MOBILE RADIO

MAINTENANCE MANUAL

66—88 MHz EXCITER BOARD 19D424395G1, G2

TABLE OF CONTENTS

DESCRIPTION

The exciter uses eight transistors, a crystal module and two integrated circuits to drive the PA assembly. The crystal module determines the (F1) transmitting frequency in single frequency applications. In addition, the exciter also provides temperature compensation voltage to all crystal modules.

In multi-frequency transmitters, the crystal modules for additional frequencies are located on the multi-frequency board.

The crystal frequency ranges from 11.0 to 14.67 megahertz, and is multiplied six times (divided by 2 and multiplied by 12 for a multiplication factor of six). Two exciter board groups are used. The Group 1 exciter board operates over a frequency range of 66.78 MHz (crystal frequencies are 11-13 MHz). Group 2 exciter boards operate over a frequency range of 77-88 MHz (crystal frequencies are 12.84-14.66 MHz).

Audio, supply voltages and control functions are connected from the system-audio-squelch (SAS) board to the exciter board through P902.

Centralized metering jack J103 is provided for use with GE Test Set Model 4EX3A11 or Test Kit 4EX8K12. The Test Set meters the multipliers, amplifier, relative power out and the regulated 10-volt line.

CIRCUIT ANALYSIS

OSCILLATOR CIRCUIT

A Colpitts oscillator consisting of Q102, a plug-in crystal module and associated components provides the fundamental operating frequency for the transmitter. The crystal module in the base circuit of Q102 is temperature compensated to maintain frequency stability within ±5 PPM over an ambient temperature range of -30°C to +60°C. Compensation voltage is applied from compensator circuit Q101. The output of the oscillator is taken from the collector of Q102, buffered by Q103 and applied to frequency divider U102.

SERVICE NOTE

Y1 and C2 are not field replaceable items. C2 is factory selected to complement the temperature/frequency characteristics of each individual crystal. Should it become necessary to replace either Y1 or C2, the entire crystal module must be replaced.

In single frequency radios, the F1 keying lead is connected directly to A- by a DA jumper connected between H12 and H31 on the SAS board. This assures F1 oscillator operation each time the PTT switch is pressed. When the PTT switch is operated, +10 Volts is present on the transmitter oscillator lead at P902-1 and 8 Volts on the emitter of Q102. R104 and R105 form a voltage divider network to establish the base voltage for Q102.

In multi-frequency radios the jumper connected between H12 and H31 on the SAS board is removed to allow F1 frequency selection via the frequency selector switch on the control unit.

When frequencies F2 thru F4 are selected the oscillator frequency from the multi-frequency board is supplied to J102-1 on the exciter through cable W2601.

COMPENSATOR CIRCUITS

The crystal modules are temperature compensated at both ends of the temperature range to provide instant frequency compensation. The temperature compensator consists of Q101, VR102, RT101, RT102 and associated components. Zener diode VR102 provides a constant +8.5 Volt reference voltage for compensator Q101.

The cold end compensation circuit does not operate at temperatures above -10°C (+14°F). When the temperature drops below -10°C, the circuit is activated. As the temperature decreases, the resistance of RT101 decreases and the compensation voltage increases.

An increase in compensation voltage decreases the capacitance of the varactor in the oscillator, thereby increasing the output frequency of the crystal module.

The hot end compensation circuit does not operate at temperatures below +50°C (122°F). When the temperature rises above +50°C, the circuit is activated. As the temperature increases, the resistance of RT102 decreases and the compensation voltage decreases. The decrease in compensation voltage increases the capacity of the varactor, decreasing the output frequency of the crystal module.

Listed below are typical minimum and maximum voltage readings to be expected at pin 4 of the crystal modules. Voltages should be measured using a high impedance meter.

TEMPERATURE RANGE	OUTPUT VOLTAGE	
	MINIMUM	MAXIMUM
-30°C	4.9 Volts	6.0 Volts
-10° to 50°C	3.7 Volts	4.3 Volts
+75°C	3.3 Volts	3.8 Volts

AUDIO IC

The transmitter audio circuitry is contained in audio IC U101. A simplified drawing of the audio IC is shown in Figure 1.

