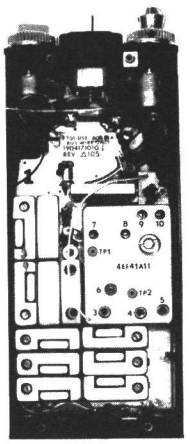
MOBILE RADIO

MASTR® Personal Series

PROGRESS LINE

PE MODELS

SYSTEMS BOARD AND CASE ASSEMBLY 19D417103G2 & G3 (5-FREQUENCY WITH TYPE 99 DECODER)



SPECIFICATIONS *

MODEL NUMBERS	
19D417103G2	406-470 MHz
19D417103G3	470-512 MHz
CONTROLS	Volume ON-OFF Switch
	Squelch Control
	Five-Frequency Selector Switch
	PTT Switch
	Tone Option Switch
	Collapsible Antenna
	Accessory Jack

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

GENERAL ELECTRIC

TABLE OF CONTENTS

SPECIFICATIONS ..... Cover

DESCRIPTION 1

CIRCUIT ANALYSIS 1

- Audio Switching 1
- DC Switching 1
- PTT Switch 1

REPEATING OSCILLATOR MODULES 1

OUTLINE DIAGRAM 4

SCHEMATIC DIAGRAM 5

PARTS LIST & PRODUCTION CHANGES 6

MULTI-FREQUENCY MODIFICATIONS 7

ILLUSTRATIONS

Figure 1 - Audio Switching 1
Figure 2 - DC Switching 1
Figure 3 - Repeating Oscillator Modules 2

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with high voltage; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

System Board A702/A703 provides system interconnections between the transmitter, receiver, tone options and operating controls in the 406 to 512 MHz, Five-Frequency with Type 99 Decoder PE Models. The System Board contains transmitter oscillator modules A5 through A9 and receiver oscillator modules A10 through A12. In addition to the oscillator modules, the system board contains 5.4 volt Regulator Module A2, Compensator Module A3, Modulator Module A4, system relay K1, an audio and DC switching circuitry.

Jacks J702 and J703 are connected to the system board and provide contacts for an external antenna, speaker, and microphone. J702 provides contacts for the external contacts for an external microphone. Placing the radio into the vehicular charger automatically connects the jack contacts to the external circuitry. The radio is also connected to the external antenna when placed in the desk charger.

CIRCUIT ANALYSIS

AUDIO SWITCHING

Audio switching for the Speaker/Microphone LS1 is controlled by diode CR5 as shown in Figure 1.

Pressing PTT switch S701 forward biases diode CR5, permitting audio from LS1 to be applied to transmitter audio module A1.

Keying the external microphone permits audio to be applied directly to the transmitter audio module.

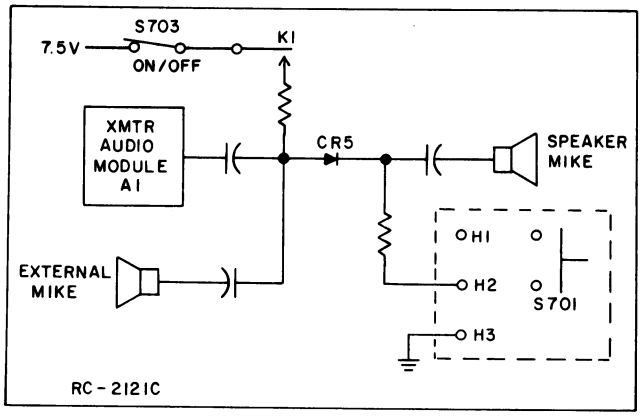


Figure 1 - Audio Switching Circuit

DC SWITCHING

Operation of system relay K1 is controlled by diode CR2 (see Figure 2).

Pressing S701 forward biases CR2, completing the relay path to ground. This energizes relay K1, and switches the battery voltage to the transmitter audio and regulator modules. Energizing K1 also connects the transmitter output to the antenna.

PTT SWITCH (A705)

Solid State PTT switch S701 forward biases diode CR2 to energize relay K1 and key the radio. When S701 is pressed PNP, transistor Q1 conducts. Transistor Q1 conducting applies a positive voltage to the base of NPN transistor Q2, causing Q2 to also conduct. Transistor Q2 conducting, provides a conduction path to ground for diode CR2. Relay K1 is energized and the radio is keyed.

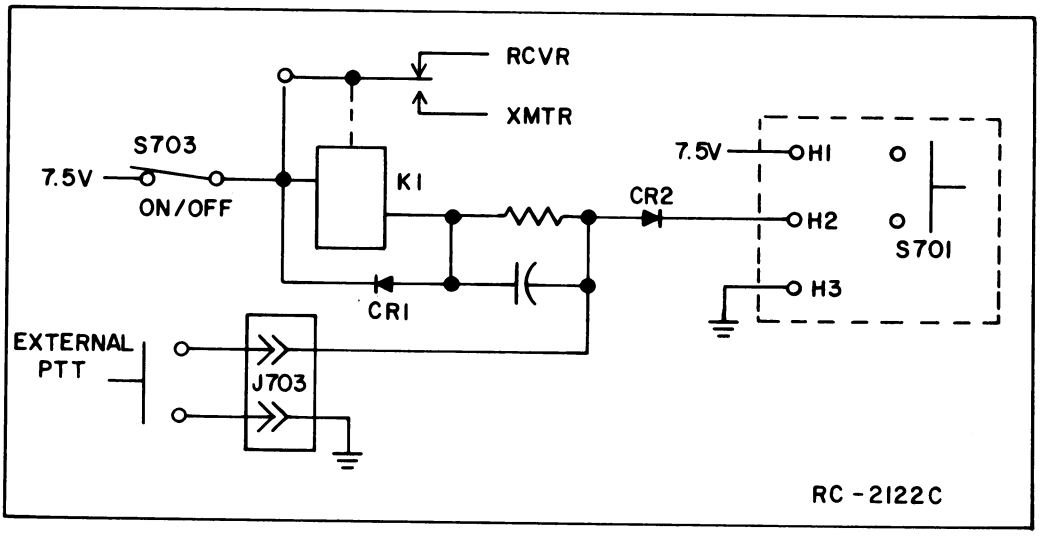


Figure 2 - DC Switching Circuit

REPEATING OSCILLATOR MODULES

Both the transmitter and receiver can be adapted to repeat the use of the same frequency without the use of additional Oscillator Modules. The Oscillator Module is replaced by a diode, allowing the frequency selector switch to have the same frequency on one or more switch positions even though only one Oscillator Module is used for each of the repeated channels. A typical diagram with repeated Oscillator Modules is shown in Figure 3.

