



communications

# MAINTENANCE MANUAL

FOR

VOICE COMMANDER SELECTIVE CALLING

OPTIONS 5912 & 5913

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LBI-8418

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*File 5024*

COMMUNICATION PRODUCTS DEPARTMENT

GENERAL  ELECTRIC

LYNCHBURG, VIRGINIA

## VOICE COMMANDER SELECTIVE CALLING

## OPTIONS 5912 &amp; 5913

The Voice Commander selective-calling options provide selective paging by activating the muted audio stages of the Voice Commander receiver only after correctly coded tones are received.

Two options are available. Option 5913 provides individual call only. Option 5912 provides group call and all call as well as individual call. Miniature electromechanical (reed) decoders and associated drive circuits are utilized in both options. Two reeds are required for Option 5913 and four reeds are required for Option 5912.

Installation instructions are provided for modifying the Voice Commander III on Installation Diagram 19D402260. Service Sheet RC-1038 provides all necessary meter readings and information for servicing the selective-calling options.

## OPERATION

Turning the Voice Commander ON permits the audio circuits to operate and produce noise in the speaker. Adjust the VOLUME and SQUELCH controls for normal operation. The reset switch is then depressed to mute the audio circuits; now only the reception of the proper combination of tones will unmute the audio stages.

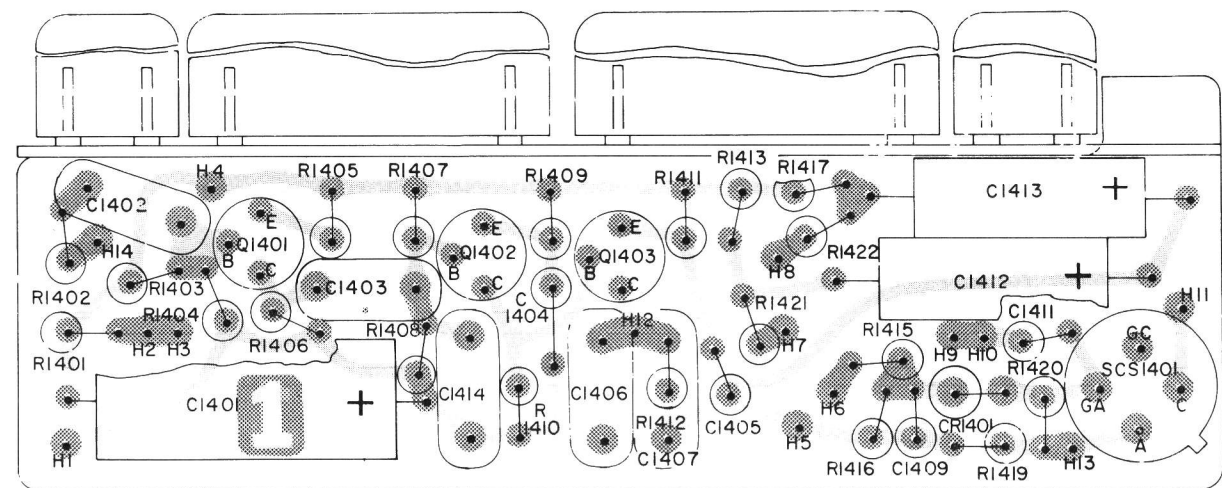
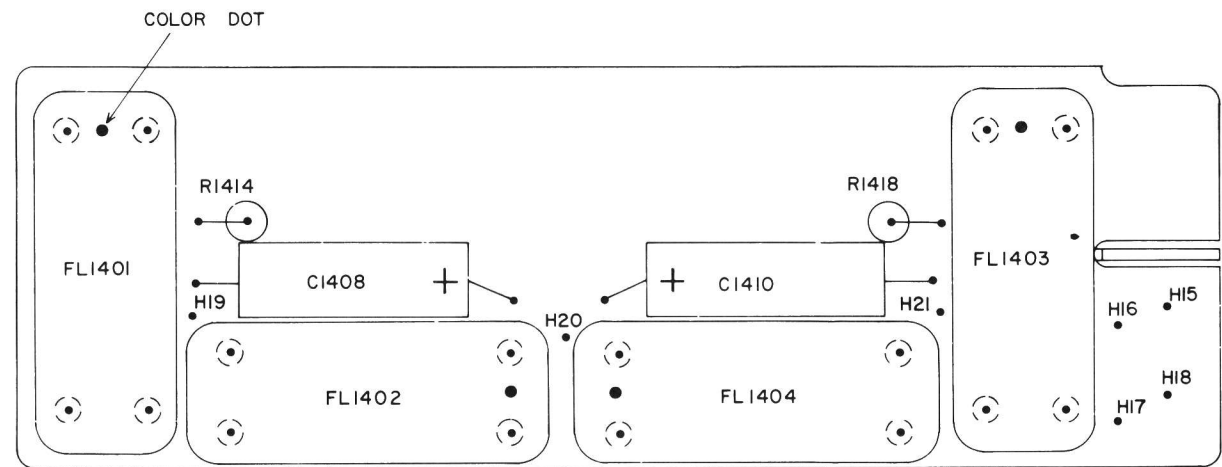
To initiate a call, the operator must turn OFF the Voice Commander and then turn it back ON so that the channel may be monitored. Upon completion of the call, the reset switch is depressed to restore audio muting.

