communications

MAINTENANCE MANUAL

GENERAL ELECTRIC PACER CHANNEL GUARD

MODEL 4NS13A11

OPTION-4561 & 4562

LBI-3233E
DF-5008

10302

COMMUNICATION PRODUCTS DEPARTMENT

GENERAL ELECTRIC

LYNCHBURG, VIRGINIA

Printed in U.S.A.

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ILLUSTRATIONS

SPECIFICATIONS
FOR
CHANNEL GUARD

MODEL 4NS13A11

CHANNEL GUARD RECEIVER

Input Level:	1.0 volt developed from a signal having 1 kc deviation.
Tone Rejection:	Down at least 30 db relative to audio output at 2/3 system dev.
Response Time:	Less than 250 ms.

CHANNEL GUARD TRANSMITTER

Output Level:	2.5 volts across 10,000 ohms.

SYSTEM

Distortion:	Less than 3 percent.
Supply Voltage:	13.8 volts dc nominal; operable at ±10%.
Operable Over Temp. Range:	-30°C to +60°C
Monitoring:	Provides automatic channel monitoring before transmission (FCC requirement) by reverting to normal squelch.

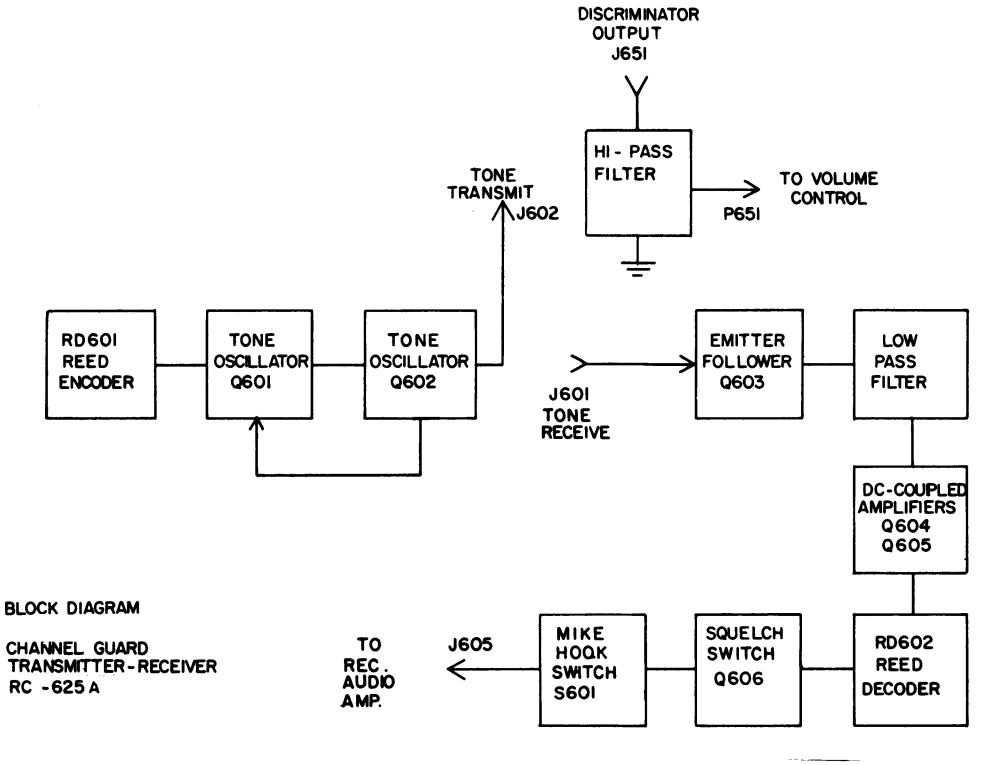
CHANNEL GUARD

INTRODUCTION

General Electric Pacer CHANNEL GUARD options are designed to eliminate the reception of undesired signals by the General Electric Pacer Receiver. All signals are locked out except those from transmitters which are continuously tone coded for positive identification by the Receiver.

The CHANNEL GUARD unit consists of a Tone Squelch Transmitter-Receiver Combination. The Tone Transmitter provides the proper tone to modulate the carrier in transmission, and the Tone Receiver decodes the tone from a desired signal to unsquelch the General Electric Pacer Receiver. Thus, stations and mobiles equipped with CHANNEL GUARD are able to communicate without undesired signals from other users of the same channel.