Complete instructions for multi-frequency modifications are contained in the Multi-Frequency Modification Diagram (see Table of Contents).

For radios equipped with Channel Guard, Type 90 Encoders/Decoders, or Type 99 Decoders, repeating Oscillator Modules also permit switching or disabling tones on the same RF frequency with the multi-frequency switch. Also, the tone and RF frequency can be changed at the same time.

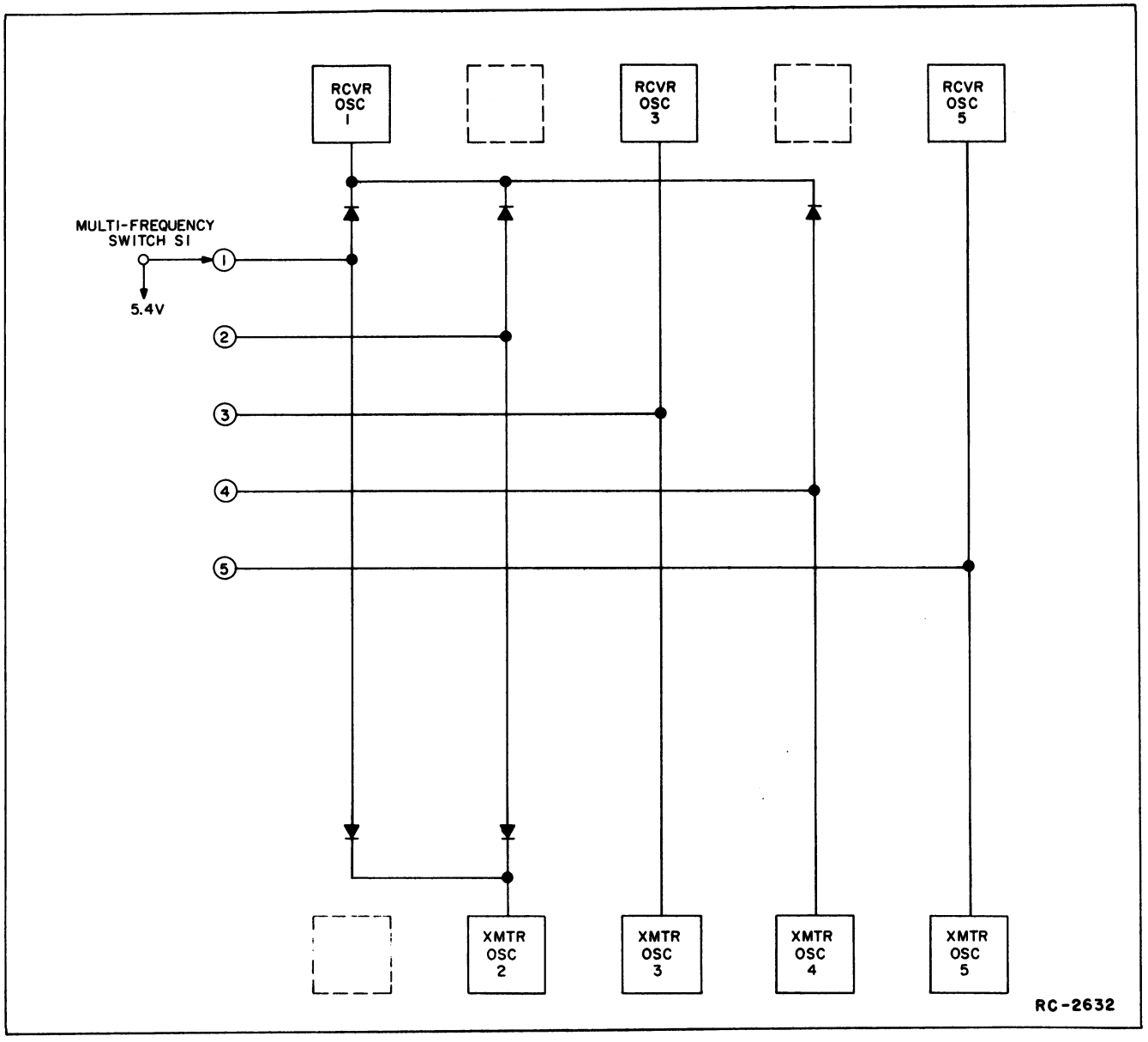
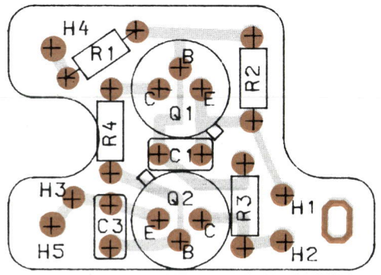


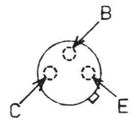
Figure 3 - Repeating Oscillator Modules

A705



(19B233083, Rev. 0)
(19B232585, Sh. 1, Rev. 0)
(19B232585, Sh. 2, Rev. 0)

