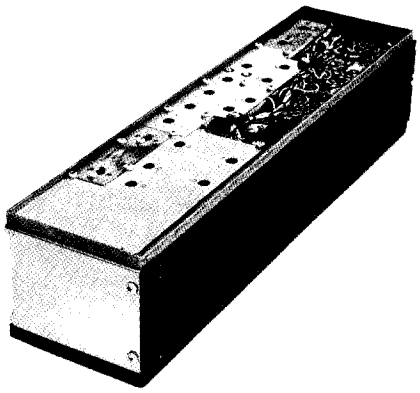
communications

(Includes Addendum dated 29 Nov 1965)

MASTR Progress Line

25-50 MC RECEIVER MODELS 4ER39A28-36 (WITH NOISE BLANKER)



Maintenance Manual LBI-3592B

ER-39-A

SPECIFICATIONS *

FCC Filing Designation	**ER-39-A**
Frequency Range	25-50 MC
Audio Output	2 watts at less than 10% distortion (using Speaker Model 4EZ16A10)
Sensitivity	
12-db SINAD (EIA Method)	0.25 µv
20-db Quieting Method	0.35 µv
Selectivity	
EIA Two-Signal Method	-85 db (adjacent channel, 20 KC channels)
20-db Quieting Method	-100 db at ±15 KC
Spurious Response	-100 db
First Oscillator Stability	±.0005% (-30°C to +60°C)
Modulation Acceptance	±6 KC (narrow-band)
Squelch Sensitivity	
Critical Squelch	0.15 µv
Maximum Squelch	Greater than 20 db quieting (less than 2 µv)
Intermodulation (EIA)	-60 db
Maximum Frequency Separation	0.4%
Frequency Response	+1 and -8 db of a standard 6-db per octave de-emphasis curve from 300 to 3000 cps (1000-cps reference)

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Certified and Guaranteed Specification Sheet for the complete specifications.

GENERAL ELECTRIC

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ILLUSTRATIONS

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with high voltage; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

November 29, 1965

ADDENDUM TO LBI-3592 and LBI-3593

LBI-3592 -- Models 4ER39A28-36 -- REV. P

LBI-3593 -- Models 4ER39A55-63 -- REV. T
Models 4ER39A37-45 -- REV. U

The following changes were made to improve noise blanker performance:

NOISE BLANKER BOARD

Changed		From		To
C24	.22 µf	(19B209243-P9)	.047 µf	(19B209243-P5)
C27	680 pf	(4029003-P4)	1000 pf	(4029003-P8)
C36	15 pf	(5496218-P44)	20 pf	(5496218-P46)
C38	22 pf	(5496218-P47)	27 pf	(5496218-P49)
CR1		19A115250-P1		19A115775-P1
R9	12 K	(3R152-P123K)	4.3 K	(3R152-P432K)
Q4		19A115706-P1		19A115768-P1

Added C43 (0.01 µf) to solder side of board between negative bus pattern and chassis ground adjacent to printed board part number.

LEVEL SHUT-OFF SWITCH BOARD

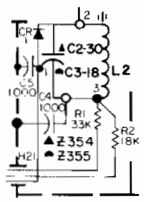
Changed choke L1 from 7488079-P50 to 19C307007-P3 (39 µhy).

RF COILS Z354/Z355 (L2)

Added:

C4 & C5	.001 µf	(5494481-P12)
CR1		7777146-P3
R1	33 K	(3R152-P333K)
R2	18 K	(3R152-P183K)

Z354/Z355 schematic changed to:

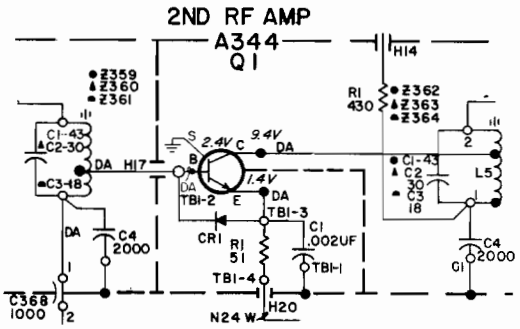


2ND RF AMPLIFIER

Deleted CR 19C301246-P1.
Changed CR1 from 4038642-P1 to 4038056-P1.
Changed Q1 from 19A115249-P1 to 19A115666-P1.

ADDENDUM TO LBI-3592 AND LBI-3593

2nd RF Amplifier schematic changed to:



COMPLETE RECEIVER AND NOISE BLANKER ALIGHMENT CHART CHANGES:

Delete Step 9.
Changed Step 13 PROCEDURE as follows:

Receiver Operating Frequency	Frequency of Applied Signal
25-27 MC	4 MC above operating frequency
27-33 MC	4 MC below operating frequency
33-42 MC	4 MC below operating frequency
42-50 MC	4 MC above operating frequency

COMMUNICATION PRODUCTS DEPARTMENT
GENERAL ELECTRIC COMPANY
LYNCHBURG, VIRGINIA

Printed in U.S.A.

DESCRIPTION

General Electric MASTR Progress Line Receiver Type ER-39-A is a double conversion, superheterodyne FM receiver designed for operation on the 25-50 megacycle band.

The receiver is of single-unit construction and is completely housed in an aluminum casting for maximum shielding and rigidity. The top compartment of the casting contains the RF, oscillator, converter, high IF and 1st low IF amplifier, and noise blanker. The bottom portion of the casting contains the audio squelch board and the optional Channel Guard board.

CIRCUIT ANALYSIS

The MASTR Progress Line Receiver is completely transistorized, using a total of 25 silicon transistors. Input leads to the receiver are individually filtered by the 20-pin feed-through by-pass connector J443.

A regulated +10 volts is used for all receiver stages except the audio PA stage which operates from the 12-volt system supply.

Centralized metering jack J442 is provided for use with General Electric Test Set, Model 4EX3A10, for ease of alignment and servicing. The Test Set meters the oscillator, multiplier, and limiter stages as well as the discriminator, audio PA, voice coil and regulated 10 volts.

RF AMPLIFIERS (A341 and A342)

RF Amplifier (A341) consists of two high-Q helical resonators and an RF amplifier stage (Q1). The RF signal from the antenna is coupled by an RF cable to a tap on L341/L343/L345. The tap is positioned to insure the proper impedance match to the antenna. RF energy is coupled through the two coils by an opening in the shield wall to the base of 1st RF Amplifier Q1. The coils are tuned to the incoming frequency by air trimmer capacitors C341 and C342. The output of Q1 is coupled through four tuned circuits to the base of the 2nd RF Amplifier A342-Q1.

The output of the 2nd RF Amplifier is coupled through three tuned circuits to the base of 1st Mixer A345-Q2.

1ST OSCILLATOR AND MULTIPLIER (A352-A357)

The receiver 1st oscillator operates in a transistorized Colpitts oscillator circuit. The oscillator crystal operates in a fundamental mode at a frequency of approximately 10 to 15 megacycles. The crystal

is cut to provide temperature compensation at the high end of the temperature range and is thermistor compensated at low temperatures. This provides ±.0005% frequency stability as soon as the receiver is energized -- without the warm-up time required by crystal ovens or warmers.

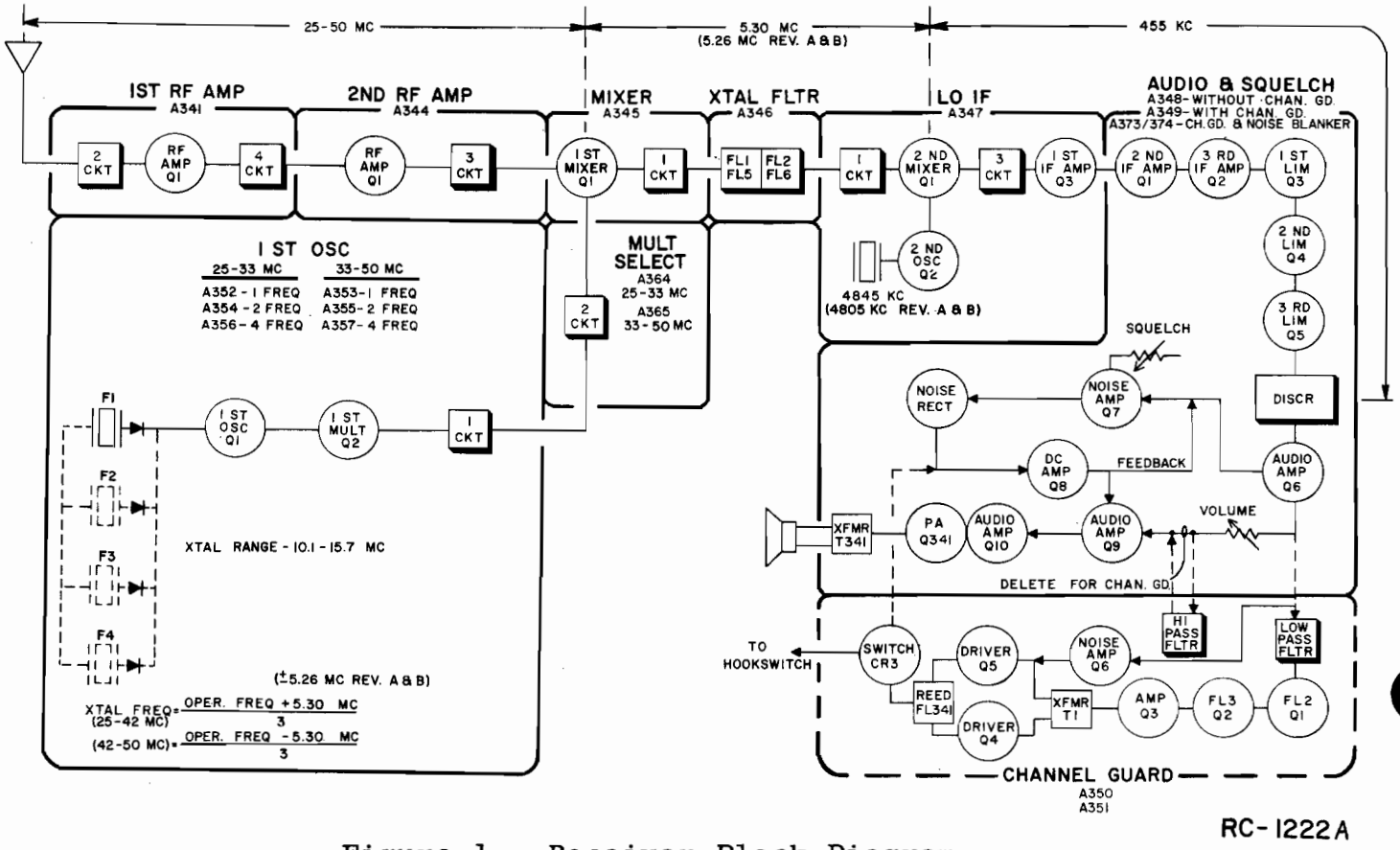


Figure 1 - Receiver Block Diagram

In single frequency receivers, bias for the oscillator is obtained by a jumper from C363 to P304.

In multi-frequency receivers, a diode is connected in series with the crystal, and up to three additional crystal circuits can be added. The 10-volt jumper is removed and the proper frequency is selected by switching the desired crystal circuit to +10 volts by means of a frequency selector switch on the control unit.

Switching the +10 volts to the crystal circuit forward biases the diode and reduces its impedance. This applies the crystal frequency to the base of oscillator transistor Q1. Feedback for the oscillator is developed across C21/C22. The output is coupled to the base of 1st multiplier Q2.

The output of the 1st multiplier (doubler Q2) is transformer-coupled (T3/T4) to multiplier selectivity assembly A364/A365. The multiplier tank is tuned to two times the crystal frequency. The stage is metered at centralized metering jack J442-4 through metering network CR1, R1, C5 and C6.

MULTIPLIER SELECTIVITY ASSEMBLY (A364/A365)

Following the 1st multiplier tank (T3/T4) are three additional tuned circuits (A364/A365-L1, -L2 and -L3). Capacitor C12/C16 couples the multiplier selectivity output to the base of the first mixer.

1ST MIXER (A345/A369) AND CRYSTAL FILTER (A346)

The RF signal from the RF amplifiers and the injection voltage from the 1st multiplier are applied to the base of 1st mixer A345/A369-Q1. The mixer collector tank (L2 and C3) is tuned to 5.3 megacycles (5.26 MC in Rev. A and B receivers) and provides impedance matching to the high IF filter.

The highly selective, two-stage crystal filter following the 1st mixer provides the major selectivity for the receiver. The output of the filter is fed through impedance matching transformer A347-T1 to the base of the 2nd mixer.

2ND OSCILLATOR, 2ND MIXER AND 1ST IF AMPLIFIER (A347)

The 2nd oscillator A347-Q2 operates in a Colpitts oscillator circuit, with feedback supplied through C2. Crystal Y1 maintains the oscillator frequency at 4845 KC (4805 KC in Rev. A and B receivers). The low-side injection voltage is fed to the base of the 2nd mixer.