A fundamental check of battery condition may be made by turning the Voice Commander OFF momentarily to disable the selective-call muting. Reset the muting after the check has been made.

## CIRCUIT ANALYSIS

Audio is coupled from the Voice Commander discriminator to the base of the audio amplifier stage (Q1) through coupling capacitor C1402. The amplified signal is then RC coupled to amplifier-limiter stage Q2. DC coupling is utilized between Q2 and limiter-driver Q3. The reed coils serve as the DC and AC load for the limiter-driver.

The reed contacts are connected to the gate of the silicon-controlled switch SCS1401. The switch is connected in series with the negative lead of the audio driver stage on the Voice Commander audio board. When the reeds respond to the tones the switch is fired, completing the negative path to the audio circuits. SCS1401 will continue to conduct until the reset switch (S1401) is pressed, opening the negative path of the supply current.



BLACK COLOR BAND ON THIS END FOR C1405 & C1409

ANODE ON THIS END FOR CR1401

LEAD FORMING FOR R1401 THRU R1422, C1404, C1405, C1409, C1411 & CR1401



BLACK COLOR BAND ON THIS END FOR C1404 & C1411

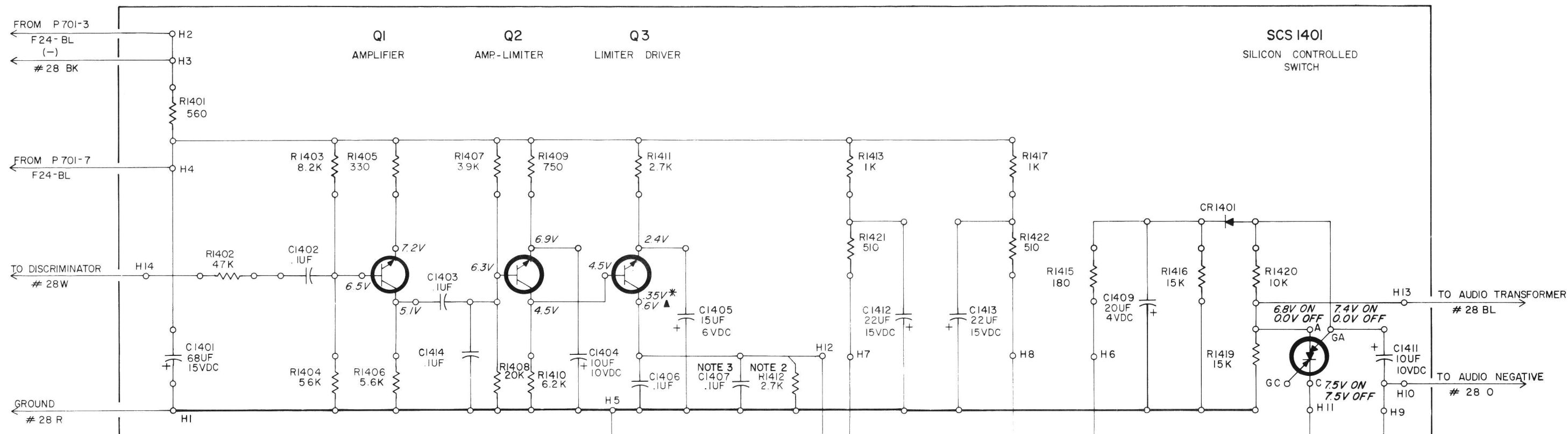
(19C303597, Rev. 0)  
(19B204302, Sh. 1, Rev. 1)  
(19B204302, Sh. 2, Rev. 1)