Audio from the microphone at pin 12 is coupled through pre-emphasis capacitor C1 to the base of Q1 in the operational amplifier-limiter circuit. Collector voltage for the transistorized microphone pre-amplifier is supplied from the 10-volt regulator on the SAS board through R979 and R980 to J901A-14.

The operational amplifier-limiter circuit consists of Q1, Q2, and Q3. Q3 provides limiting at high signal levels. The gain of the operational amplifier circuit is fixed by negative feedback through R19, R20 and the resistance in the network (Pin 9).

The output of Q3 is coupled through a de-emphasis network (R10 and C3) to an active post-limiter filter consisting of C4, C5, C6, R11, R12, R13, R15, R17 and Q4.

Following the post-limiter filter is Class A amplifier Q5. The output of Q5 is coupled through MOD ADJUST potentiometer R108, C115 and resistor R119 to the phase modulators.

SERVICE NOTE: If the DC voltages applied to the audio IC are correct and there is no audio output, replace U101.

For radios equipped with Channel Guard, the tone from the encoder is applied to the

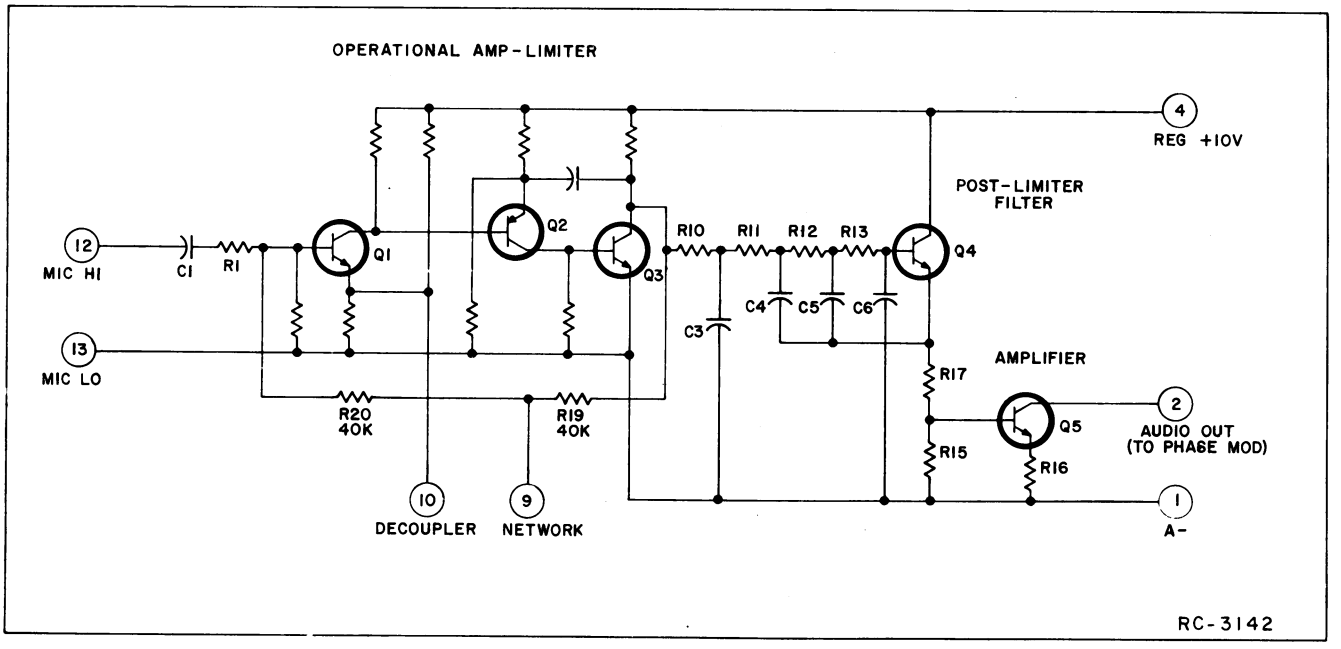

Figure 1 - Simplified Audio IC

phase modulators through P902-9, (CG HI) and resistors R117 and R121. Instructions for setting Channel Guard modulation are located in the Transmitter Alignment procedures.

