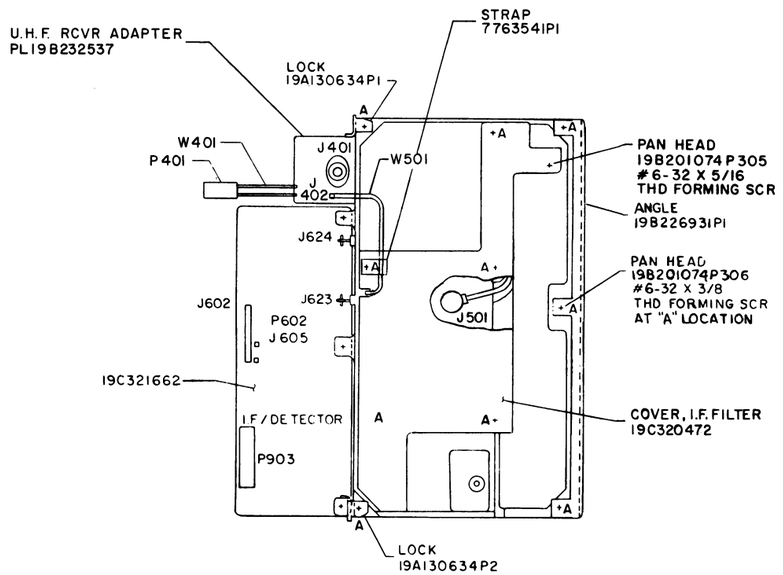
BOTTOM VIEW



RECEIVER HIGH BAND
TOP VIEW



BOTTOM VIEW

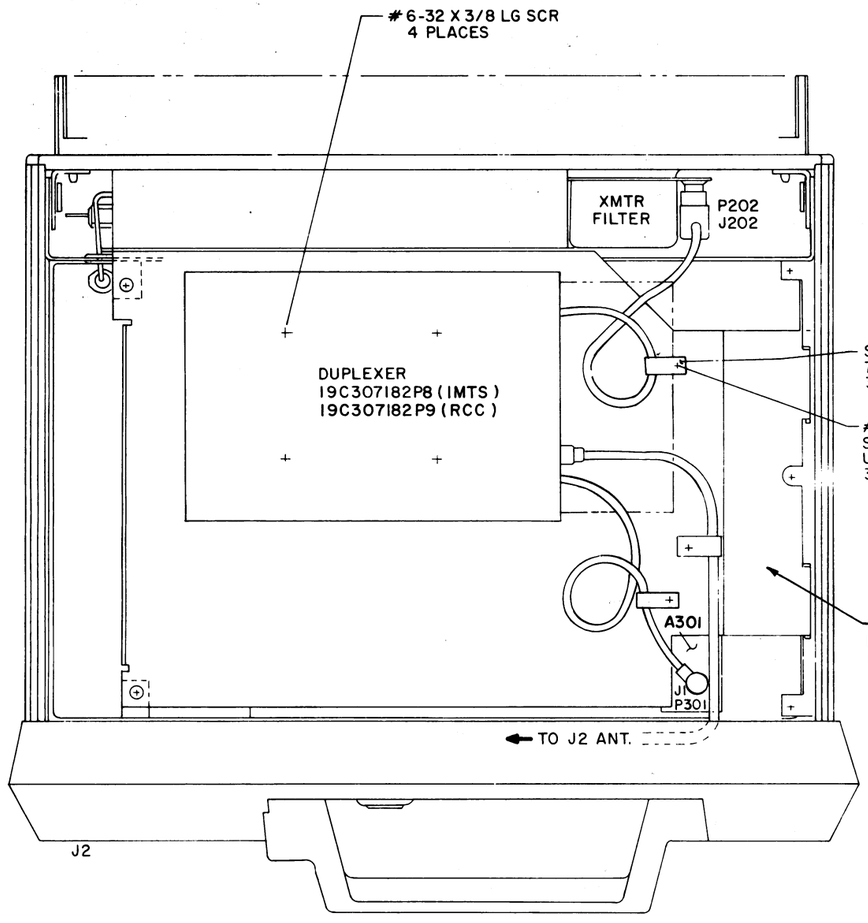


RECEIVER UHF
TOP VIEW

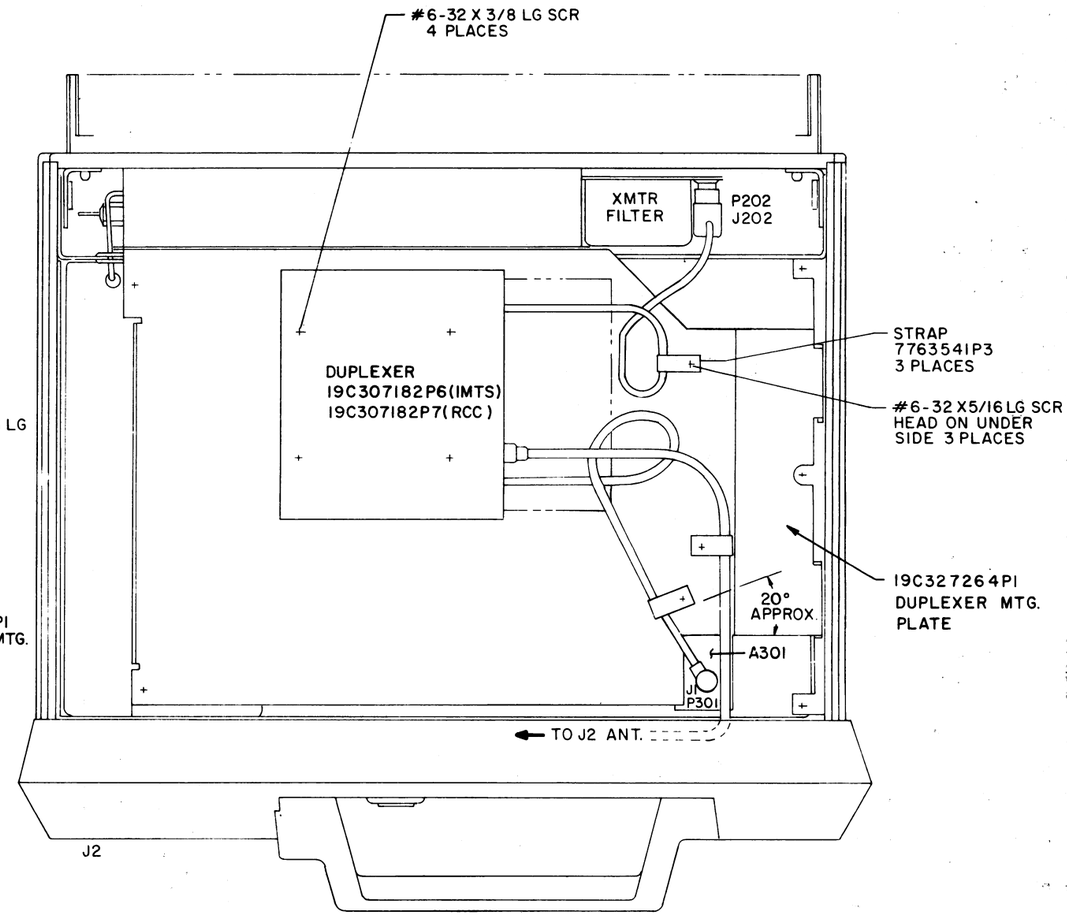
RC-3810

MECHANICAL PARTS BREAKDOWN

RECEIVER ASSEMBLY



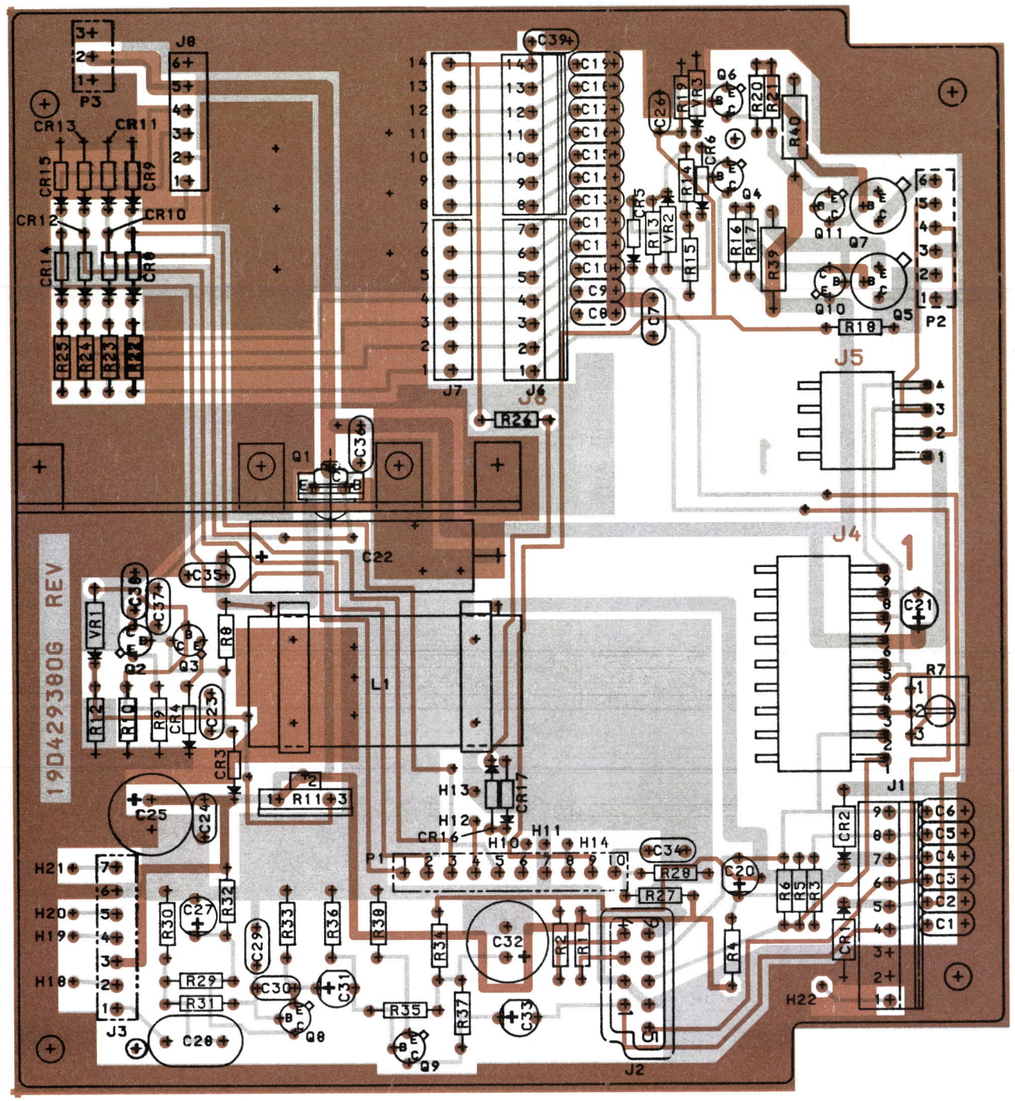
UHF DUPLEXER
& CONNECTIONS



HB DUPLEXER
& CONNECTIONS

RC-3049B

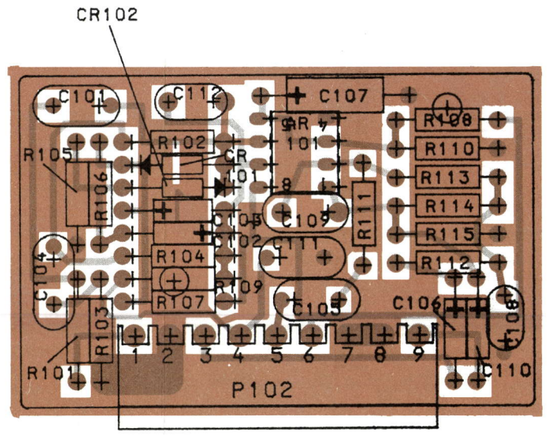