1. INDIVIDUAL CALL ONLY (2 REEDS)  
CALL SEQUENCE  
1ST TONE 2ND TONE  
FL1401 FL1402
2. INDIVIDUAL CALL WITH ALL OR GROUP CALL (4 REEDS)  
INDIVIDUAL CALL SEQUENCE  
SAME AS 1 ABOVE  
ALL OR GROUP CALL SEQUENCE  
1ST TONE 2ND TONE  
FL1403 FL1404
3. INDIVIDUAL CALL WITH ALL AND GROUP CALL (4 REEDS)  
INDIVIDUAL AND ALL CALL SEQUENCE  
SAME AS 2 ABOVE  
GROUP CALL SEQUENCE  
WITH JUMPER CONNECTED BETWEEN H19 AND H21  
SEQUENCE WILL BE:  
1ST TONE 2ND TONE  
FL1401 FL1404

SEE WIRING DIAGRAM FOR THE FOLLOWING CONNECTIONS

FROM	TO	FROM	TO
H1	LET HANG	H5	H18
H3		H6	H20
		H7	H17
H9		H8	H15
H10		H12	H16
H11		H19	H21
H13			
H14	LET HANG		

 Denotes Component Side  
 Denotes Solder Side



#### DC VOLTAGE READINGS

ALL TAKEN WITH 20,000Ω PER VOLT METER  
ALL TAKEN FROM COMMON (+) LEAD  
\* 4 REED MODEL  
▲ 2 REED MODEL

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.

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

(19D402193, Rev. 0)

- NOTES:
1. DELETE THIS CONNECTION WHEN "ALL CALL" ONLY OR "GROUP CALL" ONLY IS DESIRED.
  2. R1412 IS USED IN GROUP 1 ONLY.
  3. C1407 IS USED IN GROUP 2 ONLY.

Service Sheet

VOICE COMMANDER SELECTIVE CALL  
MODIFICATION KIT PL-19A121053-G1 & -G2

(RC-1038)