FREQUENCY DIVIDER IC

The output at pin 3 of the selected crystal module is coupled through buffer amplifier Q103 to frequency divider U102. U102 divides the oscillator frequency by 2.

When the transmitter is not keyed, Q103 is saturated (turned on) with its collector voltage near zero. Keying the transmitter turns on one of the crystal modules and its output turns Q103 off and on once each cycle. As Q103 turns on during each cycle, the drop in collector voltage causes the flip-flop to change state. Assume the flip-flop was in the "0" state (the output at "Q" near A-). The first cycle of the oscillator output causes it to switch to the "1" state (output at "Q" approximately 5 Volts). The second cycle will cause the flip-flop to switch back to the "0" state. Therefore, it requires two oscillator cycles to switch the flip-flop through one complete cycle from "0" to "1" and back to "0".

If U102 was operating in to a pure resistive load, its output would be a square wave. However, the modulator circuit presents a tuned load to the IC, so that harmonics are filtered out and the waveform at the junction of C117 and C118 (modulator input) is essentially a sine wave at one-half the oscillator frequency. The output of the frequency divider is coupled through DC blocking capacitor C117 to the first modulator stage.

BUFFER & PHASE MODULATOR

The first phase modulator consists of varactor (voltage-variable capacitor) CR101 in series with tunable coil L101. This network appears as a series-resonant circuit to the RF output of the oscillator. An audio signal applied to the modulator circuit through blocking capacitor C115 varies the bias of CR101 and CR102 resulting in a phase modulated output. A voltage divider network (R110 and R113) provides the proper bias for varactors CR101 and CR102.

The output of the modulator is coupled through blocking capacitor C120 to the base of buffer Q104.

MULTIPLIERS & AMPLIFIER

Buffer Q104 is saturated when no RF signal is present. Applying an RF signal to Q104 generates a sawtooth waveform at its collector to drive class C tripler, Q105. The tripler stage is metered through R124. The output of Q105 is coupled through tuned circuits T101 and T102 to the base of doubler Q106. T101 and T102 are tuned to one-fourth of the operating frequency. The doubler stage is metered through R127.

The output of Q106 is coupled through tuned circuits T103 and T104 to the base of second doubler Q107. T103 and T104 are tuned to one-half the operating frequency. Q107 is metered through R132.

The output of Q107 is coupled through two tuned circuits (T105 and T106) to the base of amplifier Q108. These circuits are tuned to the transmitter operating frequency.

Q108 is a class C amplifier and is metered through R135. The amplifier collector circuit consists of T107, T108, and C147 through C152 and matches the amplifier output to the input of the power amplifier assembly. The exciter provides a minimum of 300 milliwatts of RF power to the power amplifier through J101 and cable W216. The relative power output is metered through a metering circuit consisting of C153, CR103, R136 and R137.

