MOBILE RADIO

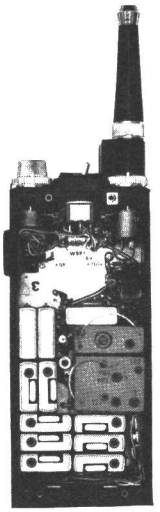
MASTR® Personal Series

PROGRESS LINE

PE MODELS

SYSTEMS BOARD AND CASE ASSEMBLY 19D413548G14

(8-FREQUENCY)



SYSTEM BOARD AND CASE ASSEMBLY 19D413548G14

SPECIFICATIONS *

MODEL NUMBERS	
19D413548G14	30-50 MHz
CONTROLS:	Volume ON-OFF Switch
	Squelch Control
	Eight-Frequency Selector Switch
	PTT Switch
	Tone Option Switch
	Collapsible Antenna

*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

ILLUSTRATIONS

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 A714 provides system interconnections between the transmitter, receiver, tone options, and operating controls in the 30 to 50 MHz, eight-frequency PE Models. The system board contains transmitter oscillator modules A4 through A11, Audio Amplifier Module A1, 5.4 Volt Regulator Module A2, Filter Module A3, optional Compressor Module A50, system relay K1 and 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 antenna and speaker, and J703 provides 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.

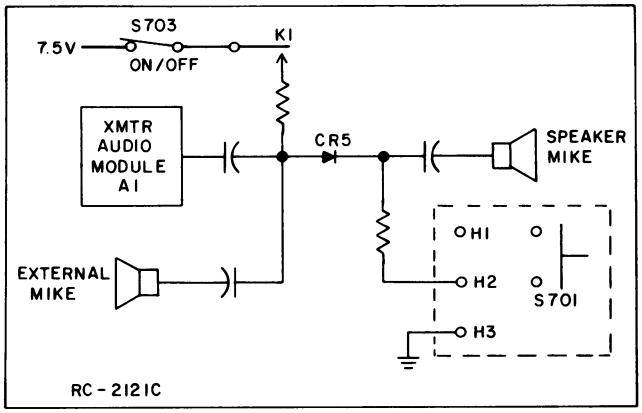


Figure 1 - Audio Switching Circuit

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 (A719)

Solid State PTT switch S701 forward biases diode CR2 to energize relay K1 and key the radio. When S701 is pressed PNP,

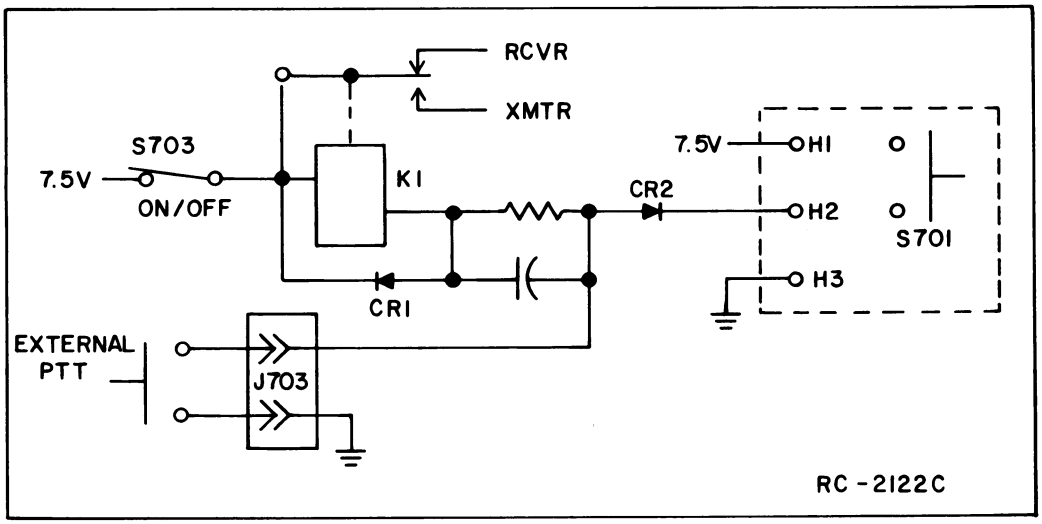


Figure 2 - DC Switching Circuit

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.

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 permits 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.