PARTS LIST

VOICE COMMANDER SELECTIVE CALLING  
MODIFICATION KIT OPTIONS 5912 and 5913  
PL-19A121053-G1 and G2

SYMBOL	G-E PART NO.	DESCRIPTION
S1401		----- SWITCHES -----
		SWITCH ASSEMBLY PL-19B204406-G1
		----- MISCELLANEOUS -----
	19B209099-P1	Switch, sensitive: SPDT, 10.1 amps at 125 VAC or 1/4 hp at 125 VAC; sim to Chery Electrical Products Corp E62-10A.
	19B204358-P1	Bracket: steel.
		----- MISCELLANEOUS -----
	19A121023-P1	Spring: steel. (Push button return).
	PL-19B204313-G1	Push Button Assembly: black butyrate. (Reset).
	19A121080-P1	Insulator: vulcanized fiber. (Used between S1401 and mount).
		----- SUBASSEMBLIES -----
C1401		SELECTIVE SIGNALLING ASSEMBLY PL-19C303320-G1 (Used in PL-19A121053-G1 only) PL-19C303320-G2 (Used in PL-19A121053-G2 only)
		----- CAPACITORS -----
	5496267-P11	Tantalum, dry solid: 68 $\mu$ f $\pm$ 20%, 15 VDCW; sim to Sprague 1S0D68X0015R2.
	5492638-P7	Fixed ceramic disc: 0.1 $\mu$ f +80% -20%, 12 VDCW; sim to Sprague 20C202.
	5491674-P2	Tantalum: 10 $\mu$ f +50% -20%, 10 VDCW; sim to Sprague S64936.
	5491674-P10	Tantalum: 15 $\mu$ f +50% -20%, 6 VDCW; sim to Sprague S64935.
	5492638-P7	Fixed ceramic disc: 0.1 $\mu$ f +80% -20%, 12 VDCW; sim to Sprague 20C202.
	5492638-P7	Fixed ceramic disc: 0.1 $\mu$ f +80% -20%, 12 VDCW; sim to Sprague 20C202. (Used in PL-19A121053-G2 only).
	5496267-P2	Tantalum, dry solid: 47 $\mu$ f $\pm$ 20%, 6 VDCW; sim to Sprague 1S0D47X0006B2.
	5491674-P9	Tantalum: 20 $\mu$ f +50% -20%, 4 VDCW; sim to Sprague S64937.
C1410		Tantalum, dry solid: 47 $\mu$ f $\pm$ 20%, 6 VDCW; sim to Sprague 1S0D47X0006B2. (Used in PL-19A121053-G2 only).
	5491674-P2	Tantalum: 10 $\mu$ f +50% -20%, 10 VDCW; sim to Sprague S64936.
	5496267-P10	Tantalum, dry solid: 22 $\mu$ f $\pm$ 20%, 15 VDCW; sim to Sprague 1S0D22X0015B2.
	5496267-P10	Tantalum, dry solid: 22 $\mu$ f $\pm$ 20%, 15 VDCW; sim to Sprague 1S0D22X0015B2. (Used in PL-19A121053-G2 only).
	5492638-P7	Fixed ceramic disc: 0.1 $\mu$ f +80% -20%, 12 VDCW; sim to Sprague 20C202.
		----- RECTIFIERS -----
	7777146-P3	Germanium; sim to 1N90.

SYMBOL	G-E PART NO	DESCRIPTION
FL1401 thru FL1404		----- SUBASSEMBLIES(Cont'd) -----
		----- FILTERS -----
		----- TONE DETECTOR ----- PL-19C300580 (FL1403 and FL1404 used in PL-19A121053-G2 only).
		Electromechanical resonant subassembly. Group No. determined by multiplying freq marked on can by 10. Example: 517.5 cps x 10 = Group No. 5175.
	PL-19C300580-G6175	517.5 cps
	PL-19C300580-G5325	532.5 cps
	PL-19C300580-G5475	547.5 cps
	PL-19C300580-G5475	562.5 cps
	PL-19C300580-G5625	577.5 cps
	PL-19C300580-G5775	592.5 cps
Q1401 thru Q1403	PL-19C300580-G5925	607.5 cps
	PL-19C300580-G6075	622.5 cps
	PL-19C300580-G6225	637.5 cps
	PL-19C300580-G6375	652.5 cps
	PL-19C300580-G6525	667.5 cps
	PL-19C300580-G6675	682.5 cps
	PL-19C300580-G6825	697.5 cps
	PL-19C300580-G6975	712.5 cps
	PL-19C300580-G7125	727.5 cps
	PL-19C300580-G7275	742.5 cps
R1401 thru R1407	PL-19C300580-G7425	757.5 cps
	PL-19C300580-G7575	772.5 cps
	PL-19C300580-G7725	787.5 cps
	PL-19C300580-G7875	802.5 cps
	PL-19C300580-G8025	817.5 cps
	PL-19C300580-G8175	832.5 cps
	PL-19C300580-G8325	847.5 cps
	PL-19C300580-G8475	862.5 cps
	PL-19C300580-G8625	877.5 cps
	PL-19C300580-G8775	892.5 cps
R1401 thru R1407	PL-19C300580-G8925	907.5 cps
	PL-19C300580-G9075	922.5 cps
	PL-19C300580-G9225	937.5 cps
	PL-19C300580-G9375	952.5 cps
	PL-19C300580-G9525	967.5 cps
	PL-19C300580-G9675	982.5 cps
	PL-19C300580-G9825	997.5 cps
	PL-19C300580-G9925	
		----- TRANSISTORS -----
	19A115123-P1	Silicon, NPN; sim to 2N2712.
R1401 thru R1407		----- RESISTORS -----
	3R152-P561J	Fixed composition: 560 ohms $\pm$ 5%, 1/4 w.
	3R152-P473J	Fixed composition: 47,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P822J	Fixed composition: 8200 ohms $\pm$ 5%, 1/4 w.
	3R152-P563J	Fixed composition: 56,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P331J	Fixed composition: 330 ohms $\pm$ 5%, 1/4 w.
	3R152-P562J	Fixed composition: 5600 ohms $\pm$ 5%, 1/4 w.
	3R152-P392J	Fixed composition: 3900 ohms $\pm$ 5%, 1/4 w.