CHANNEL GUARD provides automatic channel monitoring, enabling the operator to comply automatically with the FCC ruling that the channel be monitored before transmission. This is accomplished by using the standard squelch circuit in the Mobile Receiver when the microphone is removed from its hanger.



RC-625A. Block Diagram

INSTALLATION

The Tone Transmitter-Receiver is contained in a case 5-23/32" x 5-63/64" x 2-63/64". An extension bracket is provided for mounting the unit under the instrument panel. The case should be located so that the microphone will be within convenient reach of the operator, and where the cable for the CHANNEL GUARD Unit will reach the Fuse Assembly and the Two-Way Radio.

Installation Diagram RC-671 illustrates the entire installation procedure for the CHANNEL GUARD Case and electrical interconnections. All connections to the General Electric Pacer equipment from the CHANNEL GUARD Unit are made by plug-in connectors. No wiring changes are necessary. The microphone hang-up bracket is mounted on the front of the CHANNEL GUARD Case.

Reference should also be made to the Installation Diagram for the installation of the High-Pass Filter.

OPERATION

Lifting the microphone from its hang-up bracket disables the CHANNEL GUARD squelch operation so that everything on the channel can be heard over the speaker in the conventional manner.

A reed encoder (RD-601) is used as the frequency determining component in the Tone Transmitter. This reed is an electromechanical device resonant to the desired tone frequency. The reed is connected so that a tone of the proper frequency is generated when power is applied to the circuit.

A reed decoder (RD-602) responds to the desired tone frequency, closing a set of contacts to operate the standard squelch circuit in the Mobile Receiver.

Tone is removed from the audio of the Mobile Receiver by a special high-pass filter mounted on the IF/Audio board. This filter prevents the tone from reaching the speaker.

The output of the Tone Squelch Transmitter is fed to the phase modulator on the Transmitter board of the Mobile Transmitter. Thus, lifting the microphone from the hang-up bracket and pressing the push-to-talk button automatically unsquelches the Receiver of the unit called.

ADJUSTMENT

Only one adjustment is present in the Tone Squelch Unit. This is the Deviation Control (R608) in the Tone Transmitter. Normally this Control is set at the factory and should need no further adjustment. If, at a future time, operating conditions or system applications require readjustment of this Control, the following procedure should be followed.

With a modulation monitor connected to the Mobile Transmitter, adjust R608 for 0.75 KC deviation.

To gain access to the Deviation Control, R608, slide the unit forward.

CIRCUIT ANALYSIS

Q601 and Q602, together with reed RD601, comprise the oscillator circuit of the Tone Transmitter. Feedback for proper oscillator operation is accomplished by coupling from the collector of Q602, through R605 and C601, to the base of Q601. R608 serves as the deviation control and the signal is fed to J602 and to the grid circuit of the phase modulator, V101, of the Mobile Transmitter.

Audio from the Mobile Receiver is coupled to the Tone Receiver from J601 to the base of Q603. Q603 is connected as an emitter follower to adjust the Tone Receiver input impedance to match the output impedance of the Mobile Receiver.

The audio is coupled through a low-pass filter (consisting of L601, L602, C607, and C608) to the base of Q604. This provides pure tone for the Tone Receiver.

Q604 and Q605 are DC coupled amplifiers that raise the level of the tone signal to operate the reed decoder, RD602. When no tone is being received, the switching transistor, Q606, is conducting and provides a bias to cutoff the audio amplifier in the Mobile Receiver. When tone is received, the contacts of RD602 close. This cuts off Q606 and removes the cutoff bias from the Receiver audio circuits. The tube conducts and operates the speaker.

Power to operate the Tone Squelch Unit is provided by two terminal connections to the General Electric Pacer Fuse Block Assembly. Correct choice of connection is determined by the ground system of the vehicle. See the Installation Diagram listed in the Table of Contents.

MAINTENANCE

Refer to the Service Sheet for voltage and resistance readings.

To remove the Tone Squelch Unit from the case for servicing, slide the unit forward. The printed board may be removed to gain access to the components by gently prying loose the four drive fasteners.