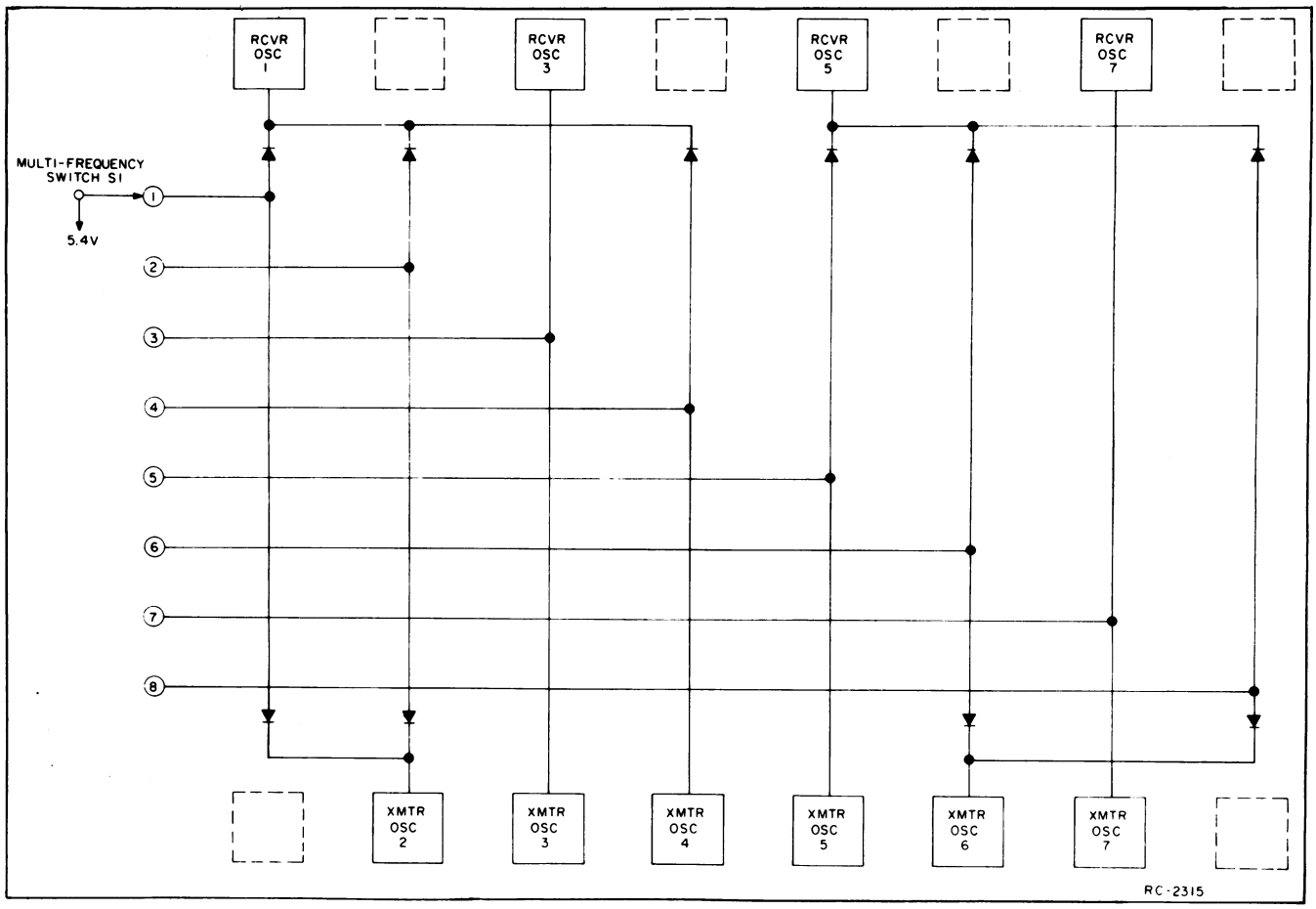
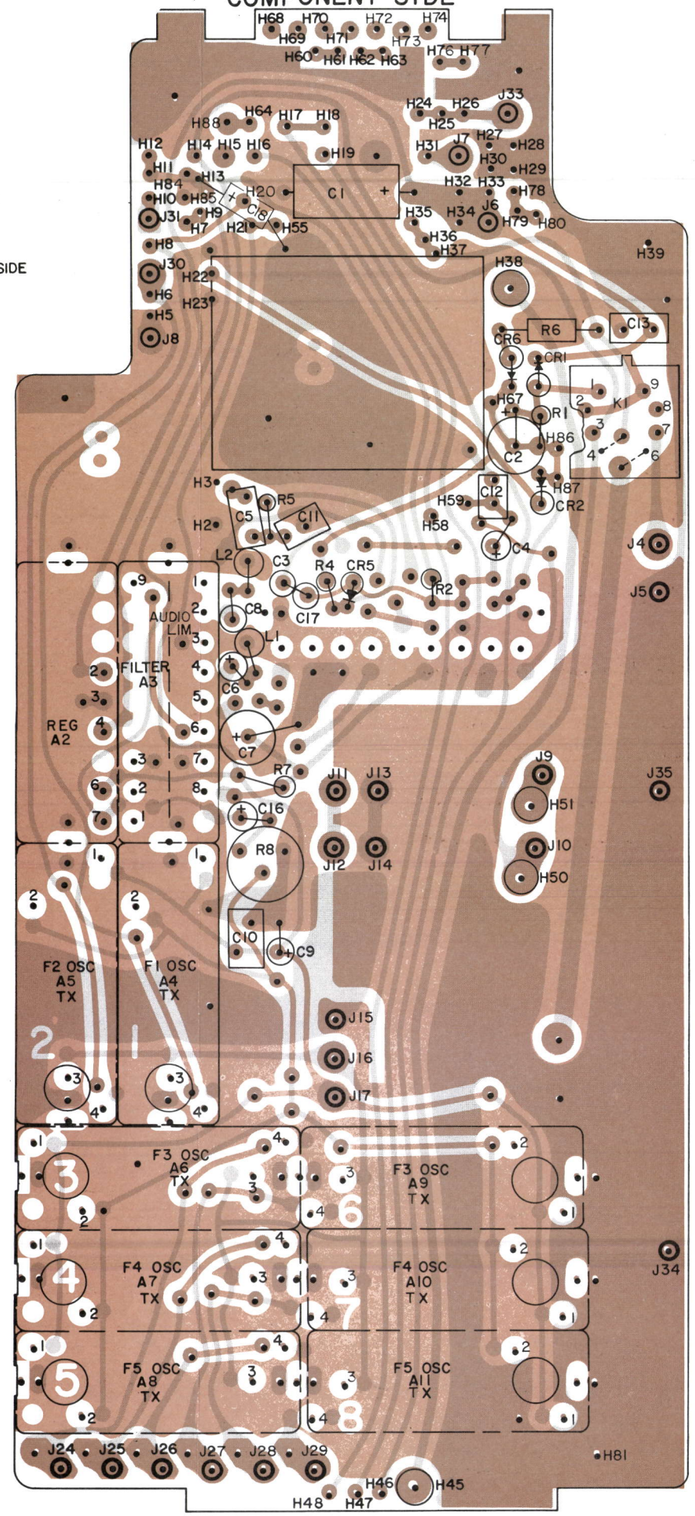