The Hi-IF signal from the filter is fed to the base of 2nd mixer Q1 with the 2nd oscillator output. The 455 KC 2nd mixer output is fed to three tuned low IF circuits (L1, L2, L3). L1, L2 and L3 are required for shaping the nose of the IF waveform and provide some additional selectivity.

Capacitor C14 couples the low IF signal to the base of the 1st low IF amplifier, A347-Q3. The output of Q3 is RC coupled to the base of the 2nd IF amplifier.

2ND IF AMPLIFIERS AND LIMITERS (A373)

Following A347-Q3 are two additional RC coupled low IF amplifiers (A373-Q1 and -Q2). The 2nd IF amplifier stage is metered at J442-2 through metering network C8, CR1 and R12.

After the IF amplifiers are three RC coupled limiter stages (A373-Q3, -Q4 and -Q5). The 1st limiter is metered at J442-3 through metering network C13, CR2, R18 and C15.

DISCRIMINATOR (A373)

The receiver utilizes a Foster-Seely type discriminator. The output of the 3rd limiter is connected to a tap on the primary tuned circuit of discriminator T1. This allows the discriminator to operate at a higher level. Diodes CR5 and CR6 rectify the 455 KC IF signals to recover the audio. The stage is metered at J442-10 through metering network R27 and C22.

1ST AUDIO AMPLIFIER (A373)

The output of the discriminator is fed to the 1st audio amplifier (Q6). This stage operates as an emitter follower to match the impedance of the discriminator to the noise amplifier stage and VOLUME control. Q6 also provides some power gain.

AUDIO AMPLIFIERS (A373)

When audio is present in the incoming signal, it is taken off the emitter of Q6 and connected to the VOLUME control through A373-J9. The VOLUME control arm connects to A373-J8 which feeds the audio signal to the base of the 2nd audio amplifier, Q9. C34, C53, C36, C37 and L4 make up the de-emphasis network. The collector current of Q9 should be adjusted to 650 milliamps by potentiometer R47 as indicated by a reading of 0.65 volts at metering jack J442-1. This adjustment should be made with the VOLUME control fully counterclockwise and the SQUELCH control fully clockwise (unsquelched). Thermistor RT1 keeps the output current constant over wide variations in temperature after R47 has been set.

Following Q9 is a Darlington circuit, which consists of compound-connected transistors Q10 and Q341. The Darlington circuit provides a higher input impedance than is normally encountered in transistor amplifiers. Also, this circuit has a more linear operation, with less distortion at maximum power output.

The output of the amplifier stage is coupled by audio transformer T341 to the loudspeaker. Audio high and low are present at the centralized metering jack (J442). When the General Electric Test Set is connected to J442, these leads are connected to the black and green jacks for sensitivity, frequency response, distortion, power output and other measurements.

SQUELCH

Noise from audio amplifier Q6 is used to operate the squelch circuit. When no carrier is present in the receiver, noise is coupled to the base of noise amplifier Q7. The gain of the noise amplifier is determined by the SQUELCH control, which varies the bias on the base of Q7.

The noise amplifier output is fed through a high-pass filter which attenuates frequencies below 3 KC. Thermistor RT2 keeps the critical squelch constant over wide variations in temperature.

Noise from the high-pass filter is rectified by CR3 and CR4, and the negative DC output of the noise rectifiers is fed to the base of DC amplifier Q8.

DC amplifier Q8 acts as a squelch switch. A negative output from the noise rectifiers cuts off the DC amplifier. When cut off, the collector is at the +10 volt supply potential. This positive voltage is fed to the base of Q9, a PNP transistor, cutting it off. Since audio stages Q9, Q10 and Q341 are DC coupled, Q10 and Q341 are cut off also. The positive voltage from the collector circuit of the DC amplifier is used as feedback to the base of noise amplifier Q7, causing it to conduct more heavily. This feedback helps to sharply cut off Q8, providing sharp, rapid switching action.

When the receiver is quieted by a signal, noise voltage from the noise rectifiers is reduced and the DC amplifier conducts. While conducting, the collector potential of Q8 is negative and negative feedback to the base of noise amplifier Q7 causes it to conduct less.

This negative voltage is applied to the base of PNP transistor Q9 causing it to conduct. Now, all the audio stages are turned on and sound is heard at the loudspeaker.

With the receiver squelched, the final audio amplifiers are cut off; and the receiver drain is less than 50 milliamps in 12-volt systems.

It should be noted that a hysteresis effect was designed into the squelch circuit and, as a result, the squelch does not operate in the same manner as other convential squelch circuits. The circuit is designed so that a weak signal will open the squelch. The signal may be reduced by 3 to 5 db without the squelch closing. This limits squelch "flutter" or "picket-fence" operation.

NOISE BLANKER (A370/A372 - Figure 2)

An RF signal and noise pulse from the antenna is fed simultaneously to the Noise Blanker and receiver RF amplifier section. The signal and noise is transformer coupled through T1/T2/T3 to the base of the first of two RF amplifier stages. The amplifier stages (Q1, Q2) raise the level of the noise pulse which is coupled through T10/T11/T12 and L10 to the base of the pulse detector Q3. A metering network consisting of R22, C21, C17 and CR2 permits the blanker to be metered at centralized metering jack J442-11.

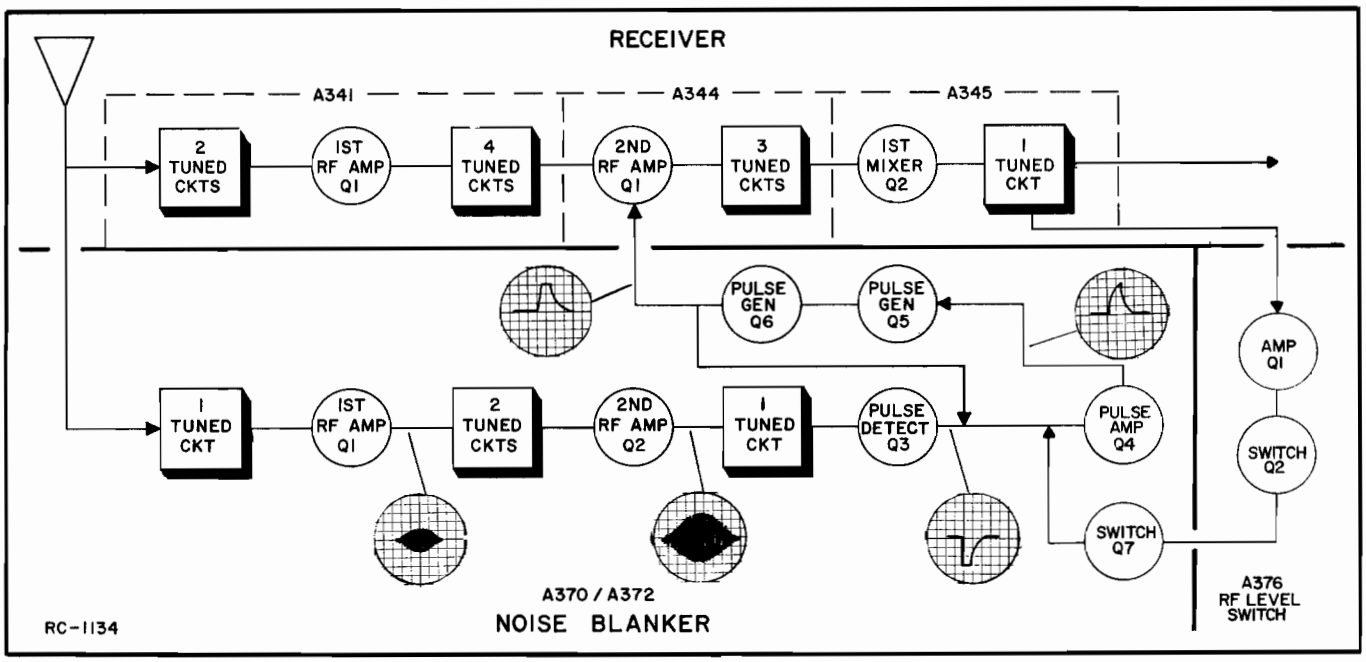


Figure 2 - Noise Blanker Block Diagram

Base bias for the pulse detector is established by R9 and CR1. CR1 is normally conducting, which keeps Q3 in a barely conducting state. A noise pulse applied to the base of Q3 causes it to conduct heavily. This results in a negative pulse at the output (collector) of Q3. Following Q3 is a low-pass RF filter consisting of C18, C22 and L5.

The output of the filter is fed to the base of pulse amplifier Q4. This stage is biased by CR3, R12 and R13 so that it is just conducting. The negative-going pulse from the pulse detector cuts CR3 off, which biases Q4 only, and a positive pulse appears at the output of pulse amplifier Q4.

Q5 and Q6 form part of the one-shot multivibrator circuit. Bias voltage through R17 keeps Q5 normally turned on. The positive voltage at the collector of Q5 keeps Q6 turned off. The amplified positive-going pulse from the pulse amplifier (Q4) is fed to the base of Q5, cutting the stage off. As Q5 cuts off, Q6 is turned on; and the output is a positive-going blanking pulse. The positive blanking pulse is fed to the emitter of 2nd RF Amplifier A344-Q1, which cuts off that stage for the duration of the noise pulse.

The positive blanking pulse to the emitter of the 2nd RF Amplifier A344-Q1 is controlled by the RF Level Shut-off Switch A376. The output of the 1st Mixer is fed through a low-pass filter network in the RF level Switch circuit to the base of the high IF level amplifier Q1. When the antenna signal input level is over 1,000 micro-volts, the high IF level output of Q1 is sufficient to turn ON level switch S2. The output of Q2 is filtered through C7, C8, L2 and then turns ON the Noise Blanker (A370/A372) switch Q7. The conduction of Q7 changes the bias to the 1st Pulse Amplifier Q4 and shorts the blanking pulse to ground.

The IF output level amplified by Q1 is not sufficient to turn Q2 ON, when the antenna signal input is below 1,000 micro-volts. As a result, Q7 does not turn ON, thereby allowing the positive blanking pulse to be fed directly to the emitter of the 2nd RF Amplifier A344-Q1.

The blanking pulse width is determined by R17, R24 and C27. Diode CR6 keeps the output pulse a square wave. CR5 prevents oscillation at temperature extremes.

At the same time the blanking pulse is fed to the receiver, samples of the pulse are fed to the automatic repetition rate switch consisting of C30, C24, CR4, R13, R14 and R20. The pulse sample is coupled through C30 and rectified by CR4. This voltage charges C24, and then discharges through R13 and R14, turning off pulse amplifier Q4. The time constant of C24, R13 and R14 are selected so that output pulses from Q6 will never exceed two kilocycles. This prevents blanking the receiver for a long enough time to keep the desired signal from being heard.

As the noise signal from the antenna is applied to the Noise Blanker, the RF signal is applied to the receiver RF amplifier (A341). The six tuned circuits in the receiver front end provide a time delay for the RF signal, which enables the blanking pulse from the Noise Blanker to cut off the RF amplifier in the receiver before the noise pulse can get there.

MAINTENANCE

DISASSEMBLY

To service the receiver from the top —

1. Pull locking handle down and pull radio about one inch out of mounting frame.
2. Pry up cover at rear of receiver.
3. Slide cover back and lift off.

To service the receiver from the bottom —

1. Pull locking handle down. Pull radio out of mounting frame.
2. Remove screws in bottom cover. Pry up cover at back of receiver.
3. Slide cover back and lift off.