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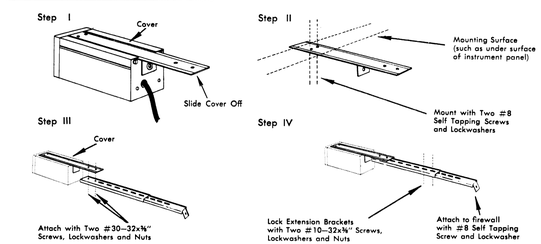
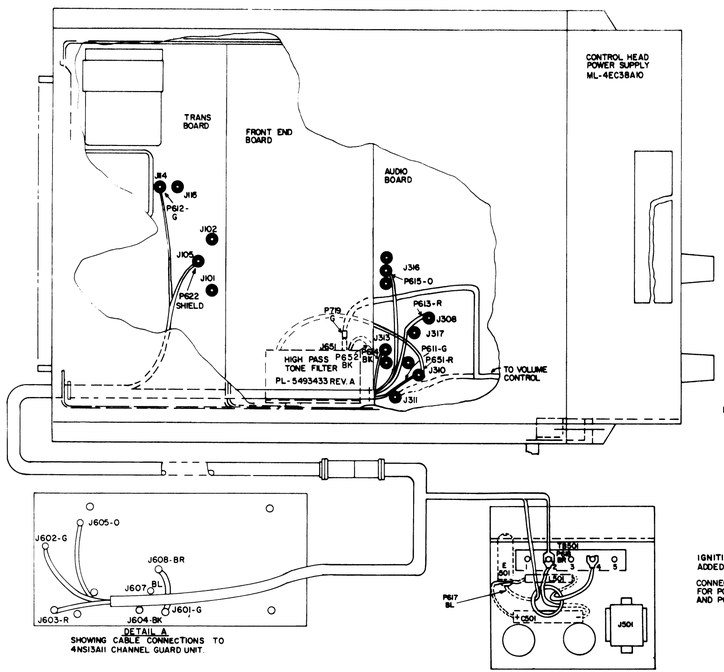
CHANNEL GUARD
INSTALLATION

MOUNTING

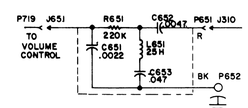
Mount the Channel Guard Unit under the instrument panel near the Two-Way Radio. It should be located so that the microphone will be within convenient reach of the operator, and where the cable for the Channel Guard Unit will reach the Fuse Assembly and the Two-Way Radio.





INSTALLATION OF HIGH PASS TONE FILTER

1. MOUNT FILTER ON OFF-SET BRACKET ON BOTTOM LEFT SIDE OF PACER CHASSIS. MOUNT GROUND LUG P652 UNDER MOUNTING SCREW.
2. REMOVE P719 FROM J311 ON IF/AUDIO BOARD. ROUTE CABLE TO FILTER, AND CONNECT P719 TO J651.
3. ROUTE RED CABLE FROM FILTER TO IF/AUDIO BOARD AND CONNECT P651 TO J310.



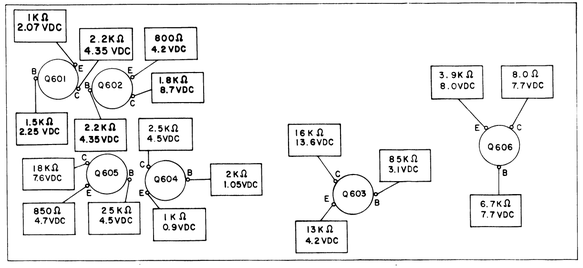
IGNITION NOISE FILTER KIT PL-A4036144-G1 MUST BE ADDED TO THE FUSE BLOCK ASSEMBLY AS SHOWN.

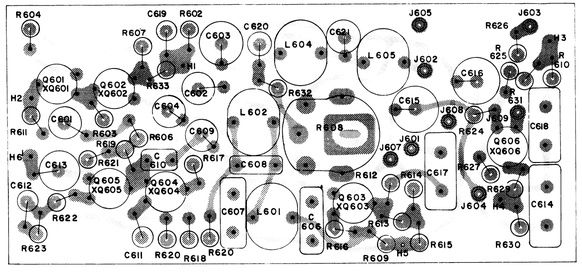
CONNECTIONS SHOWN FOR NEGATIVE GROUND SYSTEM. FOR POSITIVE GROUND SYSTEM CONNECT P617 TO T8501-2 AND P618 TO E501. ALSO REVERSE LEADS OF C501.