Figure 3 - Repeating Oscillator Modules

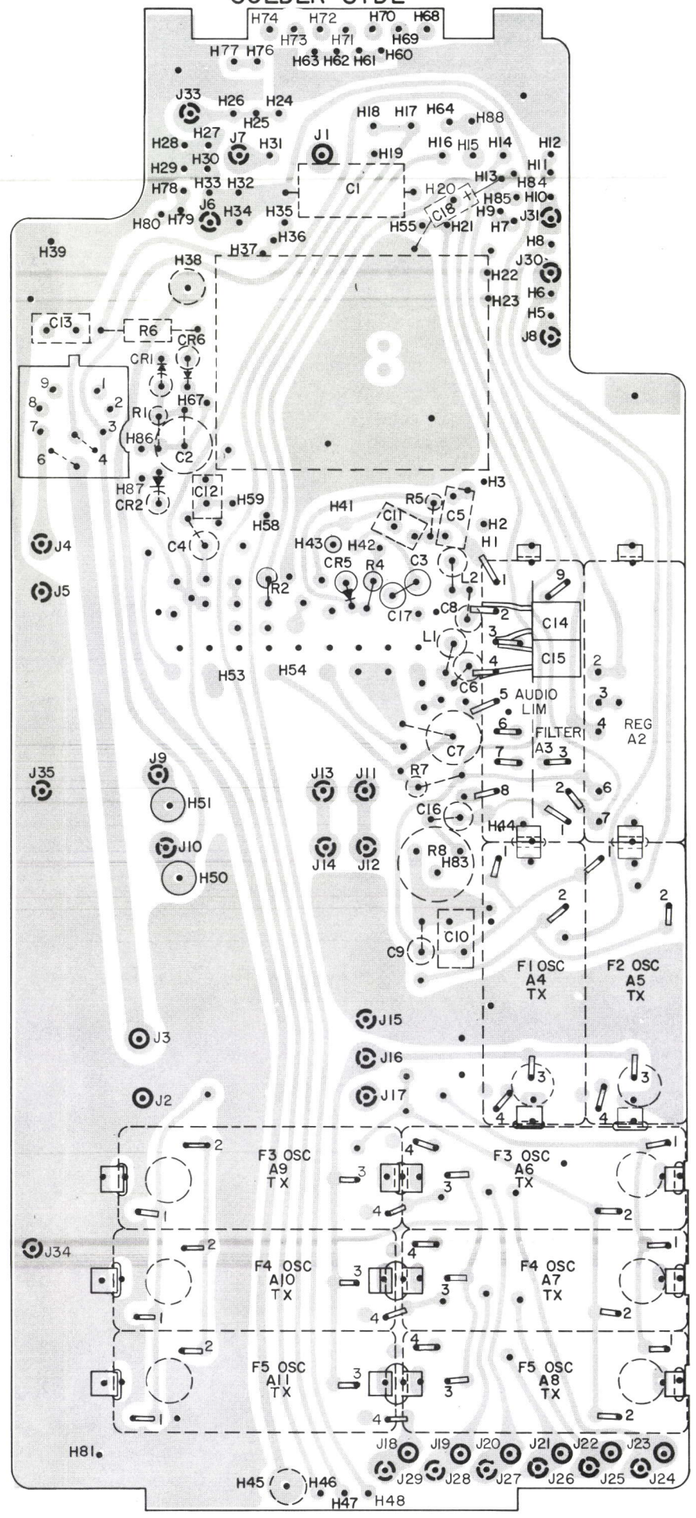
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