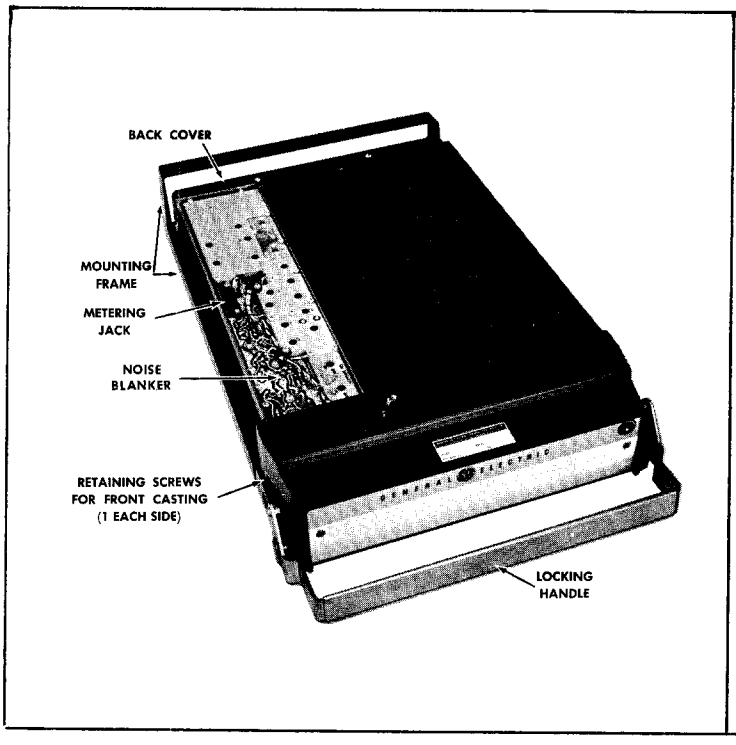


Figure 3 - Removing Top Cover

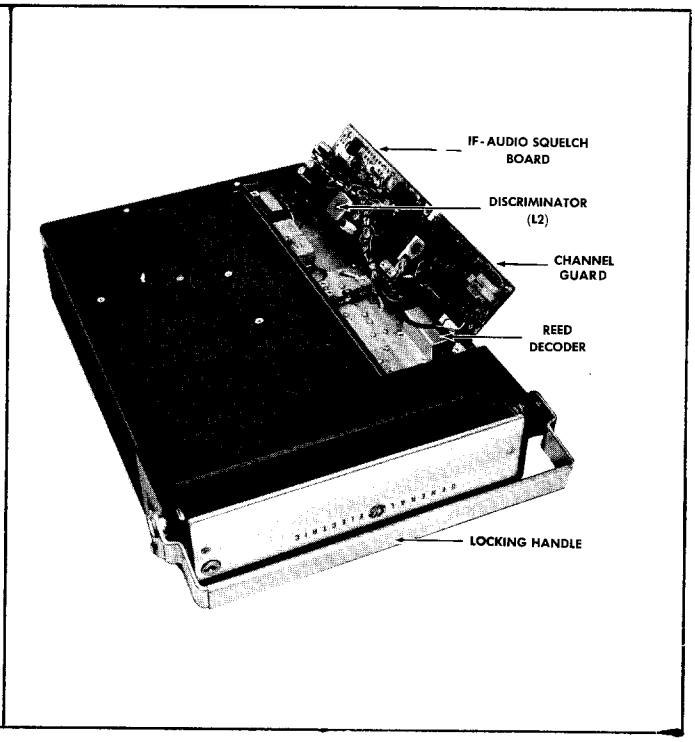


Figure 4 - Removing Bottom Cover

To remove the receiver from the system frame —

1. Loosen the two Phillips-head retaining screws in front casting (see Figure 3), and pull casting away from system frame.
2. Remove the four screws in the back cover.
3. Remove the two screws holding the receiver at each end of the system frame.
4. Disconnect the antenna jack and the 20-pin connector from the front of the receiver, and slide the unit out of the system frame.

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FRONT END ALIGNMENT

EQUIPMENT REQUIRED

1. G-E Test Set Model 4EX3A10, Station Meter Switching Panel, or 20,000 ohms-per-volt Multimeter with a 1-volt scale.
2. A 455 KC and 25-50 MC signal source. Connect a one-inch piece of insulated wire no larger than .065-inch diameter to generator output probe.

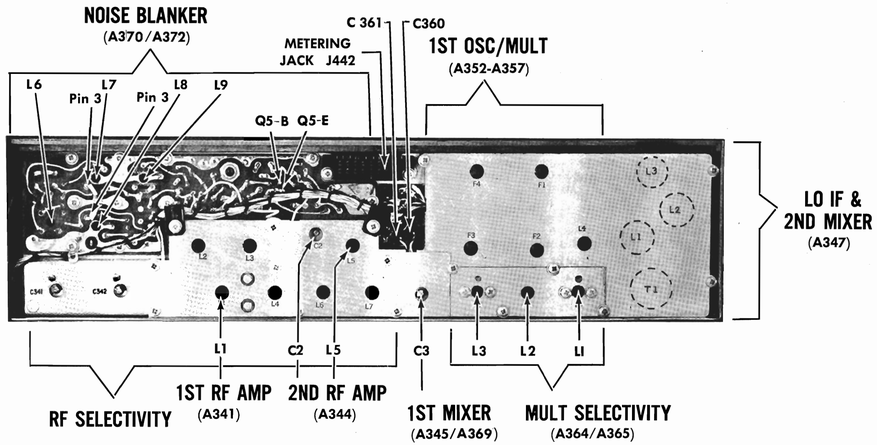
PRELIMINARY CHECKS AND ADJUSTMENTS

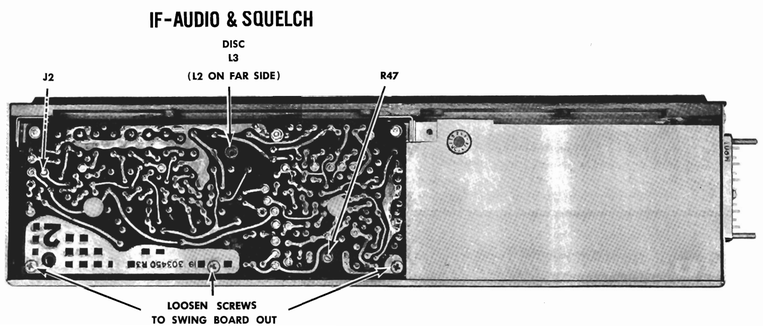
1. Connect Test Set Model 4EX3A10 to Receiver Centralized Metering Jack J442 and set meter sensitivity switch to TEST 1 position.
2. With VOLUME control fully counterclockwise and SQUELCH control fully clockwise (receiver unsquelched) and TEST Set in Position G, adjust R47 on IF-AUDIO & SQUELCH board for a reading of 0.65 volts. If using Multimeter, connect leads to J442-1 (AUDIO PA) and J442-8 (System Negative).
3. With Test Set in Position J, check for regulated +10 volts. If using Multimeter, measure from C360 to C361.
4. If using Multimeter, connect the positive lead to J442-16 (Ground).

ALIGNMENT PROCEDURE

STEP	METERING POSITION 4EX3A10	METERING POSITION Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			OSCILLATOR/MULTIPLIER		
1.	D (MULT-1)	Pin 4	L4 (on 1st OSC/MULT) and L1, L2, & L3 (on MULT SELECTIVITY)	See Procedure	Tune L4 on 1st OSC/MULT and L1 on MULT SELECTIVITY for maximum meter reading. Tune L2 for minimum meter reading. Then tune L3 for maximum meter reading. Change voltage scale if necessary. Repeat Step 1.
			RF AMPLIFIER & SELECTIVITY		
2.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal adjacent to L7. Adjust the signal generator for discriminator zero.
3.	B (2ND IF AMP)	Pin 2	C341, C342, and L1 thru L7 (RF SELECTIVITY)	Maximum	Apply an on-frequency signal to antenna jack, keeping below saturation. Tune C341, C342, and L1 thru L7 for maximum meter reading.
4.	"	"	L3 (MULT SELECTIVITY)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L2 and L3 on MULT SELECTIVITY for maximum meter reading.
			FREQUENCY ADJUSTMENT		
5.	A (DISC)	Pin 10	C9 on 1st OSC (C10, C11 or C12 for multi-frequency)	Zero	Apply an on-frequency signal to the antenna jack. Tune C9 for zero discriminator reading. In multi-frequency units, tune C10, C11 or C12 as required.

* NOTE — The low IF coils have been aligned at the factory and will normally réquire no further adjustment. If alignment is necessary, refer to the receiver outline diagram for location of resistor loading points A, B and C.





COMPLETE RECEIVER & NOISE BLANKER ALIGNMENT

EQUIPMENT REQUIRED

1. G-E Test Set Model 4EX3A10, Station Meter Switching Panel, or 20,000 ohms-per-volt Multimeter with a 1-volt scale.
2. A 455 KC and 25-50 MC signal source. Connect a one-inch piece of insulated wire no larger than .065-inch diameter to generator output probe.
3. Two 33,000-ohm resistors for tuning low IF coils.*

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect Test Set Model 4EX3A10 to Receiver Centralized Metering Jack J442 and set meter sensitivity switch to the TEST 1 position.
2. Set crystal trimmer C9 to mid-capacity. In multi-frequency receivers, set C10, C11 or C12 to mid-capacity as required. Where the maximum frequency spacing is less than 200 KC, align the unit on channel F1. If the frequency spacing is greater than 200 KC, align the receiver on the center frequency.
3. With VOLUME control fully counterclockwise and SQUELCH control fully clockwise (receivers unsquelched) and Test Set in Position G, adjust R47 on IF-AUDIO & SQUELCH Board for a reading of 0.65 volts. If using Multimeter, connect leads to J442-1 (AUDIO-PA) and J442-8 (System Negative).
4. With Test Set in Position J, check for regulated +10 volts. If using Multimeter, measure from C360 to C361.
5. If using Multimeter, connect the positive lead to J442-16 (Ground).
6. Adjust all slugs on Noise Blanker to bottom of coil form, closest to printed wiring board.
7. Set C2 on 2nd RF AMP to minimum capacity (silver side of rotor toward Blanker board). Failure to do so may cause the receiver to oscillate.

ALIGNMENT PROCEDURE

STEP	METERING POSITION 4EX3A10	METERING POSITION Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			DISCRIMINATOR		
1.	A (DISC)	Pin 10	L3 (Bottom slug on IF-AUDIO & SQUELCH Board	Zero	Apply a 455-KC signal to J2 on IF-AUDIO & SQUELCH Board and adjust L3 (disc secondary) for zero meter reading.
2.	A (DISC)	Pin 10	L2 (top) and L3 (bottom slug on IF-AUDIO & SQUELCH Board)	1.7 volts (2.1 v maximum)	Switch Test Set to TEST 3 position. Alternately apply a 445-KC and 463-KC signal while adjusting L2 and L3 for readings of at least 1.7 volts, but not more than 2.1 volts. Both readings must be within 0.1 volt.
3.	D (MULT-1)	Pin 4	L4 (on 1st OSC/MULT) and L1, L2 & L3 (on MULT SELECTIVITY)	See Procedure	Tune L4 and L1 for maximum meter reading. Tune L2 for minimum meter reading. Change voltage scale if necessary. Then tune L3 for maximum meter reading. Repeat Step 3.
			RF AMPLIFIERS & SELECTIVITY		
4.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal adjacent to L6 (RF SELECTIVITY). Adjust the signal generator for discriminator zero.
5.	B (2nd IF AMP)	Pin 2	L7, L6, L4, L3 and L2 (RF SELECTIVITY) L5 (2nd RF AMP)	Maximum	Apply an on-frequency signal and tune as shown below, keeping signal below saturation. Apply Signal Generator Probe To: — Tune: L6 — L7 L4 — L6 and L5 L1 (1st RF AMP) — L4 and L2
6.	B (2nd IF AMP)	Pin 2	C341, C342 (RF SELECTIVITY) and L1 (1st RF AMP)	Maximum	Apply an on-frequency signal to antenna jack J441. Tune C341, C342 and L1 for maximum meter reading, keeping signal below saturation.
7.	"	"	L7, L6, L4, L3, L2, C342 and and C341 (RF SELECTIVITY). L5 (2nd RF AMP), L1 (1st RF AMP)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L7, L6, L5, L4, L3, L2, L1, C342 and C341 for maximum meter reading.
8.	"	"	L3 SELECTIVITY	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L2 and L3 on MULT SELECTIVITY Board for maximum meter reading.
9.	"	"	C2 (on 2nd RF AMP)	Minimum	Apply signal as above. Short base to emitter of Q5 in Noise Blanker. Increase signal level until a slight increase in meter reading is observed. Then tune C2 for minimum meter reading.
			MIXER AND LO IFS*		
10.	"	"	C3 (1st MIXER)		C3 does not peak but provides impedance matching for the crystal filter input and should only be tuned when observing IF trace on oscilloscope.
11.	"	"	L5 (Lo IF & 2nd MIXER)	Maximum	Apply signal as above, and tune L5 for maximum meter reading, keeping signal below saturation.
12.	B (2nd IF AMP)	Pin 2	L1, L2 and L3 (Lo IF & 2nd MIXER)	Maximum	With one end of the 33,000-ohm resistors to ground, load and peak as follows: Load L2 at point B-Peak L1 and L3. Load L1 and L3 at points A and C-Peak L2.
			NOISE BLANKER		
13.	H (BLANKER)	Pin 11(-) and Pin 16(+)	L8, L8, L7 and L6 on NOISE BLANKER	Maximum	Apply a signal according to the following table: Receiver operating frequency — Frequency of applied signal 25-27 MC — 4 MC below operating freq. 27-33 MC — 4 MC above operating freq. 33-43 MC — 3 MC below operating freq. 42-50 MC — 3 MC above operating freq. Apply signal generator probe to: — Tune: Pin 3 of L8 — L8 (TRS peak) Pin 3 of L7 — L8 (1st peak) Antenna Jack — 25-33 MC (L7, 1st peak; L6 2nd peak) 33-50 MC (L7 and L6; 1st peak)
14.	"	"	"	Maximum	Apply signal on blanker frequency to the antenna jack. Retune L6, L7, L8 and L9 for maximum meter reading.
15.	"	"	"	0.1 v	Apply a 1,000-microvolt signal on blanker frequency to antenna jack. Reading should be approximately 0.1 volt.
			FREQUENCY ADJUSTMENT		
16	A (DISC)	Pin 10	C9 (1st OSC/MULT Board) (C10, C11 or C12 for multi-frequency)	Zero	Apply an on-frequency signal to antenna jack. Tune C9 for zero discriminator reading. In multi-frequency units, tune C10, C11 or C12 as required.

* NOTE — The low IF coils have been aligned at the factory and will normally require no further adjustment. If alignment is necessary, refer to the RECEIVER OUTLINE DIAGRAM for location of resistor loading points A, B and C.