Installation Diagram

GENERAL ELECTRIC PACER
CHANNEL GUARD
MODEL 4NS13A11; REV. G

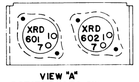
(RC-671E)



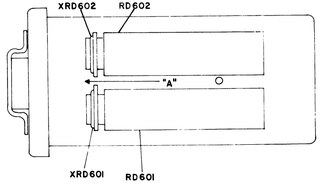


ALL READINGS TAKEN WITH 20,000 OHMS-PER-VOLT METER. READINGS TAKEN FROM TRANSISTOR SOCKET INPUT VOLTAGE 13.8V

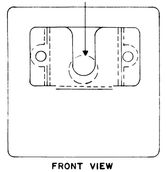
RESISTANCE READING TAKEN WITH ALL TRANSISTORS AND PLUGS DISCONNECTED FROM MOBILE UNIT. ALL READINGS TAKEN FROM -12V POINT EXCEPT XQ606 WHICH ARE FROM GND.



VIEW "A" ROTATED 90° CW



TOP VIEW WITH CASE REMOVED

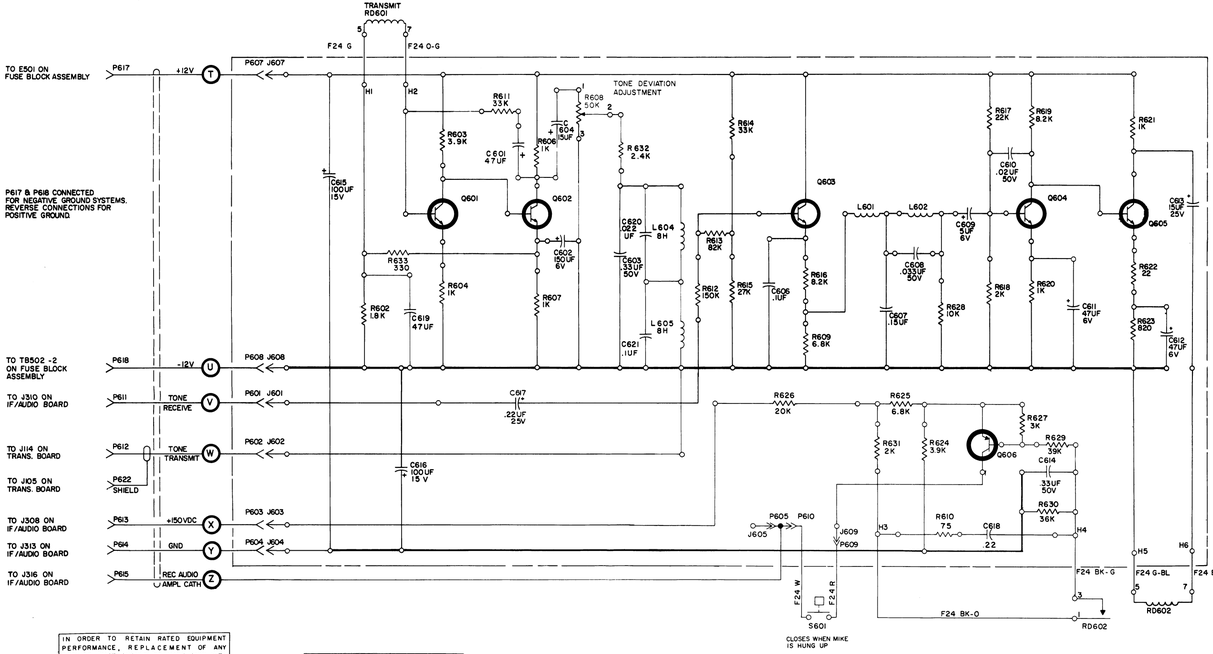


FRONT VIEW

Denotes Component Side

Denotes Solder Side

(D-5499641, Rev. 3)
(19B204334, Sh. 1, Rev. 0)
(19B204334, Sh. 2, Rev. 1)



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.

RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS, OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN MICROMICROFARADS UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS

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
4NS13A11	G

(D-5498950, Rev. 10)

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Service Sheet

GENERAL ELECTRIC PACER CHANNEL GUARD MODEL 4NS13A11; REV. G

(RC-664E)