LEAD IDENTIFICATION
FOR Q1 AND Q2



OR

IN-LINE TRIANGULAR
TOP VIEW

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

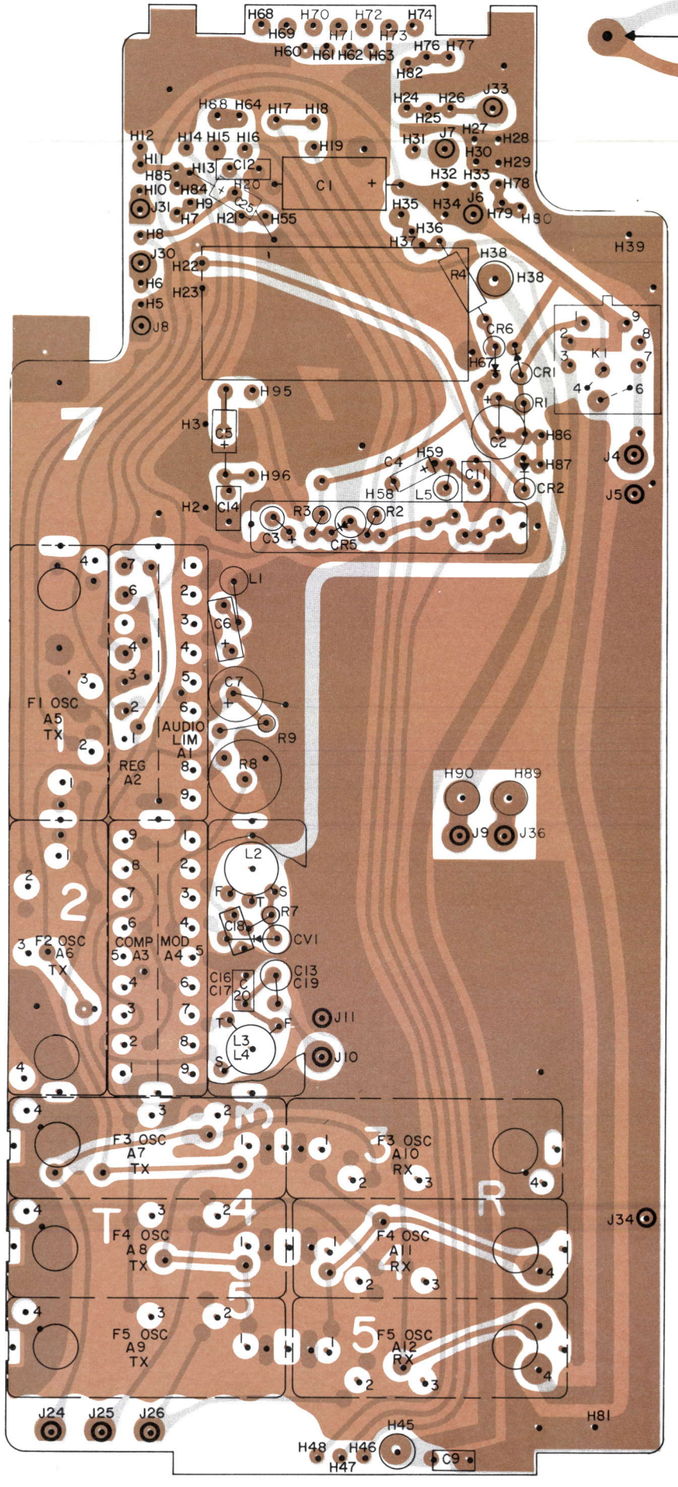
(19B232770, Rev. 2)

ALL RESISTORS ARE 1/8 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.

OUTLINE DIAGRAM

406—512 MHz SYSTEM BOARD

COMPONENT SIDE

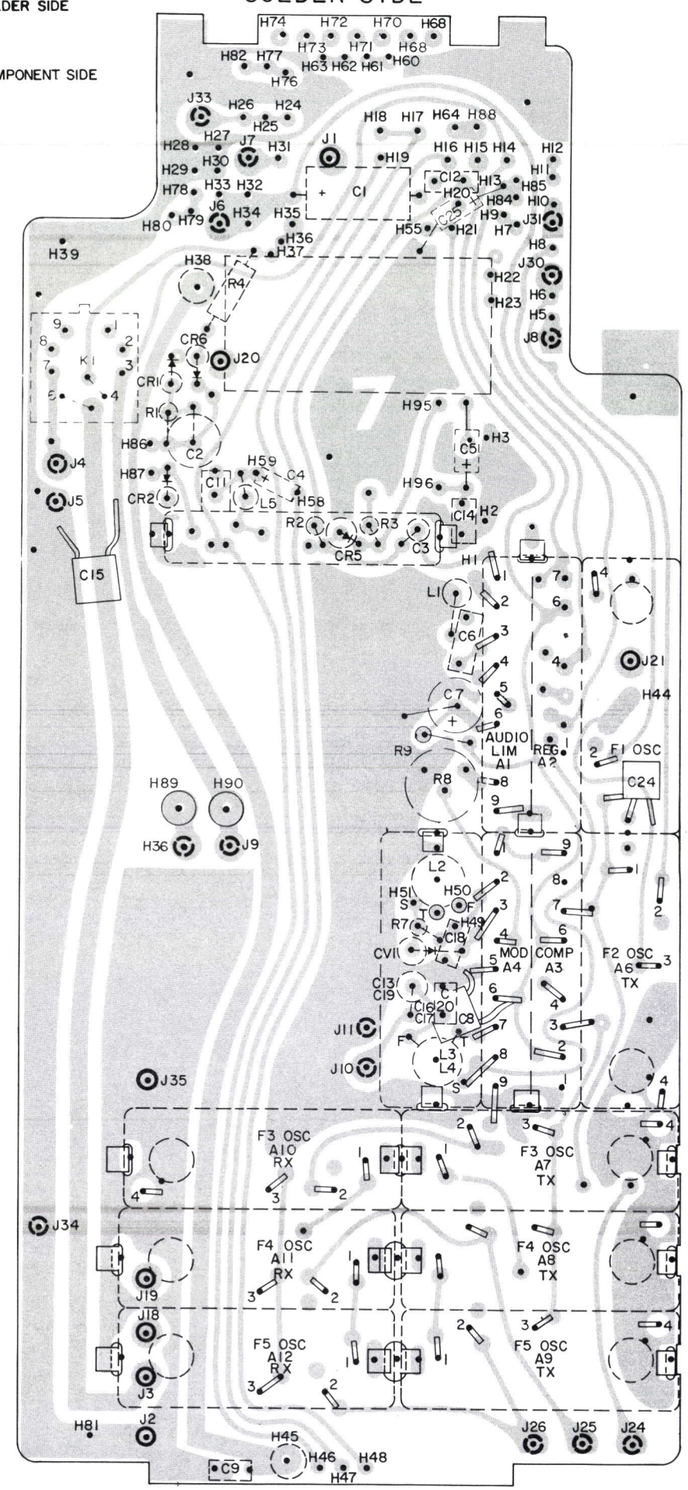


(19D417006, Sh. 2, Rev. 7)
(19D417006, Sh. 3, Rev. 7)