SYMBOL	G-E PART NO	DESCRIPTION
R1408 thru R1422		----- SUBASSEMBLIES(Cont'd) -----
		----- RESISTORS(Cont'd) -----
	3R152-P203J	Fixed composition: 20,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P751J	Fixed composition: 750 ohms $\pm$ 5%, 1/4 w.
	3R152-P622J	Fixed composition: 6200 ohms $\pm$ 5%, 1/4 w.
	3R152-P272J	Fixed composition: 2700 ohms $\pm$ 5%, 1/4 w.
	3R152-P272J	Fixed composition: 2700 ohms $\pm$ 5%, 1/4 w. (Used in PL-19A121053-G1 only).
	3R152-P102J	Fixed composition: 1000 ohms $\pm$ 5%, 1/4 w.
	3R152-P223J	Fixed composition: 22,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P181J	Fixed composition: 180 ohms $\pm$ 5%, 1/4 w.
SCS1401	3R152-P153J	Fixed composition: 15,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P102J	Fixed composition: 1000 ohms $\pm$ 5%, 1/4 w. (Used in PL-19A121053-G2 only).
	3R152-P223J	Fixed composition: 22,000 ohms $\pm$ 5%, 1/4 w. (Used in PL-19A121053-G2 only).
	3R152-P153J	Fixed composition: 15,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P103J	Fixed composition: 10,000 ohms $\pm$ 5%, 1/4 w.
	3R152-P511J	Fixed composition: 510 ohms $\pm$ 5%, 1/4 w.
	3R152-P511J	Fixed composition: 510 ohms $\pm$ 5%, 1/4 w. (Used in PL-19A121053-G2 only).
		----- SWITCHES -----
	19A115198-P2	Silicon controlled: 300 mw at 25°C ambient temp; sim to 3N60.
		----- MISCELLANEOUS -----
4036040-P1		Contact, pin: silver; sim to American Brass 724. (Used for mounting FL1 thru FL4).