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

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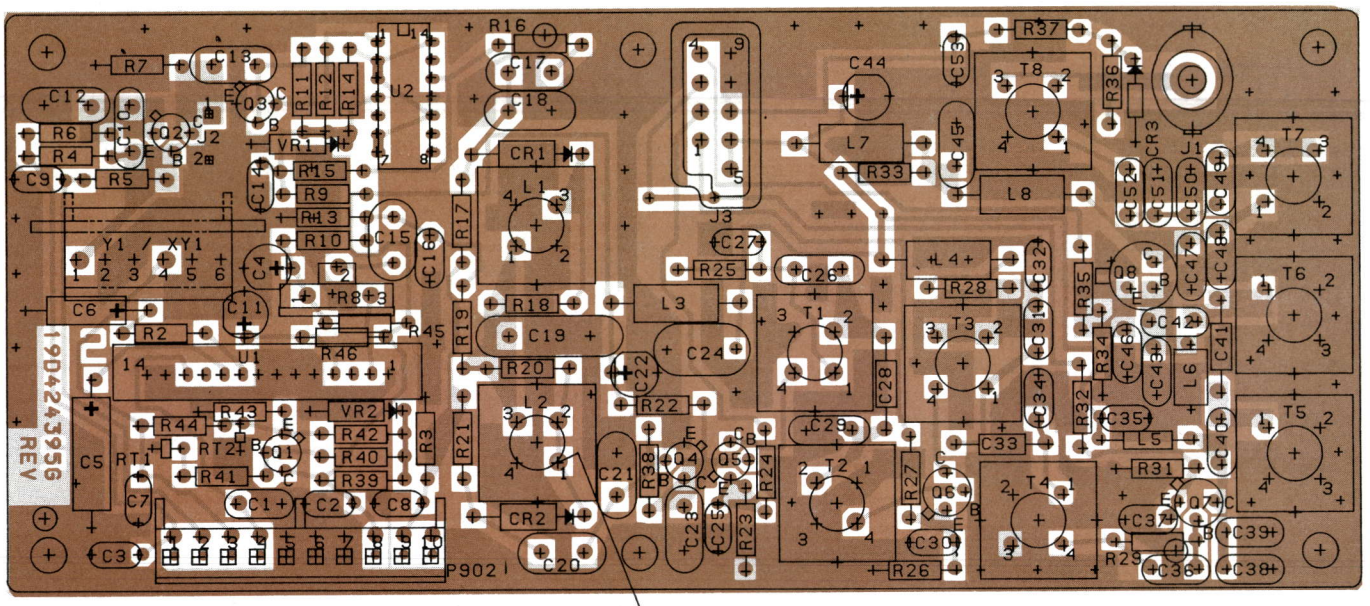
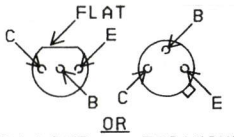
PARTIAL REFERENCE DESIGNATIONS ARE SHOWN.
FOR COMPLETE DESIGNATION, PREFIX WITH
100 SERIES. EXAMPLE: C1-C101, R1-R101, ETC.
EXCEPT P902.



(19D424406, Rev. 1)
(19B227662, Sh. 1, Rev. 2)
(19B227662, Sh. 2, Rev. 2)

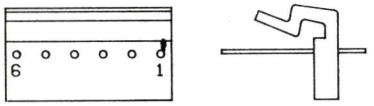
LEAD IDENTIFICATION
FOR Q1 THRU Q7



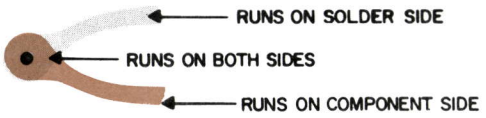
TOP VIEW

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

COLOR DOT ON BASE OF COIL
IDENTIFIES PIN 1 ON L1,L2,
T1 & T2

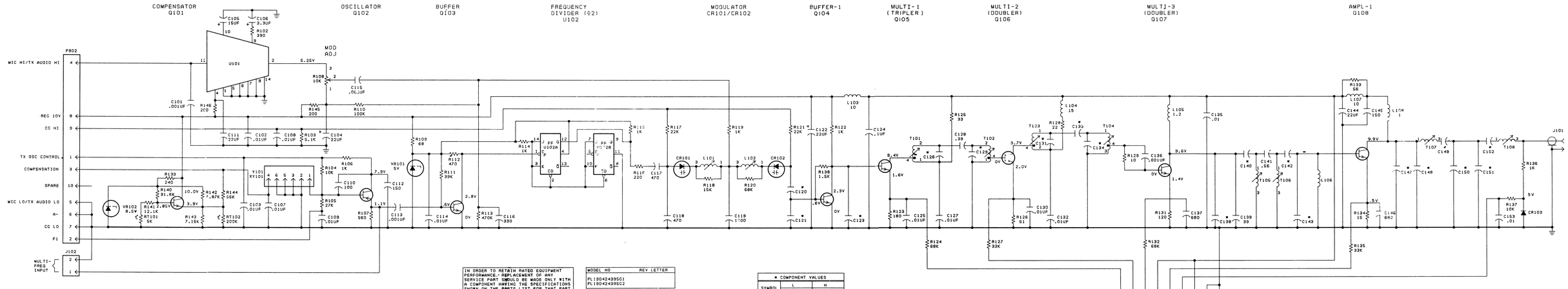


PIN ORIENTATION
FOR Y1 / XY1



OUTLINE DIAGRAM

66—88 MHz EXCITER BOARD
19D424395G1, G2



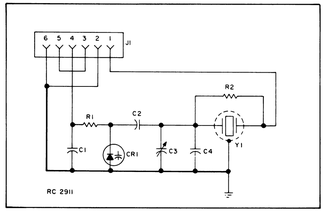
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

MODEL NO	REV LETTER
PL19D424395G1	
PL19D424395G2	

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND=RESISTOR VALUES IN OHMS UNLESS FOLLOWED WY 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.