SYSTEM BOARD 19D429380G1



CONNECTIONS CHART		
FROM	TO	WIRE
H10	H11	DA
H12	H13	DA

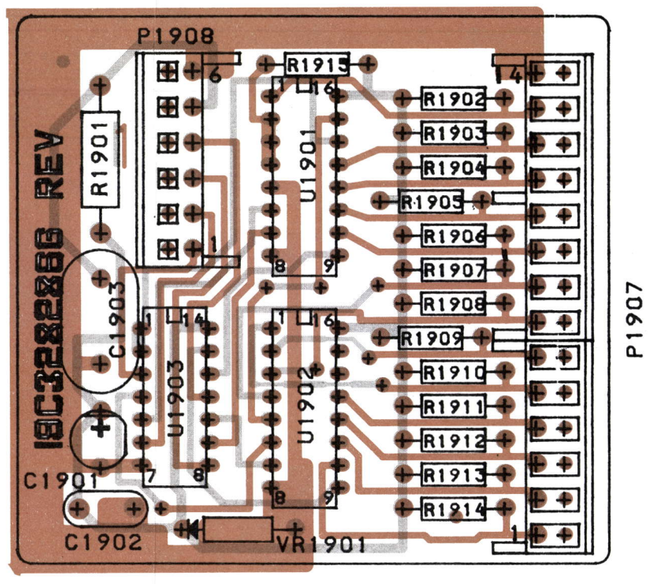
(19D429817, Rev. 1)
(19A138150, Sh. 1, Rev. 1)
(19A138150, Sh. 2, Rev. 1)

AUDIO PROCESSOR BOARD 19C321542G1



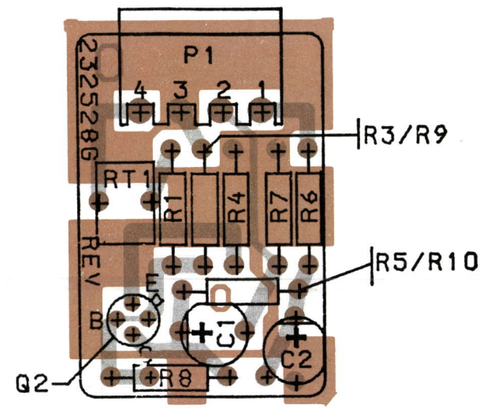
(19C327048, Rev. 4)
(19A130538, Sh. 1, Rev. 1)
(19A130538, Sh. 2, Rev. 1)

DECIMAL-TO-BINARY DECODER BOARD
19C328286G1

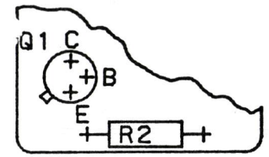


(19C328631, Rev. 0)
(19A137450, Sh. 1, Rev. 1)
(19A137450, Sh. 2, Rev. 1)

TX AUDIO ADAPTER BOARD



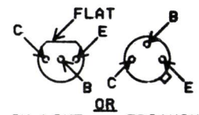
FOR PL19B23252 8G2



FOR PL19B232528G1

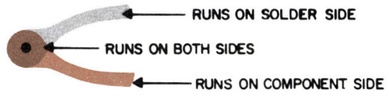
(19B232922, Rev. 1)
(19A137427, Sh. 1, Rev. 0)
(19A137427, Sh. 2, Rev. 0)

LEAD IDENTIFICATION
FOR Q2-Q4, Q6, Q8-Q11



TOP VIEW

NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.