TEST PROCEDURES

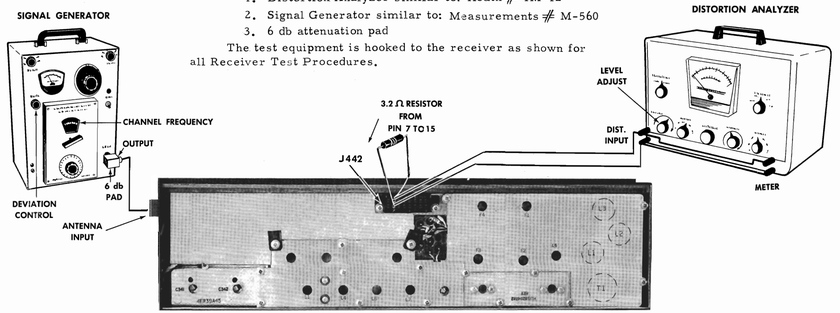
These Test Procedures are designed to help you to service a receiver that is operating---but not properly. The problems encountered could be low power, poor sensitivity, distortion, limiter not operating properly, and low gain. By following the sequence of test steps starting with Step 1, the defect can be quickly localized. Once the defective stage is pin-pointed, refer to the "Service Check" listed to correct the problem. Additional corrective measures are included in the Troubleshooting Procedure. Before starting with the Receiver Test Procedures, be sure the receiver is tuned and aligned to the proper operating frequency.

TEST EQUIPMENT REQUIRED

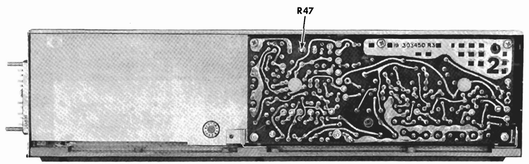
for test hookup shown:

1. Distortion Analyzer similar to: Heath # 1M-12
2. Signal Generator similar to: Measurements # M-560
3. 6 db attenuation pad

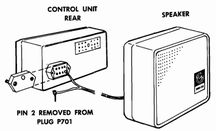
The test equipment is hooked to the receiver as shown for all Receiver Test Procedures.



COMPONENT TOP VIEW



COMPONENT BOARD WIRING VIEW



STEP 1

AUDIO POWER OUTPUT AND DISTORTION

TEST PROCEDURE

Measure Audio Power Output as follows:

1. Connect a 1,000-microvolt test signal modulated by 1,000 cycles ±3.3 KC deviation to the antenna jack J441.
2. Two-Watt Speaker:
   When speaker is used, disconnect speaker lead pin from J701-2 (on rear of Control Unit). Hook up a 3.2-ohm load resistor from J442-15 to J442-7

   OR

   Handset:
   When handset is used, lift handset off of hookswitch.
3. Two-Watt Speaker:
   Connect Distortion Analyzer input across the 3.2-ohm resistor as shown

   OR

   Handset:
   Connect Distortion Analyzer input from J442-15 to J442-7.
4. Two-watt speaker--set volume control for two-watt output (2.53 VRMS):

VOLTMETER SCALE ON DISTORTION ANALYZER

5. Make distortion measurements according to manufacturer's instructions. Reading should be less than 10% (5% is typical).

SERVICE CHECK

If the distortion is more than 10%, or maximum audio output is less than two watts (for two-watt speaker) make the following checks:

1. Battery and regulator voltage---low voltage will cause distortion. (Refer to Receiver Schematic Diagram for voltages.)
2. Audio Bias Adjust (R47)---should be adjusted for 0.65 volts. (Refer to Receiver Alignment on reverse side of page.)
3. Audio Gain (Refer to Receiver Troubleshooting Procedure).
4. Discriminator Alignment (Refer to Receiver Alignment on reverse side of page).

STEP 2

USABLE SENSITIVITY (12 db SINAD)

TEST PROCEDURE

Measure sensitivity of the receiver modulated at the standard test modulation as follows:

1. Be sure Test Step 1 checks out properly.
2. Reduce the Signal Generator output from setting in Test Step 1.
3. Adjust Distortion Analyzer LEVEL control for a +2 db reading.
4. Set CONTROL from LEVEL to DISTORTION reading. Repeat Steps 1, 2 and 3 until difference in reading is 12 db (+2 db to -10 db).
5. The 12-db difference (Signal plus Noise and Distortion to noise plus distortion ratio) is the "usable" sensitivity level. Reading should be less than 0.35 microvolts with audio output at least one watt (1.83 volts RMS across the 3.2-ohm receiver load).

SERVICE CHECK

If the sensitivity level is more than 0.35 microvolts, make the following checks:

1. Alignment of RF stages (Refer to RF Alignment in Receiver Alignment on reverse side of page.)
2. Gain measurements as shown on the Receiver Troubleshooting Procedure.

STEP 3

MODULATION ACCEPTANCE BANDWIDTH (IF BANDWIDTH)

TEST PROCEDURE

1. Be sure Test Steps 1 and 2 check out properly.
2. Set Signal Generator output for twice the microvolt reading obtained in Test Step 2 - 4.
3. Increase Signal Generator frequency deviation.
4. Adjust LEVEL Control for +2 db.

DB SCALE ON DISTORTION ANALYZER

5. Set CONTROL from LEVEL to DISTORTION reading. Repeat Steps 3, 4 and 5 until difference between readings becomes 12 db (from +2 db to -10 db).

LEVEL DISTORTION ON DISTORTION ANALYZER

6. Deviation control reading for the 12-db difference is the Modulation Acceptance Bandwidth of the receiver. It should be more than ±6 KC (but less than ±9 KC).

SERVICE CHECK

If the Modulation Acceptance Bandwidth test does not indicate the proper width, check the following:

1. Make gain measurements as shown on the Receiver Troubleshooting Procedure.
2. Voltage reading of Limiter (Q1) should read 0.6 volts RMS with a ten-microvolt input signal on Test Set Meter or 1.25 volts with voltmeter. (Measure at J442-2).

STEP 1 - QUICK CHECKS

SYMPTOM	PROCEDURE
NO SUPPLY VOLTAGE	Check power connections and continuity of supply leads, and check fuse in power supply. If fuse is blown, check receiver for short circuits.
NO REGULATED 10 VOLTS	Check the 12-volt supply. Then check regulator circuit (See Troubleshooting Procedure for Power Supply).
LOW 2ND LIM READING	Check supply voltages and then check oscillator reading at J442-4 as shown in STEP 2. Make SIMPLIFIED VTVM GAIN CHECKS from 2nd Mixer through 2nd Limiter stages as shown in STEP 2.
LOW OSCILLATOR READING	Check alignment of Oscillator (Refer to Front End Alignment Procedure). Check voltage and resistance reading of 1st Oscillator/Multiplier Q1/Q2. Check crystal Y1.
LOW RECEIVER SENSITIVITY	Check Front End Alignment (Refer to Receiver Alignment Procedure). Check antenna connections, cable and relay. Check voltage and resistance readings of RF Amp and 1st and 2nd Mixers. Make SIMPLIFIED GAIN CHECKS (STEP 2).
LOW AUDIO	Check Audio PA (Q341) output current at J442-1. If reading is low-- a. Check BIAS ADJ for 0.65 VDC at J442-1 and -8 (STEP 2). b. Check Q341. Check unsquelched voltage readings in Audio section (Refer to Receiver Schematic Diagram). Check voltage and resistance readings on Channel Guard receiver.
IMPROPER SQUELCH OPERATION	Check voltage and resistance readings of Squelch circuit (Refer to Receiver Schematic Diagram).
DISCRIMINATOR IDLING TOO FAR OFF ZERO	See if discriminator zero is on 455 KC.

STEP 3- VOLTAGE RATIO READINGS

EQUIPMENT REQUIRED:

1. RF VOLTMETER (SIMILIAR TO BOONTON MODEL 91-CA OR MILLIVAC TYPE MV-18 C.
2. SIGNAL ON RECEIVER FREQUENCY (BELOW SATURATION). CORRECT FREQUENCY CAN BE DETERMINED BY ZEROING THE DISCRIMINATOR. USE 1,000 CYCLE SIGNAL WITH 2.3 KC DEVIATION FOR AUDIO STAGE.

PROCEDURE:

1. APPLY PROBE TO INPUT OF STAGE (FOR EXAMPLE, BASE OF RF AMP). PEAK RESONANT CIRCUIT OF STAGE BEING MEASURED AND TAKE VOLTAGE READING (E_1).
2. MOVE PROBE TO INPUT OF FOLLOWING STAGE (1ST MIXER*). REPEAK FIRST RESONANT CIRCUIT THEN PEAK CIRCUIT BEING MEASURED AND TAKE READING (E_2).
3. CONVERT READINGS BY MEANS OF THE FOLLOWING FORMULA.

$$\text{VOLTAGE RATIO} = \frac{E_2}{E_1}$$

4. CHECK RESULTS WITH TYPICAL VOLTAGE RATIOS SHOWN ON DIAGRAM.

* NOTE: ON 1ST MIXER, REMOVE CRYSTAL BEFORE MEASURING BASE VOLTAGE. REPLACE CRYSTAL TO MEASURE COLLECTOR VOLTAGE.
ON 2ND MIXER, INCREASE SIGNAL INPUT TO APPROX. 0.3 V TO OVERRIDE INJECTION VOLTAGE.

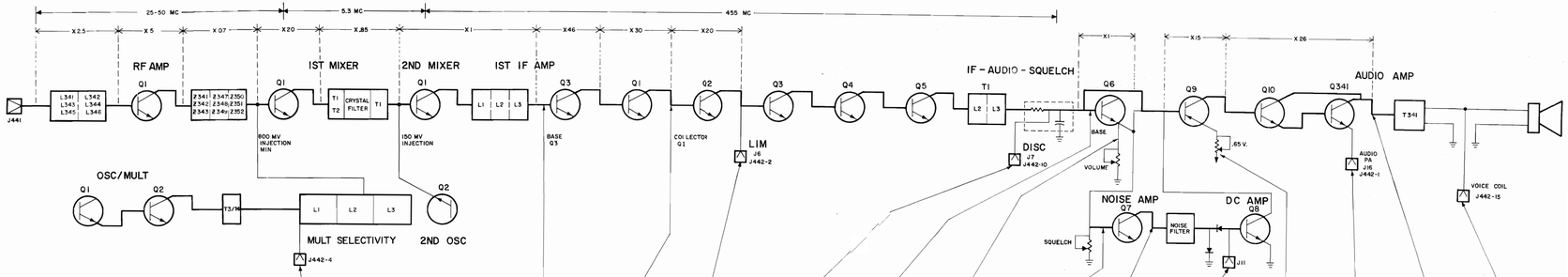
STEP 2- SIMPLIFIED VTVM GAIN CHECKS

EQUIPMENT REQUIRED:

1. VTVM-AC & DC
2. SIGNAL GENERATOR (MEASUREMENTS M560 EQUIV.)

PRELIMINARY STEPS:

1. SET VOLUME CONTROL FULLY CLOCKWISE.
2. SET SQUELCH CONTROL FULLY COUNTERCLOCKWISE.
3. RECEIVER SHOULD BE PROPERLY ALIGNED.
4. CONNECT SIGNAL GENERATOR TO ANTENNA JACK.
5. VTVM CONNECTS BETWEEN GROUND AND POINTS INDICATED BY ARROWS.



SIGNAL GENERATOR INPUT. MAINTAIN SETTING AT DISCRIMINATOR ZERO		UNMODULATED	UNMODULATED	10 MICROVOLT UNMODULATED	STANDARD SIGNAL- (1 MILLIVOLT AT RCVR FREQ. MODULATED BY 1KC WITH 3.3KC DEVIATION)	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	NO SIGNAL	NO SIGNAL	NO SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL
PROCEDURE		INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES BY 5% DC *	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES TO MINIMUM DC *								VOLUME CONTROL FULLY COUNTERCLOCKWISE AND SQUELCH FULLY CLOCKWISE			ADJUST VOLUME CONTROL FOR RATED 0 WATT OUTPUT ACROSS 3.2 OHM LOAD
READING	2.4 VDC	GENERATOR OUTPUT SHOULD BE APPROX. 1000 MICROVOLTS	GENERATOR OUTPUT SHOULD BE APPROX. 300 MICROVOLTS	2 VDC	0.1 VAC	0.5 VAC	0.5 VAC	0.07 VAC	2.5 VAC	2.0 VDC	ADJUST FOR 0.65VDC WITH VTVM ON J442-1 AND J442-8	0.65 VDC	7.0 VAC	2.53 VAC

* NEG. LEAD OF VTVM TO -10 V.