* COMPONENT VALUES

SYMBOL	L 66-78 MHZ	H 77-88 MHZ
C120	680	510
C121	330	270
C123	150	120
C126	33	20
C129	33	20
C131	33	24
C133	1.0	62
C134	33	24
C138	43	18
C140	22	18
C142	20	15
C143	51	36
C147	43	20
C148	43	24
C149	33	20
C150	43	33
C151	47	15
C152	22	18



CRYSTAL MODULE (TYPICAL)

(19B622280, Rev. 3)

VOLTAGE READINGS

VOLTAGE READINGS ARE TYPICAL READINGS MADE WITH THE TRANSMITTER KEYED, AND MEASURED WITH A 20,000 OHMS-PER-VOLT METER WITH REFERENCE TO A- AND NOT CHASSIS GROUND. AN RF CHOKE (25-50 MICROHENRYS) IS USED IN THE HOT METER LEAD TO AVOID DETUNING RF CIRCUITS.

SCHEMATIC DIAGRAM

66—88 MHz EXCITER BOARD
19D424395G1, G2

Issue 1

PARTS LIST

LBI30557B

EXCITER BOARD
19D424395G1 66-78 MHz
19D424395G2 77-88 MHz

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C101	19A116655P19	Ceramic disc: 1000 pF ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C102 and C103	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C104	19A134203P6	Tantalum: 22 uF ±20%, 15 VDCW.
C105	540R267P14	Tantalum: 15 uF ±20%, 20 VDCW; sim to Sprague Type 150D.
C106	540R267P9	Tantalum: 3.3 uF ±20%, 15 VDCW; sim to Sprague Type 150D.
C107 thru C109	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C110	19A116656P100J7	Ceramic disc: 100 pF ±5%, 500 VDCW; temp coef -750 PPM.
C111	19A134203P6	Tantalum: 22 uF ±20%, 15 VDCW.
C112	19A700105P38	Mica: 150 pF ±5%, 500 VDCW.
C113	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C114	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C115	19A116080P106	Polyester: 0.068 uF ±10%, 50 VDCW.
C116	54R4481P105	Ceramic disc: 330 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C117 and C118	7489162P43	Silver Mica: 470 pF ±5%, 500 VDCW; sim to Sprague Type 118.
C119	7147203P14	Silver Mica: 1800 pF ±5%, 500 VDCW; sim to Electro Motive Type DM-2D.
C120L	7489162P47	Silver Mica: 680 pF ±5%, 500 VDCW; sim to Sprague Type 118.
C120H	7489162P44	Mica: 22 uF ±5%, 500 VDCW.
C121L	7489162P39	Silver Mica: 330 pF ±5%, 500 VDCW; sim to Sprague Type 118.
C121H	19A700105P46	Mica: 270 pF ±5%, 500 VDCW.
C122	19A134203P6	Tantalum: 22 uF ±20%, 15 VDCW.
C123L	19A700105P38	Mica: 150 pF ±5%, 500 VDCW.
C123H	19A700105P36	Mica: 120 pF ±5%, 500 VDCW.
C124	19A116080P107	Polyester: 0.1 uF ±10%, 50 VDCW.
C125	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C126L	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C126H	19A116656P20J0	Ceramic disc: 20 pF ±5%, 500 VDCW, temp coef 0 PPM.
C127	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C128	19A700013P8	Phenolic: 0.39 pF ±5%, 500 VDCW.
C129L	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C129H	19A116656P20J0	Ceramic disc: 20 pF ±5%, 500 VDCW, temp coef 0 PPM.
C130	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C131LL	19A116656P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM.
C131H	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM.
C132	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C133L	19A700013P13	Phenolic: 1.00 pF ±5%, 500 VDCW.
C133H	19A700013P12	Phenolic: 0.82 pF ±5%, 500 VDCW.