PARTS LIST

TONE SQUELCH TRANSMITTER - RECEIVER
MODEL 4NS13A11, REV. G

PL-5496361-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		CAPACITORS
C601*	5496267-P15	Tantalum: 47 uf ±20%, 20 VDCW; sim to to Sprague 150D476X0020B2. Changed by Rev. G.
		In Rev. F:
	5495670-P18	Electrolytic; 50 uf +100% -15%, 25 VDCW; sim to Sprague 30D186A1.
C602	5496267-P3	Tantalum (dry solid type); 150 uf ±20%, 6 VDCW. Sim to Sprague Elec 150D157X0006B2.
C603*	7491930-P111	Mylar dielectric; 0.33 uf ±20%, 100 VDCW; sim to G-E 61F. Changed by Rev. G.
		In Rev. F:
	5491189-P109	Mylar dielectric; 0.22 uf ±20%, 50 VDCW; sim to Good-All 601PE.
C604	5495670-P16	Electrolytic, (vertical mount type); insulated, sealed in aluminum tube, 15 uf +100% -15%, 25 VDCW; Sim to Sprague 30D183A1.
C605*		Deleted by Rev. G.
		In Rev. F.
	5491189-P108	Mylar dielectric; 0.22 uf ±20%, 50 VDCW; sim to Good-All 601PE.
C606	5491189-P106	Mylar® dielectric; straight leads, 0.10 ±20%, 50 VDCW; Sim to Good-All Electric 601PE.
C607	5491189-P107	Mylar® dielectric; straight leads, 0.15 uf ±20%, 50 VDCW; Sim to Good-All Electric 601PE.
C608	5491189-P103	Mylar® dielectric; straight leads, 0.033 uf ±20%, 50 VDCW; Sim to Good-All Electric 601PE.
C609*	7489483-P1	Electrolytic tubular: 5 uf +100% -10%, 6 VDCW; sim to Sprague 30D125A1. Changed by Rev. G.
		In Rev. F:
	5495670-P3	Electrolytic; 5 uf +100% -15%, 6 VDCW; sim to Sprague 30D125A1.
C610	5491189-P102	Mylar® dielectric; straight leads 0.022 uf ±20%, 50 VDCW; Sim to Good-All Electric 601PE.
C611 and C612	5496267-P2	Tantalum (dry solid type); Hermetically sealed, 47 uf ±20%, 6 VDCW; Sim to Sprague 150D476X0006B2.
C613	5495670-P16	Electrolytic, (vertical mount type); insulated sealed in aluminum tube, 15 uf +100% -15%, 25 VDCW; Sim to Sprague 30D183A1.
C614*	5491189-P109	Mylar dielectric; 0.33 uf ±20%, 50 VDCW. Sim to Good-All Electric 601PE, Changed by Rev. D.
	5495670-P18	In Models of Rev. C or earlier: Electrolytic; 50 uf ±100%, -10%, 25 VDCW. Sim to Sprague 30D186A1.
C615*	7489483-P16	Electrolytic tubular: 100 uf +100% -10%, 15 VDCW; sim to Sprague 30D175A1. Changed by Rev. G.
		In Rev. F:
	5495670-P10	Electrolytic; 100 uf +100% -10%, 15 VDCW; sim to Sprague 30D172A1.
C616	5495670-P10	Electrolytic, (vertical mount type); insulated, sealed in aluminum tube, 100 uf +100% -15%, 15 VDCW; Sim to Sprague 30D172A1.
C617*	5491189-P108	Mylar® dielectric; straight leads, 0.22 uf ±20%, 50 VDCW; Sim to Good-All Electric 601PE.
	7489483-P6	In Models of Rev. A or earlier: Electrolytic; (miniature for 85°C operation); hermetically sealed in aluminum tube, 5 uf 100% -10%, 25 VDCW; Sim to Sprague 30D179A1.
C618*	5491189-P108	Mylar dielectric; 0.22 uf ±20%, 50 VDCW. Sim to Good-All 601PE. Changed by Rev. F.
	7161189-P2	In Models of Rev. E or earlier: Disc; 0.10 uf +80% -30%, 50 VDCW; Sim to Sprague 36C172.
C619*	5496267-P2	Tantalum: 47 uf ±20%, 6 VDCW; sim to Sprague 150D476X0006B2. Added by Rev. G.
C620*	7491930-P106	Mylar dielectric; 0.022 uf ±20%, 100 VDCW; sim to G-E61F. Added by Rev. G.
C621*	7491930-P109	Mylar dielectric; 0.1 uf ±20%, 100 VDCW; sim to G-E 61F. Added by Rev. G.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		DIODES
CR601*		Deleted by Rev. G.
		In Rev. F:
	5492262-P1	Germanium.
		LAMPS
I601*		Deleted by Rev. G.
		In Rev F.
	4034664-P1	1762 Lamp.
		JACKS AND RECEPTACLES
J601 thru J605	4033513-P1	Pin: Contact; brass, cadmium plated finish; Sim to Bead Chain L93-4.
J606*	4033513-P1	Deleted by Rev. A.
J607 and J608	4033513-P1	Pin: Contact; brass, cadmium plated finish; Sim to Bead Chain L93-4.
		INDUCTORS
L601 and L602	5496528-P1	Inductor, Epoxy dip, DC res 200 ohms min, 260 ohms max, 300 cps to 4000 cps, 10.8 henries ±0.5 @300 cps; 8.0 henries ±0.8 @ 1,000 cps.
L603*		Deleted by Rev. G.
		In Rev. F:
	5491736-P5	2.6 mh ±10% @ 0.01 v. sim to Alladin 33-176.
L604* and L605*	5496528-P1	Inductor; DC resistance 200 ohms, Freq. 300 cps to 4,000 cps, 7.0 to 9.4 Henries @ 1,000 cps. Added by Rev. G.
		TRANSISTORS
Q601* and Q602*	4037333-P2	Silicon, NPN. Type 4JX4C788. Changed by Rev. G.
		In Rev. F:
	5492639-P2	Germanium, NPN
Q603-Q605	5492639-P2	Germanium, NPN.
Q606*	5496665-P6	Germanium, PNP. Added by Rev. D.
		SWITCHES
S601*	7481654-P6	Switch: push button, momentary contact, SPNO, 1/10 amp at 115 vac. Sim to Grayhill 30-1.
	19B200547-P1	In Models of Rev. C or earlier: Switch, RPBT, 7.5 amps @15 vac. Sim to Elec Corp, S-37-15Z. Changed by Rev. A.
	5496383-P1	In Models of Rev. A or earlier: DPDT, Sim to Cherry B36-11Z.
		RESISTORS
R601*		Deleted by Rev. G.
		In Rev. F:
	3R77-P132J	Composition; 1300 ohms ±5%, 1/2 w.
R602	3R77-P182J	Composition, 1800 ohms ±5%, 1/2 w.
R603	3R77-P392J	Composition, 3900 ohms ±5%, 1/2 w.
R604	3R77-P102J	Composition, 1000 ohms ±5%, 1/2 w.
R605*		Deleted by Rev. G.
		In Rev. F:
	3R77-P103J	Composition; 10,000 ohms ±5%, 1/2 w.
R606*	3R77-P102J	Composition; 1,000 ohms ±5%, 1/2 w. Changed by Rev. G.
		In Rev. F:
	3R77-P751J	Composition; 750 ohms ±5%, 1/2 w.
R607	3R77-P102J	Composition, 1000 ohms ±5%, 1/2 w.
R608	7491365-P7	Potentiometer; 50,000 ohms ±20%, linear taper, 0.1 w. Sim to Chicago Telephone Supply UPE-70.
R609	3R77-P682J	Composition, 6800 ohms ±5%, 1/2 w.
R610*	3R77-P750J	Fixed composition; 75 ohms ±5%, 1/2 w. Added by Rev. F.
R611*	3R77-P333J	Composition; 33,000 ohms ±5%, 1/2 w. Added by Rev. G.

