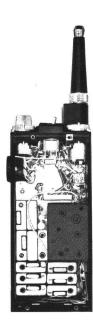


MASTR® Personal Series

PROGRESS LINE

PE MODELS SYSTEMS BOARD AND CASE ASSEMBLY 19D423294G2



SPECIFICATIONS *

MODEL NUMBERS

19D423294G2

CONTROLS:

66-88 MHz

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.

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- 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 provides system interconnections between the transmitter, receiver, tone options and operating controls in the 66 to 88 MHz, eight-frequency PE Models. The system board contains transmitter oscillator modules A5 through A12, audio amplifier module A1, 5.4 volt regulator module A2, compensator module A3, modulator module A4, 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.

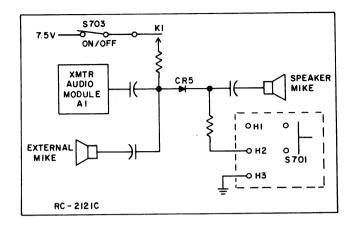


Figure 1 - Audio Switching Circuit

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 (A704)

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

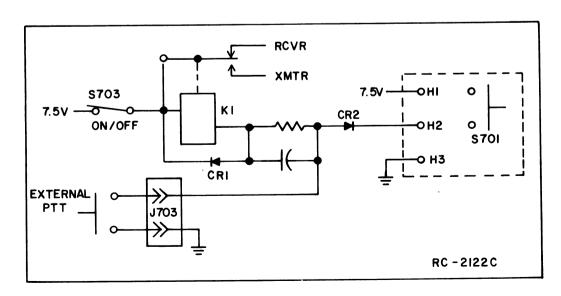


Figure 2 - DC Switching Circuit

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 multifrequency 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.