COMPONENT SIDE



(19D416966, Sh. 2, Rev. 8)
(19D416966, Sh. 3, Rev. 8)

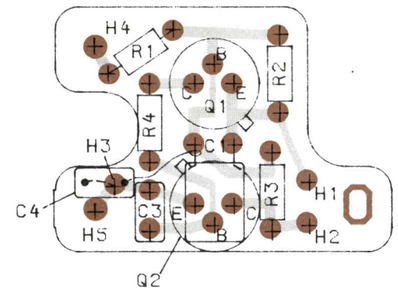
SOLDER SIDE



(19D423011, Rev. 4)

(19D416966, Sh. 2, Rev. 8)

A719



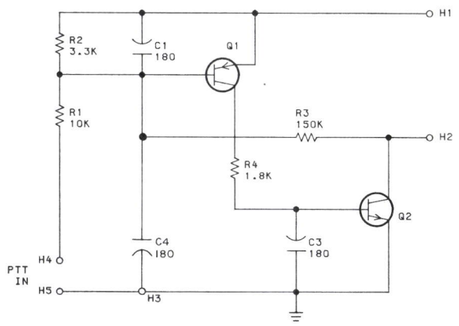
(19B233083, Rev. 2)
(19B232585, Sh. 1, Rev. 0)
(19B232585, Sh. 2, Rev. 0)

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.



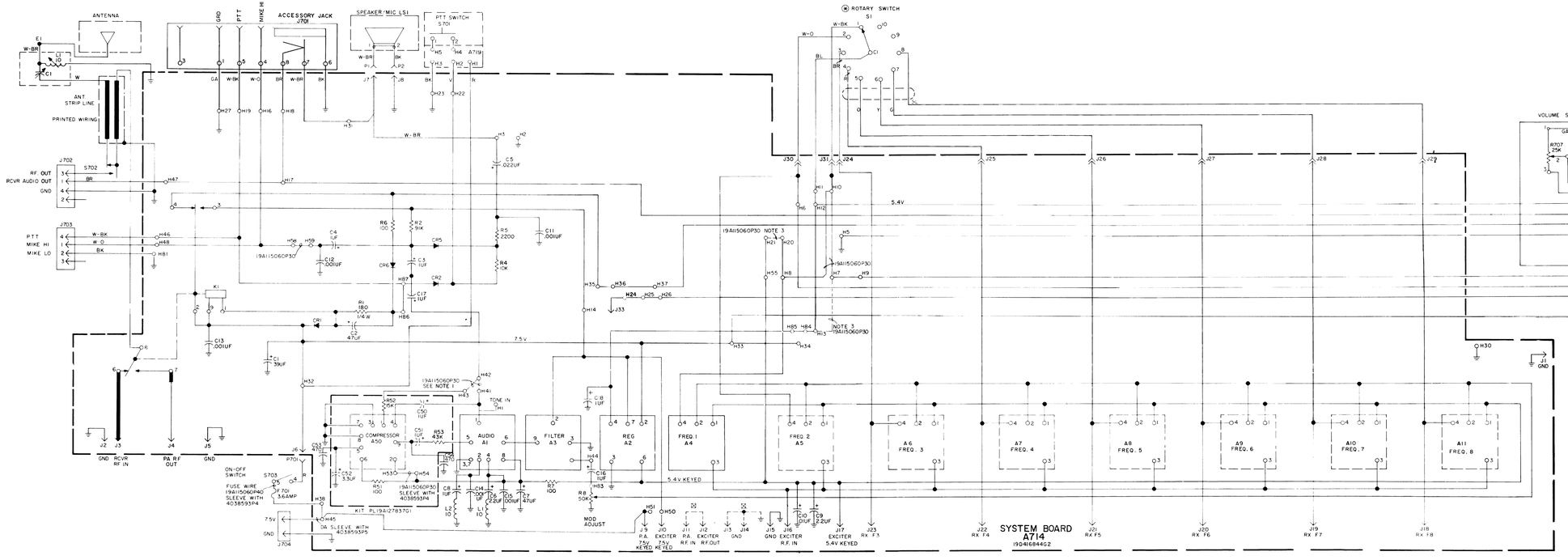
(19B232770, Rev. 3)

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
PLI9B232386G1	A

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

30—50 MHz SYSTEM BOARD



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
PL19D435483G14	E
PL19A127837G1	A
PL19D416844G2	C

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 MICROFARADS (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. CONNECT HOLE 42 TO HOLE 41 WHEN COMPRESSOR ASSY IS NOT USED. CONNECT HOLE 42 TO HOLE 43 WHEN COMPRESSOR ASSY IS USED.
2. DA = #22 AWG.
3. CONNECT HOLE 7 TO HOLE 13 AND REMOVE JUMPER BETWEEN HOLE 7 AND HOLE 10 FOR SINGLE FREQ RX OPERATION. CONNECT HOLE 20 TO HOLE 21 AND REMOVE JUMPER BETWEEN HOLE 8 AND HOLE 10 FOR SINGLE FREQ. TX OPERATION.