SYMBOL	G-E PART NO	DESCRIPTION
		RESISTORS (CONT'D)
R612	3R77-P154J	Composition, 0.15 megohm ±5%, 1/2 w.
R613	3R77-P823J	Composition, 82,000 ohms ±5%, 1/2 w.
R614	3R77-P333J	Composition, 33,000 ohms ±5%,1/2 w.
R615	3R77-P273J	Composition, 27,000 ohms ±5%, 1/2 w.
R616	3R77-P822J	Composition, 8200 ohms ±5%, 1/2 w.
R617	3R77-P223J	Composition, 22,000 ohms ±5%, 1/2 w.
R618	3R77-P203J	Composition, 2000 ohms ±5%, 1/2 w.
R619	3R77-P822J	Composition, 8200 ohms ±5%, 1/2 w.
R620 and R621	3R77-P102J	Composition, 1000 ohms ±5%, 1/2 w.
R622	3R77-P220J	Composition, 22 ohms ±5%, 1/2 w.
R623	3R77-P821J	Composition, 820 ohms ±5%, 1/2 w.
R624*	3R77-P392J	Composition, 3900 ohms ±5%, 1/2 w.
	3R77-P123J	In Models of Rev. C or earlier: Composition, 12,000 ohms ±5%, 1/2 w.
R625*	3R77-P682J	Composition, 6800 ohms ±5%, 1/2 w. Added by Rev. D.
R626*	3R77-P203J	Composition, 20,000 ohms ±5%, 1/2 w.
	3R77-P563J	In Models of Rev. C or earlier: Composition, 56,000 ohms ±5%, 1/2 w.
R627*	3R77-P302J	Composition, 3000 ohms ±5%, 1/2 w.
	3R77-P364J	In Models of Rev. C or earlier: Composition, 360,000 ohms ±5%, 1/2 w.
R628	3R77-P103J	Composition, 10,000 ohms ±5%, 1/2 w.
R629*	3R77-P393J	Composition, 6800 ohms ±5%,1/2 w. Added by Rev. D.
R630*	3R77-P363J	Composition, 36,000 ohms ±5%, 1/2 w. Added by Rev. D.
R631*	3R77-P202J	Composition, 2000 ohms ±5%, 1/2 w. Added by Rev. D.
R632*	3R77-P243J	Composition; 2400 ohms ±5%, 1/2 w. Added by Rev. G.
R633*	3R77-P331J	Composition; 330 ohms ±5%, 1/2 w Added by Rev. G.
		SOCKETS
XQ601 thru XQ606	5490277-P2	Transistor socket, 4-contacts, low-loss mica filled phenolic; contact res 0.03 ohms max 1 amp; Sim to Elec Cac 3305.
XRD601 and XRD602	7768887-P14	Tube socket and shield: (7-pin miniature); mica filled phenolic, bottom mount, also flat top with 4 ground lugs, phosphor-bronze contacts; rating-860 vrms at sea level, 220 vrms at 50,000 feet; current 1 amp, operating temp. -80°C.
		RESONANT REED ENCODERS
RD601		D.C. coil res - 600 ohms ±10%. Freq stability - when operated over temp. range of -40°C to +100°C deviation from design center freq shall not exceed ±0.5% for frequencies from 67 cps to 180 cps. Standard 7 pin miniature tube socket mounting. Sim to Security device laboratory J-810. Part No. determined by multiplying freq. by a factor of 10. Example: 67.0 cps x 10 equals Part No. 670. The following frequencies & Part No. are recommended for Channel Guard:
	3R161-P719	71.9 cps*
	3R161-P770	77.0 cps*
	3R161-P825	82.5 cps*
	3R161-P885	88.5 cps*
	3R161-P948	94.8 cps*
	3R161-P1000	100 cps*
	3R161-P1028	103.5 cps*
	3R161-P1035	103.5 cps*
	3R161-P1056	105.6 cps*
	3R161-P1072	107.2 cps*
	3R161-P1085	108.5 cps*
	3R161-P1100	110.9 cps*
	3R161-P1115	111.5 cps*
	3R161-P1148	114.8 cps*
	3R161-P1148	114.8 cps*
	3R161-P1177	117.7 cps*
	3R161-P1188	118.8 cps*
	3R161-P1209	120.9 cps*
	3R161-P1230	123.0 cps*
	3R161-P1243	124.3 cps*
	3R161-P1273	127.3 cps*
	3R161-P1277	127.7 cps*
	3R161-P1312	131.2 cps*
	3R161-P1318	131.8 cps*
	3R161-P1348	134.8 cps*
	3R161-P1365	136.5 cps*
	3R161-P1385	138.5 cps*
	3R161-P1413	141.3 cps*