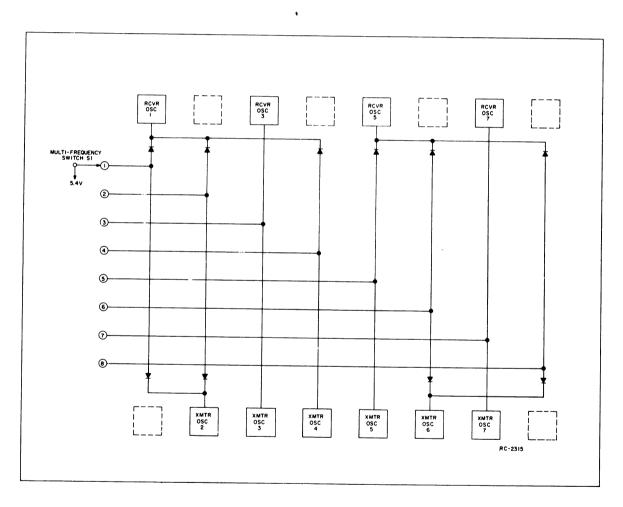


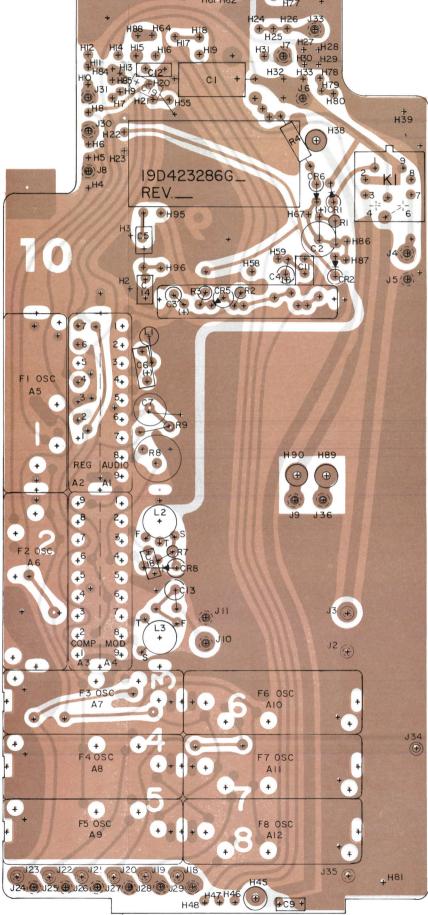
Figure 3 - Repeating Oscillator Modules

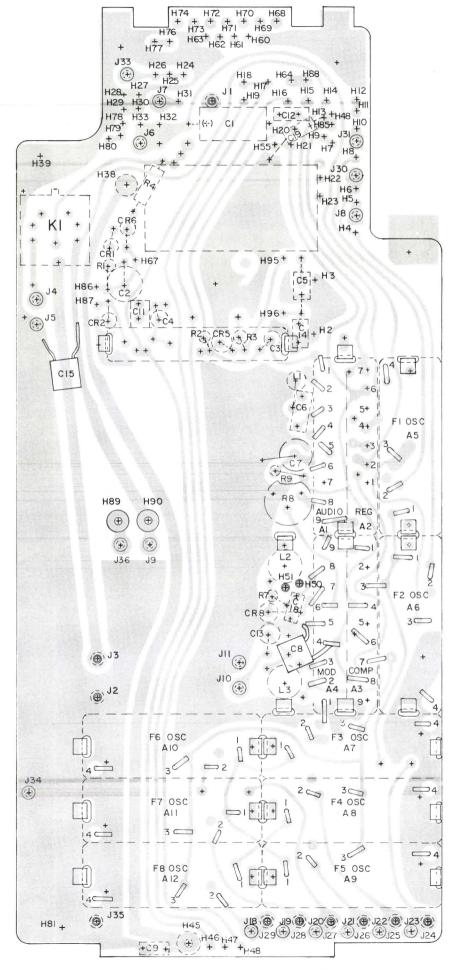
COMPONENT SIDE

SOLDER SIDE

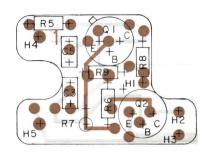
RUNS ON SOLDER SIDE RUNS ON BOTH SIDES RUNS ON COMPONENT SIDE

LBI30190





A 704



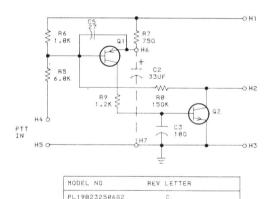
LEAD IDENTIFICATION FOR QI AND Q2



IN-LINE OR TRIANGULAR TOP VIEW

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

(19B233296, Rev. 3) (19B232970, Sh. 1, Rev. 1) (19B232970, Sh. 2, Rev. 2)



NOTE: C2 IS PART OF KIT 19A136579

ALL RESISTORS ARE 1/8 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K-1000 OHMS OR ME6-1,000,000 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.

(19B232959, Rev. 4)