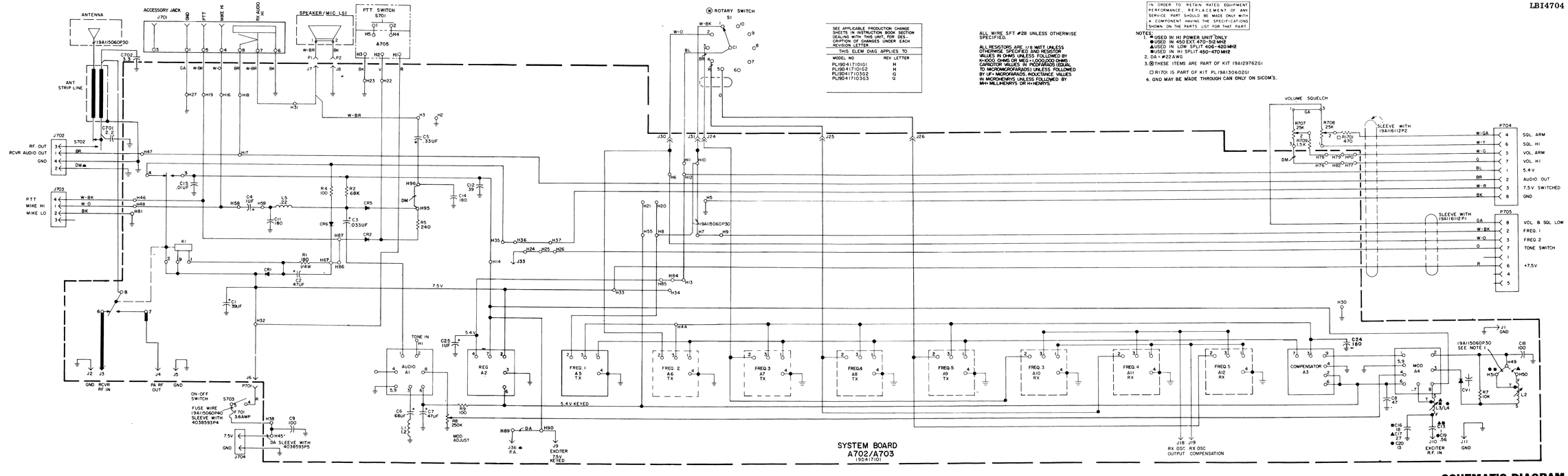
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

(19D417965, Rev. 11)

SOLDER SIDE



(19D417006, Sh. 2, Rev. 7)



SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO

MODEL NO	REV LETTER
PLI904171010G1	H
PLI904171010G2	H
PLI904171035G2	G
PLI904171036G3	G

ALL WIRE SFT #28 UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS ARE 1/8 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.

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.

NOTES:
1. ■ USED IN HI POWER UNIT ONLY
   ● USED IN 450 EXT. 470-512 MHZ
   ▲ USED IN LOW SPLIT 406-420 MHZ
   ■ USED IN HI SPLIT 450-470 MHZ
2. DA = #22 AWG
3. Ⓡ THESE ITEMS ARE PART OF KIT 19A129762G1
   □ R1701 IS PART OF KIT PL19A130602G1
4. GND MAY BE MADE THROUGH CAN ONLY ON SICOM'S.

SYSTEM BOARD
A702/A703
19D417101

(19B621970, Rev. 17)