RC-1207A

OUTLINE DIAGRAM

25 — 50 MC, MASTR RECEIVER
MODELS 4ER39A10-63

NOISE BLANKER
A370 (25-33 MC)
A371 (33-42 MC)
A372 (42-50 MC)

NOISE LEVEL SHUT-OFF
A376

1ST OSCILLATOR/MULTIPLIER
25-33 MC 33-50 MC
A352 — 1 FREQ — A353
A354 — 2 FREQ — A355
A356 — 4 FREQ — A357

(19B204655, Sheet 1, Rev. 2)
(19B204655, Sheet 2, Rev. 2)

(19B204412, Sheet 1, Rev. 1)
(19B204412, Sheet 2, Rev. 1)

TO J4 ON IF-AUDIO & SQUELCH BOARD

TO J4 ON IF-AUDIO & SQUELCH BOARD

2ND MIXER
A347

TRANSISTOR	EMITTER		BASE		COLLECTOR	
A370/372	+	−	+	−	+	−
Q1	200Ω	360Ω	1.6K	360Ω	360Ω	500Ω
Q2	100Ω	360Ω	1.5K	65Ω	30Ω	30Ω
Q3	200Ω	360Ω	1.6K	360Ω	360Ω	500Ω
Q4	100Ω	100Ω	11K	2.6K	5K	6K
Q5	1K	1K	3.3K	75K	3.3K	3.3K
Q6	0	0	3K	16.5K	330Ω	600Ω
Q7	1K	1K	3.5K	6K	4K	5K
A376-Q1	2K	2K	3K	3K	3.5K	6K
A376-Q2	0	0	1K	3K	3.5K	6K

TOP VIEW

●NOISE BLANKER ONLY

RESISTOR LOADING POINTS

(19B205441, Sh. 1, Rev. 0)
(19B205441, Sh. 2, Rev. 0)

TRANSISTOR	EMITTER		BASE		COLLECTOR	
	+	−	+	−	+	−
A352/363-Q1	1K	1K	4.5K	2.8K	120Ω	120Ω
A352/363-Q2	55Ω	80Ω	1K	1K	110Ω	110Ω
A345-Q1	2.7K	2.7K	7.5K	3.8K	650Ω	500Ω
A341-Q1	450Ω	270Ω	800Ω	450Ω	350Ω	350Ω
A347-Q1	3.8K	5.3K	8.1K	2.9K	200Ω	200Ω
A347-Q2	2.7K	6.8K	5.5K	2.7K	200Ω	200Ω
A347-Q3	2.2K	2.3K	2.3K	2.2K	2.7K	3.2K
A348/374-Q1	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A348/374-Q2	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A348/374-Q3	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A348/374-Q4	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A348/374-Q5	1.0K	1.0K	7K	2.8K	360Ω	360Ω
A348/374-Q6	✱3.2K	✱2.9K	36.0K	2.5K	0	0
A348/374-Q7	1.7K	1.7K	11.0K	4.0K	7.0K	16K
A348/374-Q8	180Ω	180Ω	100K	2.8K	11.0K	1MK
A348/374-Q9	2.2K	2.2K	4.1K	45K	2.3K	2.3K
A348/374-Q10	✱ 40Ω	95Ω	2.3K	2.3K	40Ω	36Ω
Q741	✱ 1Ω	1Ω	40Ω	35Ω	40Ω	36Ω

✱ READINGS MAY VARY DUE TO DIFFERENCES IN TRANSISTORS.

(19B620741, Rev. 14)

IF-AUDIO & SQUELCH BOARD
A348 (WITHOUT CHANNEL GUARD) A373 (NOISE BLANKER)
A349 (WITH CHANNEL GUARD) A374 (NOISE BLANKER & CHANNEL GUARD)

(19C303451, Sheet 1, Rev. 4)
(19C303451, Sheet 2, Rev. 4)

BOTTOM VIEW

RESISTANCE READINGS

ALL READINGS ARE TYPICAL READINGS MEASURED WITH A 20,000 OHM-PER-VOLT METER, AND WITH CONTROL CABLE DISCONNECTED (OR IN STATIONS, PLUG TO J443 DISCONNECTED). READINGS ARE MADE WITH A SHORTING JUMPER CONNECTED FROM C361 (+10V) TO C360 (−10), AND ARE MEASURED FROM TRANSISTOR PINS TO C361. +OR — SIGNS SHOW METER LEAD TO C361.

CAUTION

ALWAYS REMOVE THE SHORTING JUMPER AFTER MAKING RESISTANCE READINGS. APPLYING POWER WITH THE SHORTING JUMPER CONNECTED MAY DAMAGE THE UNIT

FOR READINGS OF:	USE SCALE:
1-100Ω	X 1
100-1K Ω	X 10
1K-50K Ω	X 1,000
50K Ω	X 100,000

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

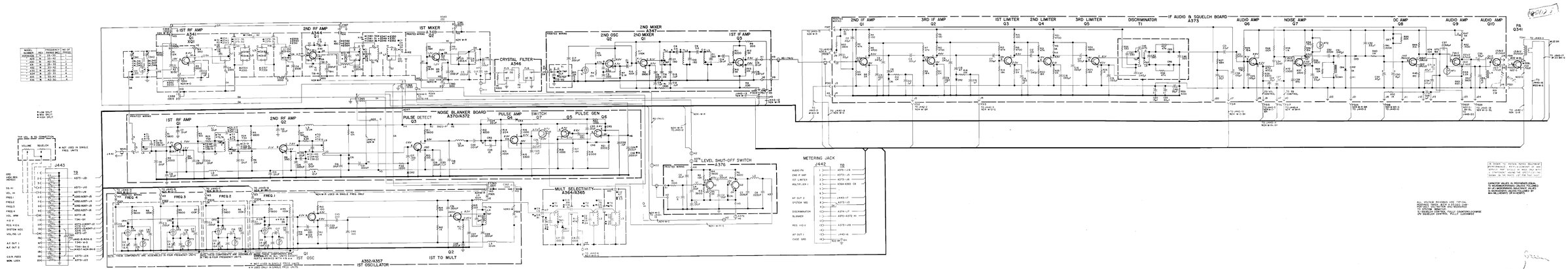
1ST RF AMP
A341

2ND RF AMP
A344

(NOISE BLANKER ONLY)

1ST MIXER
A369

MULTIPLIER-SELECTIVITY
A364 (25-33 MC)
A365 (33-50 MC)



(198620721, Rev. 29)

SCHEMATIC DIAGRAM

25 — 50 MC MASTR RECEIVER
MODELS 4ER39A28-36
(WITH NOISE BLANKER)