*WITHESE ITEMS ARE PART OF SWITCH KIT PL19A192680.

⊠ J11, J12, J13, J14 ARE PART OF LOW POWER MOD. KIT PL19A136967G3.

(198621939, Rev. 12)

SCHEMATIC DIAGRAM

30—50 MHz SYSTEM BOARD

PARTS LIST

LBI4693C

SYSTEM BOARD/CASE ASSEMBLY
19D413548G14
ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
A714		SYSTEM BOARD 19D416844G2 30-50 MHz
A1	19C320354G1	Audio Amplifier and Limiter.
A2*	19C328070G1	Regulator Module. In REV B & earlier:
	19C311900G2	Regulator Module.
A3	19C320345G1	Active Post Limiter Filter. NOTE: When reordering A4-A11 give GE Part No. and exact crystal frequency. Crystal Freq = Operating Freq
A4 thru A11	4E6314A10	Transmitter Oscillator.
		- - - - - - - - - - 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 and C4	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C5	19A116244P2	Ceramic: 0.022 µf ±20%, 50 VDCW.
C6	5491674P8	Tantalum: 2.2 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C7	5491674P42	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 162D.
C8	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C9	5491674P8	Tantalum: 2.2 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C10	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
C11 thru C15	5495323P12	Ceramic: .001 µf +100% -20%, 75 VDCW.
C16	5491674P28	Tantalum: 1.0 µf ±20%, 25 VDCW; sim to Sprague Type 162D.
C17	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C18*	5491674P1	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D. Added by REV C.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 and CR2	19A115100P1	Silicon; sim to Type 1N458A.
CR5	19A115100P1	Silicon; sim to Type 1N458A.
CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - 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 3233-1.
J9* thru J31*	19A116366P4	Contact, electrical: sim to Concord 10-891-1. Earlier than REV A:
	19A116366P1	Contact, electrical: sim to Cambion 3232-01-03.