OUTLINE DIAGRAMS

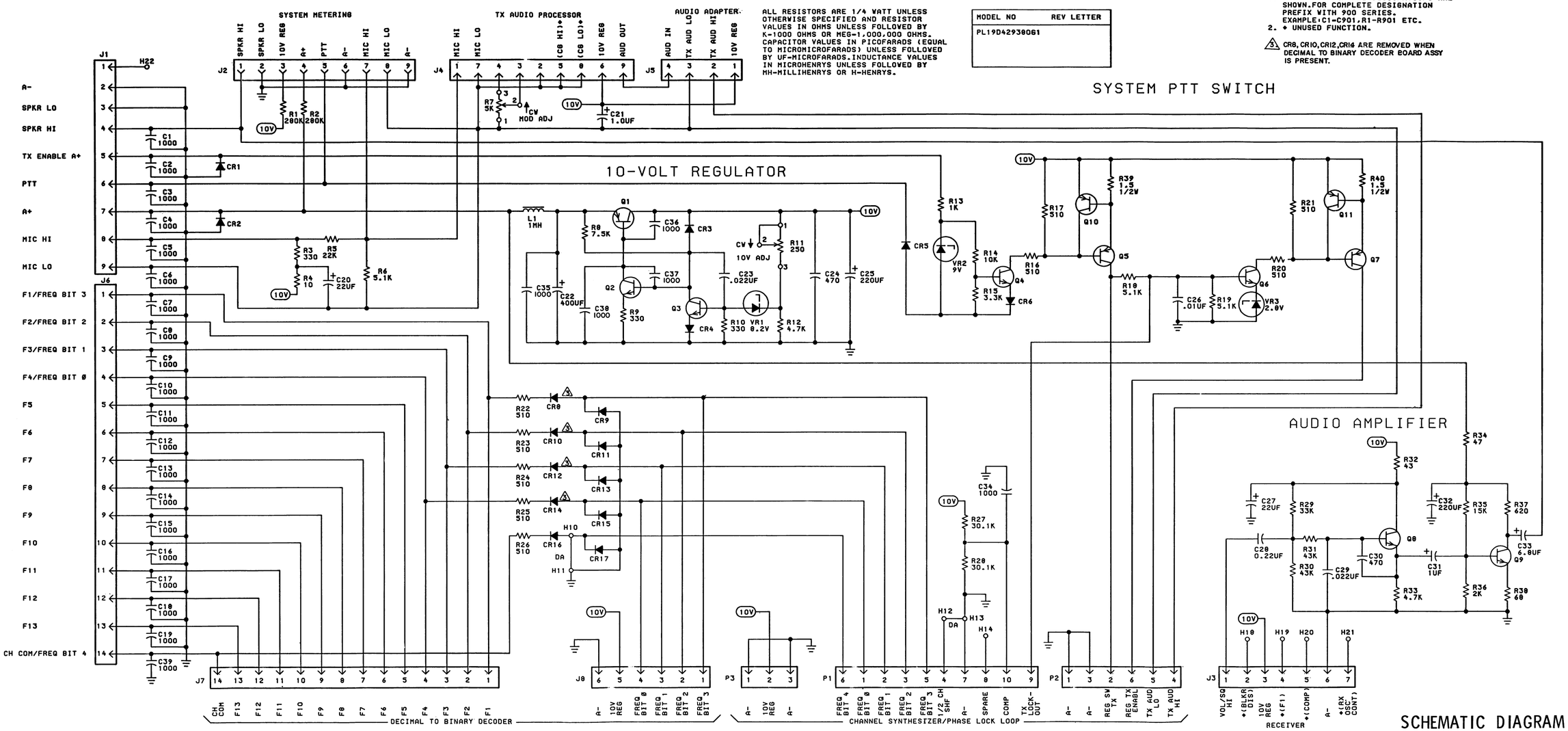
SYSTEM BOARD 19D429380G1
AUDIO PROCESSOR BOARD 19C321542G1 & G2
TX AUDIO ADAPTER BOARD 19B232528G2
DECIMAL-TO-BINARY DECODER BOARD

NOTES:
1. PARTIAL REFERANCE DESIGNATIONS ARE SHOWN.FOR COMPLETE DESIGNATION PREFIX WITH 900 SERIES. EXAMPLE:C1=C901,R1=R901 ETC.
2. ◆ UNUSED FUNCTION.

△5 CR8,CR10,CR12,CR14 ARE REMOVED WHEN DECIMAL TO BINARY DECODER BOARD ASSY IS PRESENT.