OUTLINE DIAGRAM

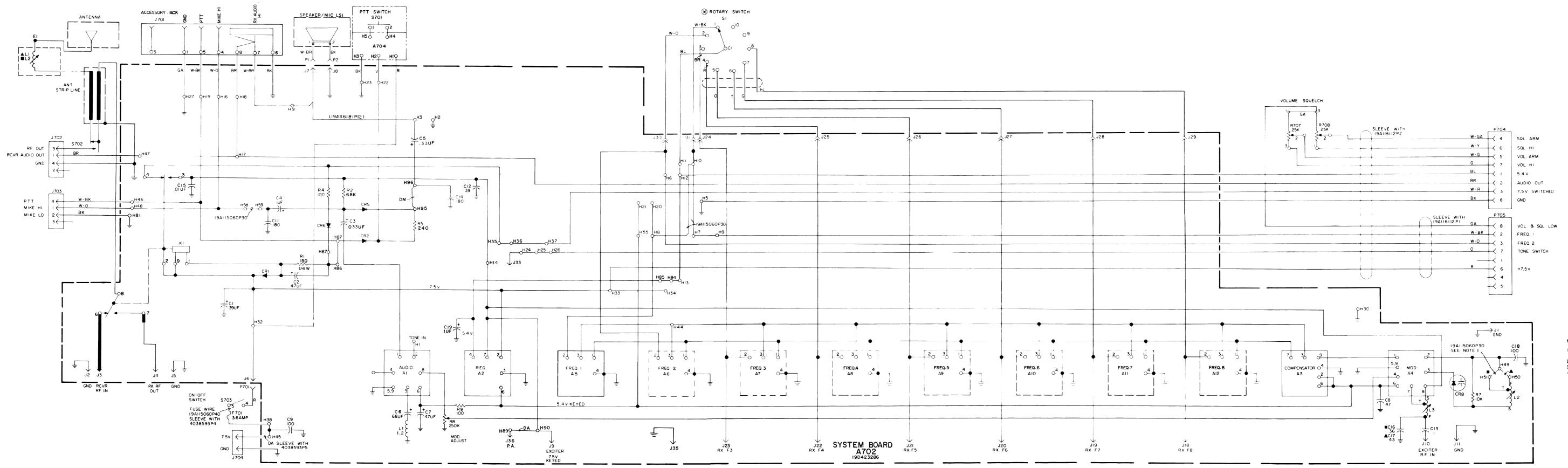
66-88 MHz SYSTEM BOARD

Issue 2

(19D416614, Sh. 2, Rev. 9) (19D416614, Sh. 3, Rev. 10)

(19D416614, Sh. 2, Rev. 9)

(19D424125, Rev. 4)



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 PL19D423286G2 PL19D423294G2

ALL RESISTORS ARE 1/8 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K:1000 OHMS ON 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

- I. ▲USED IN LOW SPLIT 66-75 MHZ
 ■USED IN MID SPLIT 75-87 MHZ
- 2. DA = #22 AWG
- 3. STHESE ITEMS ARE PART OF KIT PLISAI29268GI 4. ALL WIRES TO BE T28 UNLESS OTHERWISE SPECIFIED.
- 5. GROUND MAY BE THROUGH CAN ONLY ON SICOM'S.

SCHEMATIC DIAGRAM

66-88 MHz SYSTEM BOARD

PARTS LIST LBI30191A

SYSTEM BOARD/CASE ASSEMBLY 19D423294G2 AND ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
A702		SYSTEM BOARD 19D42328662
Al	19C320062G1	Transmitter Audio Module.
A2*	19C328070G1	Regulator Module.
		In REV D & earlier:
	19C311905G2	Regulator Module.
A3	19C320060G1	Oscillator Compensator Module.
A4	19C320084G1	Modulator Module.
Cl	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 T376B333K035AS.
		In REV B:
	5491674P49	Tantalum: 0.068 μf ±10%, 20 VDCW; sim to Sprague
		162D. In REV A & earlier:
	5491674Pl	Tantalum: 1.0 μf +40-20%, 10 VDCW; sim to Sprague Type 162D.
C4	5491674Pl	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 T376B334K020AS.
		In REV B:
	5491674P48	Tantalum: 0.68 μ f $\pm 10\%$, 10 VDCW; sim to Sprague Type $\bf 162D$.
		In REV A & earlier:
	19A116244P2	Ceramic: $0.022 \mu f \pm 20\%$, 50 VDCW.
C6	19C307102P19	Tantalum: 68 μf ±20%, 4 VDCW.
C7	5491674P42	Tantalum: 47 μ f $\pm 20\%$, 6 VDCW; sim to Sprague Type 162D.
C8	19A116114P7053	Ceramic: 47 pf ±5%, 100 VDCW; temp coef -750 PPM
С9	19A116114P7065	Ceramic: 100 pf ±5%, 100 VDCW; temp coef -750 PP
C11	19All6ll4Pl0073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C12	19A116114P2049	Ceramic: 39 pf ±10%, 100 VDCW; temp coef -80 PPM
C13	5491601P120	Phenolic: 1.0 pf ±5%, 500 VDCW.
C14	19A116114P10073	Ceramic: 180 pf $\pm 10\%$, 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*	5491674Pl	Tantalum: 1.0 µf +40-20%, 10 VDCW; sim to Sprague Type 162D. Added by REV E.
		DIODES AND RECTIFIERS
CR1	19A115250Pl	Silicon, fast recovery, 225 mA, 50 PIV.
CR2	5494922P1	Silicon; sim to Type 1N456.

SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION
CR5	5494922P1	Silicon; sim to Type lN456.			TRANSISTORS			ASSOCIATED ASSEMBLIES
CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.	Q1	19A129187P1	Silicon, PNP.			NOTE: When reordering A5 and A6, give GE Part
CR8	5495769P9	Diode, silicon.	Q2	19A116201P3	Silicon, NPN.			Number and exact crystal frequency. Crystal Freq = Operating Freq.
•		JACKS AND RECEPTACLES			RESISTORS	A5	4EG27A13	Transmitter Oscillator.
J1 thru J5	19A116366P4	Contact, electrical: sim to Concord 10-891-1.	R1	3R151P103J	Composition: 10K ohms ±5%, 1/8 w.	thru Al2		
J6	19A116366P2	Contact, electrical: sim to Cambion 3233-1.	R2 R3	3R151P332J 3R151P154J	Composition: 3.3K ohms ±5%, 1/8 w. Composition: 150K ohms ±5%, 1/8 w.			
thru J8		,	R4	3R151P182J	Composition: 1.K ohms ±5%, 1/8 w.			FRONT COVER ASSEMBLY 19C317416G2
J9 thru	19A116366P4	Contact, electrical: sim to Concord 10-891-1.						
JII			A704*		PUSH TO TALK SWITCH BOARD 19B232586G2 (Added by REV C)	LS1	19A116090P1	Permanent magnet: 2.00 inch, 8 ohms ±10% voice coil imp, 450 Hz ±112 Hz resonant; freq range
J18 thru	19Al16366P4	Contact, electrical: sim to Concord 10-891-1.						coll imp, 450 Hz fill Hz resonant; freq range 400 to 3000 Hz.
J31	19All6366P2	Contact, electrical: sim to Cambion 3233-1.						
and J34	194110306P2	Contact, electrical. Sim to Campion 5255-1.	C1*	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM. Deleted by REV A.	P1	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.
J35	19A116366P4	Contact, electrical: sim to Concord 10-891-1.	сз	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.	and P2		
and J36			C5*	19A116114P2044	Ceramic: 27 pf ±50%, 100 VDCW; temp coef -80 PPM.			MULTI-FREQUENCY KIT
		RELAYS			Added by REV B.			19A129268G1
K1	19B209562P2	Relay, hermetic sealed: 45 to 100 ohms 2 form C contacts, 5.0 VDC nominal, 1.0 w max operating;			TRANSISTORS			
		sim to GE 3SCS1002A2.	Q1	19A129187P1	Silicon, PNP.	S1	19B219515G1	Rotary: 1 section, 1 pole, (adjustable 2 to 10 positions), non-shorting; sim to Grayhill Co.
			Q2	19A116201P3	Silicon, NPN.			50MY23155-1-8N.
L1*	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.			RESISTORS	İ		HI/LOW SPLIT MODIFICATION KIT 19A130604G1 66-76 MHz
		In REV C & earlier:	R5	3R151P682J	Composition: 6.8K ohms ±5%, 1/8 w.			19A130604G2 75-88 MHz
	19B209420P125	Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4K.	R6 R7*	3R151P182J 3R151P751J	Composition: 1.8K ohms ±5%, 1/8 w. Composition: 750 ohms ±5%, 1/8 w.			
			R/*	3R131P7313	Earlier than REV A:	C16	19A116114P2048	Ceramic: 36 pf ±5%, 100 VDCW; temp coef -80 PPM.
				3R151P102J	Composition: 1K ohms ±5%, 1/8 w.	C17	19Al16114P2051	Ceramic: 43 pf ±5%, 100 VDCW; temp coef -80 PPM.
		·						
L2	19A127798G1	Coil. Includes:			1			