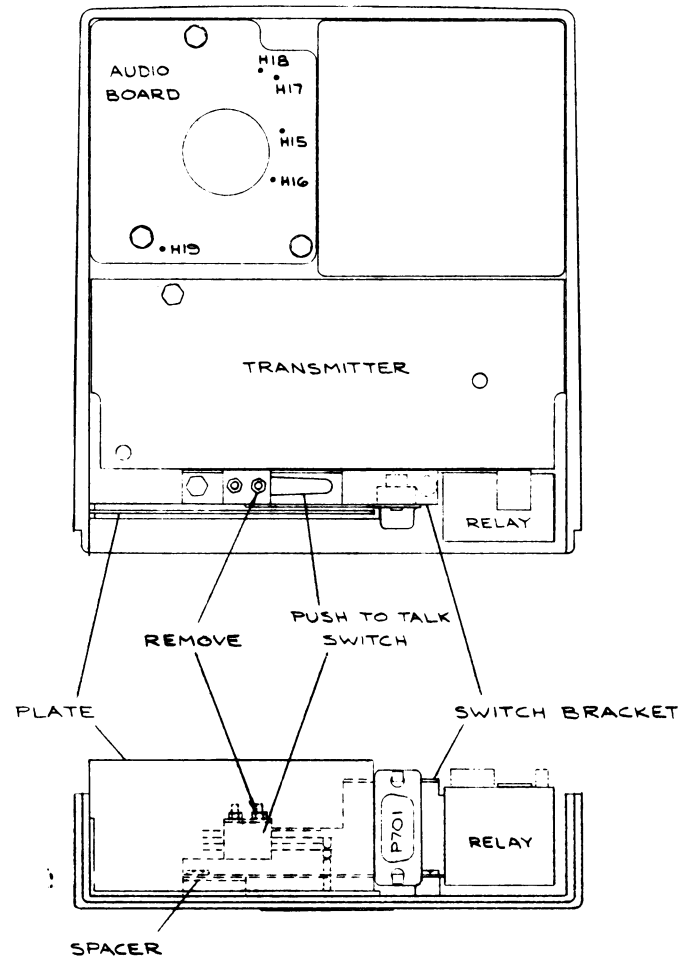


FIG. 1

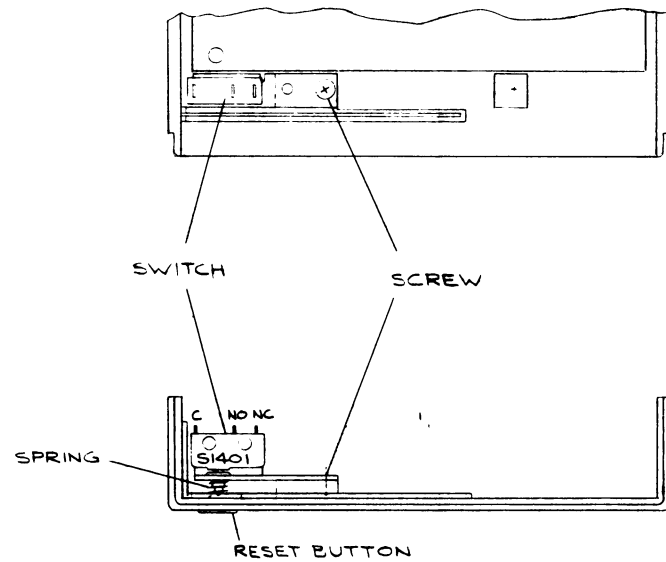


FIG. 2

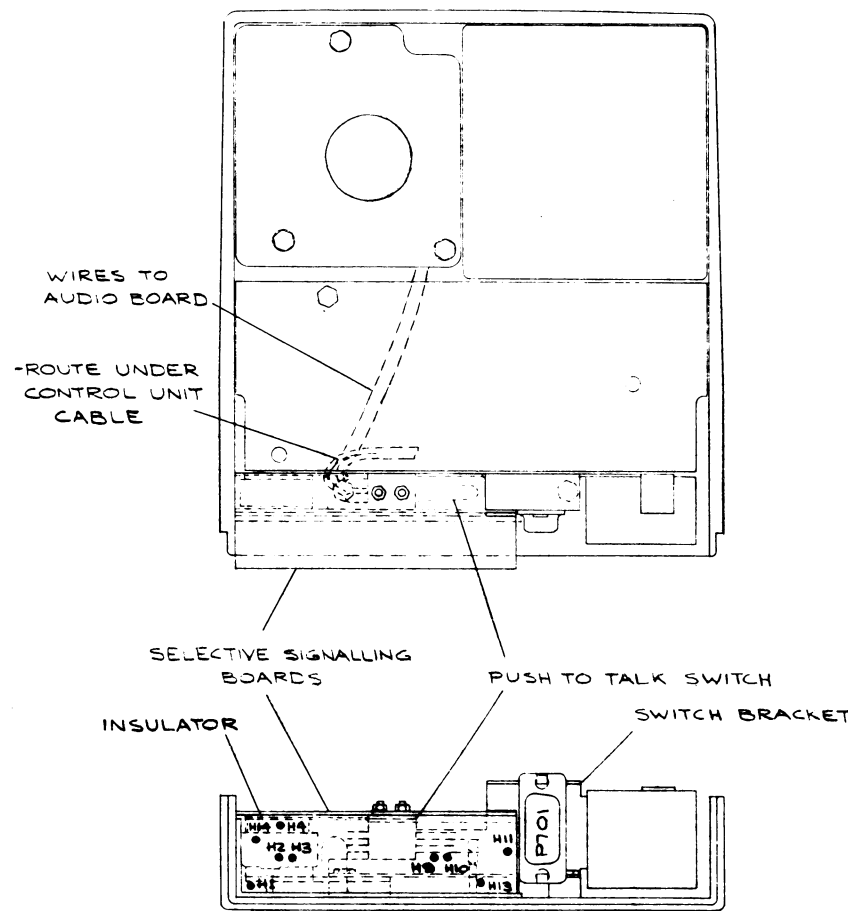


FIG. 3

INSTALLATION INSTRUCTIONS

1. REMOVE POWER SUPPLY AND CONTROL UNIT REAR COVER.
2. REMOVE AND DISCARD PLATE (FIG. 1).
3. REMOVE SCREWS AND WASHERS FROM AUDIO BOARD (FIG. 1).
4. REMOVE SCREW FROM TRANSMITTER (FIG. 1).
5. REMOVE SCREWS FROM SWITCH BRACKET (FIG. 1).
6. REMOVE AND DISCARD SPACER FROM UNDER SWITCH BRACKET (FIG. 1).
7. REMOVE 1 NUT & WASHER SECURING PUSH TO TALK SWITCH.
8. INSTALL RESET BUTTON, SPRING AND SWITCH WITH SCREW PROVIDED (FIG. 2).
9. MAKE CONNECTIONS PER CONNECTIONS CHART AND ROUTE WIRES AS SHOWN (FIG. 3).