SYMBOL	GE PART NO.	DESCRIPTION
J32*	19A116366P2	Contact, electrical: sim to Cambion 3233-1, Deleted by REV A.
J33 and J34	19A116366P2	Contact, electrical: sim to Cambion 3233-1.
J35*	19A116366P4	Contact, electrical: sim to Concord 10-891-1. Earlier than REV A:
	19A116366P2	Contact, electrical: sim to Cambion 3232-1.
K1*	19B209562P2	- - - - - - - - - - RELAYS - - - - - - - - - - Relay, hermetic sealed: between 45 - 100 ohms, 2 form C contacts, 5.0 VDC nominal, 1.0 ♥ max operating; sim to GE 3SCS100JA2. In REV A:
	19B209562P1	Relay, hermetic sealed: 98 ohms ±10%, 2 form C contacts, 6.0 VDC nominal, 1.0 ♥ max operating; sim to GE 3SCS100JA2. Added by REV A.
L1 and L2	19B209420P125	- - - - - - - - - - INDUCTORS - - - - - - - - - Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4X.
R1*	3B152P181J	- - - - - - - - - - RESISTORS - - - - - - - - - - Composition: 180 ohms ±5%, 1/4 w. In REV A:
	3B152P221J	Composition: 220 ohms ±5%, 1/8 w. Earlier than REV A:
	3B151P391J	Composition: 390 ohms ±5%, 1/8 w.
R2	3B151P913J	Composition: 91K ohms ±5%, 1/8 w.
R4	3B151P103J	Composition: 10K ohms ±5%, 1/8 w.
R5	3B151P222J	Composition: 2.2K ohms ±5%, 1/8 w.
R6 and R7	3B151P101K	Composition: 100 ohms ±10%, 1/8 w.
R8	19A116412P9	Variable, cermet: 500 ohms ±10%, 1/2 w; sim to Bellpot Model 82 PY.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XK1*	19A115834P5	Contact, electrical: sim to AMP 4-331272-3. (Quantity 7). Deleted by REV A.
A719*		PUSH TO TALK SWITCH BOARD 19B232586G2 (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 - - - - - - - - - - 19B232586G2
Q1	19A129187P1	Silicon, PNP.
Q2	19A116201P3	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R5	3B151P682J	Composition: 6.8K ohms ±5%, 1/8 w.
R6	3B151P182J	Composition: 1.8K ohms ±5%, 1/8 w.
R7	3B151P102J	Composition: 1K ohms ±5%, 1/8 w.
R8	3B151P154J	Composition: 150K ohms ±5%, 1/8 w.
R9	3B151P122J	Composition: 1.2K ohms ±5%, 1/8 w.
A719*		PUSH TO TALK SWITCH BOARD 19B232586G1 (Added by REV E) (Deleted by REV F)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C3 and C4	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A129187P1	Silicon, PNP.
Q2	19A116201P3	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3B151P103J	Composition: 10K ohms ±5%, 1/8 w.
R2	3B151P332J	Composition: 3.3K ohms ±5%, 1/8 w.
R3	3B151P154J	Composition: 150K ohms ±5%, 1/8 w.
R4	3B151P182J	Composition: 1.8K ohms ±5%, 1/8 w.
		- - - - - - - - - - FUSES - - - - - - - - - -
F701	19A127884G1	Fuse Kit.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J701	19B216594G2	Connector, female: 6 contacts.
J702		See Mechanical Parts RC2598 items 14, 16.
J703		See Mechanical Parts RC2598 item 14.
J704		See Mechanical Parts RC2598 item 53-55, 75, 76.
		- - - - - - - - - - RELAYS - - - - - - - - - -
K1*	19A127836G1	Sensitive: 95 ohms ±10%, 2 form C contacts, 9.3 to 9.9 VDC (over the temp range indicated); sim to C.P. Clare MF1401G01. Deleted by REV B.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P701	19A115834P4	Contact, electrical: sim to AMP 2-332070-0.
P704 thru P705	19A127569G1	Plug: 8 contacts.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R707	19A116227P1	Resistor/Switch: variable, carbon file, 25K ohms ±20%, 1/6 w, (S701), SPST, 3 amp at 125 VAC.
R708	19A116227P2	Variable, carbon file: 25K ohms ±20%, 1/6 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S701		See Mechanical Parts RC2598, items 35-41.
S702		See Mechanical Parts RC2598, items 42-49.
S703		(Part of S707).
		ASSOCIATED ASSEMBLIES
		FRONT COVER ASSEMBLY 19C317416G2 (STANDARD) 19C317416G6 (HI-POWER)
		- - - - - - - - - - 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 2-332070-0.
		COMPRESSOR KIT 19A127837G1
A50	19C311907G2	Audio Compressor Module.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C50 and C51	5491674P1	Tantalum: 1.0 µf +40 -20%, 10 VDCW; sim to Sprague Type 162D.
C52	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C53 and C54	19A116192P2	Ceramic: 470 pf ±20%, 50 VDCW; sim to Erie 811I-A050-W5R-471M.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R50	3B151P103J	Composition: 10K ohms ±5%, 1/8 w.
R51	3B151P101J	Composition: 100 ohms ±5%, 1/8 w.
R52	3B151P153J	Composition: 15K ohms ±5%, 1/8 w.
R53	3B151P433J	Composition: 43K ohms ±5%, 1/8 w.
		MULTI-FREQUENCY MODIFICATION KIT 19A129268G1
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B319515G1	Rotary: 1 section, 1 pole, (adjustable 2 to 10 positions), non-shorting; sim to Grayhill Co. 50WY23150-1-8N.
	5494922P1	Diode, silicon. (Used for repeated frequencies only).
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19B216897G3	Rear Cover Assembly. (See RC2598, items 59, 60).
	19B216897G4	Rear Cover Assembly. Clip type. (See RC2598, items 59, 61).
	19B319768G1	Antenna Assembly. (See RC-2598, items 7, 21-24).
	19D413522G1	Battery, rechargeable. Nickel Cadmium.
	19A127884G1	Fuse Kit.
	4038831P4	Alignment tool. Fork tip.
	19B219079G1	Alignment tool. Allen tip.
		LOADING COIL ASSEMBLY 19C320365G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116462P3	Variable: less than 2 pf to more than 20 pf, 100 VDCW, -320 PPM/°C.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19B219759G1	Coil. Includes:
	19B209436P1	Tuning slug.
		MECHANICAL PARTS (SEE RC2598)
1	19A134425P1	Machine screw, hex head: No. 2-56-2 x 3/16.
2	19C317394P4	Gasket.
3	19B209452T P2	Diaphragm: No. 2 inches dia.
4	9S81P5002C6	Screw, phillips head: No. 2-56 x 1/8.
5	19A127319P1	Nut: No. 1/4-32.
6	4037004P18	Washer, non-metallic.
7	8708P7005C6	Set screw: No. 3-48 x 3/16.
8	19B232784G1	Knob assembly.
9	19B219768G1	Antenna assembly. (Includes items 21-24, 77).
10	19D413531P2	Grille. (Standard).
	19B226502P2	Grille. (Hi-Power).
11	NP27029P2	Nameplate (GE monogram - Standard).
	NP27029P3	Nameplate (GE monogram - Hi-Power).
12	19D413543G4	Case assembly. (Includes item 14, 15, 19, 35-41, 50, 51).
13	19B216858P1	Insert.
14	19A127753P1	Contact (Part of J702 and J703).
15	19A134548P1	Insert, screw thread: 2-56; sim to Tridair Ind. SPG256BZ-SX.
16	19B216862P2	Contact (Part of J702).
17	19A127779G5	Antenna tube and insert.
18	19A116834P1	Solderless terminal.
19	19B216875P1	Support.
20	19C320365G1	Loading Coil Assembly. (Includes items 25-27).
21	19C320383P3	Antenna rod (Part of item 9).
22	19C320352P1	Bushing (Part of item 9).
23	19A129644P1	Antenna Cap (Part of item 9).