SCHEMATIC DIAGRAM

406—512 MHz SYSTEM BOARD

Issue 4

PARTS LIST

LBI4703D

SYSTEM BOARD/CASE ASSEMBLY
19D417103G2 406-470 MHz
19D417103G3 470-512 MHz
AND
ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
A702 and A703		SYSTEM BOARD A702 19D417101G1 406-470 MHz A703 19D417101G2 470-512 MHz
A1	19C320062G1	Transmitter Audio Module.
A2*	19C328070G1	Regulator Module.
		In REV G & earlier:
	19C311905G2	Regulator Module.
A3	19C320060G1	Oscillator Compensator Module.
A4	19C320084G1	Modulator Module.
		NOTE: When reordering A5-A9 give GE Part Number and exact crystal frequency. Crystal Freq= Operating Freq / 24.
A5 thru A9	4EG27A11	Transmitter Oscillator.
		NOTE: When reordering A10-A12, give GE Part Number and exact crystal frequency.
		406-420 MHz crystal Freq= $\frac{Fo+20}{21}$
		450-512 MHz crystal Freq= $\frac{Fo-20}{21}$
A10 thru A12	4EG28A12	Receiver Oscillator. (406-420 MHz).
	4EG28A13	Receiver Oscillator. (450-512 MHz).
		- - - - - - - - - - - CAPACITORS - - - - - - - - -
C1	5491674P30	Tantalum: 39 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C2	5491674P42	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 162D.
C3*	5491674P51	Tantalum: 0.033 µf ±10%, 35 VDCW; sim to Kemet T376P33K 03AS.
		In REV D-F:
	5491674P49	Tantalum: 0.068 µf ±10%, 20 VDCW; sim to Sprague Type 162D.
		In REV C & earlier:
	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C4	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C5*	5491674P52	Tantalum: 0.33 µf ±10%, 20 VDCW; sim to Kemet T376B334K 020AS.
		In REV D-F:
	5491674P48	Tantalum: 0.68 µf ±10%, 10 VDCW; sim to Sprague Type 162D.
		In REV C & earlier:
	19A116244P2	Ceramic: 0.022 µf ±20%, 50 VDCW.
C6	19C307102P19	Tantalum: 68 µf ±20%, 4 VDCW.
C7	5491674P42	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 162D.
C8	19A116114P7053	Ceramic: 47 pf ±5%, 100 VDCW; temp coef -750 PPM.
C9	19A116114P7065	Ceramic: 100 pf ±5%, 100 VDCW; temp coef -750 PPM.
C10*	19A116114P2007	Ceramic: 2.2 pf ±10%, 100 VDCW; temp coef -80 PPM. Deleted by REV A.
C11	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C12	19A116114P2049	Ceramic: 39 pf ±10%, 100 VDCW; temp coef -80 PPM.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
C13	5491601P120	Phenolic: 1.0 pf ±5%, 500 VDCW.
C14	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C15	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
C18	19A116114P8065	Ceramic: 100 pf ±5%, 100 VDCW; temp coef -1500 PPM.
C19	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C20	19A116114P2035	Ceramic: 13 pf ±5%, 100 VDCW; temp coef -80 PPM.
C21* thru C23*	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM. Added by REV F. Deleted by REV H.
C24*	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM. Added by REV F.
C25*	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D. Added by REV H.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR2	5494922P1	Silicon; sim to Type 1N456.
CR5	5494922P1	Silicon; sim to Type 1N456.
CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CV1	5495769P9	Silicon, capacitive.
		- - - - - - - - JACKS AND RECEPTACLES - - - - -
J1* thru J5*	19A116366P4	Contact, electrical: sim to Concord 10-891-1.
		Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.
J6 thru J8	19A116366P2	Contact, electrical: sim to Cambion 3233-01-03.
J9* thru J11*	19A116366P4	Contact, electrical: sim to Concord 10-891-1.
		Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.
J18* thru J21*	19A116366P4	Contact, electrical: sim to Concord 10-891-1.
		Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.
J24* thru J26*	19A116366P4	Contact, electrical: sim to Concord 10-891-1.
		Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.
J30* and J31*	19A116366P4	Contact, electrical: sim to Concord 10-891-1.
		Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.
J32*	19A116366P2	Contact, electrical: sim to Cambion 3233-01-03. Deleted by REV A.
J33 and J34	19A116366P2	Contact, electrical: sim to Cambion 3233-01-03.
J36*	19A116366P4	Contact, electrical: sim to Concord 10-891-1. Added by REV A.
		- - - - - - - - - - - RELAYS - - - - - - - - - -
K1*	19B209562P3	Relay, hermetic sealed: 45 to 86 ohms, 10%, 2 form C contacts, 5.0 VDC nominal, 1.0 w max operating; sim to GE 3SCS1001A2.
		In REV B:
	19B209562P2	Relay, hermetic sealed: between 45-100 ohms, 2 form C contacts, 5.0 VDC nominal, 1.0 w max operating; sim to GE 3SCS1001A2.
		In REV A:
	19B209562P1	Relay, hermetic sealed: 98 ohms ±10%, 2 form C contacts, 6.0 VDC nominal, 1.0 w max operating; sim to GE 3SCS1001A2. Added by REV A.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - - INDUCTORS - - - - - - - -
L1	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1K.
L2	19A127798G2	Coil: 3.5-4.3 µh. Includes:
	19B209436P1	Tuning slug.
L3	19B219527G1	Coil.
L4	19B219527G3	Coil.
L5*	19B209420P105	Coil, RF: 0.22 µh ±10%, 0.14 ohms DC res max; sim to Jeffers 4416-5K. Added by REV E.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1*	3R152P181J	Composition: 180 ohms ±5%, 1/4 w.
		In REV A:
	3R151P221J	Composition: 220 ohms ±5%, 1/8 w.
		Earlier than REV A:
	3R151P391J	Composition: 390 ohms ±5%, 1/8 w.
R2*	3R151P683J	Composition: 68K ohms ±5%, 1/8 w.
		In REV C & earlier:
	3R151P913J	Composition: 91K ohms ±5%, 1/8 w.
R4	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
R5*	3R151P241J	Composition: 240 ohms ±5%, 1/8 w.
		In REV C & earlier:
	3R151P103J	Composition: 10K ohms ±5%, 1/8 w.
R6*	3R151P222J	Composition: 2.2K ohms ±5%, 1/8 w. Deleted by REV D.
R7	3R151P103J	Composition: 1K ohms ±5%, 1/8 w.
R8	19A116412P4	Variable, cermet: 250K ohms ±10%, 0.16 w; sim to Helipot Model 62 PF.
R9	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
		- - - - - - - - - - - SOCKETS - - - - - - - - - -
XK1*	19A115834P5	Contact, electrical: sim to AMP 3-331272-5. (Quantity 7). Deleted by REV A.
A705*		PUSH TO TALK SWITCH BOARD 19B232586G1 (Added by REV F)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C3	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
		- - - - - - - - - - - TRANSISTORS - - - - - - - -
Q1	19A129187P1	Silicon, PNP.
Q2	19A116201P3	Silicin, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R151P103J	Composition: 10K ohms ±5%, 1/8 w.
R2	3R151P332J	Composition: 3.3K ohms ±5%, 1/8 w.
R3	3R151P154J	Composition: 150K ohms ±5%, 1/8 w.
R4	3R151P182J	Composition: 1.8K ohms ±5%, 1/8 w.
R5	3R151P682J	Composition: 6.8K ohms ±5%, 1/8 w.
R6	3R151P182J	Composition: 1.8K ohms ±5%, 1/8 w.
R7	3R151P102J	Composition: 1K ohms ±5%, 1/8 w.
R8	3R151P154J	Composition: 150K ohms ±5%, 1/8 w.
R9	3R151P122J	Composition: 1.2K ohms ±5%, 1/8 w.
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C701	19A116114P2007	Ceramic: 2.2 pf ±10%, 100 VDCW; temp coef -80 PPM. Added by REV B.
C702*	19A116114P12	Ceramic: 3.3 pf 5%, 100 VDCW; temp coef 0 PPM.
		In REV B-D:
	19A116114P4	Ceramic: 1.5 pf 5%, 100 VDCW; temp coef 0 PPM. Added by REV B.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - - - FUSES - - - - - - - - - - -
F701	19A127884G1	Fuse Kit.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J701	19B216594G2	Connector, female: 6 contacts.
J702		(See Mechanical Parts RC2605 items 14, 16).
J703		(See Mechanical Parts RC2605 items 14, 48).
J704		(See Mechanical Parts RC2605 items 51-53, 73, 76).
		- - - - - - - - - - - RELAYS - - - - - - - - -
K1*	19A127836G1	Sensitive: 95 ohms ±10%, 2 form C contacts, 5.5 to 9.0 VDC (over the temp range indicated); sim to C.P. Clare MF1401G01. Deleted by REV B.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P701	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.
P704 and P705	19A127569G1	Plug: 8 contacts.
P706*	19A127569G1	Plug: 8 contacts. Deleted by REV B.
		- - - - - - - - - - - RESISTORS - - - - - - - - -
R707	19A116227P1	Resistor/Switch: variable, carbon film, 25K ohms ±20%, 1/8 w, (Includes S703), SPST, 3 amp at 125 VAC.
R708	19A116227P2	Variable, carbon film: 25K ohms ±20%, 1/8 w.
R709	3R151P152K	Composition: 1.5K ohms ±10%, 1/8 w.
R710*	3R151P103K	Composition: 10K ohms ±10%, 1/8 w. Deleted by REV B.
		- - - - - - - - - - SWITCHES - - - - - - - - -
S701		(See Mechanical Parts RC2605 items 33-39).
S702		(See Mechanical Parts RC2605 items 40-47).
S703		(Part of R707).
S704*	19A116648P5	Toggle: SPDT; sim to C and K Components 7107SDG. Deleted by REV B.
		ASSOCIATED ASSEMBLIES
		FRONT COVER ASSEMBLY 19C317416G2
		- - - - - - - - - LOUDSPEAKERS - - - - - - - - -
LS1	19A116090P1	Permanent magnet: 2.00 inch, 8 ohms ±10% voice coil imp, 450 Hz ±112 Hz resonant; freq range 400 to 3000 Hz.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P1 and P2	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.
		HI/LOW SPLIT MODIFICATION KIT 19A127838G3 450-470 MHz 19A127838G4 406-420 MHz
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C16	19A116114P2038	Ceramic: 18 pf ±5%, 100 VDCW; temp coef -80 PPM.
C17	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
		MULTI-FREQUENCY MODIFICATION KIT 19A129762G1
		- - - - - - - - - - SWITCHES - - - - - - - - -
S1	19B219976G1	Switch Assembly.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19B216897G3	Rear Cover Assembly. (See RC2605, items 58, 59).
	19B216897G4	Rear Cover Assembly. Clip type. (See RC2605, items 58, 60).