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

MODEL NO	REV LETTER
PL19D429380G1	



SCHEMATIC DIAGRAM

SYSTEM BOARD 19D429380G1

Issue 3

(19R622368, Rev. 4)

PARTS LIST

SYNTHESIZED RADIO SYSTEM BOARD
19D429380G1
ISSUE 1

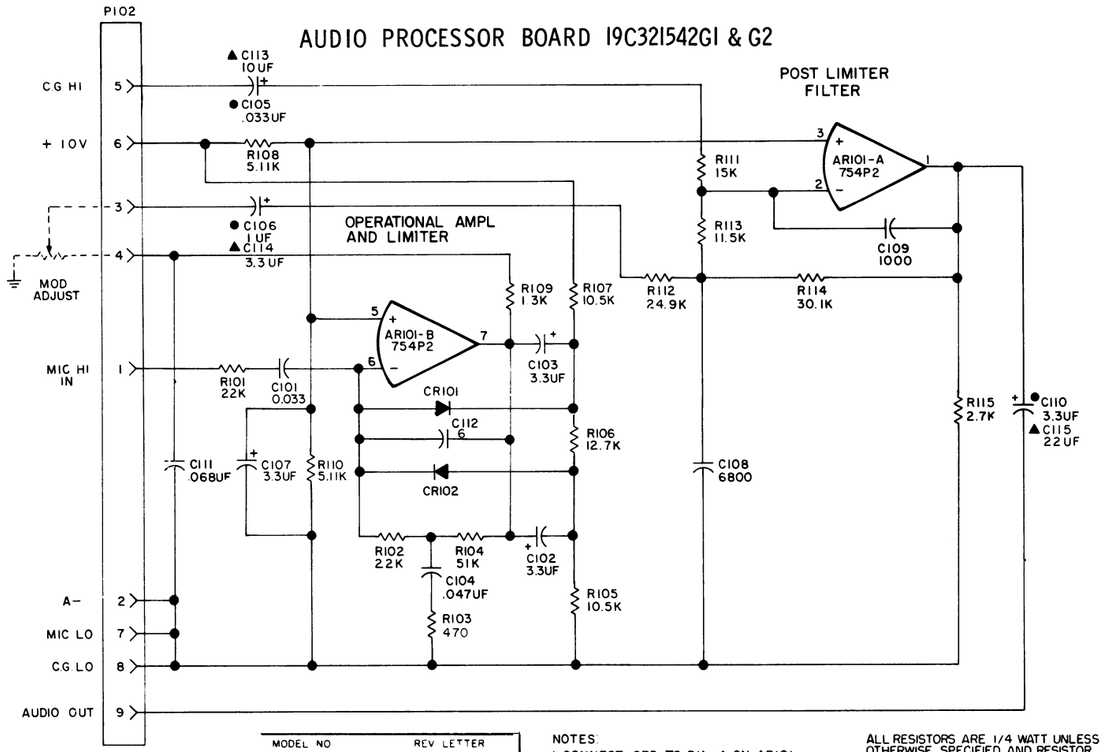
SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - -
C901 thru C919	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C920	19A134202P6	Tantalum: 22 µf ±20%, 15 VDCW.
C921	19A134202P14	Tantalum: 1 µf ±20%, 35 VDCW.
C922	19A115680P24	Electrolytic: 400 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C923	19A116080P103	Polyester: 0.022 µf ±10%, 50 VDCW.
C924	19A116655P13	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C925	19A134319P1	Electrolytic: 220 µf +75% -10%, 25 VDCW; sim to Sprague Type 502D182.
C926	19A116080P1	Polyester: 0.1 µf ±20%, 50 VDCW.
C927	19A134202P6	Tantalum: 22 µf ±20%, 15 VDCW.
C928	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C929	19A116080P103	Polyester: 0.022 µf ±10%, 50 VDCW.
C930	19A116655P13	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C931	19A134202P14	Tantalum: 1 µf ±20%, 35 VDCW.
C932	19A134319P1	Electrolytic: 220 µf +75% -10%, 25 VDCW; sim to Sprague Type 502D182.
C933	19A134202P15	Tantalum: 6.8 µf ±20%, 35 VDCW.
C934 thru C939	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR901 and CR902	4037822P1	Silicon, 1000 mA, 400 PIV.
CR903 thru CR906	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR908 thru CR917	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - JACKS AND RECEPTACLES - - - - - -
J901	19A116659P53	Connector, printed wiring: 9 contacts; sim to Molex 09-65-1091.
J902	19B219374G2	Connector. Includes:
	19C317957P2	Shell.
	19A116651P1	Contact, electrical. (Quantity 9).
J903	19A116659P142	Connector, printed wiring: 7 contacts; sim to Molex 09-67-1074.
J904	19A116659P31	Connector, printed wiring: 9 contacts; sim to Molex 09-2373-9A.
J905	19A116659P140	Connector, printed wiring: 4 contacts; sim to Molex 09-66-1041.
J906 and J907		Connector. Includes:
	19A116659P51	Connector, printed wiring: 7 contacts; sim to Molex 09-65-1071. (Quantity 1 each).
	19A116659P11	Connector, printed wiring: 7 contacts; sim to Molex 09-64-1071. (Quantity 1 each).
J908	19A116659P12	Connector, printed wiring: 6 contacts; sim to Molex 09-64-1061.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L901	19A115894P1	Audio freq: 1.0 mh inductance, 0.35 ohms DC res.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P901	19A116659P29	Connector, printed wiring: 10 contacts; sim to Molex 09-64-1103.
P902	19A116659P28	Connector, printed wiring: 6 contacts; sim to Molex 09-64-1063.
P903	19A116659P141	Connector, printed wiring: 3 contacts; sim to Molex 09-67-1034.
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q901	19A116942P1	Silicon, PNP.
Q902 thru Q904	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q905	19A115562P2	Silicon, PNP; sim to Type 2N2904A.
Q906	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q907	19A115562P2	Silicon, PNP; sim to Type 2N2904A.
Q908 and Q909	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q910 and Q911	19A115852P1	Silicon, PNP; sim to Type 2N3906.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R901 and R902	19C314256P22803	Metal film: 280K ohms ±1%, 1/4 w.
R903	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R904	3R152P100J	Composition: 10 ohms ±5%, 1/4 w.
R905	3R152P223J	Composition: 22K ohms ±5%, 1/4 w.
R906	3R152P512J	Composition: 5.1K ohms ±5%, 1/4 w.
R907	19B209358P105	Variable, carbon film: approx 200 to 5K ohms ±10%, 0.25 w; sim to CTS Type X-201.
R908	3R152P752J	Composition: 7.5K ohms ±5%, 1/4 w.
R909 and R910	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R911	19B209358P101	Variable, carbon film: approx 25 to 250 ohms ±10%, 0.2 w; sim to CTS Type X-201.
R912	3R152P472J	Composition: 4.7K ohms ±5%, 1/4 w.
R913	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R914	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R915	3R152P332J	Composition: 3.3K ohms ±5%, 1/4 w.
R916 and R917	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R918 and R919	3R152P512J	Composition: 5.1K ohms ±5%, 1/4 w.
R920 thru R926	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R927 and R928	19C314256P23012	Metal film: 30.1K ohms ±1%, 1/4 w.
R929	3R152P333J	Composition: 33K ohms ±5%, 1/4 w.
R930 and R931	3R152P433J	Composition: 43K ohms ±5%, 1/4 w.
R932	3R152P430J	Composition: 43 ohms ±5%, 1/4 w.
R933	3R152P472J	Composition: 4.7K ohms ±5%, 1/4 w.
R934	3R152P470J	Composition: 47 ohms ±5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R935	3R152P153J	Composition: 15K ohms ±5%, 1/4 w.
R936	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R937	3R152P621J	Composition: 620 ohms ±5%, 1/4 w.
R938	3R152P680J	Composition: 68 ohms ±5%, 1/4 w.
R939 and R940	7147161P17	Composition: 1.5 ohms ±5%, 1/2 w.
		- - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR901	4036887P40	Zener: 500 mW, 8.2 v. nominal.
VR902	4036887P7	Zener: 500 mW, 9.0 v. nominal.
VR903	4036887P2	Zener: 500 mW, 2.8 v. nominal.
		- - - - - - - - - MISCELLANEOUS - - - - - - - -
	19A115185P3	Retainer strap. (Secures L1 - Quantity 2).
	19B232917P1	Heat sink. (Q1).
	19A134016P1	Insulator, bushing. (Used with Q1).
	19A116023P3	Insulator, plate. (Used with Q1).
	19B200525P104	Rivet, tubular. (Secures Q1 heat sink).
	4036555P1	Insulator, washer: nylon. (Used with Q5, Q7).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