SYMBOL	GE PART NO.	DESCRIPTION
C134L	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C134H	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM.
C135	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
C136	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C137	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C138L	19A116656P43J2	Ceramic disc: 43 pF ±5%, 500 VDCW, temp coef -230 PPM.
C138H	19A116656P18J0	Ceramic disc: 18 pF ±5%, 500 VDCW, temp coef 0 PPM.
C139	19A116656P39J2	Ceramic disc: 39 pF ±5%, 500 VDCW, temp coef 0 PPM.
C140L	19A116656P22J0	Ceramic disc: 22 pF ±5%, 500 VDCW, temp coef 0 PPM.
C140H	19A116656P18J0	Ceramic disc: 18 pF ±5%, 500 VDCW, temp coef 0 PPM.
C141	19A700013P10	Phenolic: 0.56 pF ±5%, 500 VDCW.
C142L	19A116656P20J0	Ceramic disc: 20 pF ±5%, 500 VDCW, temp coef 0 PPM.
C142H	19A116656P15J0	Ceramic disc: 15 pF ±5%, 500 VDCW, temp coef 0 PPM.
C143L	19A116656P51J2	Ceramic disc: 51 pF ±5%, 500 VDCW, temp coef -230 PPM.
C143H	19A116656P36J2	Ceramic disc: 36 pF 500 VDCW, temp coef -220 PPM.
C144	19A134203P6	Tantalum: 22 uF ±20%, 15 VDCW.
C145	19A700105P38	Mica: 150 pF ±5%, 500 VDCW.
C146	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C147L	19A116656P43J2	Ceramic disc: 43 pF ±5%, 500 VDCW, temp coef -220 PPM.
C147H	19A116656P20J0	Ceramic disc: 20 pF ±5%, 500 VDCW, temp coef 0 PPM.
C148L	19A116656P43J2	Ceramic disc: 43 pF ±5%, 500 VDCW, temp coef -220 PPM.
C148H	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM.
C149L	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C149H	19A116656P20J0	Ceramic disc: 20 pF ±5%, 500 VDCW, temp coef 0 PPM.
C150L	19A116656P43J2	Ceramic disc: 43 pF ±5%, 500 VDCW, temp coef -220 PPM.
C150H	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C151L	19A116656P47J2	Ceramic disc: 47 pF ±5%, 500 VDCW, temp coef -220 PPM.
C151H	19A116656P15J0	Ceramic disc: 15 pF ±5%, 500 VDCW, temp coef 0 PPM.
C152L	19A116656P22J0	Ceramic disc: 22 pF ±5%, 500 VDCW, temp coef 0 PPM.
C152H	19A116656P18J0	Ceramic disc: 18 pF ±5%, 500 VDCW, temp coef 0 PPM.
C153	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR101 and CR102	5495769P12	Diode, silicon.
CR103	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J101	19A130924G1	Connector, receptacle: coaxial, jack type; sim to Cinch 14S11813.
J102	19A701785P1	Contact, electrical; sim to Molex 08-50-0404.
J103	19B219374G1	Connector, 9 contacts.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L101L	19C321810G2	Coil. Includes:
	19B209674P1	Tuning slug.
L101H	19C321810G3	Coil. Includes:
	19B209674P1	Tuning slug.
L102L	19C321810G2	Coil. Includes:
	19B209674P1	Tuning slug.
L102H	19C321810G3	Coil. Includes:
	19B209674P1	Tuning slug.
L103	19A700000P23	Coil, RF: 3.3 uH ±10%.
L104	19A700000P25	Coil, RF: 5.6 uH ±10%, 350 VRMS.
L105	19B209420P114	Coil, RF: 1.2 uH ±10%, .18 ohms DC res max; sim to Jeffers 4436-1K.
L106	19A701091G1	Coil.
L107	19A700000P23	Coil, RF: 3.3 uH ±10%.
L108	19A700000P12	Coil, RF: 1.0 uF ±10%.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P902	19A116659P2	Connector, printed wiring: 10 contacts rated at 5 amps; sim to Molex 09-52-3102.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q101	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q102	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q103 thru Q105	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q106 and Q107	19A115328P1	Silicon, NPN.
Q108	19A116868P1	Silicon, NPN; sim to Type 2N4427.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R102	19A700106P53	Composition: 390 ohms ±5%, 1/4 w.
R103	3R152P512J	Composition: 5.1K ohms ±5%, 1/4 w.
R104	19A700106P97	Composition: 10K ohms ±5%, 1/4 w.
R105	19A700106P97	Composition: 7K ohms ±5%, 1/4 w.