SYMBOL	GE PART NO.	DESCRIPTION
	19B219953G4	Antenna Assembly. (See RC2605, items 19-23).
	19D413522G1	Battery, rechargeable. Nickel Cadmium.
	19A127884G1	Fuse Kit.
	4038381P4	Alignment tool. Fork tip.
	19B219079G1	Alignment tool. Allen tip.
		MECHANICAL PARTS (SEE RC2605)
1	19A134425P1	Machine screw, hex: No. 2-56 x 3/16.
2	19C317394P4	Gasket.
3	19B204527P2	Diaphragm: No. 2 inch dia.
4	N681P5002C6	Screw, phillips head: No. 2-56 x 1/8.
5	19A127319P1	Nut: No. 1/4-32.
6	4035630P1	Washer.
7	N70BP703C6	Set screw: No. 3-48 x 3/16.
8	19B232784G1	Knob. (Includes items 7 and 66).
9	19B219953G4	Antenna assembly. (Includes items 19-23).
10	19D413531P2	Grille.
11	NP270290P2	Nameplate. (GE monogram).
12	19D413542G8	Case assembly. (Includes items 14, 15, 18, 27, 48, 69, 70).
13	19B216858P1	Insert.
14	19A127753P1	Contact. (Part of J702 and J703).
15	19A134548P1	Insert, screw thread: No. 2-56.
16	19B216862P2	Contact. (Part of J702).
17	19A127779G8	Antenna tube. (Includes 19A129651P1 teflon insert).
18	19B216875P1	Support.
19	19C320352P1	Bushing. (Part of item 9).
20	19B219650P1	Antenna rod. (Part of item 9).
21	19A129652P1	Nut, knurled: thd size 7/16-40. (Part of item 9).
22	19A129649P1	Antenna Cap. (Part of item 9).
23	N70P703C6	Set screw: No. 3-48 x 3/16. (Part of item 9).
24	19C317050P1	Protective Cover.
25	19A129390P1	Disc.
26	19A130426G2	Knob. (Includes items 63, 64).
27	19A129723P1	Rivet.
28	19B219540P1	Catch.
29	19B216520P4	Washer, nylon: 1/4 inch.
30	19A127319P2	Nut: No. 1/4-28.
31	19B216926P8	Decorative cap. (TYPE 99).
32	19C320721P1	Seal. (Used with TYPE 99 Switch).
33	N41P1006	Screw, slotted, steel: No. 0-80 x 3/8. (Part of S701).
34	19C328416G1	Button assembly. (Part of S701).
35	19C328407P1	Collar. (Part of S701).
36	19A137621P1	Plate. (Part of S701).
37	19A137620P1	Spring. (Part of S701).
38	N207P1C6	Hex nut. (Part of S701).
39	19B209643P2	Switch, push. (Part of S701).
40	19B216865P1	Insulator. (Part of S702).
41	N647P5004C	Cap screw: 2-56 x 1/4. (Part of S702).
42	19B216864P1	Contact. (Part of S702).
43	19B216863P1	Spring contact. (Part of S702).
44	N910P6C6	Retaining ring. (Part of S702).
45	19A127754P1	Gasket. (Part of S702).

SYMBOL	GE PART NO.	DESCRIPTION
46	19A127755P1	Spring. (Part of S702).
47	19B216862P1	Contact. (Part of S702).
48	N330P605F22	Eyelet, brass: 1/16 x 5/32.
49	N330P602F22	Eyelet, brass: 1/16 x 1/16. (Not Used).
50	19A127762P1	Strap.
51	19B216891G1	Spring assembly. (Part of J704).
52	19D413467P1	Fastener. (Part of J704).
53	19A115795P3	Flat head screw: steel, 2-56 x 5/16. (Part of J704).
54	19B219443P1	Insulator, pressure sensitive.
55	19C311491P3	Can. (Used with Regulator, Oscillator Compensator, and Compressor Circuits).
56	19B219510P1	Insulator. (Located between System and Receiver Boards).
57	19A116270P1	Tape, pressure sensitive. (Specify length).
58	19C317394P6	Gasket.
59	19B216897G3	Rear Cover Assembly (without clip).
60	19B216897G4	Rear Cover Assembly (with clip).
61	19A130397P1	Strap.
62	N404P8	Lockwasher, internal tooth: No. 2. (Not Used).
63	N70P703C6	Set screw: No. 3-48 x 3/16.
64	19A130517P1	Insert, threaded.
65	4037064P18	Washer, nonmetallic: 1/8 inch dia.
66	19A137254P1	Insert, tap.
67	19A130993P1	Gasket.
68	N513P604C	Groove pin. (Not Used).
69	19A127802P1	Shield rivet.
70	19A116773P805	Tap screw, Phillips POZIDRIV®: No. 4-24 x 5/16.
71	N170P9004P2	Cap screw: No. 4-40 x 1/4. (Not Used).
72	19A130926P1	Plate nut. (Not Used).
73	19A130586P1	Insulator.
74	NP243580-L	Nameplate (numbers 0-9- Code number).
75	4033198P18	Metallic eyelet.
76	19B232109P1	Button plug.

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 descriptions of parts affected by these revisions.

REV. A - System Board 19D417101G1&2
To make compatible with more options.
Changed K1 and increased size of runs on printed wire board.

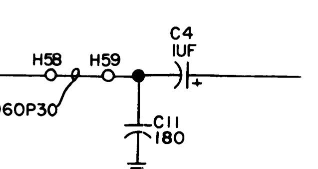
REV. B - To improve relay pickup performance at low voltages. Changed K1 and R1.

REV. C - To reduce RF losses on UHF systems. Changed K1.

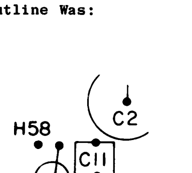
REV. D - To improve frequency response. Changed C3, C5, R2, R5 and deleted R6.

REV. E - To reduce susceptability to internal RFI. Added L5.

Schematic Was:



Outline Was:



REV. F - To reduce susceptability to internal RFI.
Added C22-C25.

REV. A - Case Assembly 19D417103G2&3
To incorporate a Vendor Change of Accessory jack J701 on Outline Diagram.

REV. B - To make compatible with more options.
Changed K1.

REV. C - To prevent accidental shorts of battery pack to ground.
Added insulator to battery connector J704.

REV. D - To incorporate metal nuts for PTT switch mounting screws.
Added nuts.

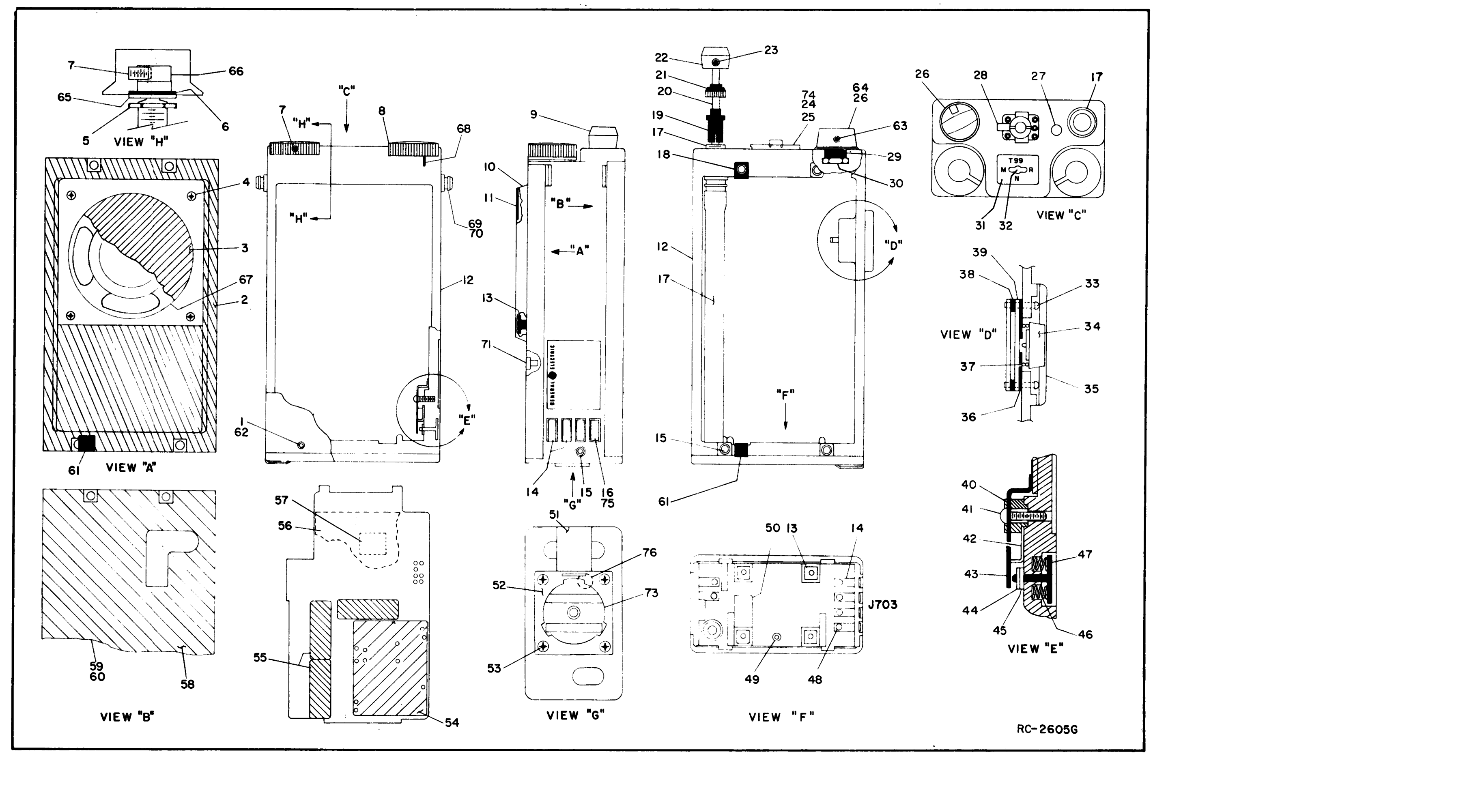
REV. E - To improve impedance match between antenna and stripline.
Changed C702.

REV. G - Systems Board 19D417101 G1 & G2
To improve frequency response.
Changed C3 and C5.

REV. H - To incorporate a new 5.4v regulator module.
Changed A2 and added C25.

REV. F - Case Assembly 19D417103G2&G3
To add newly designed PTT switch.
Added A705.
Changed S701 and knobs.

REV. G - To improve transmitter stability.
Added shield.



MULTI-FREQUENCY MODIFICATIONS

(19D417138, Sh. 1, Rev. 5 Sh. 2, Rev. 3)

The multi-frequency modifications include instructions for adjusting the stop post on multi-frequency switch S1, for adding oscillator modules, for repeating frequencies, and repeating oscillator modules.

1- STOP POST ADJUSTMENT

CAUTION

Due to the small size of the stop posts, be very careful when making adjustments to avoid losing the stops.

1. Remove the multi-frequency switch as directed in the Disassembly Procedure (see Table of Contents in LBI-4709).
2. Turn the shaft fully counterclockwise as viewed from the knob end.
3. Unscrew the panel seal to gain access to the stop post (see Figure 1).
4. Install the stop post in the appropriate hole as shown in the following chart.

NO. OF FREQS	MOVE ADJUSTABLE STOP TO
2	H2
3	H3
4	H4
5	H5

5. Replace the panel seal with the side marked "Bottom" against surface "Z".
6. Re-install the Multifrequency Switch.

2- ADDING OSCILLATOR MODULES

1. After completing the stop post adjustment, connect the leads from multi-frequency switch S1 as shown in the following chart (see Figure 3 for connection points). Tape back all unused leads.

CONNECTION CHART			
FROM	TO	WIRE COLOR	S1 POSITION
S1-C1	H11 (solder)	SFT-BL	
S1-1	J31	SFT-W-BK	1
S1-2	J30	SFT-W-O	2
S1-3	J24	BR	3
S1-4	J25	R	4
S1-5	J26	O	5

2. Place the oscillator module(s) in the proper holes (see Figure 3). Then bend over tabs on the can and solder to the adjacent pads (see Figure 2).
3. Bend the leads of the oscillator module as shown in Figure 2 (or appropriate Outline Diagram) and solder to the adjacent pads.
4. For two or more transmitter frequencies and one receiver frequency, remove the jumper from H7 to H10 and add a sleeved jumper (#26 AWG) from H7 to H13 on the Systems Board.
5. For two or more receiver frequencies and one transmitter frequency, remove the jumper from H8 to H10 and add a sleeved jumper (#26 AWG) from H20 and H21 on the Systems Board.

3- REPEATING FREQUENCIES

For repeating both transmitter and receiver frequencies without adding additional oscillator modules, add a sleeved jumper (#26 AWG) between the frequencies to be repeated. For example, if transmitter and receiver channels 1 and 5 are to be repeated, add the jumper from S1-1 to S1-5.

4- REPEATING OSCILLATOR MODULES

To repeat frequencies for the transmitter only or the receiver only, diodes can be used in place of oscillator modules.

1. Set the stop on S1 and install the oscillator modules whose frequencies are not to be repeated as directed in Section I and II.
2. Install the oscillator(s) whose frequencies are to be repeated as directed above except solder the Number 2 pin to the "E" pad instead of the "P" pad (see Figure 2).
3. For every channel that a frequency is being repeated, assemble a diode (5494922P1) in the space normally intended for the oscillator module by putting the annode lead in the Number 2 hole, bending it over and soldering to the "P" pad. The cathode lead will be terminated later.
4. For each different frequency that is repeated, an additional diode (5494922P1) is to be assembled in respective channel closest to the oscillator module being repeated. Assemble the diode in the Number 1 hole, annode lead down and sleeved, and connect to the associated "E" pad. Then run the jumper from this pad to the "P" pad of related oscillator module.

The cathode end of the diodes should be connected together using mid air connections. Make the connection and run the wire down the side of the diode along the component side of the board to the next diode, and so on until all the diode's cathodes are connected together. Route these wires to give the shortest connections. Now connect a lead to the cathode of the diode that is closest to the repeated oscillator module and run this lead down the side of the diode and through any empty hole or slot to the solder side of the board, and connect the lead to the "E" pad of the oscillator module. Next sleeve the diodes as shown in Figure 4.

EXAMPLE: Channel 3 and 4 to be same as Channel 1.
Channel 5 to be same as Channel 2.

(This example applies Tx Frequencies only).

1. Assemble the oscillator module in Channels 1 and 2 as normal except connect the Number 2 lead to the "E" pad instead of "P" pad.
2. Assemble (1) diode in the Number 2 hole, anode lead down, in each of Channels 3, 4 & 5 and solder to "P" pads.
3. Since two frequencies are being repeated, two additional diodes will be required, one in the Number 1 hole of Channel 3 and the other in the Number 1 hole of Channel 5, anode lead down. Sleeve, bend, and solder leads to the "E" pad. Connect jumper between the "E" pad of the Number 3 Channel and "P" pad of oscillator module Number 1. Connect a jumper between the "E" pad of Number 5 Channel and "P" pad of oscillator module Number 2.
4. Connect the top lead (cathode) of diodes (3) in Channel 3 and 4 to each other by soldering jumper wire to leads, dressing the wire down the side of the diodes and along the board. Connect a jumper from the top of diode in the Number 1 hole of Channel 3 to the "E" pad of oscillator module Number 1. Run the wire down through the board using any available hole or slot to the solder side. Connect the jumper from the diode in Channel Number 5 to oscillator module Number 2 in the same manner.
5. Connect top lead (cathode) of diodes (2) in Channel 5 to each other by soldering jumper wire to lead, dressing wire down the side of the diodes and along the board. Connect jumper from top of diode in #1 hole of Channel 5 to "E" pad of Sicom #2. Run wire down through board using any available hole or slot, to solder side.

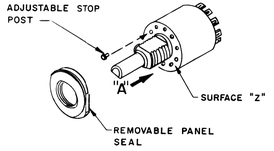


Figure 1 - Stop Post Adjustment

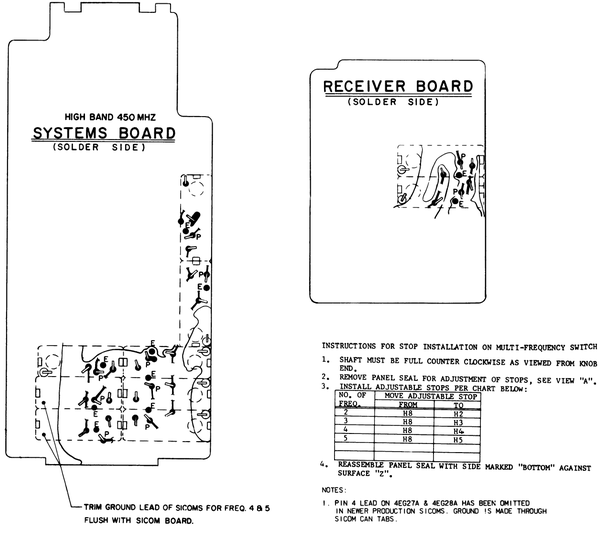


Figure 2 - Oscillator Module and Diode Installation

(19D417138, Sh. 2, Rev. 3)

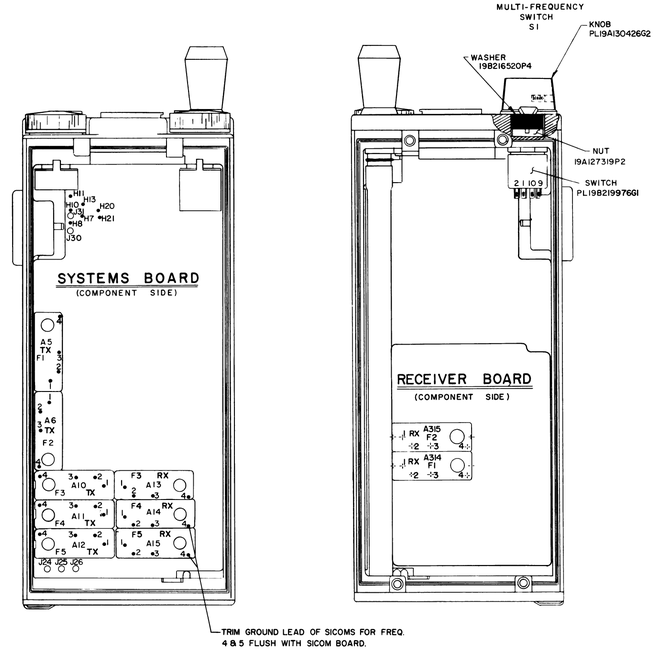


Figure 3 - Oscillator Mounting Positions & S1 Connection Points

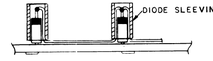


Figure 4 - Typical Diode Mounting

(19D417138, Sh. 1, Rev. 5)