AUDIO PROCESSOR BOARD I9C321542G1 & G2



MODEL NO	REV LETTER
PL19C321542G1	C
PL19C321542G2	

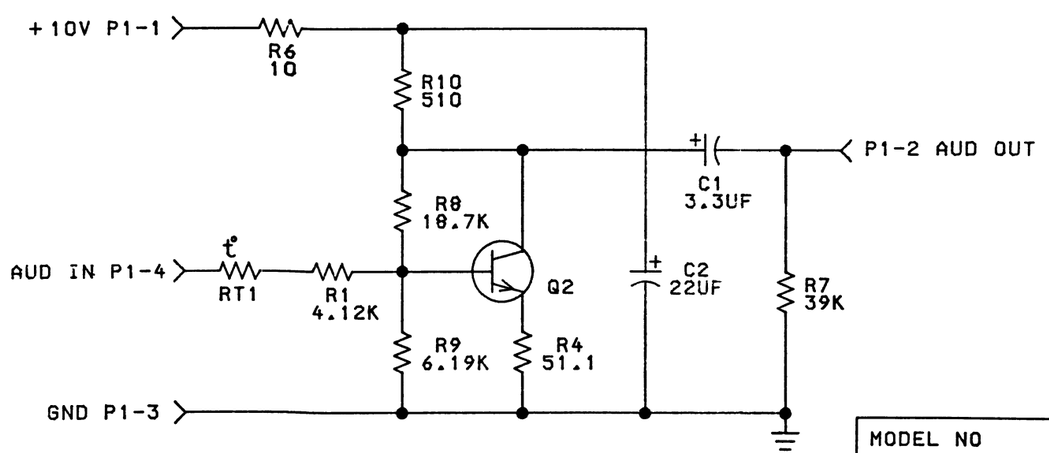
NOTES:
1. CONNECT GRD TO PIN 4 ON ARIOI, CONNECT VCC (+10V) TO PIN 8 ON ARIOI.