	19B209436P1	Tuning slug.	R8	3R151P154J	Composition: 150K ohms ±5%, 1/8 w.			ANTENNA LOADING COIL KIT 19A130904G3 LOW SPLIT
L3	19B216910G1	Coil. Includes:	R9	3R151P122J	Composition: 1.2K ohms ±5%, 1/8 w.			19A130904G4 MID SPLIT
	19B209436P1	Tuning slug.						
		RESISTORS	F701	19A127884G1	Fuse Kit.	L1	19B227191G1	Coil. Includes:
R1	3R152P181J	Composition: 180 ohms ±5%, 1/4 w.			JACKS AND RECEPTACLES		19B209436P1	Tuning slug.
R2*	3R151P683J	Composition: 68K ohms ±5%, 1/8 w.	J701	19B216594G2	Connector, female: 6 contacts.	L2	19B227191G2	Coil. Includes:
		In REV A & earlier:	J702		See Mechanical Parts RC3012 items 20, 22.		19B209436P1	Tuning slug.
] _{P4}	3R151P913J 3R151P101K	Composition: 91K ohms ±5%, 1/8 w. Composition: 100 ohms ±10%, 1/8 w.	J703		See Mechanical Parts RC3012 items 20, 59, 60.	ļ		MISCELLANEOUS
R4 R5*	3R151P101K 3R151P241J	Composition: 100 onms ±10%, 1/8 w. Composition: 240 ohms ±5%, 1/8 w.	J704		See Mechanical Parts RC3012 items 61-65.		19B219768G1	Antenna Assembly. (Includes items 27-31).
		In REV A & earlier:					19D413522G4 19A127884G1	Battery, rechargeable. Nickel Cadmium. Fuse Kit.
	3R151P103J	Composition: 10K ohms ±5%, 1/8 w.	P701	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.		4038831P4	Alignment Tool. Fork tip.
R6*	3R151P222J	Composition: 2.2K ohms ±5%, 1/8 w. Deleted by REV B.	P704 and	19A127569P1	Plug: 8 contacts.		19B219079G1	Alignment Tool. Allen tip.
R7	3R151P103J	Composition: 10K ohms ±5%, 1/8 w.	P705		RESISTORS		19B219442P1	Antenna Strip Line.
R8	19A116412P4	Variable, cermet: 2.5K ohms ±10%; sim to Helipot Model 62 PR250K.	R707	19A116227Pl	Resistor/Switch: variable, carbon film, 25K ohms ±20%, 1/8 w, (Includes S703), SPST, 3 amp at			MECHANICAL PARTS (RC3013)
R9	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.	R708	19A116227P2	125 VAC. Variable, carbon film: 25K ohms ±20%, 1/8 w.			
A704*		PUSH TO TALK SWITCH BOARD	R108	13011022172		1 2	19A130397P1 N4)4P8P	Ground Strap. (Used on front & rear covers). Lockwasher, internal tooth: No. 2. (Not Used).
		19B232586G1 (Added by REV B, Deleted by REV C)				3	19A134425P1	Machine screw, hex head: No. 2-56 x 3/16.
		CAPACITORS	S701		See Mechanical Parts RC3012 items 42-49.	4	19C317394P4	Gasket.
C1	19All6ll4Pl0073	Ceramic: 180 pf ±10½, 100 VDCW; temp coef	\$7C2 \$703		See Mechanical Parts RC3012 items 50-57. (Part of R707).	5	198204527P2	Diaphragm: No. 2 inches dia.
		-3300 РРМ.	3103		(rate of Rivi).	6	N681P5002C6	Screw, phillips head: No. 2-56 x 1/8.
СЗ	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.				7	19A127319P1	Nut: No. 1/4-32.
C4*	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM. Added by REV A.				8	4037064P18	Washer, non-metallic.
		-3300 PPM. Added by MEV A.	1			9	N70BP703C6	Set screw: No. 3-48 x 3/16.