R106	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R107	19A700106P57	Composition: 560 ohms ±5%, 1/4 w.
R108	19B209358P106	Variable, carbon film: approx 300 to 10K ohms ±10%, 1/4 w; sim to CTS Type X-201.
R109	19A700106P35	Composition: 68 ohms ±5%, 1/4 w.
R110	19A700106P111	Composition: 100K ohms ±5%, 1/4 w.
R111	19A700106P101	Composition: 39K ohms ±5%, 1/4 w.
R112	19A700106P55	Composition: 470 ohms ±5%, 1/4 w.
R113	3R152P474J	Composition: 470K ohms ±5%, 1/4 w.
R114 thru R115	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R116	19A700106P47	Composition: 220 ohms ±5%, 1/4 w.
R117	19A700106P95	Composition: 22K ohms ±5%, 1/4 w.
R118	19A700106P91	Composition: 15K ohms ±5%, 1/4 w.
R119	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R120	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R121	19A700106P95	Composition: 22K ohms ±5%, 1/4 w.
R122	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R123	19A700106P45	Composition: 180 ohms ±5%, 1/4 w.
R124	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R125	19A700106P27	Composition: 33 ohms ±5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R126	19A700106P32	Composition: 51 ohms ±5%, 1/4 w.
R127	19A700106P99	Composition: 33K ohms ±5%, 1/4 w.
R128	19A700106P23	Composition: 22 ohms ±5%, 1/4 w.
R129	19A700106P15	Composition: 10 ohms ±5%, 1/4 w.
R131	19A700106P41	Composition: 120 ohms ±5%, 1/4 w.
R132	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R133	19A700106P33	Composition: 56 ohms ±5%, 1/4 w.
R134	19A700106P19	Composition: 15 ohms ±5%, 1/4 w.
R135	19A700106P99	Composition: 33K ohms ±5%, 1/4 w.
R136	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R137	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R138	19A700106P67	Composition: 1.5K ohms ±5%, 1/4 w.
R139	3R152P241J	Composition: 240 ohms ±5%, 1/4 w.
R140	19A701250P349	Metal film: 31.6K ohms ±1%, 250 VDCW, 1/4 w.
R141	19A701250P309	Metal film: 12.1K ohms ±1%, 250 VDCW, 1/4 w.
R142	19A701250P287	Metal film: 7.87K ohms ±1%, 250 VDCW, 1/4 w.
R143	19A701250P283	Metal film: 7.15K ohms ±1%, 250 VDCW, 1/4 w.
R144	19A700106P105	Composition: 56K ohms ±5%, 1/4 w.
R145 and R146	19A700106P46	Composition: 200 ohms ±5%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT101	19C300048P7	Thermister: 50K ohms ±10%; sim to ML Industries 10103.
RT102	19C300048P5	Disc: 200K ohms ±10%, sim to ML 4D 051.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T101 and R102	19D416635G5	Coil. Includes:
	54R3185P13	Tuning slug.
T103	19C307170P301	Coil, RF: variable, wire size No. 20 AWG; sim. to Paul Smith Co. Sample No. 082876-82-2.
T104	19C307170P302	Coil, RF: variable, wire size No. 20 AWG; sim. to Paul Smith Co. Sample No. 082876-82-6.
T105 thru T108	19C307170P303	Coil, RF: variable, wire size No. 20 AWG; sim. to Paul Smith Co. Sample No. 071774-0C-6.
		- - - - - - - - - - INTEGRATED CIRCUITS - - - - - - - - - -
U101	19A702886G2	Audio Amplifier.
U102	19A116842P1	Digital, High Speed TTL: Dual J-K Master-Slave Flip Flop; sim to SN54H73N.
		- - - - - - - - - - VOLTAGE REGULATORS - - - - - - - - - -
VR101	4036887P56	Zener: 500 mW, 5.0 v. nominal.
VR102	4036887P9	Silicon, zener.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XT101	19A116659P50	Connector, printed wiring: 6 contacts; sim to Molex 09-65-1061.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19A129424G2	Can. (Used with L101, L102, T101-T106).
	19A701333P4	Insulator, washer: nylon. (Used with Q108).
		ASSOCIATED PARTS
		- - - - - - - - - - CRYSTAL MODULES - - - - - - - - - -
		NOTE: When reordering, give GE Part No. and specify exact operating frequency needed.
		Fx = Fo / N
Y101	19B226962G31	Crystal module: 5 PPM, 66-78 MHz.
	19B226962G32	Crystal module: 5 PPM, 77-88 MHz.