SYMBOL	G-E PART NO	DESCRIPTION
		RESONANT REED ENCODERS (CONT'D)
	3R161-P1424	142.4 cps
	3R161-P1462	146.2 cps*
	3R161-P1463	146.3 cps
	3R161-P1503	150.3 cps
	3R161-P1514	151.4 cps*
	3R161-P1545	154.5 cps
	3R161-P1568	156.8 cps*
		RESONANT REED DECODERS
RD602		D.C. coil res - 600 ohms ±10%. Bandwidth to be at least ±1.2% and no greater than ±2.7% of design center freq at 4 ma for freq from 67.0 cps to 180 cps. Contact rating 12 VDC @100 ma, 48 VDC at 10 ma, 150 VDC at 2 ma. Standard 7 pin miniature tube socket mounting. Part No. determined by multiplying freq by a factor of 10. Example: 67.0 cps x 10 equals Part No. 670. The following frequencies & Part No. are recommended for Channel Guard.
	3R160-P719	71.9 cps*
	3R160-P770	77.0 cps*
	3R160-P825	82.5 cps*
	3R160-P885	88.5 cps*
	3R160-P948	94.8 cps*
	3R160-P1000	100 cps *
	3R160-P1026	102.6 cps
	3R160-P1035	103.5 cps*
	3R160-P1056	105.6 cps*
	3R160-P1072	107.2 cps*
	3R160-P1085	108.5 cps
	3R160-P1100	110.9 cps*
	3R160-P1115	111.5 cps
	3R160-P1148	114.8 cps
	3R160-P1148	114.8 cps*
	3R160-P1177	117.7 cps
	3R160-P1188	118.8 cps*
	3R160-P1209	120.9 cps
	3R160-P1230	123.0 cps*
	3R160-P1243	124.3 cps
	3R160-P1273	127.3 cps*
	3R160-P1277	127.7 cps
	3R160-P1312	131.2 cps*
	3R160-P1318	131.8 cps
	3R160-P1348	134.8 cps
	3R160-P1365	136.5 cps*
	3R160-P1385	138.5 cps
	3R160-P1413	141.3 cps*
	3R160-P1424	142.4 cps
	3R160-P1462	146.2 cps*
	3R160-P1463	146.3 cps
	3R160-P1503	150.3 cps
	3R160-P1514	151.4 cps*
	3R160-P1545	154.5 cps
	3R160-P1568	156.8 cps*