SYMBOL	GE PART NO.	DESCRIPTION
24	19B219770G1	Nut, spacer: thd size No. 7/16 x 40. (Part of item 9).
25	19A116869P1	Tap screw, phillips: No. 2-32 x 1/4.
26	19C320359P1	Cover.
27	19A129539P1	Gasket.
28	19C311050P1	Protective Cover.
29	19A129399P1	Disc. (Located inside item 28).
30	19A130429G2	Knob assembly.
31	N70P703C6	Set screw: No. 3-48 x 3/16.
32	19B218540P1	Support.
33	19B216520P4	Washer, non-metallic.
34	19A127319P2	Nut: No. 1/4-28.
35	N41P1006	Machine screw, steel: No. 0-80 x 3/8. (Part of S701).
36	19C328418G1	Button assembly. (Part of S701).
37	19C328407P1	Collar (Part of S701).
38	19A137621P1	Plate. (Part of S701).
39	19A137620P1	Spring. (Part of S701).
40	N207P1C6	Hex nut, brass: thd. size No. 0-80. (Part of S701).
41	19B209643P2	Push switch: sim to Bowmar KB Series. (Part of S701).
42	19B216865P1	Insulator (Part of S702).
43	N847P5004C	Cap screw: 2-56 x 1/4. (Part of S702).
44	19B216864P1	Contact (Part of S702).
45	19B216863P1	Spring contact. (Part of S702).
46	N910P6C6	Retaining ring. (Part of S702).
47	19A127754P1	Gasket (Part of S702).
48	19A127755P1	Spring (Part of S702).
49	19B216862P1	Contact (Part of S702).
50	X330P605F22	Eyelet, brass: 1/16 x 5/32.
51	X330P602F22	Eyelet, brass: 1/16 x 1/16.
52	19A127762P1	Bushing.
53	19B216891G1	Spring assembly. (Part of J704).
54	19D413467P1	Fastener (Part of J704).
55	19A115794P3	Flat head screw: brass, 2-56 x 5/16. (Part of J704).
56	19B219799P1	Insulator.
57	19A115834P5	Contact, electrical. (Not Used).
58	19C311491P3	Can. (Used with A1-A3).
59	19C317394P6	Gasket.
60	19B216897G3	Rear Cover Assembly (without clip).
61	19B216897G4	Rear Cover Assembly (with clip).
62	19A130397P1	Strap.
63		(Not Used).
64	19A130993P1	Gasket.
65	19A137254P1	Insert, tapped.
66	4033630P1	Washer: teflon.
67		(Not Used).
68	19A127802P1	Rivet, shield.
69	19A116773P805	Tap screw, Phillips POZIDRIV®: No. 4-24 x 5/16.
70	19A115983P10	Seal.
71	19C317383P1	Dummy plug.
72	N509P606C	Pin.
73	19A115983P3	Gasket.
74		(Not Used).
75	19A130586P1	Insulator.
76	19B232109P1	Button plug.
77	N70P703C6	Set screw: No. 3-48 x 3/16.
78	FEB 757	Switch assembly, push to talk. (Includes items 35-41 unassembled).

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 - Compressor Kit 19A127837G1
Incorporated into initial shipment.

REV. A - System Board and Case Assembly 19D413548G14
To update drawings to vendor change to accessory jack J701. Changed J701 Module Layout Diagram in the Combination Maintenance Manual.

REV. B - To make compatible with more options. Changed K1 and runs on printed wire board.

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

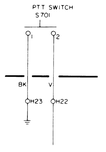
REV. D - To incorporate metal nuts to PTT mounting screws. Added nuts.

REV. A - System Board 19D416844G2
To make compatible with more options. Changed K1 and runs on printed wire board.

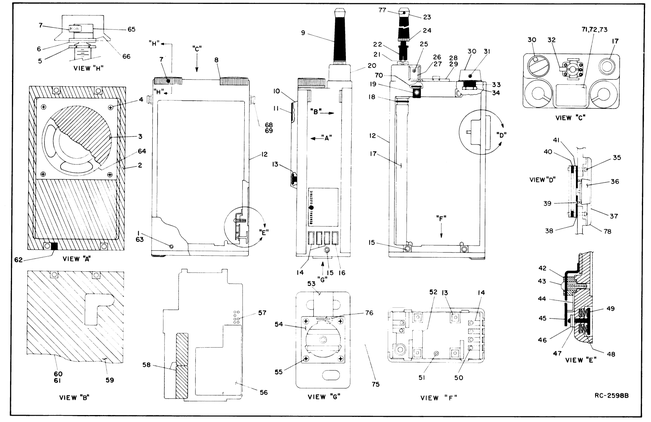
REV. B - To improve relay pick-up. Changed K1 and R1.