					_	
MBOL	GE PART NO.	DESCRIPTION		SYMBOL	GE PART NO.	DESCRIPTION
		ASSOCIATED ASSEMBLIES		11	4035630Pl	Washer: teflon.
		NOTE: When reordering A5 and A6, give GE Part	$\ \ $	12	19B232784G1	Knob. (Includes items 9, 10).
		Number and exact crystal frequency. Crystal Freq = Operating Freq.	$\ \ $	13	19B219768G1	Antenna assembly. (Includes items 27-31
		6	Ш	14	19D413531P2	Grille.
5 hru	4EG27A13	Transmitter Oscillator.	П	15	NP270290P2	Nameplate. (GE monogram).
12				16	19A127802P1	Rivet.

N70BP703C6 19A137254P1

SYMBOL GE PART NO.		DESCRIPTION			
11	4035630P1	Washer: teflon.			
12	19B232784G1	Knob. (Includes items 9, 10).			
13	19B219768G1	Antenna assembly. (Includes items 27-31).			
14	19D413531P2	Grille.			

19D413542G14

19B216858P1

19A127753P1

19A116719P1

19B216862P2

19A127779G5

19A116854P1 19B216875P1

19A130904G3

19A130904G4

19C320383P3 19C320352P1

N70P703C6

19A129649Pl

19B219770G1

19A116869Pl

19C320359P1

19A129559P1 19C317050P1

19A129390P1

19A130517P1

19A130426G2

19B216520P4

19A127319P2

19B219540P1

19C328416G1

19C328407P1

19A137621P1

19A137620P1

19B209643P2

19A127755Pl

19A127754P1

19B216863P1

19B216864Pl

19B216865P1

FEB 757

N55P1006

19All6773P805 Tap screw, Phillips POZIDRIV®: No. 4-24 x 5/16.

Antenna rod. (Part of item 13).

Antenna Cap. (Part of item 13).

Disc. (Located inside item 28).

Nut: thd. size No. 1/4-28.

Button. (Part of \$701).

Collar. (Part of S701).

Plate. (Part of S701).

Spring. (Part of S701).

Spring. (Part of S701).

Push switch. (Part of S701).

Contact. (Part of S702).

Spring. (Part of S702).

Gasket. (Part of S702).

Contact. (Part of S702).

Insulator. (Part of S702).

Retaining ring. (Part of S702).

Spring contact. (Part of S702).

Cap screw: No. 2-56 x 1/4. (Part of S702).

Knob assembly. (Includes items 8, 37).

Machine screw: No. 0-80 & 3/8. (Part of S701).

Switch Assembly: Push to talk. (Includes items 42-44, 46-49).

Tap screw, phillips: No. 2-32 x 1/4.

Bushing. (Part of item 13).

Loading Coil Assembly, Mid-Split. (Includes item: 32-34).

Set screw: No. 3-48 x 3/16. (Part of item 13).

Nut, spacer: thd. size No. 7/16 x 40. (Part of item 13).

DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION
Washer: teflon. Knob. (Includes items 9, 10).	58 59	N330P605F22 19A127760P1	Eyelet, brass: 1/16 x 5/32. (Not Used).
Antenna assembly. (Includes items 27-31).	60	19A127762P1	Bushing. Spring assembly, (Part of J704).
Grille. Nameplate. (GE monogram).	62	19B216891G1 19D413467P1	Fastener (Part of J704).
Rivet. Tap screw, Phillips POZIDRIV®: No. 4-24 x 5/16.	63 64	19A130586P1 19A115794P3	Insulator. Flat head screw: steel, 2-56 x 5/16. (Part of J704).
Case assembly. (Includes items 20, 21, 25, 43-50, 59).	65	19B219443P1	Insulator.
Insert. Contact. (Part of J702 & J703).	66 67	19C311491P3 19C317394P6	Can. (Used with Al-A4). Gasket.
Insert, screw thread: No. 2-56; sim to Tridair Ind. SP0256BRS-SX.	68 69	19B216897G3 19B216897G4	Rear Cover Assembly. (without clip). Rear Cover Assembly. (with clip).
Contact. (Part of J702). Antenna tube and insert.	70	19A130993P1	Gasket.
Solderless terminal.			
Support. Loading Coil Assembly, Low-Split. (Includes items 32-34).			

VIEW "A"	10 "H" "C" 12 14 15 16 17 18 19	13 "B"———————————————————————————————————	60 19 59 20.	VIEW "C" 49 48 42 VIEW "D" 43 47 44 45 57 56 55 54
68 69 67 VIEW "B"	66 63 65			

6 *COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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 19D423386G2 REV. A - Case Assembly 19D423294G2

Incorporated into initial shipment.

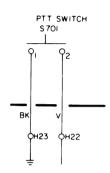
REV. B - System Board 19D423286G2

To incorporate a new 5.4 V Regulator module. Changed A2 and added C19.

REV. B - Case Assembly 19D423294G2

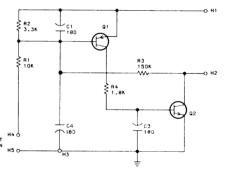
To improve reliability. Changed S701 and added PTT circuit A704. Also changed knobs.

Schematic Diagram was:

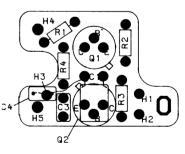


REV. C - To make compatible with GE-STAR. Changed A704.

Schematic Diagram was:



Outline Diagram was:



REV. A - PTT Circuit 19B232586G1

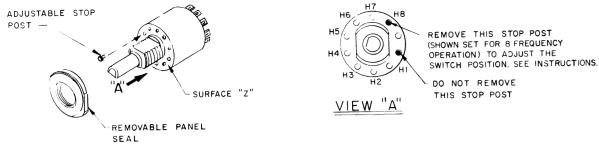
To improve performance. Added C4.

REV. A - PTT Circuit 19B232586G2

To improve performance. Deleted C1 and added R7.

REV. B - To improve RF filtering. Added C5.

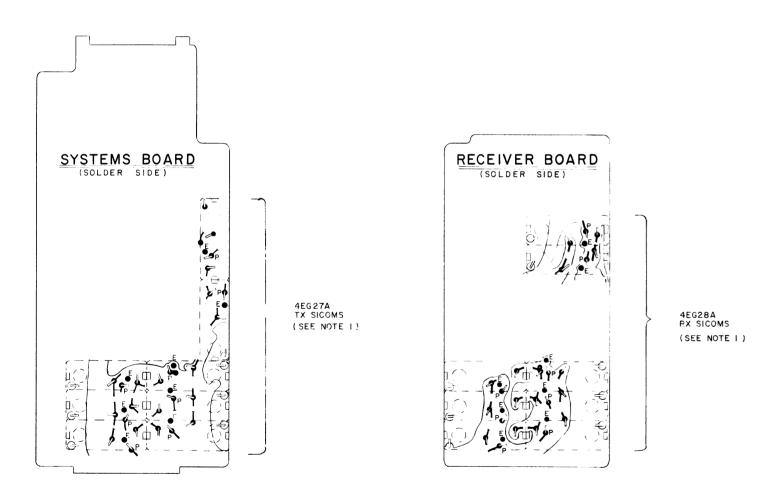
REV. C - To make compatible with GE-STAR. Changed pattern on printed wire board to add C2.