10. ASSEMBLE SWITCH BRACKET, PRINTED BOARD (SELECTIVE SIGNALLING) & INSULATOR, SECURE PRINTED BOARD WITH HARDWARE MOUNTING PUSH TO TALK SWITCH. (FIG. 3)
11. REASSEMBLE AUDIO BOARD AND TRANSMITTER.
12. TEST PER A4039298.
13. REASSEMBLE CONTROL UNIT REAR COVER AND POWER SUPPLY.

CONNECTIONS CHART					
WIRE FROM	ON	WIRE	TO	ON	REMARKS
H17	AUDIO BOARD	DA	H18	AUDIO BOARD	REMOVE
H3	SELECTIVE SIGNALLING BOARDS	#28 BK	H15	AUDIO BOARD	
H14		#28 W	H16		
H10		#28 O	H17		
H13		#28 BL	H18		
H1		#28 R	H19		
TERM. 3	P701	F24 BL	H2	SELECTIVE SIGNALLING BOARD	CLIP LOOP & INSTALL WIRE PROVIDED IN CONTROL UNIT CABLE
TERM. 7	P701	F24 BL	H4		
H9	SELECTIVE SIGNALLING BOARDS	#28 W	C	S1401	
H11		#28 R	NC	S1401	

Installation Diagram  
VOICE COMMANDER SELECTIVE CALL  
MODIFICATION KIT PL-19A121053-G1 & -G2  
(19D402260, Rev. 0)