REV. C - To incorporate a new 5.4V regulator module. Changed A2. Added C18.

REV. E - System Board and Case Assembly 19D413548G14
To improve reliability and change knobs.
Added PTT switch A719. Changed S701 and changed knobs.
Schematic Diagram ###



REV. A - PTT Switch 19D413548G1
To improve RF filtering. Added C4.



*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

MULTI-FREQUENCY MODIFICATIONS

(19D416567, Sh. 3, Rev. 3 & Sh. 4, Rev. 2)

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 (Refer to LBI-4640)
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 ADJUSTMENT STOP TO:
2	H2
3	H3
4	H4
5	H5
6	H6
7	H7
8	H8

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)	BL	
S1-1	J31	W-BK	1
S1-2	J30	W-O	2
S1-3	J24	B	3
S1-4	J25	R	4
S1-5	J26	O	5
S1-6	J27	Y	6
S1-7	J28	G	7
S1-8	J29	BL	8

2. Place the oscillator module(s) in the proper holes (see Figure 2). 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 4 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 4 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 3 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 and 6 to be same as Cahnnel 2. } Tx

1. Assemble the oscillator module in Channels 1 and 2 as normal except connect the Number 4 lead to the "E" pad instead of "P" pad.
2. Assemble (1) diode in the Number 4 hole, anode lead down, in each of Channels 3, 4, 5, & 6 and solder to "P" pads.
3. Since two frequencies are being repeated, two additional diodes will be required, one in the Number 3 hole of Channel 3 and the other in the Number 3 hole of Channel 5. 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.

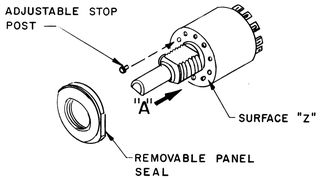
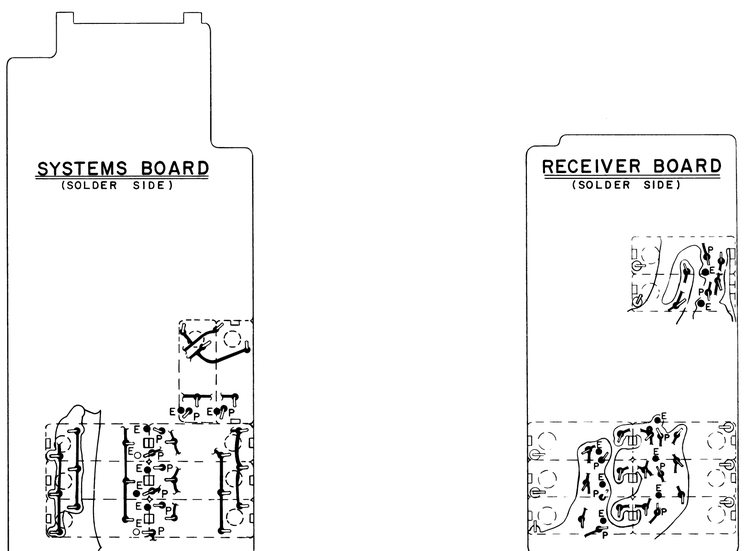
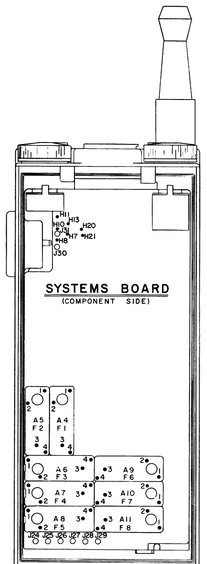


Figure 1 - Stop Post Adjustment



(19D416567, Sh. 4, Rev. 2)

Figure 2 - Oscillator Module and Diode Installation



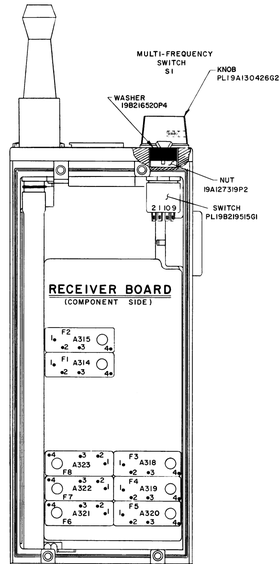


Figure 3 - Oscillator Mounting Positions & S1 Connection Points

(19D416567, Sh. 3, Rev. 3)

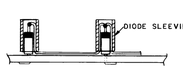


Figure 4 - Typical Diode Mounting