(19C321854, Rev. 7)

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

● G1
▲ G2

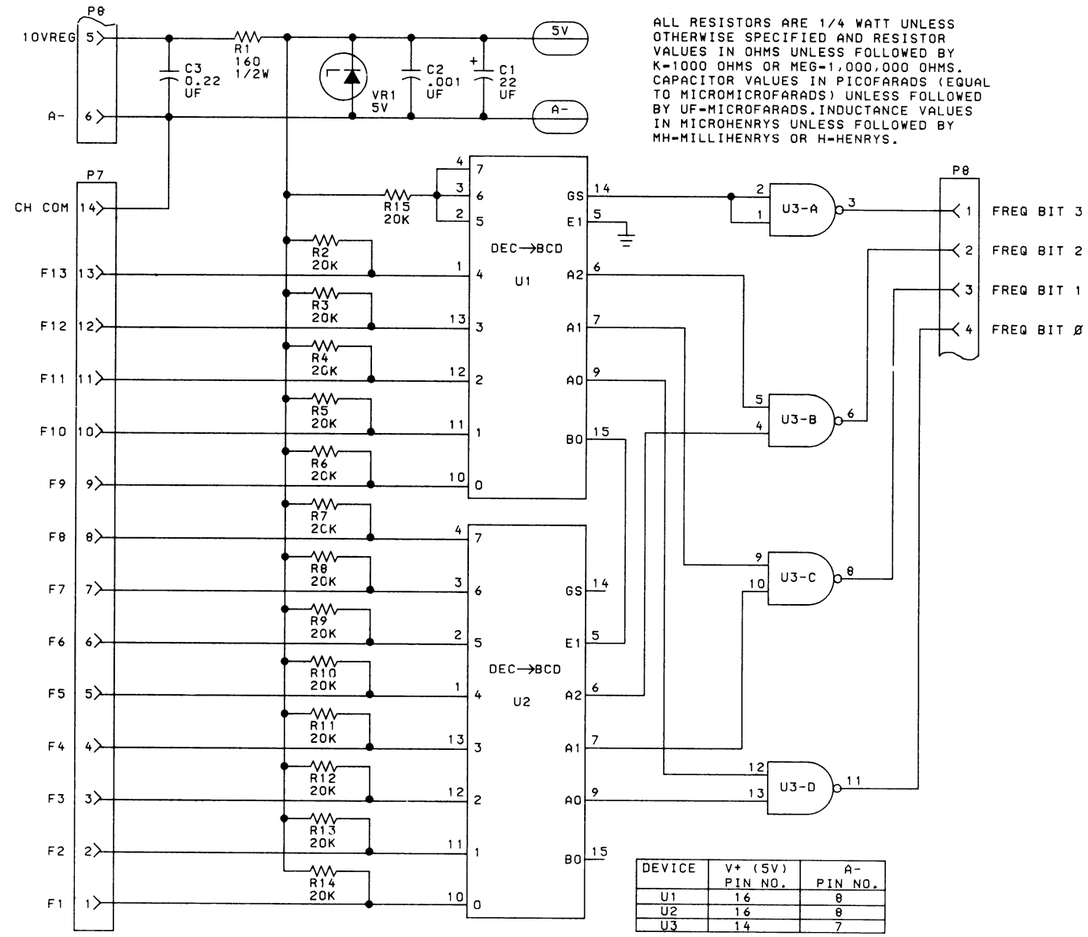
TX AUDIO ADAPTER BOARD 19B232528G2



(19B232931, Rev. 2)

MODEL NO	REV LETTER
PL19B232528G2	

DECIMAL-TO-BINARY DECODER BOARD 19C328286G1



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

DEVICE	V+ (5V) PIN NO.	A- PIN NO.
U1	16	8
U2	16	8
U3	14	7

NOTE:
1. PARTIAL DESIGNATIONS SHOWN. FOR COMPLETE DESIGNATION ADD PREFIX 1900. EXAMPLE C1=C1901.

MODEL NO	REV LETTER
PL19C328286G1	

(19C328646, Rev. 1)