PARTS LIST

LBI-3586B

25-50 MC RECEIVER WITH NOISE BLANKER
MODELS 4EB39A28 - 4EB39A36
(PL-19ZD508G09 G15-27)
REV N

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES - - - - - - - -
A341		RF AMPLIFIER ASSEMBLY PL-19B204770-G1
		- - - - - - - - CAPACITORS - - - - - - - -
C1	5494481-P12	Ceramic disc; radial leads, .001 pf ±10%, 500 VDCW.
C2	5494481-P14	Ceramic disc; radial leads, .002 pf ±10%, 500 VDCW.
C3	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak.
C4	5496218-P247	Ceramic disc, temp-comp, radial leads, 22 pf, ±5%, 500 VDCW, temp coef = 80 PPM.
C5	5494481-P14	Ceramic disc, radial leads, .002 pf, ±10%, 500 VDCW.
C6	5494481-P12	Ceramic disc, radial leads, .001 pf, ±10%, 500 VDCW.
C17	5496218-P237	Ceramic disc, temp-comp, radial leads, 6 pf, ±5%, 3000 VDCW, temp coef -80 PPM.
		- - - - - - - - INDUCTORS - - - - - - - -
L2	PL-19A121082-G2	Toroidal coil.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q2	19A115245-P1	Silicon, NPN.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q5	19A115249-P2	Silicon, NPN; sim to Type 2N918.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P523K	Fixed composition: 12,000 ohms ±10%, 1/4 w.
R2	3R152-P302K	Fixed composition: 3000 ohms ±10%, 1/4 w.
R3	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
R4	3R152-P391K	Fixed composition: 390 ohms ±10%, 1/4 w.
		- - - - - - - - SOCKETS - - - - - - - -
XQ1	5490277-P1	Transistor, mica-filled phen: 4 contacts rated 1 amp at 400 VRMS; sim to Elco 3302.
		- - - - - - - - CAPACITORS - - - - - - - -
C2	5494481-P14	Ceramic disc; radial leads, .002 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
C3	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5.
C4	5496218-P247	Ceramic disc; temp-comp, radial leads, 22 pf ±5%, 500 VDCW, temp coef -80 PPM.
C5	5494481-P14	Ceramic disc; radial leads, .002 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
C6	5494481-P12	Ceramic disc; radial leads, .001 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
		- - - - - - - - TERMINALS - - - - - - - -
CR1	4038042-P1	Germanium.
		- - - - - - - - TRANSISTORS - - - - - - - -
CR1	19A115249-P1	Silicon, NPN.
		- - - - - - - - INDUCTORS - - - - - - - -
L2	PL-19A121082-G2	Toroidal coil.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q2	19A115245-P1	Silicon, NPN.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P563J	Fixed composition: 56,000 ohms ±5%, 1/4 w.
R2	3R152-P822J	Fixed composition: 8200 ohms ±5%, 1/4 w.
R3	3R152-P202J	Fixed composition: 2000 ohms, ±5%, 1/4 w.
R4	3R152-P102J	Fixed composition: 1000 ohms ±5%, 1/4 w.
R5	3R152-P390J	Fixed composition: 39 ohms ±5%, 1/4 w.
R8*	3R152-P102J	Fixed composition: 1000 ohms, ±5%, 1/4 w. Deleted by REV. K.
R5*	3R152-P390J	Fixed composition: 39 ohms, ±5%, 1/4 w. Deleted by REV. K.
R9*	3R152-P471K	Fixed composition: 470 ohms, ±10%, 1/4 w. Added by REV. K.
R12*	3R152-P151J	Fixed composition: 150 ohms, ±5%, 1/4 w. Added by REV. K.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7487424-P19	Miniature, phen: 3 terminals.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
C309*		FIRST MIXER ASSEMBLY PL-19B204430-G2
		- - - - - - - - CAPACITORS - - - - - - - -
C2	5494481-P14	Ceramic disc; radial leads, .002 pf, ±10%, 500 VDCW.
C3	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak.
C4	5496218-P247	Ceramic disc, temp-comp, radial leads, 22 pf, ±5%, 500 VDCW, temp coef = 80 PPM.
C5	5494481-P14	Ceramic disc, radial leads, .002 pf, ±10%, 500 VDCW.
C6	5494481-P12	Ceramic disc, radial leads, .001 pf, ±10%, 500 VDCW.
C17	5496218-P237	Ceramic disc, temp-comp, radial leads, 6 pf, ±5%, 3000 VDCW, temp coef -80 PPM.
		- - - - - - - - INDUCTORS - - - - - - - -
L2	PL-19A121082-G2	Toroidal coil.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q2	19A115245-P1	Silicon, NPN.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P563J	Fixed composition: 56,000 ohms ±5%, 1/4 w.
R2	3R152-P822J	Fixed composition: 8200 ohms ±5%, 1/4 w.
R3	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R4	3R152-P102J	Fixed composition: 1000 ohms ±5%, 1/4 w.
R5	3R152-P390J	Fixed composition: 39 ohms ±5%, 1/4 w.
R8*	3R152-P102J	Fixed composition: 1000 ohms, ±5%, 1/4 w. Deleted by REV. K.
R5*	3R152-P390J	Fixed composition: 39 ohms, ±5%, 1/4 w. Deleted by REV. K.
R9*	3R152-P471K	Fixed composition: 470 ohms, ±10%, 1/4 w. Added by REV. K.
R12*	3R152-P151J	Fixed composition: 150 ohms, ±5%, 1/4 w. Added by REV. K.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
A366*		CRYSTAL FILTER ASSEMBLY PL-19B216416-G3 Used in units of Rev C. Units of Rev B or earlier used Crystal Filter Assembly PL-19B216416-G1 (see below).
		- - - - - - - - FILTERS - - - - - - - -
FL5 and FL6	PL-19C304094-G4	Bandpass.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P432K	Fixed composition: 4300 ohms ±10%, 1/4 w.
R2	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
A366*		CRYSTAL FILTER ASSEMBLY PL-19B204616-G1 In Models of Rev B or earlier.
		- - - - - - - - FILTERS - - - - - - - -
FL1 and FL2	PL-19C304094-G1	Bandpass.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P432K	Fixed composition: 4300 ohms ±10%, 1/4 w.
R2	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
A367		SECOND MIXER ASSEMBLY PL-19B204438-G1
		- - - - - - - - CAPACITORS - - - - - - - -
C1	5490008-P9	Silver mica, dipped phen: radial leads, 18 pf ±5%, 500 VDCW; sim to Electro Motive Type 5G-15.
C2 and C3	5490008-P25	Silver mica, dipped phen: radial leads, 200 pf ±5%, 500 VDCW; sim to Electro Motive Type 5G-201.
C4*	19ZD09243-P7 5491189-P106	Polyester dielectric; 0.1 uf ±20%, 40 VDCW. In REV L and earlier: Mylar: dielectric; 0.1 uf ±20%, 50 VDCW.
C5*	19ZD09243-P4 5491189-P103	Polyester dielectric; .033 uf ±20%, 40 VDCW. In REV L and earlier: Mylar: dielectric; 0.33 uf ±20%, 50 VDCW.
C6	5496219-P47	Ceramic disc; 22 pf ±5%, 500 VDCW, temp coef 0 PPM.
C7*	5496219-P269 5496219-P566 5496219-P666	Ceramic disc; 180 pf ±5%, 500 VDCW, temp coef 150 PPM. In models of REV. G: Ceramic disc; 130 pf ±5%, 500 VDCW, temp coef -330 PPM. In REV. L and earlier: Ceramic disc; 120 pf ±5%, 500 VDCW, temp coef -470 PPM.
C12* and C13*	19ZD09243-P7 5491189-P106	Polyester dielectric; 0.1 uf, ±20%, 40 VDCW. Mylar: dielectric; 0.01 uf ±20%, 50 VDCW.
C14* and C15*	19ZD09243-P1 5491189-P101	Polyester dielectric; 0.01 uf ±20%, 40 VDCW. In REV. L and earlier: Mylar: dielectric; 0.01 uf, ±20%, 50 VDCW.
C16*	19ZD09243-P5 5491189-P104	Polyester dielectric; .047 uf ±20%, 40 VDCW. In REV. L and earlier: Mylar: dielectric; .047 uf ±20%, 50 VDCW.
C17	5494481-P112	Ceramic disc; .001 uf ±10%, 500 VDCW.
		- - - - - - - - TERMINALS - - - - - - - -
E1	4038104-P1	Lug: solder dipped brass.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 and J2	4033513-P4	Contact, electrical: sim to Bead Chain LS3-3.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
L1*	19C302062-G7	Coil, includes tuning slug 7160519-P2. In REV. J and earlier:
L2*	19C302062-G6	Coil, includes tuning slug 7160519-P2. In REV. J and earlier:
L3*	19C303664-G3	Coil, includes tuning slug 7160519-P2.
L4*	19C302062-G8	Coil, includes tuning slug 7160519-P2. In REV. J and earlier:
L5*	19C303664-G3	Coil, includes tuning slug 7160519-P2.
L4		(Part of L3) Deleted by REV. K
L5*		(Part of T1) Changed by REV. K to:
L4		(Part of T1)
		- - - - - - - - PLUGS - - - - - - - -
P1	4029840-P2	Contact, electrical: solder coated brass: sim to Amp 42827-2.
P2	4029840-P1	Contact, electrical: solder coated brass: sim to Amp 41854.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q1	19A115245-P1	Silicon, NPN.
Q2 and Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P152K	Fixed composition: 1500 ohms ±10%, 1/4 w.
R2	3R152-P392K	Fixed composition: 3900 ohms ±10%, 1/4 w.
R2*	3R152-P104K 3R152-P103K	Fixed composition: 0.4 megohm ±10%, 1/4 w. In Models of Rev C or earlier: Fixed composition: 10,000 ohms ±10%, 1/4 w.
R4*	3R152-P394K 3R152-P333K	Fixed composition: 0.39 megohm ±10%, 1/4 w. In models of Rev C or earlier: Fixed composition: 33,000 ohms ±10%, 1/4 w.
R3 and R6	3R152-P103K	Fixed composition: 10,000 ohms ±10%, 1/4 w.
R7	3R152-P512J	Fixed composition: 5100 ohms ±5%, 1/4 w.
R8 and R9	3R152-P201J	Fixed composition: 200 ohms ±5%, 1/4 w.
R10	3R152-P302J	Fixed composition: 3000 ohms ±5%, 1/4 w.
R11	3R152-P622J	Fixed composition: 6200 ohms ±5%, 1/4 w.
R12	3R152-P302J	Fixed composition: 3000 ohms ±5%, 1/4 w.
R13	3R152-P302J	Fixed composition: 3000 ohms ±5%, 1/4 w.
R15*	3R152-P153K	Fixed composition: 15,000 ohms ±10%, 1/4 w. (Added by Rev H).
R16*	3R152-P104K	Fixed composition: 100,000 ohms, ±10%, 1/4 w. Added by REV. D.
R17*	3R152-P394K	Fixed composition: 390,000 ohms, ±10%, 1/4 w.
		- - - - - - - - TRANSFORMERS - - - - - - - -
T1		COIL ASSEMBLY PL-19B204414-G1
C18	19C301540-P261	Ceramic disc; temp-comp, radial leads, 82 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798-P2	Tuning slug.
		- - - - - - - - CRYSTALS - - - - - - - -
Y1*	19A110192-P3	Quartz: freq 4843 KCS ±100 cps at 25 C, temp range +20 to +75 C. In Models of Rev B or earlier:
	19A110192-P1	Quartz: freq 4805 KCS ±100 cps at 25 C, temp range -30 to +75 C.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
A352 thru A357		FIRST OSCILLATOR ASSEMBLY A352 PL-19B204419-G13 (4EB39A28) A353 PL-19B204419-G16 (4EB39A29, 30) A354 PL-19B204419-G14 (4EB39A31) A355 PL-19B204419-G17 (4EB39A32, 33) A356 PL-19B204419-G15 (4EB39A34) A357 PL-19B204419-G18 (4EB39A35, 36)
		- - - - - - - - CAPACITORS - - - - - - - -
C1	5494481-P112	Ceramic disc: radial leads, .001 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
C2	5494481-P112	Ceramic disc: radial leads, .001 pf ±10%, 500 VDCW; sim to EMC Type JF Discap. (Used in Models 4EB39A31-36).
C3 and C4	5494481-P112	Ceramic disc: radial leads, .001 pf ±10%, 500 VDCW; sim to EMC Type JF Discap. (Used in Models 4EB39A31-36).
C5	5496219-P351	Ceramic disc; temp-comp, radial leads, 33 pf ±5%, 500 VDCW, temp coef -750 PPM.
C6	5496219-P251	Ceramic disc; temp-comp, radial leads, 33 pf ±5%, 500 VDCW, temp coef -750 PPM. (Used in Models 4EB39A31-36).
C7 and C8	5496219-P251	Ceramic disc; temp-comp, radial leads, 33 pf ±5%, 500 VDCW, temp coef -750 PPM. (Used in Models 4EB39A34-36).
C9	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5.
C10	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5. (Used in Models 4EB39A31-36).
C11 and C12	5491271-P106	Variable, air dielectric, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5. (Used in Models 4EB39A34-36).
C13	5496219-P40	Ceramic disc; temp-comp, radial leads, 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C14	5496219-P40	Ceramic disc; temp-comp, radial leads, 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM. (Used in Models 4EB39A31-36).
C15 and C16	5496219-P40	Ceramic disc; temp-comp, radial leads, 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM. (Used in Models 4EB39A34-36).
C17	19C300685-P93	Ceramic disc; temp-comp, radial leads, 5 pf ±0.5 pf, 500 VDCW, temp coef 0 PPM.
C18	19C300685-P93	Ceramic disc; temp-comp, radial leads, 5 pf ±0.5 pf, 500 VDCW, temp coef 0 PPM. (Used in Models 4EB39A31-36).
C19 and C20	19C300685-P93	Ceramic disc; temp-comp, radial leads, 5 pf ±0.5 pf, 500 VDCW, temp coef 0 PPM. (Used in Models 4EB39A34-36).
C21	5496219-P771	Ceramic disc; temp-comp, radial leads, 220 pf ±5%, 500 VDCW, temp coef -750 PPM. (Used in Models 4EB39A29, 30, 32, 33, 35 and 36).
C22	5496219-P773	Ceramic disc; temp-comp, radial leads, 270 pf ±5%, 500 VDCW, temp coef -750 PPM. (Used in Models 4EB39A28, 31 and 34).
C23	5494481-P114	Ceramic disc: radial leads, .002 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
C24*	5490008-P31	Silver mica, dipped phen: radial leads, 150 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. Deleted by REV. K.
C25*	5496219-P467	Ceramic disc; temp-comp, radial leads, 150 pf ±5%, 500 VDCW, temp coef -220 PPM. Deleted by REV. K.
C26 thru C28	5494481-P112	Ceramic disc: radial leads, .001 pf ±10%, 500 VDCW; sim to Type JF Discap.
C31	5494481-P113	Ceramic disc: radial leads, .001 pf ±10%, 500 VDCW; sim to EMC Type JF Discap.
C45*	5490008-G45	Silver mica, dipped phen: radial leads, 220 pf ±5%, 500 VDCW. Added by REV. K.
C46*	5496219-G563	Ceramic disc; temp-comp, radial leads, 100 pf ±5%, 500 VDCW, temp coef -220 PPM. Added by REV. K.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1*	19A115348-P1	Silicon. (Deleted by REV. F.)
CR2	19A115348-P1	Silicon. (Used in Models 4EB39A31-36).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
		- - - - - - - - DIODES AND RECTIFIERS(Cont'd) - - - - - - - -
CR3 and CR4	19A115348-P1	Silicon. (Used in Models 4EB39A34-36).
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 and J2	4033513-P4	Contact, electrical: sim to Bead Chain LS3-3.
J3 and J4	4033513-P4	Contact, electrical: sim to Bead Chain LS3-3.
J5	4033513-P4	Contact, electrical: sim to Bead Chain LS3-3.
J6	4033513-P4	Contact, electrical: sim to Bead Chain LS3-3. (Used in Models 4EB39A31-36).
		- - - - - - - - INDUCTORS - - - - - - - -
L2 and L3	7488079-P16	Choke, RF: 10 µh ±10%, 0.6 ohm DC res; sim to Jeffers 4421-7.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q1 and Q2	19A115330-P1	Silicon, NPN.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P563J	Fixed composition: 5600 ohms ±5%, 1/4 w.
R2	3R152-P962J	Fixed composition: 9600 ohms ±5%, 1/4 w. (Used in Models 4EB39A31-36).
R3 and R4	3R152-P562J	Fixed composition: 5600 ohms ±5%, 1/4 w. (Used in Models 4EB39A34-36).
R5*	3R152-P104K	Fixed composition: 0.1 megohm ±10%, 1/4 w. (Deleted by REV. F.)
R5	3R152-P104K	Fixed composition: 0.1 megohm ±10%, 1/4 w. (Used in Models 4EB39A31-36).
R7 and R16	3R152-P104K	Fixed composition: 0.1 megohm ±10%, 1/4 w. (Used in Models 4EB39A28, 31 and 34).
R9	3R152-P153J	Fixed composition: 15,000 ohms ±5%, 1/4 w.
R10	3R152-P101K	Fixed composition: 100 ohms ±10%, 1/4 w.
R11 and R13	3R152-P102J	Fixed composition: 1000 ohms ±5%, 1/4 w.
R15*	3R152-P151J	Fixed composition: 150 ohms ±5%, 1/4 w. Deleted by REV. K.
R14	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R15	3R152-P101K	Fixed composition: 100 ohms ±10%, 1/4 w.
R19*	3R152-P560J	Fixed composition: 36 ohms, ±5%, 1/4 w. Added by REV. F.
R21*	3R152-P750J	Fixed composition: 75 ohms, ±5%, 1/4 w. Added by REV. K.
		- - - - - - - - THERMISTORS - - - - - - - -
RT1	19ZD09284-P5	Disc: 43 ohms res nominal at 25°C, color code green.
RT2	19ZD09284-P5	Disc: 43 ohms res nominal at 25°C, color code green. (Used in Models 4EB39A31-36).
RT3 and RT4	19ZD09284-P5	Disc: 43 ohms res nominal at 25°C, color code green. (Used in Models 4EB39A34-36).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
T2* and T4*		T2* 19ZD05416-G1 (4EB39A28, 32-34) In Models 4EB39A28, 32-34 in REV. J and earlier: 19ZD04763-G1 (4EB39A28, 32-34)
		T4* 19ZD05416-G2 (4EB39A29-31, 35, 36) In Models 4EB39A29-31, 35, 36 in REV. J and earlier: 19ZD04763-G2 (4EB39A29-31, 35, 36)
		- - - - - - - - TRANSFORMERS - - - - - - - -
		- - - - - - - - COIL ASSEMBLY - - - - - - - -
T2*		T2* 19ZD05416-G1 (4EB39A28, 32-34) In Models 4EB39A28, 32-34 in REV. J and earlier: 19ZD04763-G1 (4EB39A28, 32-34)
T4*		T4* 19ZD05416-G2 (4EB39A29-31, 35, 36) In Models 4EB39A29-31, 35, 36 in REV. J and earlier: 19ZD04763-G2 (4EB39A29-31, 35, 36)
		- - - - - - - - CAPACITORS - - - - - - - -
C34	5496218-P253	Ceramic disc; temp-comp, radial leads, 39 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4EB39A29-31, 35 and 36).
C35	5496218-P248	Ceramic disc; temp-comp, radial leads, 24 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4EB39A29-31, 35 and 36).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798-P5	Tuning slug.
		- - - - - - - - SOCKETS - - - - - - - -
XY1		Refer to Mechanical Parts (RC-1199).
XY2		Refer to Mechanical Parts (RC-1199). (Used in Models 4EB39A31-36).
XY3 and XY4		Refer to Mechanical Parts (RC-1199). (Used in Models 4EB39A34-36).
		- - - - - - - - CRYSTALS - - - - - - - -
		When reordering give G-E Part No, and specify exact freq needed. 25-42 MC crystal freq = (OF +5.30 MC) ÷ 3. 42-50 MC crystal freq = (OF -5.30 MC) ÷ 3.
Y1	19ZD06376-P1	Quartz: freq range 10686,666 to 12753,333 KC, temp range -30°C to +85°C. (25-33 MC). (Used in Models 4EB39A28, 31 and 34).
Y1	19ZD06376-P2	Quartz: freq range 12753,333 to 15733,333 KC, temp range -30°C to +85°C. (33-42 MC). (Used in Models 4EB39A28, 31 and 34).
Y1	19ZD06376-P3	Quartz: freq range 13246,666 to 16266,666 KC, temp range -30°C to +85°C. (42-50 MC). (Used in Models 4EB39A28, 31 and 34).
Y2	19ZD06376-P1	Quartz: freq range 10686,666 to 12753,333 KC, temp range -30°C to +85°C. (25-33 MC). (Used in Models 4EB39A31 and 34).
Y2	19ZD06376-P2	Quartz: freq range 12753,333 to 15733,333 KC, temp range -30°C to +85°C. (33-42 MC). (Used in Models 4EB39A31 and 34).
Y2	19ZD06376-P3	Quartz: freq range 13246,666 to 16266,666 KC, temp range -30°C to +85°C. (42-50 MC). (Used in Models 4EB39A31 and 34).
Y3 and Y4	19ZD06376-P1	Quartz: freq range 10686,666 to 12753,333 KC, temp range -30°C to +85°C. (25-33 MC). (Used in Models 4EB39A34).
Y3 and Y4	19ZD06376-P2	Quartz: freq range 12753,333 to 15733,333 KC, temp range -30°C to +85°C. (33-42 MC). (Used in Models 4EB39A35).
Y3 and Y4	19ZD06376-P3	Quartz: freq range 13246,666 to 16266,666 KC, temp range -30°C to +85°C. (42-50 MC). (Used in Models 4EB39A36).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - - -
A364* and A365*		MULTIPLEX SELECTIVITY ASSEMBLY A364 PL-19ZD05326-G1 (4EB39A28, 31, 34) A365 PL-19ZD05326-G2 (4EB39A29, 30, 32, 33, 35 and 36)
		- - - - - - - - CAPACITORS - - - - - - - -
C7 and C8	5493392-P107	Ceramic dielectric, feed-thru: 470 pf, ±100% -0%, 500 VDCW.
C9	5491601-P123	Tubular, molded, axial leads, 1.5 pf ±5%, 500 VDCW. (Used in Models 4EB39A28, 31, 34).
C10	5491601-P117	Tubular, molded, axial leads, 0.68 pf ±5%, 500 VDCW. (Used in Models 4EB39A28, 31, 34).
C11	5491601-P118	Tubular, molded, axial leads, 0.75 pf ±5%, 500 VDCW. (Used in Models 4EB39A28, 31, 34).
C12	5491601-P132	Tubular, molded, axial leads, 4.7 pf ±5%, 500 VDCW. (Used in Models 4EB39A28, 31, 34).
C13	5491601-P137	Tubular, molded, axial leads, 0.91 pf ±5%, 500 VDCW. (Used in Models 4EB39A29, 30, 32, 33, 35, 36).
C14	5491601-P114	Tubular, molded, axial leads, 3.3 pf ±5%, 500 VDCW. (Used in Models 4EB39A29, 30, 32, 33, 35, 36).
C15	5491601-P115	Tubular, molded, axial leads, 0.56 pf ±5%, 500 VDCW. (Used in Models 4EB39A29, 30, 32, 33, 35, 36).
C16	5491601-P130	Tubular, molded, axial leads, 3.3 pf ±5%, 500 VDCW. (Used in Models 4EB39A29, 30, 32, 33, 35, 36).
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1	4038056-P1	Diode, Germanium.
		- - - - - - - - RESISTORS - - - - - - - -
R1	3R152-P473K	Fixed composition: 47,000 ohms, ±10%, 1/4 w.
		- - - - - - - - TRANSFORMERS - - - - - - - -
T1 thru T6		COIL ASSEMBLY T1 19ZD05325-G2 (4EB39A28, 31, 34) T2 19ZD05325-G1 (4EB39A28, 31, 34) and T3 T4 19ZD05325-G2 (4EB39A29, 30, 32, 33, 35, 36) T5 19ZD05325-G1 (4EB39A29, 30, 32, 33, 35, 36) and T6
		- - - - - - - - CAPACITORS - - - - - - - -
C1 and C2	5496218-P232	Ceramic disc; temp-comp, radial leads, 36 puf, ±5%, 500 VDCW, temp coef +80 PPM (Used in Models 4EB39A28, 31, 34).
C3	5496218-P251	Ceramic disc, temp-comp, radial leads, 33 puf, ±5%, 500 VDCW, temp coef +80 PPM (Used in Models 4EB39A28, 31, 34).
C4 and C5	5496218-P248	Ceramic disc, temp-comp, radial leads, 24 puf, ±5%, 500 VDCW, temp coef +80 PPM (Used in Models 4EB39A28, 31, 34).
C6	5496218-P247	Ceramic disc, temp-comp, radial leads, 22 puf, ±5%, 500 VDCW, temp coef +80 PPM (Used in Models 4EB39A29, 30, 32, 33, 35, 36). In Models 4EB39A28-36 in REV. J and earlier:

(LBI-3586)(CONT'D ON PAGE 16)

TROUBLESHOOTING PROCEDURE

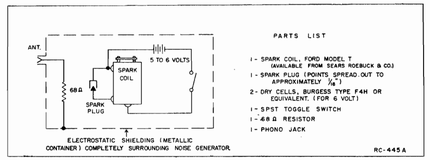
Before starting the Noise Blanker troubleshooting procedure, make sure the receiver is operating properly. Align the Noise Blanker as described on the ALIGNMENT PROCEDURE Sheet. Then make the following Troubleshooting checks:

STEP 1—PERFORMANCE CHECK

Equipment Required:

RF Signal Generator coupled through a 6 db pad.

Noise Generator with repetition rate and level controls, (similar to Empire Devices Model IG102) or constructed noise generator shown below:



Noise Blanker

Procedure:

1. Couple noise generator into receiver through a tee connector at RF Signal Generator.

2. Cut off pulse section of blanker by shorting Q4 base to emitter pattern (identified by yellow ink dot on solder side of noise blanker board). Adjust the noise generator (Model IG102) repetition rate to 2500 cps and increase the output level until receiver sensitivity is degraded by 45 db. Remove Q4 base-emitter short. With pulse section on, receiver sensitivity should restore to within 5 db of a normal 20 db quieting level (measured with the noise generator (Model IG102) tee connected but not operative).
   If the constructed noise generator is used, a significant increase in impulse noise output should be noted when pulse section of blanker is disabled by shorting Q4 base-emitter pattern (identified by yellow ink dot). Since the output level or repetition rate of a constructed noise generator cannot be controlled, a performance figure cannot be specified for the constructed noise generator output.

STEP 2—QUICK CHECKS

Equipment Required:

Audio Voltmeter (VTVM)
Audio Oscillator (sine wave)

SYMPTOMS	PROCEDURE
No regulated 10-volts	Check the 12-volt supply. Then check regulator circuit. (Refer to troubleshooting procedure for power supply.)
No blanking	Check waveforms (STEP 3) and voltage ratios (STEP 4).
Partial or no blanking	a. Check RF attenuation as follows: Connect signal generator to Antenna Jack. Adjust the output of the signal generator for 0.2 volts on the 2nd IF amplifier (position B on test set) and note the signal generator reading. Short the Q5 base to emitter pattern (identified by red ink dot) and increase the signal generator output until the same 2nd IF amplifier reading is obtained. Signal level must increase 60 db or more.
	b. Check repetition rate switch. Connect a 6-KC sine wave signal from audio oscillator through a 0.33-μf capacitor to point "A" located on the noise blanker board. Adjust the output of the audio oscillator for 2-volts, peak-to-peak. Observe the output of the pulse generator with an oscilloscope. The repetition rate of the pulse generator should not increase over 2 KC or decrease under 1 KC. (This is true for sine wave inputs like intermodulation in the blanker channel but not for strong impulse noise from antenna.)
	c. Check vehicle ignition system. Worn-out points, bad spark plugs, or breaks in ignition wiring can cause a "dirty" ignition pulse to be generated causing the blanker to operate incorrectly.

STEP 4—VOLTAGE RATIO READINGS

Equipment Required:

RF Voltmeter (similar to Boonton Model 91-CA or Millivac Type MV-18 C)

Procedure

1. Apply probe to input of stage (for example, base of 1st RF Amp). Peak resonant circuit of stage being measured and take voltage reading (E_1).

2. Move probe to input of following stage (2nd RF Amp). Repeak first resonant circuit. Then peak circuit being measured and take reading (E_2).

3. Convert readings by means of the following formula.

$$\text{Voltage Ratio} = \frac{E_2}{E_1}$$

4. Check results with typical voltage ratios shown on diagram for each stage.

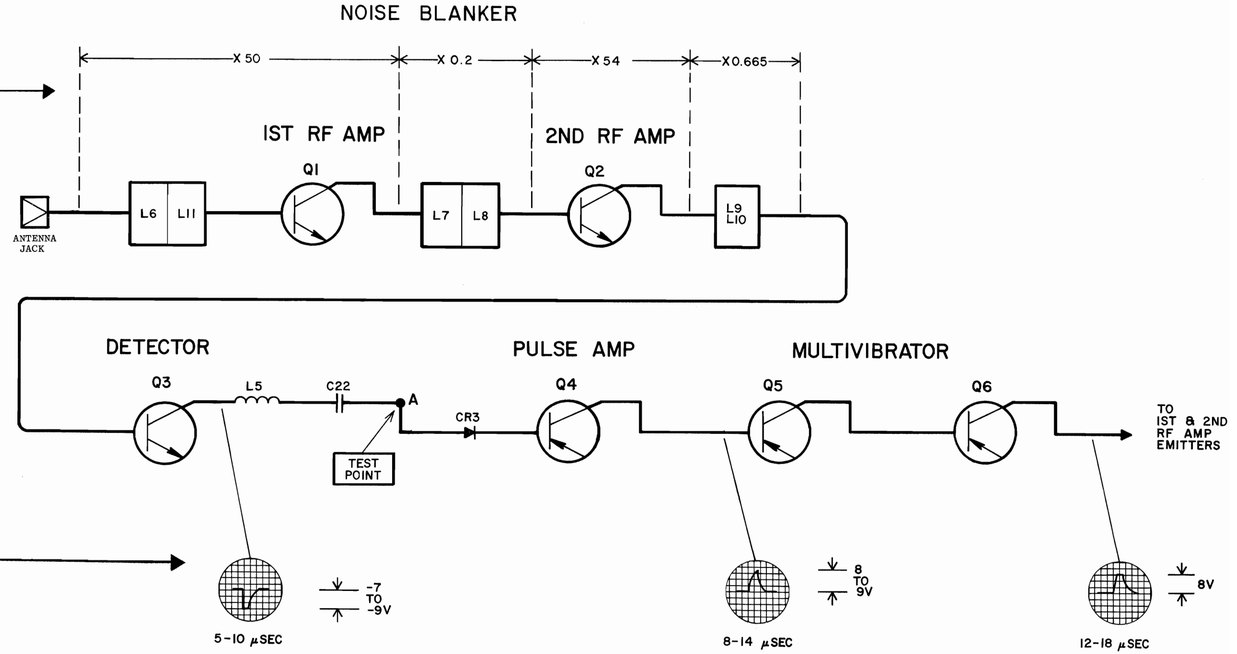
STEP 3—WAVE FORMS

Equipment Required:

Oscilloscope
Noise Generator

Procedure:

Adjust noise generator for maximum output level and observe waveforms on oscilloscope at the indicated points.