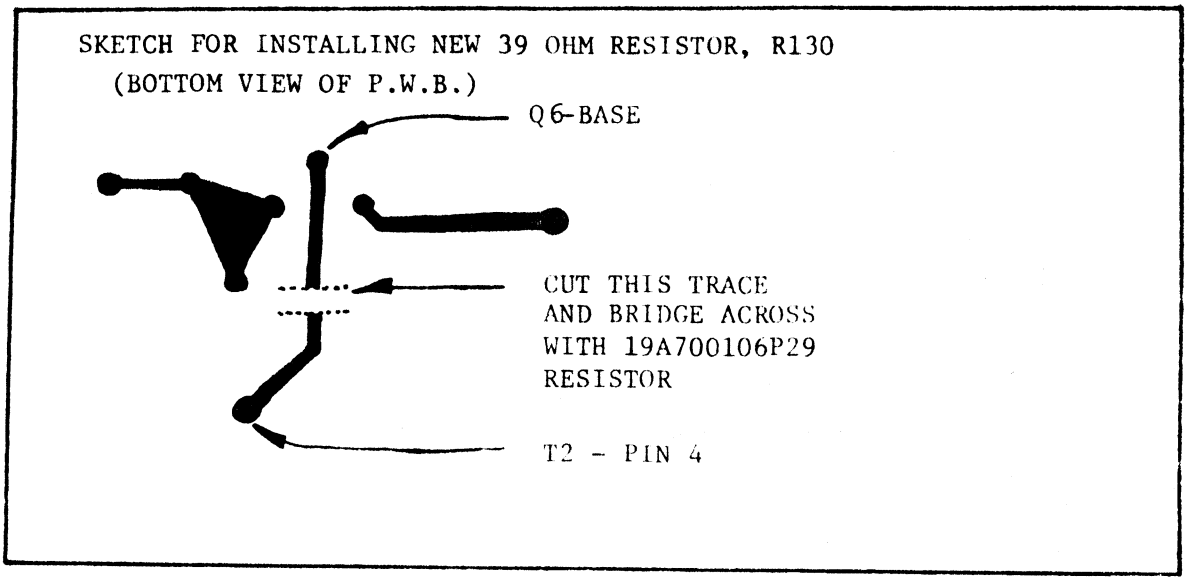
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

ADDENDUM TO LBI30549B

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

REV.A- 19D424395G1,2 66-88 MHZ EXCITER BOARD

TO IMPROVE OPERATION OF Q104. ADDED R130 IN SERIES WITH THE BASE OF Q104 TO INSTALL R130 THE PRINTED WIRE BOARD RUN MUST BE CUT AS SHOWN IN THE DIAGRAM BELOW AND R130 SOLDERED ACROSS THE BREAK. THE BODY OF R130 SHOULD REST AS CLOSELY AS POSSIBLE TO THE BOTTOM OF THE BOARD. LEADS SHOULD BE TRIMMED TO 1/4 INCH. THE PART NUMBER FOR R130 IS:19A700106P29- 39 OHMS, + 5%, 250 VDCW,1/4 WATT.



REV.B- TO INCORPORATE A NEW INTEGRATED CIRCUIT. REPLACED U102. OLD AND NEW COMPONENTS ARE INTERCHANGEABLE. NEW PART NUMBER FOR U102 IS : 19A700037P34 DUAL J/K FF WITH CLEAR.