SCHEMATIC DIAGRAMS

AUDIO PROCESSOR BOARD 19C321542G1 & G2
TX AUDIO ADAPTER BOARD 19B232528G2
DECIMAL-TO-BINARY DECODER BOARD

PARTS LIST

AUDIO PROCESSOR BOARD
A101
19C321542G1, G2
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
AR101*	19A116754P2	Integrated circuit, linear: sim to MC1458SP1 High Slew Rate OP AMP.
		In REV A & earlier:
	19A116754P1	Integrated circuit, linear: Dual In-Line 8-Pin Minidip Package; sim to T1, SN72558 NSC.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C101	19A116080P204	Polyester: 0.033 µf ±5%, 50 VDCW.
C102 and C103	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C104	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
C105	19A116080P204	Polyester: 0.033 µf ±5%, 50 VDCW.
C106	5491674P28	Tantalum: 1.0 µf ±20%, 25 VDCW; sim to Sprague Type 162D.
C107	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C108	19A116080P216	Polyester: .0068 µf ±5%, 50 VDCW.
C109	19A116655P20	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C110	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C111	19A116080P206	Polyester: 0.068 µf ±5%, 50 VDCW.
C112*	5496218P37	Ceramic disc: 6.0 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM. Added by REV B.
C113	19A700003P7	Tantalum: 10 µf ±20%, 16 VDCW.
C114	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C115	19A700003P8	Tantalum: 22 µf ±20%, 16 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR101 and CR102	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P102	19A116659P76	Connector, printed wiring: 9 contacts; sim to Molex 09-52-3091.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R101	19A134231P223J	Deposited carbon: 22K ohms ±5%, 1/8 w; sim to Mepco/Electra Type CR16.
R102	19A700106P95	Composition: 22K ohms ±5%, 1/4 w.
R103*	19A700106P55	Composition: 470 ohms ±5%, 1/4 w.
		In REV A & earlier:
	3R152P681J	Composition: 680 ohms ±5%, 1/4 w.
R104	19C314256P25112	Metal film: 51.1K ohms ±1%, 1/4 w.
R105	19C314256P21052	Metal film: 10.5K ohms ±1%, 1/4 w.
R106	19C314256P21272	Metal film: 12.7K ohms ±1%, 1/4 w.
R107	19C314256P21052	Metal film: 10.5K ohms ±1%, 1/4 w.
R108	19C314256P25111	Metal film: 5.11K ohms ±1%, 1/4 w.
R109	3R152P132J	Composition: 1.3K ohms ±5%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
R110	19C314256P25111	Metal film: 5.1K ohms ±1%, 1/4 w.
R111	19A700106P91	Composition: 15K ohms ±5%, 1/4 w.
R112*	19C314256P22492	Metal film: 24.9K ohms ±1%, 1/4 w.
		Earlier than REV A:
	19C314256P22472	Metal film: 24.7K ohms ±1%, 1/4 w.
R113	19C314256P21152	Metal film: 11.5K ohms ±1%, 1/4 w.
R114	19C314256P23012	Metal film: 30.1K ohms ±1%, 1/4 w.
R115	19A700106P73	Composition: 2.7K ohms ±5%, 1/4 w.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19A142927P1	Insulator.

PARTS LIST

TX AUDIO ADAPTER BOARD
19B232528G2
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A134202P105	Tantalum: 3.3 µf ±10%, 15 VDCW.
C2	19A134202P6	Tantalum: 22 µf ±20%, 15 VDCW.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	19A116659P7	Connector, printed wiring: 4 contacts; sim to Molex 09-52-3041.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q2	19A115910P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19C314256P24121	Metal film: 4.1K ohms ±1%, 1/4 w.
R4	19C314256P25119	Metal film: 511.9 ohms ±1%, 1/4 w.
R6	3R152P100J	Composition: 10 ohms ±5%, 1/4 w.
R7	3R152P393J	Composition: 39K ohms ±5%, 1/4 w.
R8	19C314256P21872	Metal film: 18.7K ohms ±1%, 1/4 w.
R9	19C314256P26191	Metal film: 6.19K ohms ±1%, 1/4 w.
R10	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	5490828P54	Thermistor: 50 ohms ±10%, color code blue; sim to Carborundum Type B08075-16.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

DECIMAL-TO-BINARY DECODER BOARD
19C328286G1
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1901	19A134202P6	Tantalum: 22 µf ±20%, 15 VDCW.
C1902	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C1903	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1907		Connector. Includes:
	19A116659P3	Connector, printed wiring: 8 contacts; sim to Molex 09-52-3082.
	19A116659P4	Connector, printed wiring: 6 contacts; sim to Molex 09-52-3062.
P1908	19A116659P4	Connector, printed wiring: 6 contacts; sim to Molex 09-52-3062.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1901	3R77P161J	Composition: 160 ohms ±5%, 1/2 w.
R1902 thru R1915	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1901 and U1902	19A134305P104	Digital, 8-Line-To-3-Line Octal Priority: Identification No. 74LS148.
U1903	19A134305P4	Digital, Quad 2- Input Positive-Nand Gate: Identification No. 74LS03.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1901	4036887P51	Zener: 500 mW, 5.10 v. nominal.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

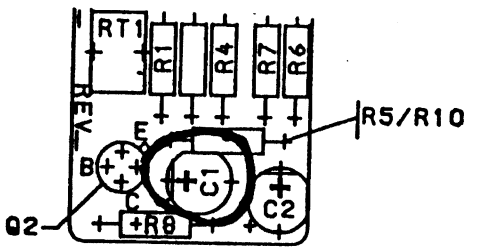
ADDENDUM NO. 1 TO LBI30802C

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

19B232528G2 AUDIO ADAPTER BOARD

REV. A-To improve transmitter audio response at 300 Hz, changed C1 to 19A700234P9 (Capacitor: polyester; .022 uF +/-10%, 50 VDCW).

From:



To: