2-WAY MOBILE RADIO

MAINTENANCE MANUAL FOR GENERAL ELECTRIC NOISE BLANKER MODEL 4EZ14B10, 11 & 12 (Using Modification Kit A-4038585-G1)

Options
4861-4863
(Front Mount)
4864-4866
(Trunk Mount)

SPECIFICATIONS

Receiver Frequency	Blanker Frequency	Blanker Model
25-33 MC	30.2 to 36.5 MC	4EZ14B10
33-42 MC	36.5 to 46.8 MC	4EZ14B11
42-50 MC	46.8 to 52.3 MC	4EZ14B12

Blanking time - 10 microseconds maximum

Maximum instantaneous repetition rate - 100 KC

Blanker RF bandwidth - 0.5 MC

Power input - 12 volts at 23 milliamps

RF impedance - 50 ohms

Dimensions (HWD) - 1-1/2" x 8-1/4" x 5-1/2"

Weight - 1-1/2 lbs.

Pulse output - 8 volts (nominal negative-going pulse)

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GENERAL ELECTRIC NOISE BLANKER
MODEL 4EZ14B10, 11 & 12

GENERAL DESCRIPTION

The General Electric RF Noise Blanker is designed to reduce ignition noise effects and other pulse type noise interference when used with TPL receivers operating in the 25-50 megacycle band.

The General Electric Noise Blanker features completely automatic switching; there are no manual switches to contend with. As soon as the TPL unit is turned on, the Noise Blanker begins to operate automatically. As there are no manual switches to degrade receiver sensitivity and range, the TPL receiver operates at top sensitivity all of the time. The automatic switch prevents the receiver from being completely disabled under certain intermodulation conditions.

FIELD INSTALLATION

For field installations, the receiver RF Amplifier assembly must be modified before the Noise Blanker can be attached to the TPL unit.

In receiver types ER-32-A & B, install Modification Kit A-4038585-G1 according to Modification Instructions A-4038590 below.

In receiver types ER-32-H & J, RF Amplifier Model 4EF16B10 must be converted to a Model 4EF16A10 by Modification Kit A-4039168-G1 according to Installation Instructions LBI-3437. After converting the RF Amplifier to a Model 4EF16A10, install Modification Kit A-4038585-G1 according to Modification Instructions A-4038590 below.

MODIFICATION INSTRUCTIONS
(A-4038590, Sh. 1, 2, 3, Rev. O)

1. These instructions cover the installation of Modification Kit A-4038585 for application of Noise Blankers 4EZ14A10, 11 & 12 with low band TPL RF Assembly 4EF16A10.

2. This step covers the preparation of the receiver for installation of the Modification Kit.

   a. Remove the RF Assembly 4EF16A10 from the front frame by removing the four (4) screws holding this assembly and unplugging the wires connecting the RF Assembly to the remainder of the unit.

   b. Now remove the RF Assembly 4EF16A10 from the front frame.

c. Remove front can and transistor Q411 in area shown in Figure 1.

d. Remove resistor R413 connecting XQ411-E and TB1-2 by unsoldering or clipping therefrom.

e. Remove hardware holding TB1 in place. All hardware but the screw will be reused later.

f. Route cable supplied with Modification Kit A-4038585 through the can on the RF Assembly as shown in Figure 1. This cable can be identified by its male, right-angle connection on one end. Connect to terminal strip as shown in Figure 2. Now install terminal strip with cable attached as located in Figure 1. Use the longer screw furnished with the kit to assemble. Be sure three (3) lockwashers are applied -- one between each terminal strip foot and the nut. Connect the resistor furnished as part of this kit between the new terminal strip and XQ411-E and solder. (See Figure 2.)

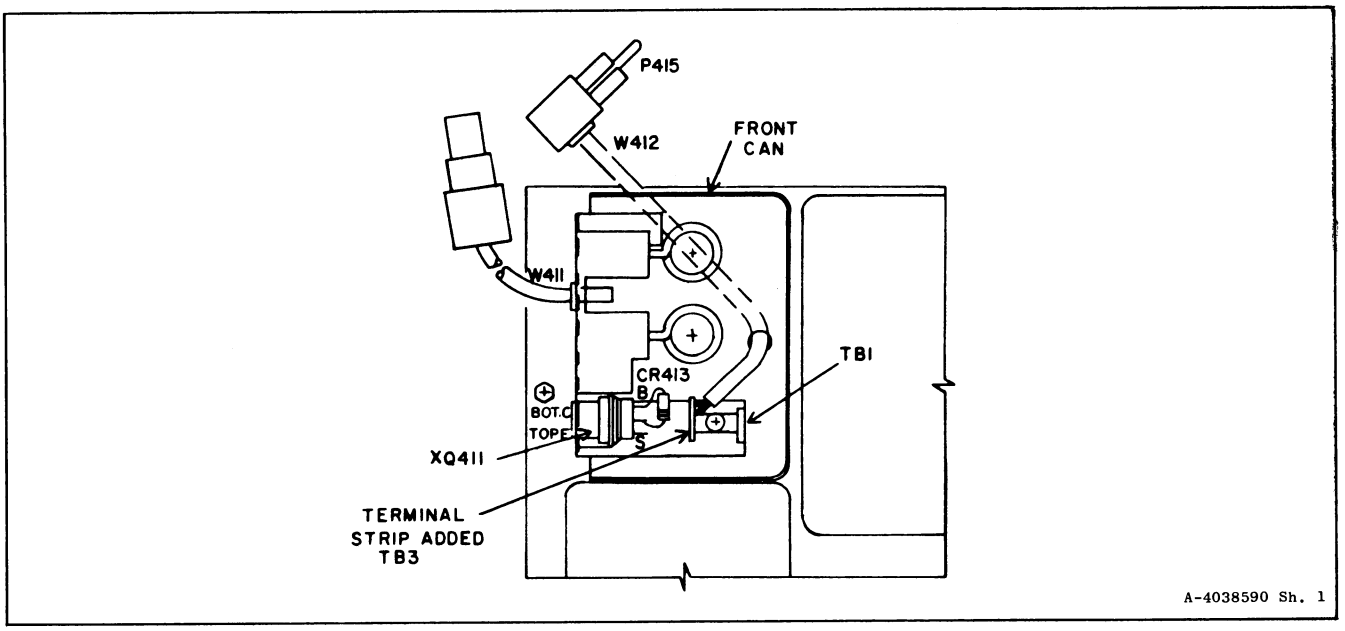


Figure 1 - RF Assembly (Partial View)

Install diode CR413 between XQ411-E and XQ411-B as shown in Figure 1 and 3; when soldering, be sure to heat sink the leads on body sides of the solder joint.

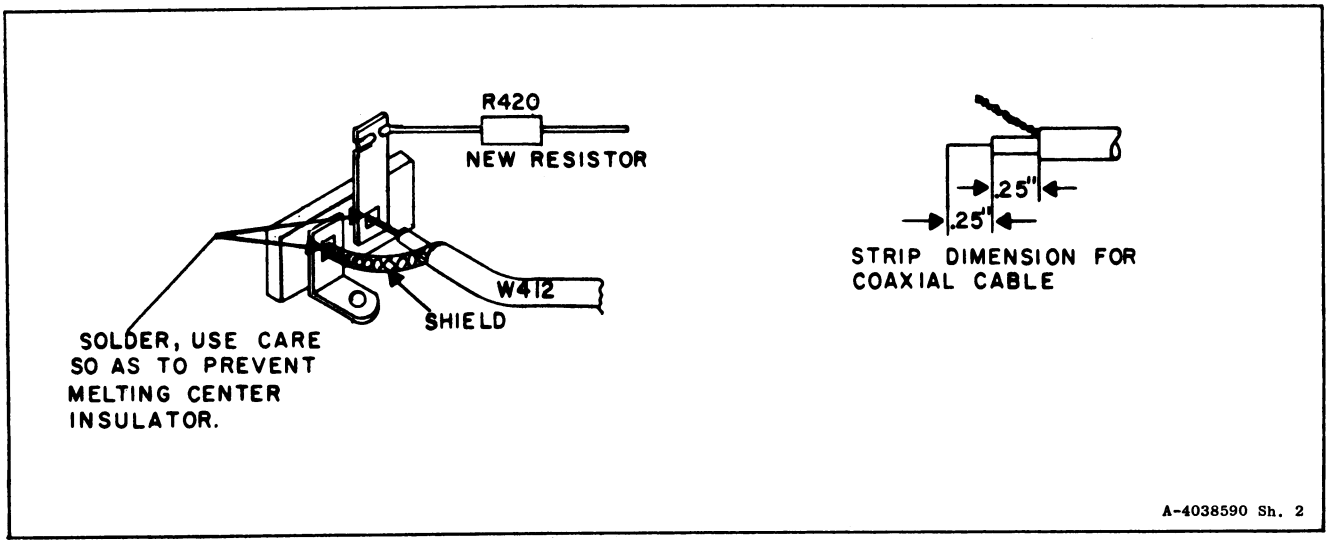


Figure 2 - Connections to TB3

3. The installation of the kit is now complete insofar as the RF portion of the receiver is concerned.

   a. Replace cover and its hardware on the RF Assembly.

   b. Reinstall RF Assembly into the mounting frame and make the connections removed in step 2a. Then reinstall the transistor removed in step 2c.

4. a. Install power cable (which terminates with P2354) as shown in Figure 3.

   b. The cables should be routed as shown in Figure 3 about the control unit.

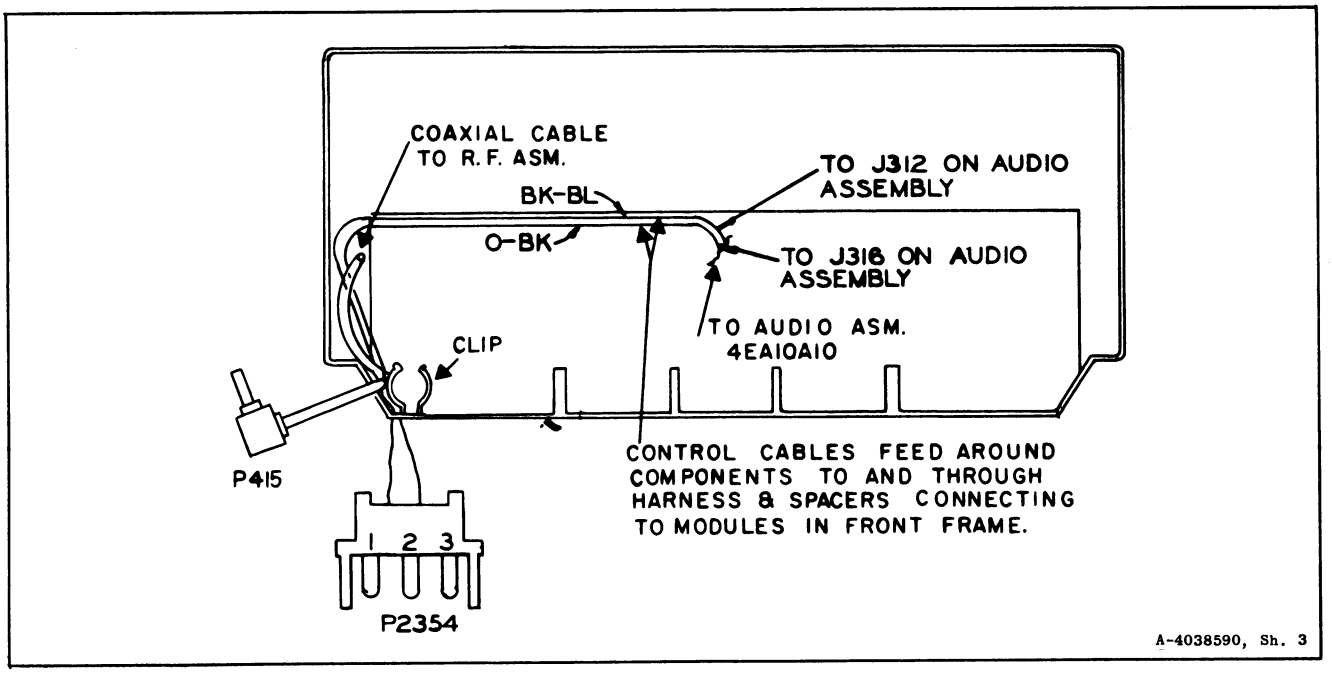


Figure 3 - Cable Routing (Back View of Control Unit)

INSTALLATION

The Noise Blanker is housed in an aluminum assembly that mounts under the front or receiver portion of the TPL unit. For field installation of the Noise Blanker, refer to the instructions below as well as Installation Diagram RC-847. Cable connections from the TPL unit to the Noise Blanker are included on the Installation Diagram.

FRONT OR SPLIT MOUNT INSTALLATION

1. Loosen the knurled knobs and/or screws on each side of the TPL Mounting Bracket.
2. Hook the cut-outs on the Blanker Support Assembly over the shafts of the knurled knobs or screws.
3. Retighten knobs and screws.
4. Connect cables as shown on Installation Diagram RC-847.

TRUNK MOUNT INSTALLATION

1. Install Trunk Mounting Frame 5493954-G2 in place of the old Trunk Mounting Frame.
2. Loosen the two screws in the Mounting straps on each side of the TPL unit.
3. Hook the cut-outs in the Blanker Support Assembly over the screw shafts.
4. Place TPL unit in Trunk Mounting Frame and close the catch over the hook on the Mounting Straps.
5. Retighten screws in Mounting Straps.

CIRCUIT ANALYSIS

An RF signal and noise pulse from the antenna is transformer-coupled simultaneously to a Blanker RF Amplifier section and to an RF Preamplifier. The Blanker RF Amplifier section contains two RF amplifier stages and a detector stage. Amplifiers Q2351 through Q2354 raise the level of the noise pulse which is then detected by Q2355.

R2353 is the THRESHOLD ADJUSTMENT for setting the threshold of blanking to match the receiver. TEST JACK J2353 is used when realignment of the Noise Amplifier is required.

The detected noise pulse is applied to Blanking Pulse Generator A2351 where it is further amplified by Q1 to raise the level of the pulse. The amplified pulse is then fed to the base of Q3. Q2 and Q3 form part of the one-shot multivibrator. Q3 is normally ON (or conducting) while Q2 is normally OFF. The amplified negative-going pulse is

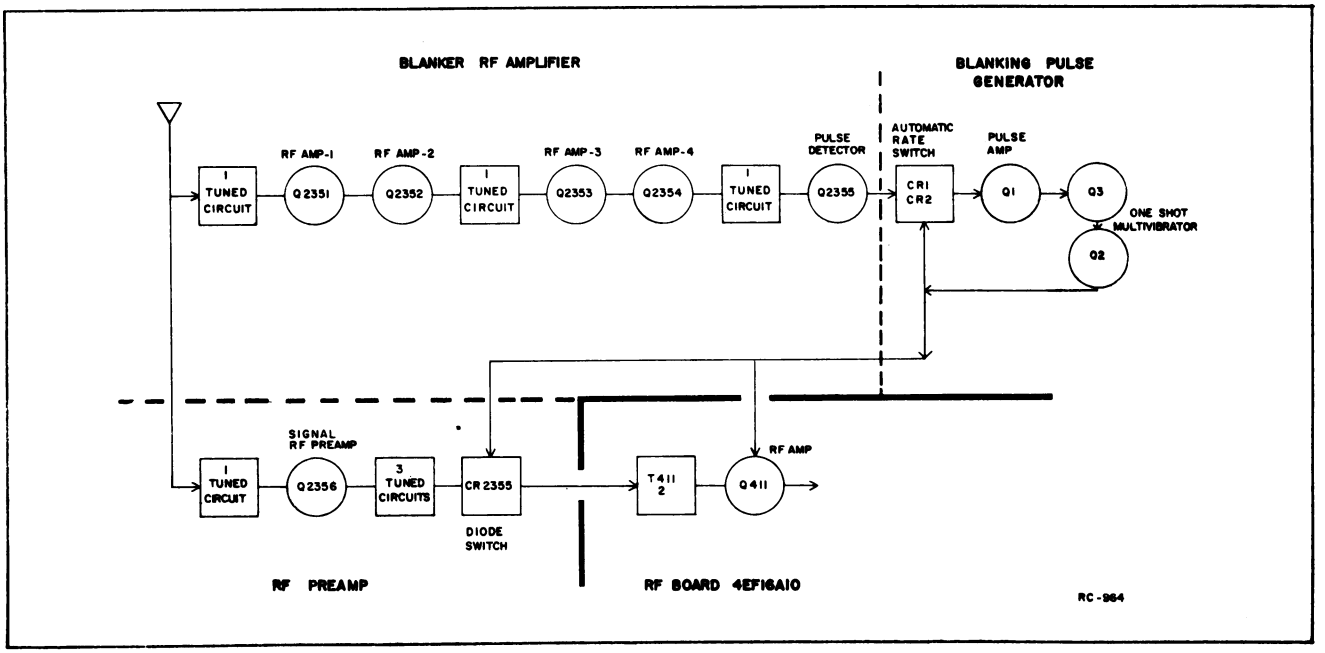


Figure 4 - Block Diagram

fed to the base of Q3, cutting the stage off. As Q3 cuts off, Q2 cuts on, and the output of Q2 is a blanking pulse (negative-going) of approximately 8 microseconds duration. This blanking pulse is fed simultaneously to Diode Switch CR2355 and to the emitter of RF amplifier Q411 (in the receiver) through an RF shielded cable. This pulse disables the receiver for the duration of the noise pulse.

To prevent blanking over periods of time long enough to interfere with the normal operation of the receiver, an automatic switch consisting of CR1 and CR2 is connected between Q2 and Q1. The automatic switch prevents the Blanker from continuously shutting off the receiver under conditions of intermodulation within the passband. For example: Without automatic switching, two signals separated by 100 KC or greater and within the 0.5-MC passband could beat together (depending on levels) to produce pulses at a 100 KC or greater repetition rate. Without the automatic switch, this would operate the Blanker continuously, cutting off the desired signals in the receiver.

With the automatic switch, any high (100 KC or greater) repetition rate, which persists for more than a few cycles, will be limited to a maximum repetition rate of 60 KC. This means that the receiver cannot be shut off by the blanking pulses for a long enough period to keep the desired signal from being heard.

As the noise signal from the antenna is applied to the Noise Amplifier section, the RF signal is applied to the RF Preamplifier stage Q2356. The four tuned circuits in this stage and the two tuned circuits in the receiver provide a time delay for the RF signal. This delay enables the blanking pulse from the Blanking Pulse Generator to cut off the RF Amplifier in the receiver before the noise pulse can get there.

In addition to the blanking pulse at the RF Amplifier, the Diode switch (CR2355) at the output of RF Preamplifier Q2356, is triggered (cut off) by the blanking pulse. This additional blanking further attenuates high level noise pulses that might not be blanked in the receiver.

BENCH ALIGNMENT

This section outlines the procedure for completely aligning the Noise Blanker and should be followed when the unit has been misaligned or modified, or whenever interference is encountered on the Blanker frequency.

Before starting the Noise Blanker alignment, make sure that the TPL receiver is operating normally. If it is necessary to realign the receiver, refer to the RECEIVER ALIGNMENT in the Instruction Book. When checking the receiver for normal operation, P2353, (RF OUT) must be disconnected from the receiver antenna jack J413, and the signal generator connected directly to J413. Make sure that J2355 (PULSE OUT) is connected to P415, and TEST SWITCH S2351 is held in the OFF position. This is necessary to insure the proper operating voltage on the receiver RF Amplifier.

NOTE

Do not attempt to phase tune the receiver with the Noise Blanker operating. When phase tuning, disable the Noise Blanker by means of Test Switch S2351.

RECEIVER PREAMPLIFIER

Equipment Required

1. A non-metallic screwdriver or tuning tool.
2. A 25-50-MC signal generator.
3. A 20,000 ohm-per-volt meter with a 0-3-volt scale, or a 0-100-microampere DC meter.

Procedure

1. Connect the RF OUTPUT P2353 to the receiver input jack J413.
2. Set signal generator to the receiver RF frequency and connect to the Blanker ANTENNA INPUT Jack J2351.

3. Connect meter between LIM-1 jack J301 (on 4EA10A10) and J304 (Reference Bus on 4EA10A10).

4. Preset trimmers C2372, C2374, C2379, and C2382 (Figure 5) to approximately the correct setting (maximum capacity is low end of band). Trimmers are at maximum capacity when solder dot on ceramic rotor is closest to chassis.

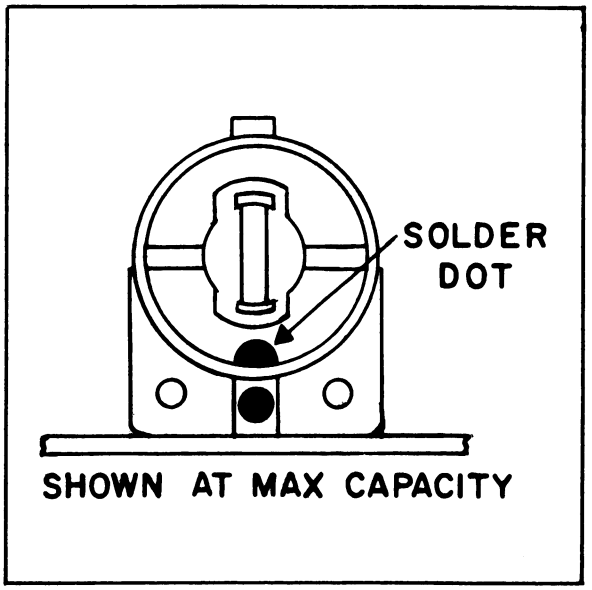


Figure 5 - Presetting Trimmers

5. Adjust signal generator for zero discriminator reading.

6. Adjust C2372, C2374, C2379, and C2382 for maximum reading at J301. Reduce signal generator output so that meter reading does not exceed one volt when adjusting the trimmers.

7. When the RF Preamplifier is correctly aligned, the sensitivity should be equal to, or better than, the sensitivity of the receiver with the Preamplifier disconnected.

NOISE AMPLIFIER

Equipment Required

1. A hexagonal tuning tool.

2. A signal generator.

3. A 20,000 ohm-per-volt meter with a 0-3-volt scale or a 0-100-microampere DC meter.

Procedure

1. Set the signal generator to the frequency determined by Table I.

2. Plug negative meter probe into TEST JACK J2353 with positive probe to positive bus, J304.

3. Set THRESHOLD ADJ R2353 fully clockwise.

4. Peak T2357 (or T2358/T2359), T2354 (or T2355/T2356) and T2351 (or T2352/T2353) in that order.

TABLE I

FREQUENCY SELECTION TABLE *

IF RECEIVER OPERATING FREQUENCY IS:	THEN RECOMMENDED BLANKER FREQUENCY IS:	NOISE BLANKER MODEL NUMBER
25-29 MC	34.5 MC	4EZ14B10
29-33 MC	36.5 MC	"
33-36 MC	38.5 MC	4EZ14B11
36-38 MC	41.0 MC	"
38-42 MC	46.8 MC	"
42-44 MC	46.8 MC	4EZ14B12
44-49.5 MC	52.3 MC	"

*If interference is noted on the recommended frequency, tune the Blanker to a clear frequency following the limitations noted below:

1. Do not tune Noise Amplifier to within one megacycle of the receiver operating frequency or a loss of sensitivity will result.
2. To minimize receiver spurious, tune the Blanker to a higher frequency than the receiver operating frequency when possible.
3. If it is necessary to tune to a lower frequency than the receiver to find a clear channel, do not tune the Noise Amplifier to within one megacycle of the receiver oscillator.

THRESHOLD ADJUSTMENT

Equipment Required

1. A noise generator as shown in Figure 6.
2. If available, a 50-ohm RF attenuator with a 70 db (or greater) range, or:
3. Two 4-inch lengths of wire (bent at right angles) for small antennas.
4. A 25-50-MC Signal generator coupled through a 6-db pad.
5. An audio voltmeter (VTVM).

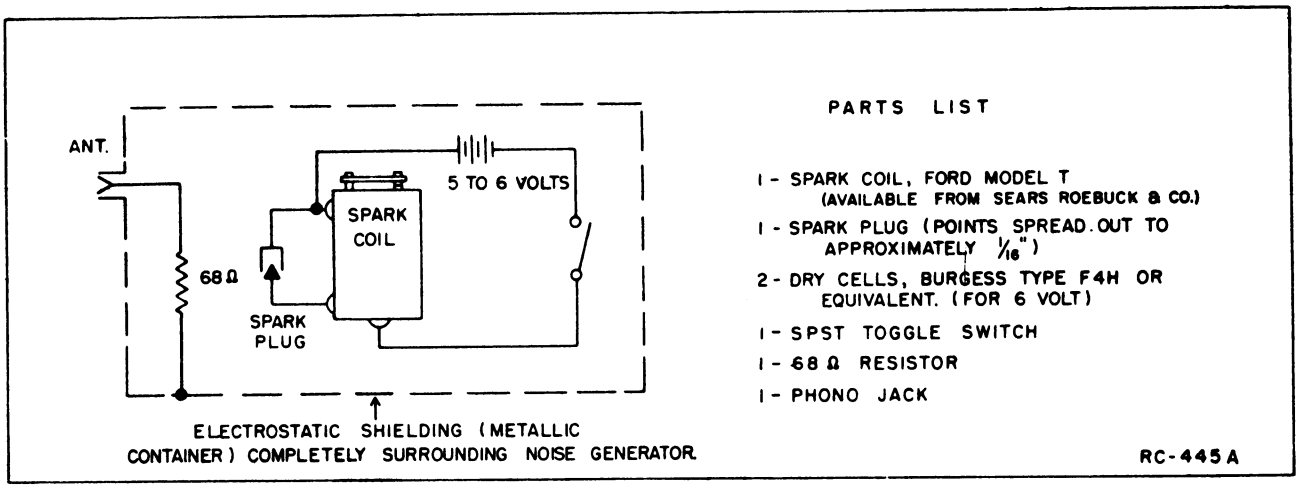


Figure 6 - Noise Generator

Procedure

1. Connect the equipment as shown in Figure 7.

2. Turn the noise generator off.

3. Adjust the signal for 30 db quieting.

4. If the RF attenuator is used, adjust it for full attenuation. Do not use antennas when using the RF attenuator.

5. Turn the noise generator On.

6. Hold Blanker TEST SWITCH S2351 in the Off position. Adjust the RF attenuator (if used), or the spacing between the small antennas (if no RF attenuator), so that the noise degrades the 30 db quieting by 3 db (to 27 db quieting).

7. Release the TEST SWITCH and adjust THRESHOLD ADJUSTMENTS R2353 so that the Blanker just begins to blank out the noise, or until minimum gain is reached (R2353 fully counterclockwise).

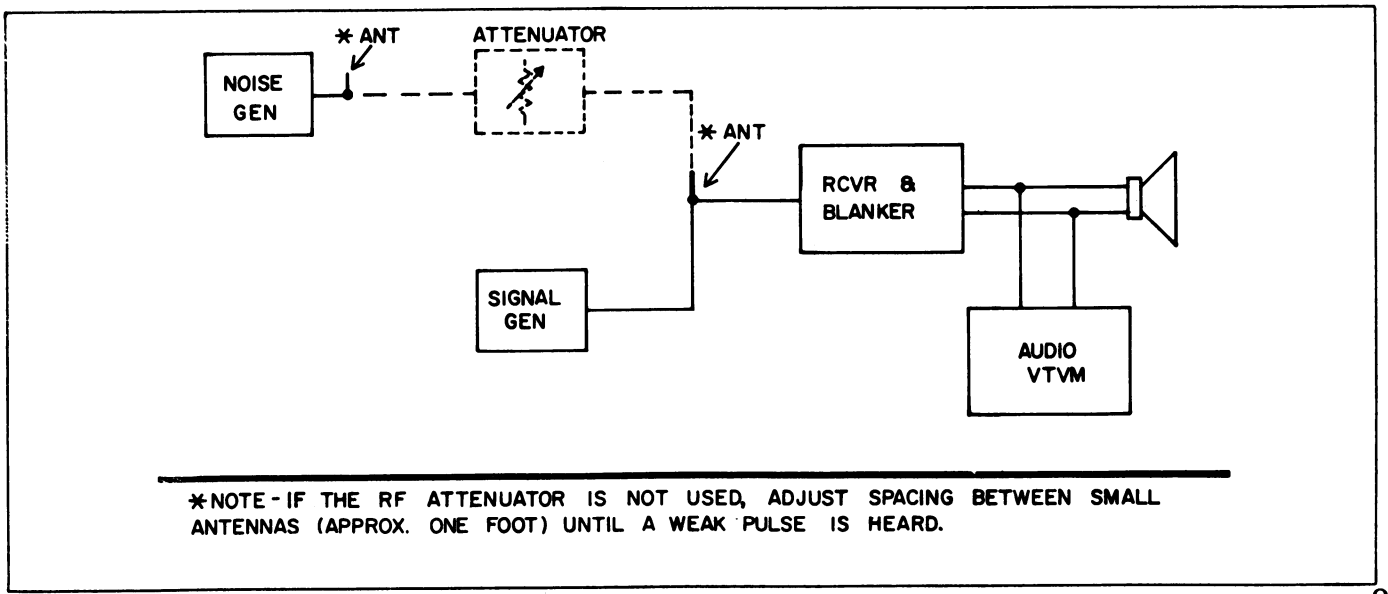


Figure 7 - Equipment Connection Diagram

PERFORMANCE CHECK

After completing the Blanker Alignment, the following performance check can be made to determine if the Blanker is operating normally.

Equipment Required

1. A noise generator with a 10-KC repetition rate, an adjustable output level, and 50-ohm output impedance.

2. A 25-50-MC signal generator coupled through a 6 db pad.

3. An audio voltmeter (VTVM).

Procedure

1. Set the noise generator for a 10-KC repetition rate.

2. While holding the TEST SWITCH (S2353) in the OFF position, adjust the output level of the noise generator until the receiver sensitivity is degraded by 50 db. For example:

   Normal 20 db quieting = -116 dbm (0.35 mv)
   20 db quieting degraded by 50 db = -116 dbm
   - 50 db
   - 66 dbm (116 mv)

3. With Blanker TEST SWITCH in the ON position, the normal 20 db quieting should be restored to within 10 db.

MAINTENANCE

To assure peak performance of the Noise Blanker, routine mechanical and electrical checks of the vehicle should be made at regular intervals. Electrical checks should include ground connections and connections to the voltage source, as well as regular inspection of ignition wiring or resistive wiring. A mechanical inspection should include a check for loose plugs, nuts, screws, and parts to make sure nothing is working loose.

TROUBLE SHOOTING

Before attempting to trouble shoot the Noise Blanker, check to see that the receiver is operating normally. Then, follow the procedures suggested for each symptom listed below.

In general, there are two types of symptoms that may indicate that the Noise Blanker is not operating properly. These symptoms are:

(1) Partial blanking or no blanking at all.
(2) Blanker degrading receiver sensitivity.

SYMPTOM I - PARTIAL OR NO BLANKING

Service Checks --

1. Check Blanker operation (refer to PERFORMANCE CHECK on page 10).

2. If the performance check indicates normal operation but the Blanker operation on the vehicle ignition noise is not satisfactory, check the ignition system. Badly worn points, bad sparkplugs or breaks in ignition wiring can cause a "dirty" ignition pulse to be generated, causing the Blanker to operate unsatisfactorily. If this condition is suspected, the vehicle ignition system should be checked by an ignition system repairman or other competent repairman.

3. If the performance check indicates the Blanker is not operating normally, the following checks should be made:

   a. Check the voltage readings as listed in Table II.

   b. Check the RF attenuation.

      1. Connect a signal generator to J2351 (Blanker ANTENNA INPUT).

      2. Connect voltmeter to J301 (LIM-1) on Audio Board 4EA10A10. Adjust the signal generator output for a reading of 60 ua.

      3. Short the base and emitter (point 3 to point 5 on eyelet board) of Q3-A2351 and increase signal generator output until the same limiter reading is obtained.

      4. The increase in signal level must be 50 db or more for proper operation.

   c. Make voltage and resistance checks as shown on Service Sheet RC-965.

SYMPTOM II - POOR RECEIVER SENSITIVITY

Service Checks --

Check the receiver sensitivity with and without the RF Preamplifier connected to the receiver. When checking with the RF Preamplifier disconnected, make sure that J2355 is connected to P415 (on RF Board), and that TEST SWITCH S2351 is held in the Off position.

1. If the sensitivity is not off by more than a few db, check the limiter reading with a 5 uv signal in at J2351. Now connect the signal generator directly into the receiver. With the RF Preamplifier disconnected and S2351 held in the Off position, the limiter reading should be less than the first reading and the receiver sensitivity should be normal. A higher reading

with the RF Preamplifier disconnected indicates a loss in the RF Preamplifier. If there is a loss indicated, visually inspect the RF Preamplifier and then make voltage and resistance checks as shown on the Service Sheet for the Blanker.

2. If the sensitivity is very poor with the Blanker connected, it may indicate that Q2-A2351 is conducting continuously, thus cutting off the signal at the Diode Switch (CR2355) and at the RF amplifier in the receiver. To check to see if Q2 is conducting continuously, simply hold TEST SWITCH S2351 in the OFF position, removing the voltage from Q2. This should restore normal receiver sensitivity. Then, check voltage readings as shown in Table II. If readings are not normal, check voltage and resistance readings in the Blanker Pulse Generator as shown on Service Sheet RC-965.

TABLE II

VOLTAGE READINGS
(Make to Reference + Bus
and are within ±20%)

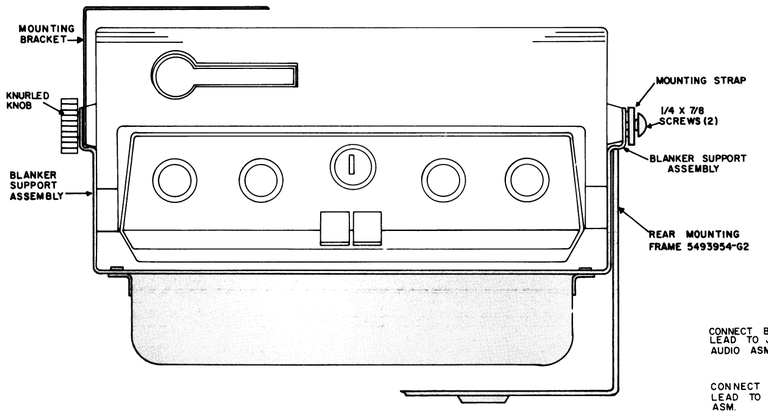
	Detector Q2355 Removed for Normal (No Blanking) Conditions	Q3-A2351 Removed for Continuous Blanking Condition
Pulse Line (TB3-1)	-4.85 V	-11 V
Diode Switch Cathode (TB4-3)	-5.5 V *	-9 V Δ
Diode Switch Anode (TB4-2)	-5.2 V	-10.8 V
Q411 (RF AMP) BASE	-5.9 V **	-9.3 V ΔΔ
Q411 Emitter	-5.8 V	-9.7 V

CONDITION	CR2355	Q411
NORMAL SWITCHING	CATHODE MORE NEGATIVE THAN ANODE -5.2V -5.5V	BASE MORE NEGATIVE THAN EMITTER -5.9V -5.8V
BLANKED	CATHODE MORE POSITIVE THAN ANODE -10.8V -9V	BASE MORE POSITIVE THAN EMITTER -9.3V -9.7

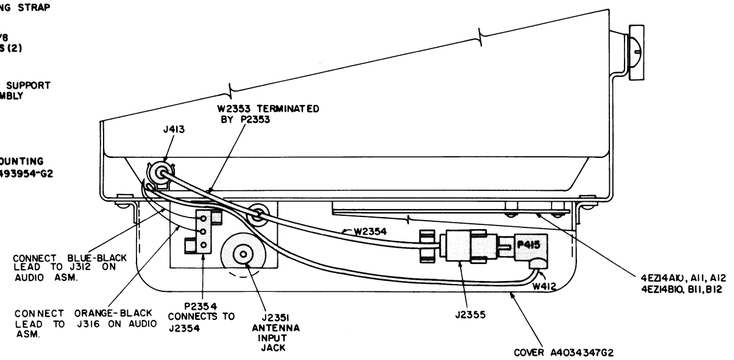
* Always more negative than diode anode.
** Always more negative than emitter.
Δ Always more positive than diode anode.
ΔΔ Always more positive than emitter.

FRONT OR TRUNK MOUNT

REAR MOUNT



NOISE BLANKER MOUNTING



CABLE CONNECTIONS

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Installation Diagram

TPL NOISE BLANKER
MODELS 4EZ14A10, 11 & 12
MODELS 4EZ14B10, 11 & 12

(RC-847B)

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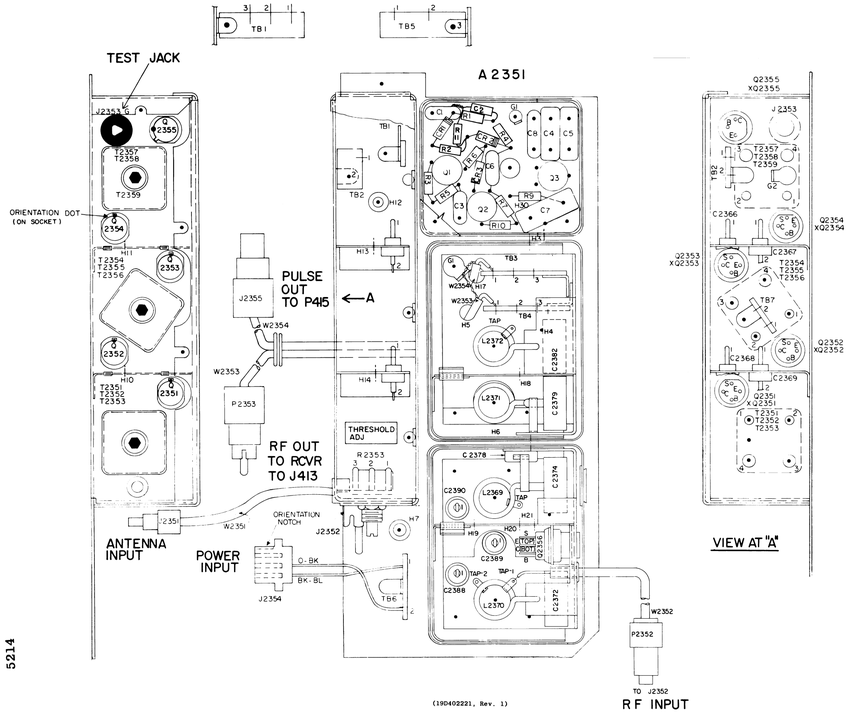

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RESISTANCE READINGS

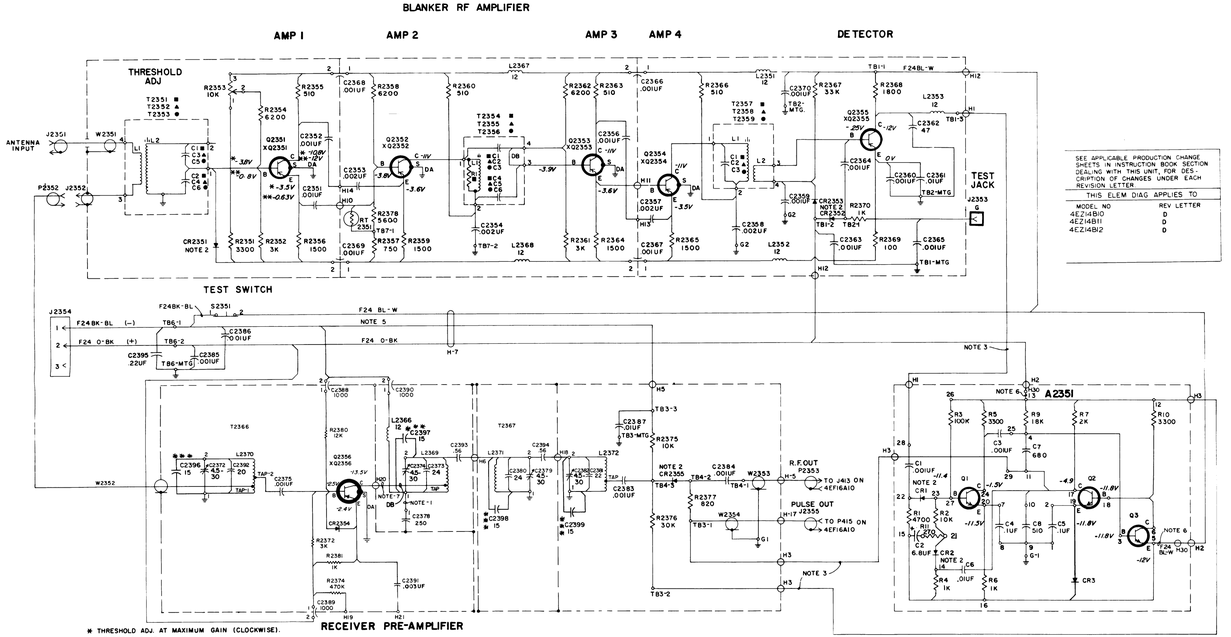
Conditions of Measurement

1. Blanker power plug J2354 disconnected from the receiver.
2. Translator removed from socket under test.
3. Pin 1 of J2354 (negative bus) shorted to pin 2 (positive bus).
4. Readings taken from top of transistor socket to negative bus, and are within ±20%.
5. Threshold control set for minimum gain (rotated counter-clockwise).

	E	B	C	S
Q2351	1.5 K	2.5 K ①	510 Ω	470 K
Q2352 ②	1.5 K	2.2 K	510 Ω	470 K
Q2353 ②	1.5 K	2.02 K	510 Ω	470 K
Q2354	1.5 K	1.5 K	510 Ω	470 K
Q2355	100 Ω	33 K ③	1.8 K	470 K
Q2356	1 K	2.4 K	0	470 K
Q1-A2351	1 K	4.5 K ④ 65 K ⑤	3.3 K	470 K
Q2-A2351 ⑥	120 Ω	3.3 K	2 K	470 K
Q3-A2351 ⑥	0	1.8 K	3.3 K	470 K

NOTES:

1. IF READING IS SUBSTANTIALLY LESS THAN ONE SHOWN IN CHART, (I.E. 100 OHMS OR LESS ON R10 SCALE) THIS INDICATES LOW RESISTANCE READING OF A FORWARD CONDUCTING DIODE. REVERSE METER LEADS FOR OTHER READING.
2. REVERSE METER LEADS FOR OTHER READING.
3. REMOVE BOTH TRANSISTORS WHILE CHECKING THESE READINGS.
4. REMOVE BOTH TRANSISTORS WHILE CHECKING THESE READINGS.



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
4EZ14B10	D
4EZ14B11	D
4EZ14B12	D

* THRESHOLD ADJ. AT MAXIMUM GAIN (CLOCKWISE).
** THRESHOLD ADJ. AT MINIMUM GAIN.

VOLTAGE READINGS WITHIN ± 20%

NOTES:

1. STRAP-BIIB3A9-.125 X .50LG X .005 THK.
2. DIODE-ORIENTATION AS SHOWN- ANODE ▶| CATHODE
3. USE TEFLON SLEEVING A4038593 P1
4. COMPONENTS MARKED ■ FOR 4EZ14B10 ONLY
   COMPONENTS MARKED ▲ FOR 4EZ14B11 ONLY
   COMPONENTS MARKED ● FOR 4EZ14B12 ONLY
5. USE TEFLON WIRE A7144127P7
6. LEAVE LOOP .650 ABOVE COMPONENT BOARD
7. USE TEFLON SLEEVING

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.

TO MAKE MODELS 4EZ14B10, B11 & B12 SEE TABLE BELOW FOR CORRECT COMPONENTS VALUES

4EZ14B10 ■		4EZ14B11 ▲		4EZ14B12 ●	
T2351	C1-39 C2-270	T2352	C3-22 C4-150	T2353	C5-15 C6-120
T2354	C1-56 C2-470 R1-270	T2355	C2-20 C5-150	T2356	C3-15 C6-120
T2357	C1-33	T2358	C2-15	T2359	C3-8

ALL RESISTORS ARE 1/2 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.

* * * C2396, C2397, C2398, AND C2399 ARE USED IN THE 25-29, 33-37, AND 42-46MC FREQ. RANGES. SEE FREQ. RANGE MODIFICATION INSTRUCTION PL19820B08507, 8, 9.

(19D402148, Rev. 6)

Service Sheet

TPL NOISE BLANKER
MODEL 4EZ14B10, 11 & 12; REV. D

(RC-965A)

PARTS LIST

NOISE BLANKER
MODEL 4E214B10, 11, 12, REV. D

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2351 and C2352	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2353 and C2354	5494481-P14	Fixed ceramic disc; 2000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2356	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2357 and C2358	5494481-P14	Fixed ceramic disc; 2000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2359 and C2360	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2361	5491189-P1	Mylar*, epoxy-dipped; 0.01 µf ±20%, 50 VDCW; Sim to Good-All 601PE.
C2362	5496670-P123	Fixed silver mica; 47 pf ±2%, 100 VDCW; Sim to Electromotive DM-10.
C2363, C2364, and C2365	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2366, C2367, C2368, and C2369	5493392-P7	Feed-thru; 1000 pf +100% -0%, 500 VDCW; Sim to Allen-Bradley FA3C.
C2370	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2372*	7484389-P13	Variable; ceramic trimmer, 4.5 to 30 pf +50% -100%, 0 temp coef, 500 VDCW. In Models earlier than Rev. D;
	7484389-P8	Variable; (ceramic trimmer); 4.75 to 55.00 pf ±20% -100%, 500 VDCW, -300°C temp coef.
C2373*	5496218-P248	Fixed ceramic disc; 24 pf ±5%, 500 VDCW, -80 temp coef. In Models earlier than Rev. D;
	5496218-P913	Fixed ceramic disc; 22 pf ±10%, 500 VDCW, +100 temp coef.
C2374*	7484389-P13	Variable; ceramic trimmer, 4.5 to 30 pf +50% -100%, 0 temp coef, 500 VDCW. In Models earlier than Rev. D;
	7484389-P8	Variable; (ceramic trimmer); 4.75 to 55.00 pf ±20 -100%, 500 VDCW, -300°C temp coef.
C2375	5494481-P12 *	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2378	7484389-P3	Fixed mica; 250 pf ±10%, 500 VDCW; Sim to Underwood JA1-HF.
C2379*	7484389-P13	Variable; ceramic trimmer, 4.5 to 30 pf +50% -100%, 0 temp coef, 500 VDCW. In Models earlier than Rev. D;
	7484389-P8	Variable; (ceramic trimmer); 4.75 to 55.00 pf ±20 -100%, 500 VDCW, -300°C temp coef.
C2380*	5496218-P248	Fixed ceramic disc; 24 pf ±5%, 500 VDCW, -80 temp coef. In Models earlier than Rev. D;
	5496218-P913	Fixed ceramic disc; 22 pf ±10%, 500 VDCW, +100 temp coef.
C2381*	5496218-P913	Fixed ceramic disc; 22 pf ±10%, 500 VDCW, +100°C temp coef. In Models earlier than Rev. B;
	5496218-P47	Fixed ceramic disc; 22 pf ±10%, 500 VDCW, 0 temp coef.
C2382*	7484389-P13	Variable; ceramic trimmer, 4.5 to 30 pf +50% -100%, 0 temp coef, 500 VDCW. In Models earlier than Rev. D;
	7484389-P8	Variable; (ceramic trimmer); 4.75 to 55.00 pf ±20 -100%, 500 VDCW, -300°C temp coef.
C2383, C2384, C2385, and C2386	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2387	5491189-P1	Mylar*, epoxy-dipped; 0.01 µf ±20%, 50 VDCW; Sim to Good-All 601PE.
C2388 thru C2390	5493392-P7	Feed-thru; 1000 pf +100% -0%, 500 VDCW; Sim to Allen-Bradley FA3C.
C2391*	5494481-P16	Fixed ceramic disc; 3000 pf ±10%, 500 VDCW, Sim to RMC JF. In Models earlier than Rev. B;
	5494481-P12	Fixed ceramic disc; 1000 pf ±10%, 500 VDCW, Sim to RMC JF.
C2392*	5496218-P249	Fixed ceramic disc; 27 pf ±5%, 500 VDCW, -80 temp coef. In Models earlier than Rev. D;
	7774846-P12	Fixed ceramic disc; 18 pf ±10%, 500 VDCW, temp coef 0.
C2393 and C2394	5491601-P115	Fixed, molded; 56 pf ±5%, 500 VDCW; Sim to Quality Components MC.
C2395	5491189-P8	Mylar*, epoxy-dipped; 0.22 uf ±20% 50-VDCW; Sim to Good-All 601PE.
C2396* thru C2399*	5496218-P244	Fixed ceramic disc; 15 pf ±5%, 500 VDCW, -80 temp coef.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - DIODES - - - - - - - - -
CR2351	4034827-P1	Germanium.
CR2352	7777146-P3	Germanium.
CR2353, CR2354, and CR2355	4034827-P1	Germanium.
		- - - - - - - JACKS AND CONNECTORS - - - - - - -
J2351		(Part of W2351).
J2352	7104941-P8	Jack, phono: Sim to Cinch 15H20309.
J2353	4033567-P4	Jack, test, stake-in, green; Sim to Alden 11008H.
J2354	5496809-P2	Receptacle, phenolic, 3 circuits; Sim to Molex 105583.
J2355		(Part of W2354).
		- - - - - - - - - INDUCTANCES - - - - - - - - -
L2351, L2352, and L2353	7488079-P17	Choke, RF, 12 µh ±10%; Sim to Jeffers 10102-34.
L2366, L2367, and L2368	7488079-P17	Choke, RF, 12 µh ±10%; Sim to Jeffers 10102-34.
L2369*	4031073-G10	7 turns left-hand wound, 10 turns per inch, tap 2-1/8 turns from bottom. In Models earlier than Rev. B; 7 turns right-hand wound, 10 turns per inch, tap 2-1/8 turns from bottom.
L2370	4031073-G11	7 turns right-hand wound, 10 turns per inch, tap 1-7/8 and 2-5/8 turns from bottom.
L2371	4031009-P4	8 turns right-hand wound, 12 turns per inch.
L2372	4031073-G6	Coil, 7 turns right-hand wound, 10 turns per inch.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P2352		(Part of W2352).
P2353		(Part of W2353).
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q2351	19C300037-P4	Germanium, MADT, PNP.
Q2352	198200131-P2	Germanium, PNP.
Q2353	19C300037-P4	Germanium, MADT, PNP.
Q2354	198200131-P2	Germanium, PNP.
Q2355	19A115009-P1	Germanium, PNP.
Q2356	19C300037-P4	Germanium, MADT, PNP.
		- - - - - - - - - RESISTORS - - - - - - - - -
R2351	3R152-P332J	Composition; 3,300 ohms ±5%, 1/4 w.
R2352	3R152-P302J	Composition; 3,000 ohms ±5%, 1/4 w.
R2353	19C300124-P4	Potentiometer, carbon film: 10,000 ohms ±20%, 1/8 w, linear taper; Sim to Mallory WLC.
R2354	3R152-P622J	Composition; 6,200 ohms ±5%, 1/4 w.
R2355	3R152-P511J	Composition; 510 ohms ±5%, 1/4 w.
R2356	3R152-P152J	Composition; 1,500 ohms ±5%, 1/4 w.
R2357	3R152-P751J	Composition; 750 ohms ±5%, 1/4 w.
R2358	3R152-P622J	Composition; 6,200 ohms ±5%, 1/4 w.
R2359	3R152-P152J	Composition; 1,500 ohms ±5%, 1/4 w.
R2360	3R152-P511J	Composition; 510 ohms ±5%, 1/4 w.
R2361	3R152-P302J	Composition; 3,000 ohms ±5%, 1/4 w.
R2362	3R152-P622J	Composition; 6,200 ohms ±5%, 1/4 w.
R2363	3R152-P511J	Composition; 510 ohms ±5%, 1/4 w.
R2364 and R2365	3R152-P152J	Composition; 1,500 ohms ±5%, 1/4 w.
R2366	3R152-P511J	Composition; 510 ohms ±5%, 1/4 w.
R2367	3R152-P333K	Composition; 33,000 ohms ±10%, 1/4 w.
R2368	3R152-P182J	Composition; 1,800 ohms ±5%, 1/4 w.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - RESISTORS (CONT'D) - - - - - - - -
R2369	3R152-P101J	Composition; 100 ohms ±5%, 1/4 w.
R2370	3R152-P102K	Composition; 1,000 ohms ±10%, 1/4 w.
R2372	3R152-P302J	Composition; 3,000 ohms ±5%, 1/4 w.
R2374	3R152-P474K	Composition; 0.47 megohm ±10%, 1/4 w.
R2375	3R152-P103J	Composition; 10,000 ohms ±5%, 1/4 w.
R2376	3R152-P303J	Composition; 30,000 ohms ±5%, 1/4 w.
R2377	3R152-P821K	Composition; 820 ohms ±10%, 1/4 w.
R2378	3R152-P562K	Composition; 5,600 ohms ±10%, 1/4 w.
R2380	3R152-P123K	Composition; 12,000 ohms ±10%, 1/4 w.
R2381	3R152-P102K	Composition; 1,000 ohms ±10%, 1/4 w.
		- - - - - - - - - THERMISTOR - - - - - - - - -
RT2351	5490828-P18	5,000 ohms ±10% at 25°C; temp coef constant 3100 ±5%; Sim to Globar 763H.
		- - - - - - - - - SWITCH - - - - - - - - -
S2351	7145098-P2	Switch, sliding; SPDT, spring return, 0.75 amp @125V; Sim to Stack Pole SS-32.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T2351	PL-198201881-G1	Transformer Assembly: Used with 4E214B10 only. Consists of the following components:
C1	5496218-P353	Capacitor, fixed ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -150.
C2	7489162-P37	Capacitor, fixed silver mica: 370 pf ±5%, 500 VDCW; Sim to Electromotive DM15.
L1		Coil: 1-turn left hand cloee wound. AWG 24, Polyurethane coated.
L2	4038656-P1	Coil: 10-1/2 turns left hand close wound.
T2352	PL-198201881-G2	Transformer Assembly; used with 4E214B11 only. Consists of the following components:
C3	5496218-P347	Capacitor, fixed ceramic disc: 22 pf ±5%, 500 VDCW, temp coef -150.
C4	7489162-P31	Capacitor, fixed silver mica: 150 pf ±5%, 500 VDCW; Sim to Electromotive DM15.
L1		Coil: 1-turn left hand closewound. AWG 24, Polyurethane coated.
L2	4038656-P1	Coil: 10-1/2 turns left hand closewound.
T2353	PL-198201881-G3	Transformer Assembly: Used with 4E214B12. Consists of the following components:
C5	5496218-P344	Capacitor, fixed ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -150.
C6	7489162-P29	Capacitor, fixed silver mica: 120 pf ±5%, 500 VDCW; Sim to Electromotive DM15.
L1		Coil: 1-turn left hand closewound. AWG 24, Polyurethane coated.
L2	4038656-P1	Coil: 10-1/2 turns left hand closewound.
T2354	PL-198201883-G1	Transformer Assembly: Used with 4E214B10. Consists of the following components:
C1	5496218-P352	Capacitor, fixed ceramic disc: 36 pf ±5%, 500 VDCW; temp coef -150.
C4	7489162-P37	Capacitor, fixed mica, 270 pf ±5%, 500 VDCW.
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.
R1	3R152-P103J	Resistor, composition, 10,000 ohms ±5%, 1/4 w.
T2355	PL-198201883-G2	Transformer Assembly: Used with 4E214B11. Consists of the following components:
C2	5496218-P346	Capacitor, fixed ceramic disc: 20 pf ±5%, 500 VDCW, temp coef -150.
C5	7489162-P31	Capacitor, fixed silver mica: 150 pf ±5%, 500 VDCW; Sim to Electromotive DM15.
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.
T2356	198201883-G3	Transformer Assembly: Used with 4E214B12. Consists of the following components:
C3	5496218-P344	Capacitor, fixed ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -150.
C6	7489162-P29	Capacitor, fixed silver mica: 120 pf ±5%, 500 VDCW; Sim to Electromotive DM15.
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - TRANSFORMERS (CONT'D) - - - - - - - -
T2357	PL-198201889-G1	Transformer Assembly: Used in 4E214B10. Consists of the following components;
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.
L2		Coil: 3-turns left hand wound, AWG 24, Polyurethane coated.
T2358	PL-198201889-G2	Transformer Assembly: Used in 4E214B11. Consists of the following components:
C2	5496218-P344	Capacitor, fixed ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -150.
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.
L2		Coil: 3-turns left hand wound, AWG 24, Polyurethane coated.
T2359	PL-198201889-G3	Transformer Assembly: Used with 4E214B12. Consists of the following components:
C3	5496218-P339	Capacitor, fixed ceramic disc: 8 pf ±5%, 500 VDCW, temp coef -150.
L1	4038652-P1	Coil: 10-1/2 turns left hand closewound.
L2		Coil: 3-turns left hand wound, AWG 24, Polyurethane coated.
T2366		Consists of L2370, C2372 and C2392.
T2367		Consists of L2360, L2369, L2371, C2373, C2374, C2379, C2380, C2381, C2382, C2393 and C2394.
		- - - - - - - - - CABLES - - - - - - - - -
W2351	5491689-P13	Cable assembly: 9-in. RG-174/U cable with female phono connector (J2351).
W2352	5491689-P13	Cable assembly: 9-in. RG-174/U cable with female phono connector (P2352).
W2353	5491689-P27	Cable assembly: 17-in. RG-174/U cable with male phono connector (P2353).
W2354	5491689-P14	Cable assembly: 12-in. RG-174/U cable with female phono connector (J2355).
		- - - - - - - - - SOCKETS - - - - - - - - - -
XQ2351* thru XQ2354	4038139-P1	Transistor socket; 4-pin, sim to Elco Corp. 3308. In Models earlier than Rev. A;
	4036353-P1	Transistor socket; 4-pin, standoff type, low loss mica-filled phenolic; Sim to Elco 3308.
XQ2355	5490277-P1	Transistor socket; 4-contact, low-loss mica-filled phenolic; Sim to Elco 3305.
XQ2356*	4038139-P1	Transistor socket; 4-pin, sim to Elco Corp. 3308. In Models earlier than Rev. A;
	4036353-P1	Transistor socket: 4-pin standoff type, low loss mica-filled phenolic; Sim to Elco 3308.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7487424-P21	Miniature, phenolic: 3-terminals.
TB2	7487424-P2	Miniature, phenolic: 1-terminal.
TB3	7487424-P14	Miniature, phenolic: 3-terminals.
TB4	7487424-P21	Miniature, phenolic: 3-terminals.
TB5	7487424-P16	Miniature, phenolic: 2-terminals.
TB6	7487424-P10	Miniature, phenolic: 1-terminal.
TB7	7487424-P52	Miniature, phenolic: 1-terminal.
		A2351 PULSE AMP/SWITCH GENERATOR
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5494481-P12	Fixed ceramic disc: 1,000 pf ±10%, 500 VDCW; Sim to RMC JF.
C2*	5496267-P1	Tantalum; 6.8 uf ±20%, 6 VDCW. In Models earlier than Rev. C;
	5491189-P1	Mylars, epoxy-dipped; 0.01 uf ±20%, 50 VDCW; Sim to Good-All 601PE.
C3	5494481-P12	Fixed ceramic disc; 1,000 pf ±10%, 500 VDCW; Sim to RMC JF.
C4 and C5	5491189-P6	Mylars, epoxy-dipped; 0.1 µf ±20%, 50 VDCW; Sim to Good-All 601PE.
C6*	5491189-P1	Mylars, .01 uf ±20%, 50 VDCW. In Models earlier than Rev. C;
	5494481-P14	Fixed ceramic disc: 2,000 pf ±10%, 500 VDCW; Sim to RMC JF.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - CAPACITORS (CONT'D) - - - - - - - -
C7	7147204-P4	Fixed silver mica: 680 pf ±5%, 500 VDCW; Sim to Electromotive DM20.
C8*	7489162-P144	Mica; 510 pf ±10%, 300 VDCW. In Models earlier than Rev. C;
	5494481-P14	Fixed ceramic disc: 2,000 pf ±10%, 500 VDCW; Sim to RMC JF.
		- - - - - - - - - DIODES - - - - - - - - -
CR1 and CR2	7777146-P3	Germanium.
CR3	5491705-P2	Silicon.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152-P472J	Composition, 4,700 ohms ±5%, 1/4 w.
R2	3R152-P103J	Composition, 10,000 ohms ±5%, 1/4 w.
R3*	3R152-P104J	Composition; 10,000 ohms ±5%, 1/4 w. In Models earlier than Rev. C;
	3R77-P563J	Composition, 56,000 ohms ±5%, 1/2 w.
R4	3R152-P102J	Composition, 1,000 ohms ±5%, 1/4 w.
R5	3R152-P332J	Composition, 3,300 ohms ±5%, 1/4 w.
R6	3R152-P102J	Composition, 1,000 ohms ±5%, 1/4 w.
R7	3R152-P202J	Composition, 2,000 ohms ±5%, 1/4 w.
R9	3R152-P183J	Composition, 18,000 ohms ±5%, 1/4 w.
R10	3R152-P332K	Composition, 3,300 ohms ±10%, 1/4 w.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19C300114-P1	Silicon, NPN.
Q2 and Q3	19C300114-P1	Silicon, NPN.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

NOISE BLANKER
MODIFICATION KIT
PL-4038585-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - DIODE - - - - - - - - -
CR413	4038642-P1	Germanium
		- - - - - - - - - RESISTOR - - - - - - - - -
R420	3R152-P471J	Composition, 470 ohms ±5%, 1/4 w.
		- - - - - - - - - CABLES - - - - - - - - -
	4038586-G1	Cable Assembly: Two 26-inch F24 wires and black braid cover with male connector P2354, and contacts P2355 and P2356.
W412	5491689-P39	Cable Assembly: 20-inch RG 174/U cable with male phono connector (P415).
		- - - - - - - - - TERMINAL - - - - - - - - -
TB3	7487424-P2	Terminal strip, one terminal and mounting bracket.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PRODUCTION CHANGES

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

REV. A - To provide standardized sockets. Changed XQ2351 thru XQ2354 and XQ2356.

REV. B - To reduce possibility of oscillation in RF amplifier. Changed C2391 and L2369.

REV. C - To improve off-channel signal rejection. Changed C2, C6, C8, R3, and added R11.

REV. D - To improve temperature compensation of RF circuits. Changed C2372 thru C2374, C2379, C2380, C2382, and C2392. Added C2396 thru C2399.

RESISTANCE

	E	B1 B	C	B2 S
Q411	2.4	1.8	0	
Q412	2.2	2.2	0	12K
X411-Q1	29K	18.5K		19K
X411-Q2	28K	18K	8K	

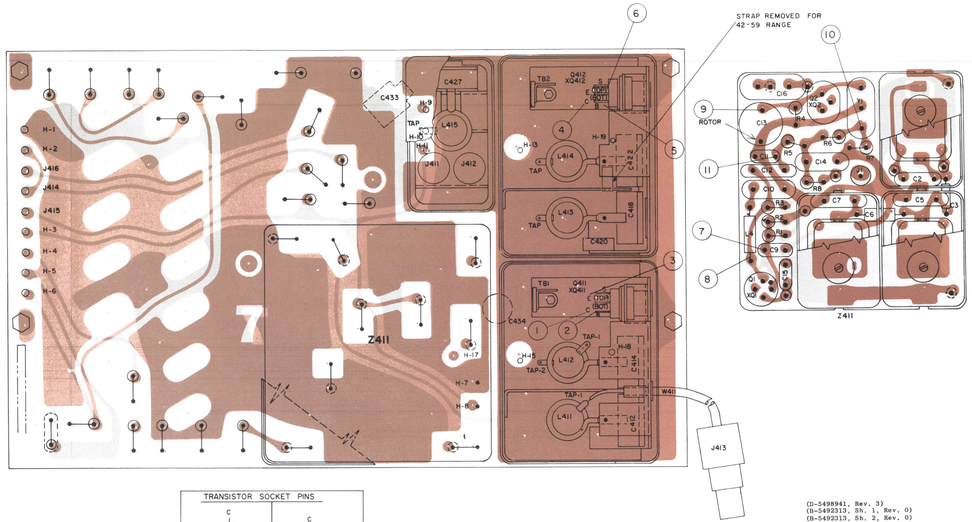
CONDITIONS OF MEASUREMENTS

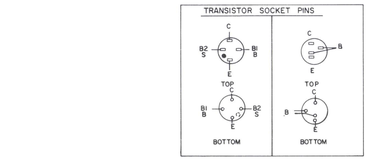
VOLTAGES:

1. READINGS TAKEN ON A 20,000 OHM - PER-VOLT METER WITH POSITIVE PROBE TO J304 OR 4EA10A10.
2. INPUT VOLTAGE - 13.8 VOLTS DC.
3. SQUELCH SETTING - MAXIMUM.
4. COMPLETE RECEIVER TERMINATED INTO A 2-WATT SPEAKER/AMP.
5. FIRST OSC. CRYSTAL REMOVED.

RESISTANCES:

1. RECEIVER DISCONNECTED FROM POWER.
2. TRANSISTOR REMOVED FROM SOCKET UNDER TEST.
3. P351 (LEAD FROM R-4, NEGATIVE BUS) SHORTED TO POSITIVE BUS (J304 OR 4EA10A10).
4. READINGS TAKEN FROM TOP OF TRANSISTOR SOCKETS TO J304 OR 4EA10A10 ARE WITHIN 20%.

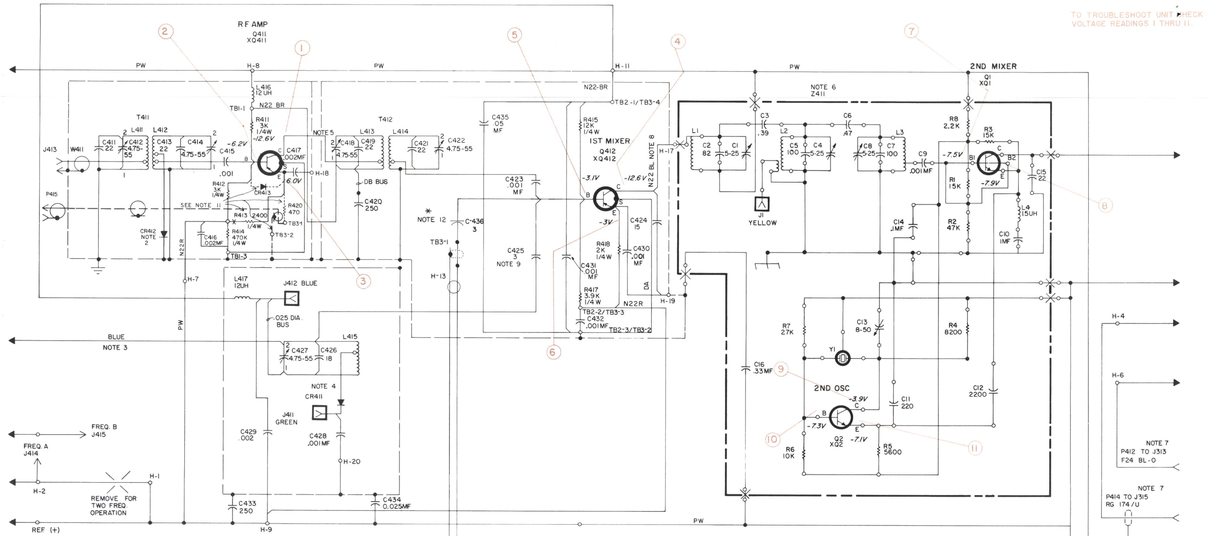




(D-5498941, Rev. 3)
(D-5498477, Sh. 1, Rev. 7)
(D-5498477, Sh. 2, Rev. 7)

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

(D-5498941, Rev. 3)
(D-5492313, Sh. 1, Rev. 0)
(D-5492313, Sh. 2, Rev. 0)



NOTES
1. FOR WIRING INSTRUCTION SEE A4031623.
2. DIODE ORIENTATION AS SHOWN (ANODE / CATHODE)
3. LET HANG FROM C427-2.
4. L415 TAP (CR411 / J411)
5. STRAP B1B3A9.005 THK X .125 X 2.90 LG.
6. Z411 IS PRINTED WIRING.
7. (TERMINATED P411,P412, P413,& P414 AT WITH A4029840 P1.)
8. LET HANG FROM XQ412-C.
9. LET HANG FROM XQ412-B1

NOTE 11. PARTS SHOWN DOTTED INSIDE R.F. AMPLIFIER SHIELD ARE ADDED BY MODIFICATION KIT PLA4035B85G1 AND R413 REMOVED WHEN RECEIVER IS USED WITH NOISE BLANKER 4EZ14A10, 4EZ14A11 OR 4EZ14A12.

NOTE 12. TO BE USED ON (G2) 4-FREQ. UNITS ONLY.

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.

DESIGNATES REFERENCE BUS (POSITION SUPPLY VOLTAGE) AND IS NOT NECESSARILY GROUND.

TERMINAL LUG.

ALL RESISTORS ARE 1/2 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.

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
4EF16A10	F

(D-5498600, Rev. 15)
(RC-996)

Service Sheet

RF AMPLIFIER/CONVERTER
MODELS 4EF16A10, 11; REV. F

(RC-598J)

20123

PARTS LIST

RF AMPLIFIER
MODEL KEF16A10
PL-5498436-G1
REV. F

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - CAPACITORS - - - - - - - - -
C411*	C-5496218-P913 C-7774846-P47	Fixed ceramic disc: 22 pf ±10%, 500 VDCW, +100 temp coef. In Models earlier than Rev. E: Fixed ceramic disc: 22 pf ±10%, 500 VDCW, 0 temp coef.
C412	7484389-P8	Variable: (Ceramic), 4.75 to 55 pf -100 to +30%, 500 VDCW, -500 temp coef.
C413*	C-5496218-P913 C-7774846-P47	Fixed ceramic disc: 22 pf ±10%, 500 VDCW, +100 temp coef. In Models earlier than Rev. E: Fixed ceramic disc: 22 pf ±10%, 500 VDCW, 0 temp coef.
C414	7484389-P8	Variable: (Ceramic), 4.75 to 55 pf -100 to +30%, 500 VDCW, -500 temp coef.
C415	5494481-P12	High dielectric: Ceramic disc, (stabilized versus freq), 1,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C416 and C417	5494481-P14	High dielectric: Ceramic disc, (stabilized versus freq), 2,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C418	7484389-P8	Variable: (Ceramic), 4.75 to 55 pf -100 to +30%, 500 VDCW, -500 temp coef.
C419*	C-5496218-P913 C-7774846-P47	Fixed ceramic disc: 22 pf ±10%, 500 VDCW, +100 temp coef. In Models earlier than Rev. E: Fixed ceramic disc: 22 pf ±10%, 500 VDCW, 0 temp coef.
C420	7484398-P3	Fixed mica: (Uncased), 250 pf ±10%, 500 VDCW. Sim to Underwood J-1-HF.
C421*	C-5496218-P913 C-7774846-P47	Fixed ceramic disc: 22 pf ±10%, 500 VDCW, +100 temp coef. In Models earlier than Rev. E: Fixed ceramic disc: 22 pf ±10%, 500 VDCW, 0 temp coef.
C422	7484389-P8	Variable: (Ceramic), 4.75 to 55 pf -100 to +30%, 500 VDCW, -500 temp coef.
C423	5494481-P12	High dielectric: Ceramic disc, (stabilized versus freq), 1,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C424	7774846-P244	Fixed ceramic disc: (Insulated, temp compensating), 15 pf ±5%, 500 VDCW.
C425	7770468-P34	Fixed ceramic: (Insulated, temp compensating), 3.0 pf ±5%, ±0.25 pf, 500 VDCW, 0 temp coef.
C426	7774846-P45	Fixed ceramic disc: (Insulated, temp compensating), 18 pf ±5%, 500 VDCW, 0 temp coef.
C427	7484389-P8	Variable: (Ceramic), 4.75 to 55 pf -100 to +30%, 500 VDCW, -500 temp coef.
C428	5494481-P12	High dielectric: Ceramic disc, (stabilized versus freq), 1,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C429	5494481-P14	High dielectric: Ceramic disc, (stabilized versus freq), 2,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C430*	5494481-P12	Fixed ceramic disc: 0.001 µf ±10%, 500 VDCW. Sim to ERC JF.
C431 and C432	5494481-P12	High dielectric: Ceramic disc, (stabilized versus freq), 1,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
C433	7484398-P3	Fixed mica: (Uncased), 250 pf ±10%, 500 VDCW. Sim to Underwood J-1-HF.
C434	5491827-P3	Disc type: (Insulated, high dielectric), 0.025 µf -80% -20%, 50 VDCW. Sim to Sprague 29C187. (Added by Rev. B).
C435	5491827-P4	Disc type: (Insulated, high dielectric), 0.05 µf -80% -20%, 50 VDCW. Sim to Sprague 44C29. (Added by Rev. B).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - RECTIFIERS - - - - - - - - -
CR411	7777146-P3	Diode, Germanium: Max peak inv 60 vw, min fwd cur 5 ma. Sim to Hughes 1N90.
CR412	4038642-P1	Diode: Max peak inv 50 vw, max fwd cur 100 ma. Sim to Radio Receptor DR385.
CR414	5496365-P3	Diode, Germanium. Used in High Power Mod Kit 4034640 only.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J411	4033567-P4	Jack, Test: (Stake in), molded nylon body, copper contact, max operating voltage 600 vrms, max operating temp 105°C. Sim to Alden Products 110-SM1-green.
J412	4033567-P6	Jack, Test: (Stake in), molded nylon body, copper contact, max operating voltage 600 vrms, max operating temp 105°C. Sim to Alden Products 110-SM1-blue.
J413	4032504-P5	Connector, Phono: Molded on termination for use with coaxial cable. (Included in W411).
J414 thru J416	4033513-P4	Contact, Pin: Brass. Sim to Bead Chain L93-3.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L411	PL-4031073-G6	Coil Assembly.
L412	PL-4031073-G8	Coil Assembly.
L413 and L414	PL-4031073-G7	Coil Assembly.
L415	PL-4031073-G9	Coil Assembly.
L416 and L417	7488079-P17	Coil, RF Choke: Ind 12.0 µf ±10%. Sim to Jeffers 10102-34.
		- - - - - - - - - PLUGS - - - - - - - - -
P411 thru P414	4029840-P1	Terminal: (Plug receptacle for 0.093 inch long pin), 1-contact. Sim to Amp 41854. Hand Tool Amp 47745.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q411	19C300037-P2	Germanium: MADT, PNP, hermetically sealed in metallic case with glass seal. Sim to T-2042. In Models of Rev A or earlier: Sim to 2N502.
Q412	19B200131-P1	Germanium: PNP; hermetically sealed in metallic case with glass seal. Sim to T-2044. In Models of Rev A or earlier: Sim to 4JX3C504.
		- - - - - - - - - RESISTORS - - - - - - - - -
R411 and R412	3R152-P302J	Fixed composition: 3,000 ohms ±5%, 1/4 w.
R413	3R152-P242J	Fixed composition: 2,400 ohms ±5%, 1/4 w.
R414	3R152-P474K	Fixed composition: 0.47 megohm ±10%, 1/4 w.
R415	3R152-P123J 3R152-P203J	Fixed composition: 12,000 ohms ±5%, 1/4 w. In Amplifiers of Rev. A or earlier: Fixed composition: 20,000 ohms ±5%, 1/4 w.
R416	3R152-P223K	Fixed composition: 22,000 ohms ±10%, 1/4 w. (Deleted by Rev. B).
R417	3R152-P392J	Fixed composition: 3,900 ohms ±5%, 1/4 w. In Amplifiers of Rev. A or earlier: Fixed composition: 6,800 ohms ±5%, 1/4 w.
R418	3R152-P202J 3R152-P472K	Fixed composition: 2,000 ohms ±5%, 1/4 w. In Amplifiers of Rev. A or earlier: Fixed composition: 4,700 ohms ±10%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T411		Transformer Assembly Consists of the following components: C411 thru C414 C8412 L411 and L412
T412		Transformer Assembly Consists of the following components: C418 and C419, C421 and C422 L413 and L414

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - CABLE - - - - - - - - -
W411	5491689-P13 4032504-P5	Cable Assembly Includes the following components: Cable: 9-inches long. Type RG-174/U. Connector, Phono: (J413)
		- - - - - - - - - SOCKETS - - - - - - - - -
XQ411	4036353-P1 5490277-P1	Transistor: PW (Stand off); low loss mica filled phenolic insulation, 4-pins (beryllium copper), rating current 1 amp, contact res 0.30 ohms maximum (per contact). Sim to Elco Corp 3308. In Models of Rev. A or earlier: Transistor: Low loss mica filled phenolic insulation; 4-contacts, 1,000 megohms mini insulation res, contact res 0.03 ohms max, max current 1 amp, working voltage 400 VRMS. Sim to Elco Corp 3303. (Used with mounting ring. Sim to Elco Corp 757).
XQ412	4036353-P1	Transistor: PW (Stand off); low loss mica filled phenolic insulation, 4-pins (beryllium copper), current rating 1 amp, contact res 0.30 ohms max (per contact). Sim to Elco Corp 3308.
		- - - - - - - - - FILTER - - - - - - - - -
Z411	PL-5492292-G1	HI-IF FILTER-MIXER/OSCILLATOR Includes the following components with Z411 prefix:
	5490515-P1	Z411-C1 Capacitor, Variable: (Ceramic trimmer), 4.5 pf (+0% -100%) to 25 pf (+50% -0%), 500 VDCW. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G11)
	5494210-P461	Z411-C2 Capacitor, Fixed ceramic disc: Insulated, temp compensating, 82 pf ±5%, 500 VDCW, -220 temp coef.
	5491601-P111	Z411-C3 Capacitor, Fixed: (Moulded), 0.39 pf ±5%, 500 VDCW. Quality Components Inc Type MC.
	5490515-P1	Z411-C4 Capacitor, Variable: (Ceramic trimmer), 4.5 pf (+0% -100%) to 25 pf (+50% -0%), 500 VDCW. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G12).
	5494210-P463	Z411-C5 Capacitor, Fixed ceramic disc: Insulated, temp compensating, 100 pf ±5%, 500 VDCW, -220 temp coef. In Mixer/Oscillators earlier than Rev. A: Capacitor, Fixed ceramic disc: Insulated, temp compensating, 110 pf ±5%, 500 VDCW, -220 temp coef.
	5494210-P464	
	5491601-P113	Z411-C6 Capacitor, Fixed: (Moulded), 0.47 pf ±5%, 500 VDCW. Quality Components Inc Type MC.
	5494210-P463	Z411-C7 Capacitor, Fixed ceramic disc: Insulated, temp compensating, 100 pf ±5%, 500 VDCW, -220 temp coef.
	5490515-P1	Z411-C8 Capacitor, Variable: (Ceramic trimmer), 4.5 pf (+0% -100%) to 25 pf (+50% -0%), 500 VDCW. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G13).
	5494481-P112	Z411-C9 Capacitor, High dielectric: Ceramic disc, (stabilized versus freq), 1,000 pf ±10%, 500 VDCW. Sim to Radio Materials JF Discap.
	5491189-P106	Z411-C10 Capacitor, Mylar®, dielectric: Crimped leads, 0.10 µf ±20%, 50 VDCW. Sim to Good-All 601PE.
	7491395-P1	Z411-C11 Capacitor, Ceramic disc: (Stabilized high dielectric temp), 220 pf ±20%, 500 VDCW.
	7491395-P14	Z411-C12 Capacitor, Ceramic disc: (Stabilized high dielectric temp), 2,200 pf ±20%, 500 VDCW.
	5490446-P1	Z411-C13 Capacitor, Variable: (Ceramic trimmer), 8 to 50 pf, 350 VDCW, -750 temp coef. Sim to Eric Resistor 537-36.
	5491189-P106	Z411-C14 Capacitor, Mylar®, dielectric: Crimped leads, 0.10 µf ±20%, 50 VDCW. Sim to Good-All 601PE.
	5494210-P247	Z411-C15 Capacitor, Fixed ceramic disc: Insulated, temp compensating, 22 pf ±5%, 500 VDCW, -80 temp coef.
	5491189-P109	Z411-C16 Capacitor, Mylar®, dielectric: Crimped leads, 0.33 µf ±20%, 50 VDCW. Sim to Good-All 601PE.
	4033568-P4	Z411-J1 Jack, Test: (Printed circuit), nylon body, berryllium copper contact, max operating voltage 600 vrms, max operating temp 105°C. Sim to Alden Products 110PCI-yellow.
	PL-5490596-G1	Z411-L1 Toroidal Coil Assembly. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G11).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - FILTER (CONT'D) - - - - - - - -
Z411-L2	PL-5490596-G2	Toroidal Coil Assembly. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G12).
Z411-L3	PL-5490596-G3	Toroidal Coil Assembly. (Included in Coil and Trimmer Assembly, G-E Dwg and Group No. PL-5490543-G13).
Z411-L4	7488079-P18	Coil, RF Choke: Inductance 15.0 µh ±10%. Sim to Jeffers Electronic Div 10202-36.
Z411-Q1	4036929-P2	Transistor, Germanium: PNP; hermetically sealed in metallic case with glass seal. Sim to R653. In Models of Rev A and B: Transistor. Sim to 4JX3C505/3N36.
Z411-Q2	5492655-P4	Transistor, Germanium: Hermetically sealed in metallic case with glass seal. Sim to 2N1086. In Models of Rev A and B: Transistor. Sim to 2N1086.
Z411-R1	3R77-P153K	Resistor, Fixed composition: 15,000 ohms ±10%, 1/2 w.
Z411-R2	3R77-P473K	Resistor, Fixed composition: 47,000 ohms ±10%, 1/2 w.
Z411-R3	3R77-P153K	Resistor, Fixed composition: 15,000 ohms ±10%, 1/2 w.
Z411-R4	3R77-P822K	Resistor, Fixed composition: 8,200 ohms ±10%, 1/2 w.
Z411-R5	3R77-P562K	Resistor, Fixed composition: 5,600 ohms ±10%, 1/2 w.
Z411-R6	3R77-P103K	Resistor, Fixed composition: 10,000 ohms ±10%, 1/2 w.
Z411-R7	3R77-P273K	Resistor, Fixed composition: 27,000 ohms ±10%, 1/2 w.
Z411-R8	3R77-P222K	Resistor, Fixed composition: 2,200 ohms ±10%, 1/2 w.
Z411-XQ1	7162500-P1	Socket, Transistor: 4-pin P,W, (stand-off type), 4-contacts - 2 (No. 816) and 2 (No. 820), berryllium copper, gold flash over silver plate.
Z411-XQ2	5490277-P1	Socket, Transistor: 4-contacts, insulated, low-loss mica-filled phenolic, 1,000 megohms min, contact res 0.03 ohms max, 1 amp. 400 vrms. Sim to Elco 3303. (Used with mounting ring. Elco 757. (G-E Dwg. and Part No. A-7162414-P11)).
Z411-Y1	4031075-P1	Crystal, Quartz: Frequency 4.990 KC, ±120 cps at 25°C.
	PL-5490543-G11	Coil and Trimmer Assembly Includes the following components: C1 L1
	PL-5490543-G12	Coil and Trimmer Assembly Includes the following components: C4 L2
	PL-5490543-G13	Coil and Trimmer Assembly Includes the following components: C8 L3

PARTS LIST

NOISE BLANKER
MODIFICATION KIT
PL-4038585-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - DIODE - - - - - - - - -
CR413	4038642-P1	Germanium
		- - - - - - - - - RESISTOR - - - - - - - - -
R420	3R152-P471J	Composition, 470 ohms ±5%, 1/4 w.
		- - - - - - - - - CABLES - - - - - - - - -
	4038586-G1	Cable Assembly: Two 26-inch F24 wires and black braid cover with male connector P2354, and contacts P2355 and P2356.
W412	5491689-P39	Cable Assembly: 20-inch RG 174/U cable with male phono connector (P415).
		- - - - - - - - - TERMINAL - - - - - - - - -
TB3	7487424-P2	Terminal strip, one terminal and mounting bracket.

PRODUCTION CHANGES

REV. C - To replace tetrode transistors with triode. Transistors Z411-Q1 and Z411-Q2 was changed.

REV. D - Increased diameter of parts used to mount stand-off boards. Changed part number of posts from 4029548-P1 to 4038104-P1.

REV. E - To provide improved operation at temperature extremes. Changed temperature coefficient of C411, C412, C419 and C421.

REV. F - To provide increased reliability of mixer circuitry. Changed value of C430.

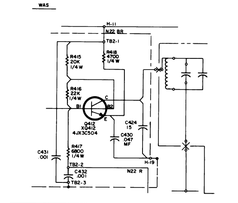
(Refer to Parts List for description of parts affected by these revisions)

REV. A- To bring Hi-IF tuning to within design center, C5 in Z411 changed.

REV. B- To improve the performance of the RF Amplifier, C434 and C435 added; Q411, Q412, R415, R417, R418 and XQ411 changed. R416 deleted.

Elementary Diagram changes shown below.

WAS



CHANGE TO