NOTES:

I. PIN 4 LEAD HAS BEEN OMITTED ON 4EG27A & 4EG28A IN NEWER PRODUCTION SICOMS. GROUND IS MADE THROUGH SICOM CAN TARS

Figure 1 - Stop Post Adjustment



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

Figure 2 - Oscillator Module and Diode Installation

MULTI-FREQUENCY MODIFICATIONS

Issue 2

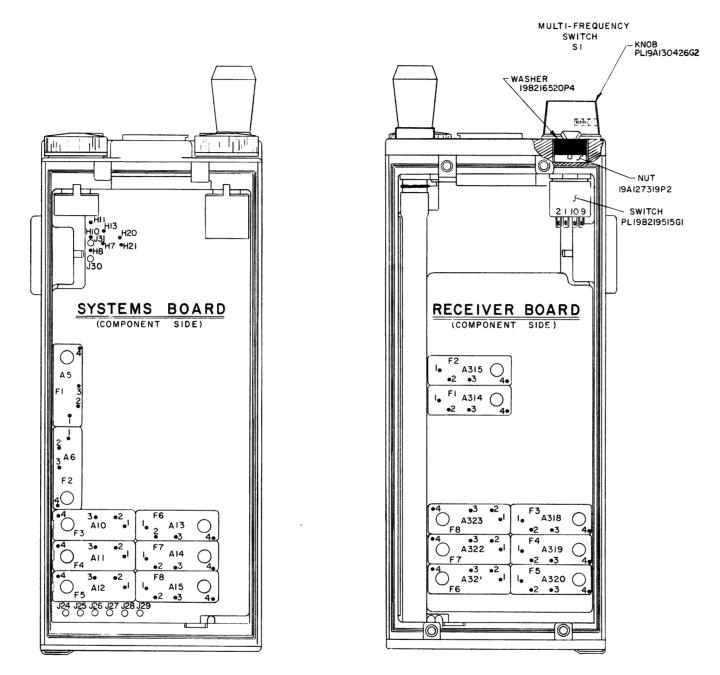


Figure 3 - Oscillator Mounting Positions & Sl Connection Points



Figure 4 - Typical Diode Mounting

MULTI-FREQUENCY MODIFICATIONS

(19D416567, Sh. 1, Rev. 9 & Sh. 2, Rev. 3)

The multi-frequency modifications include instructions for adjusting the stop post on multi-frequency switch Sl, 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).
- Turn the shaft fully counterclockwise as viewed from the knob end.
- Unscrew the panel seal to gain access to the stop post (see Figure 1).
- Install the stop post in the appropriate hole as shown in the following chart.

ST	OP POST ADJUSTMENTS
NO. OF FREQS	MOVE ADJUSTMENT STOP TO:
2	Н2
3	нз
4	H4
5	н5
6	. не
7	Н7
8	нв

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

2- ADDING OSCILLATOR MODULES

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

CONNECTION CHART						
FROM	то	WIRE COLOR	S1 POSITION			
S1-C1	Hll (solder)	BL				
S1 - 1	J31	W-BK	1			
S1-2	J30	W-0	2			
S1-3	J24	B-R	3			
S1-4	J25	R	4			
S1-5	J26	0	5			
S1 - 6	J27	Y	6			
S1-7	J28	G	7			
S1-8	J29	BL	8			

 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).

- 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
- 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 SI and install the oscillator modules whose frequencies are \underline{not} to be repeated as directed in Section I and II.
- 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 (5494922Pl) 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 and 6 to be same as Channel 2.

- 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.
- Assemble (1) diode in the Number 2 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 1 hole of Channel 3 and the other in the Number 1 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 'he board. Connect a jumper from the top of diode in the ...mber 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.