*Asterisk indicates EIA preferred frequencies.

SUB-ASSEMBLIES

CABLE-ASSEMBLY

PL-5493351-G1

PLUGS

P601 thru P604	4029840-P1	Terminal: taper pin connector; Sim to Amp 41854 or Kent 123946.
P605	4033348-P1	Contact, female friction: Brass; Sim to Bead Chain M137-34.
P607 and P608	4029840-P1	Terminal: taper pin connector; Sim to Amp 41854 or Kent 123946.
P611 and P612	4029840-P1	Terminal: taper pin connector; Sim to Amp 41854 or Kent 123946.
P613 and P614	4033348-P1	Contact, female friction: Brass; Sim to Bead Chain M135-34.
P615	4029840-P1	Terminal: taper pin connector; Sim to Amp 41854 or Kent 123946.
P617 and P618	7147264-P1	Terminal, wire.
P622	4029840-P1	Terminal: taper pin connector; Sim to Amp 41854 or Kent 123946.

MISCELLANEOUS

	19B200957-P1	Cable: 16 in. with molded on 7-pin female connector.
	19B200957-P2	Cable: 4 ft, 4 1/2 in. with molded-on 7-pin male connector.

*Asterisk indicates EIA preferred frequencies.

PRODUCTION CHANGES

(Refer to Parts List for description of parts affected by these revisions)

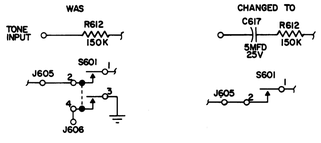
REV. A - Incorporate improved CHANNEL GUARD Switch and add DC blocking to tone input circuit.

Changes: S601 replaced by 19B200547-P1 Switch.

Added C617.

Deleted J606.

Elementary Diagram Changes:

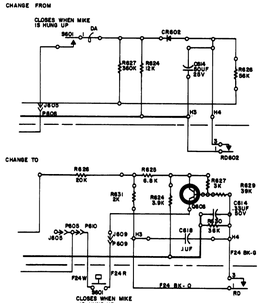


REV. B - Application better suited to non-polarized capacitors. Changed value of C617 from 5 µf, 25 VDCW to 0.22 µf, 50 VDCW.

REV. C - Changed transistors from Type No. to G.E. Drawing No. to facilitate closer control of quality of transistors.

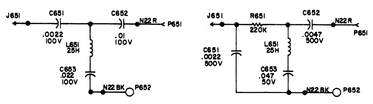
REV. D - Changed printed circuit wiring and layout and added extra stage (Q606) to eliminate excessive arcing of reed contact, and also to eliminate point-to-point wiring through board re-layout.

Elementary Diagram changed as shown below:



PL-5493433-G1 Tone Squelch Filter

REV. A - Changed circuit of filter to improve audio quality. This change cannot be made in the field except by replacing existing filter with Rev. A.



REV. E - Mounting plane of RD601 rotated 90° to reduce influence of vibration.

REV. F - Changed value of C618 and added R610 in series with C618 to provide better protection for RD602 from arcing when off-frequency signal is received. See parts list for new value of components.

REV. G - Changed value of C601, C603, C609, C615, Q601, Q602, R606; deleted C605, CR601, I601, L603, R601, R605; added C619, C620, C621, L604, L605, R611, R602, and R633 to stabilize tone output during vibration. See parts list for new value of components. New parts layout and wiring diagram changes.