(RC-1281)

(CONT'D FROM PAGE 14) (LBI-3586)

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
A364 and A365		MULTIPLIER SELECTIVITY ASSEMBLY A364 PL-19B204782-G1 (4E39A28, 31, 34) A365 PL-19B204782-G2 (4E39A29, 30, 32, 33, 35 and 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C5 and C6	5403392-P7	Ceramic dielectric, feed-thru: .001 µf ±100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C7	5491601-P115	Tubular, molded: axial leads, 0.56 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A28, 31 and 34).
C8	5491601-P115	Tubular, molded: axial leads, 0.56 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A29, 30, 32, 33, 35 and 36).
C10	5491601-P117	Tubular, molded: axial leads, 0.68 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A28, 31 and 34).
C11	5491601-P117	Tubular, molded: axial leads, 0.68 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A29, 30, 32, 33, 35 and 36).
C13	5491601-P130	Tubular, molded: axial leads, 3.3 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A28, 31 and 34).
C14	5491601-P130	Tubular, molded: axial leads, 3.3 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A29, 30, 32, 33, 35 and 36).
		- - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	7777146-P3	Germanium; sim to Type 1N90.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152-P392K	Fixed composition: 3900 ohms ±10%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T1 thru T4		COIL ASSEMBLY T1 PL-19B204780-G1 (4E39A28, 31, 34) T2 PL-19B204780-G2 (4E39A28, 31, 34) T3 PL-19B204780-G3 (4E39A29, 30, 32, 33, 35 and 36) T4 PL-19B204780-G4 (4E39A29, 30, 32, 33, 35 and 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	5496218-P252	Ceramic disc: temp-comp, radial leads, 36 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4E39A28, 31 and 34).
C3	5496218-P248	Ceramic disc: temp-comp, radial leads, 24 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4E39A29, 30, 32, 33, 35 and 36).
C4	5496218-P247	Ceramic disc: temp-comp, radial leads, 22 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4E39A29, 30, 32, 33, 35 and 36).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
A370 thru A372		NOISE BLANKER A370 PL-19C303540-G1 (4E39A28, 31, 34) A371 PL-19C303540-G2 (4E39A28, 32, 35) A372 PL-19C303540-G3 (4E39A30, 33, 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C5	5491601-P28	Tubular, molded: axial leads, 2.7 pf ±10%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A28, 31 and 34).
C7 and C8	7491827-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.
C9	7491827-P3	Ceramic disc: radial leads, .025 µf +80% -20%, 50 VDCW; sim to Sprague 29C187.
C12 and C13	7491827-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.
C14	7491827-P3	Ceramic disc: radial leads, .025 µf +80% -20%, 50 VDCW; sim to Sprague 29C187.
C17	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C18	5496219-P55	Ceramic disc: temp-comp, radial leads, 47 pf ±5%, 500 VDCW, temp coef 0 PPM.
C19	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C20*	19B209243-P7 5491189-P107	Polyester: 0.1 µf, ±20%, 40 v. In REV. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, 0.15 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
C21 and C22	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C23	5496219-P44	Ceramic disc: temp-comp, radial leads, 15 pf ±5%, 500 VDCW, temp coef 0 PPM.
C24*	19B209243-P9 5491189-P108	Polyester: 0.22 µf, ±20%, 40 v. In REV. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, 0.22 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
C25*	19B209243-P7 5491189-P106	Polyester: 0.1 µf, ±20%, 40 v. In REV. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, 0.1 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
C26	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C27	4029003-P4	Silver mica, dipped phen: radial leads, 680 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-20.
C28*	19B209243-P7 5491189-P106	Polyester: 0.1 µf, ±20%, 40 v. In Rev. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, 0.1 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
C29	5494481-P114	Ceramic disc: radial leads, .002 µf ±10%, 500 VDCW; sim to RMC Type JF Discap. (Used in Models 4E39A28, 30, 31, 33, 34 and 36).
C29	5494481-P116	Ceramic disc: radial leads, .003 µf ±10%, 500 VDCW; sim to RMC Type JF Discap. (Used in Models 4E39A29, 32 and 35).
C30*	19B209243-P1 5491189-P101	Polyester: 0.01 µf, ±20%, 40 v. In REV. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, .01 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
C39*	19B209243-P1 5491189-P101	Polyester: 0.01 µf, ±20%, 40 v. In REV. K and earlier: Mylar® dielectric, dipped epoxy: radial leads, .01 µf ±20%, 50 VDCW; sim to Good-All Type 601PE. (Used in Models 4E39A28, 31 and 34).
C40	5491601-P23	Tubular, molded: radial leads, 1.5 µf ±10%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A29, 32 and 35).
C41	5491601-P22	Tubular, molded: raxial leads, 1.2 µf ±10%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4E39A30, 33 and 36).
C42	5494481-P116	Ceramic disc: radial leads, .003 µf, ±10%, 500 VDCW. (Used in Models 4ER39A28, 30, 31, 33, 34, 36).
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	5491705-P2	Silicon.
CR2 thru CR4	7777146-P3	Germanium; sim to Type 1N90.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - -
		- - - - - DIODES AND RECTIFIERS(Cont'd) - - - - -
CR5	5491705-P2	Silicon.
CR6	7777146-P3	Germanium; sim to Type 1N90.
CR7*	4038056-P1	Diode. Added by REV. L.
		- - - - - - - - - -TRANSISTORS - - - - - - - - - -
Q1* thru Q3*	19A115666-P1 19A115249-P1	Silicon, NPN In REV. K and earlier: Silicon, NPN.
Q4* thru Q6*	19A115706-P1 19A115393-P1	Silicon, NPN. In REV. K and earlier: Silicon, NPN.
Q7*	19A115706-P1	Silicon, NPN. Added by REV. L.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152-P682K	Fixed composition: 6800 ohms ±10%, 1/4 w.
R2	3R152-P202K	Fixed composition: 2000 ohms ±10%, 1/4 w.
R3	3R152-P511K	Fixed composition: 510 ohms ±10%, 1/4 w.
R4	3R152-P391K	Fixed composition: 390 ohms ±10%, 1/4 w.
R5	3R152-P682K	Fixed composition: 6800 ohms ±10%, 1/4 w.
R6	3R152-P202K	Fixed composition: 2000 ohms ±10%, 1/4 w.
R7	3R152-P511K	Fixed composition: 510 ohms ±10%, 1/4 w.
R8	3R152-P391K	Fixed composition: 390 ohms ±10%, 1/4 w.
R9	3R152-P123K	Fixed composition: 12,000 ohms ±10%, 1/4 w.
R10	3R152-P101K	Fixed composition: 100 ohms ±10%, 1/4 w.
R11	3R152-P562K	Fixed composition: 5600 ohms ±10%, 1/4 w.
R12	3R152-P822K	Fixed composition: 8200 ohms ±10%, 1/4 w.
R13	3R152-P104K	Fixed composition: 0.1 megohm ±10%, 1/4 w.
R14	3R152-P203K	Fixed composition: 20,000 ohms ±10%, 1/4 w.
R15	3R152-P332K	Fixed composition: 3300 ohms ±10%, 1/4 w.
R16	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
R17	3R152-P183K	Fixed composition: 18,000 ohms ±10%, 1/4 w.
R18	3R152-P202K	Fixed composition: 2000 ohms ±10%, 1/4 w.
R19 and R20	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
R21	3R152-P202K	Fixed composition: 2000 ohms ±10%, 1/4 w.
R22	3R152-P102K	Fixed composition: 1000 ohms ±10%, 1/4 w.
		- - - - - - - - - SWITCHES - - - - - - - -
S1*	7481654-P7	Pushbutton: single pole, normally closed, 1/10 amp at 115 VAC; sim to Grayhill 30-2. (Deleted by REV. L.)
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T1 thru T3		COIL ASSEMBLY T1 PL-19B204694-G1 (4E39A28, 31, 34) T2 PL-19B204694-G2 (4E39A29, 32, 35) T3 PL-19B204694-G3 (4E39A30, 33, 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218-P62	Ceramic disc: temp-comp, radial leads, 91 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A28, 31 and 34).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
		- - - - - - - - - CAPACITORS(Cont'd) - - - -
C6	19B209170-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.
C31	5496218-P256	Ceramic disc: temp-comp, radial leads, 51 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4E39A29, 32 and 35).
C35	5496218-P49	Ceramic disc: temp-comp, radial leads, 27 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A30, 33 and 36).
	5491798-P4	Tuning slug. (Used in Models 4E39A29, 32 and 35).
	5491798-P5	Tuning slug. (Used in Models 4E39A28, 30, 31, 33, 34 and 36).
T4 thru T6		COIL ASSEMBLY T4 PL-19B204695-G1 (4E39A28, 31, 34) T5 PL-19B204695-G2 (4E39A29, 32, 35) T6 PL-19B204695-G3 (4E39A30, 33, 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2	5496218-P61	Ceramic disc: temp-comp, radial leads, 82 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A28, 31 and 34).
C10	19B209170-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.
C32	5496218-P55	Ceramic disc: temp-comp, radial leads, 47 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A29, 32 and 35).
C36	5496218-P44	Ceramic disc: temp-comp, radial leads, 15 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A30, 33 and 36).
		- - - - - - - - - RESISTORS - - - - - - - - -
R23	3R152-P752K	Fixed composition: 7500 ohms ±10%, 1/4 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798-P4	Tuning slug. (Used in Models 4E39A29, 32 and 35).
	5491798-P5	Tuning slug. (Used in Models 4E39A28, 30, 31, 33, 34 and 36).
T7 thru T9		COIL ASSEMBLY T7 PL-19B204696-G1 (4E39A28, 31, 34) T8 PL-19B204696-G2 (4E39A29, 32, 35) T9 PL-19B204696-G3 (4E39A30, 33, 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C3	5496218-P62	Ceramic disc: temp-comp, radial leads, 91 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A28, 31 and 34).
C11	19B209170-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
		- - - - - - - - - CAPACITORS(Cont'd) - - - -
C33	5496218-P256	Ceramic disc: temp-comp, radial leads, 51 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4E39A29, 32 and 35).
C37	5496218-P48	Ceramic disc: temp-comp, radial leads, 24 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A30, 33 and 36).
		- - - - - - - - - RESISTORS - - - - - - - - -
R24	3R152-P752K	Fixed composition: 7500 ohms ±10%, 1/4 w.
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798-P4	Tuning slug. (Used in Models 4E39A29, 32 and 35).
	5491798-P5	Tuning slug. (Used in Models 4E39A28, 30, 31, 33, 34 and 36).
T10 thru T12		COIL ASSEMBLY T10 PL-19B204697-G1 (4E39A28, 31, 34) T11 PL-19B204697-G2 (4E39A29, 32, 35) T12 PL-19B204697-G3 (4E39A30, 33, 36)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C4	5496218-P63	Ceramic disc: temp-comp, radial leads, 100 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A28, 31 and 34).
C15 and C16	19B209170-P2	Ceramic disc: radial leads, .01 µf +80% -30%, 50 VDCW; sim to Sprague 19C180.
C34	5496218-P58	Ceramic disc: temp-comp, radial leads, 62 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A29, 32 and 35).
C38	5496218-P47	Ceramic disc: temp-comp, radial leads, 22 pf ±5%, 500 VDCW, temp coef 0 PPM. (Used in Models 4E39A30, 33 and 36).
		- - - - - - - - - RESISTORS - - - - - - - - -
R25	3R152-P752K	Fixed composition: 7500 ohms ±10%, 1/4 w.
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798-P4	Tuning slug.
A376*		NOISE LEVEL SHUT-OFF ASSEMBLY PL-19C303985-G1
		- - - - - - - - - -CAPACITORS - - - - - - - - - -
C1	5496219-P237	Ceramic disc, 6 pf, 500 VDCW, temp coef -80 PPM, ±0.25 pf.
C2	19B209243-P1	Polyester, 0.01 µf, ±20%, 40 VDCW.
C3	5494481-P111	Ceramic disc, .001 pf, ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C4 thru C6	7491827-P2	Capacitor disc, 0.01 µf, +80%, -30%, 50 VDCW.
C7	7774750-P11	Fixed ceramic disc, .005 µf, +100%, -0%, 500 VDCW.
C8	19B209243-P3	Polyester, .022 µf, ±20%, 40 VDCW.
		- - - - - - - - - -DIODES - - - - - - - - - -
CR1	4038056-P1	Germanium.
		- - - - - - - - - - COILS- - - - - - - - - -
L1	7488079-P50	Choke, RF, 39 µh, ±10%, 2 ohms DC res; sim to Jeffers 4422-11.
L2	7488079-P48	Choke, RF, 27 µf, ±10%, 1.4 ohms DC res; sim to Jeffers 4422-9.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115245-P1	Silicon, NPN.
Q2	19A115123-P1	Silicon, NPN; sim to 2N2712.
		- - - - - - - - - - REGISTORS - - - - - - - - - -
R1	3R152-P102K	Fixed composition: 1000 ohms, ±10%, 1/4 w.
R2	3R152-P123K	Fixed composition: 12000 ohms, ±10%, 1/4 w.
R3	3R152-P392K	Fixed composition: 3900 ohms, ±10%, 1/4 w.
R4	3R152-P562K	Fixed composition: 5600 ohms, ±10%, 1/4 w.
R5	3R152-P202J	Fixed composition: 2000 ohms, ±5%, 1/2 w.
R6	3R152-P562K	Fixed composition: 5600 ohms, ±10%, 1/4 w. Added by REV. L.
A373		IF/AUDIO ASSEMBLY PL-19D402327-G8
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	19A115028-P116	Mylars dielectric, dipped phen: radial leads, 0.22 µf ±20%, 200 VDCW.
C3	19A115028-P111	Mylars dielectric, dipped phen: radial leads, .047 µf ±20%, 200 VDCW.
C4	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C5	19A115028-P109	Mylars dielectric, dipped phen: radial leads, .022 µf ±20%, 200 VDCW.
C6	19A115028-P111	Mylars dielectric, dipped phen: radial leads, .047 µf ±20%, 200 VDCW.
C7	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C8	5496219-P717	Ceramic disc: temp-comp, radial leads, 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C9	19A115028-P109	Mylars dielectric, dipped phen: radial leads, .022 µf ±20%, 200 VDCW.
C10	19A115028-P114	Mylars dielectric, dipped phen: radial leads, 0.1 µf ±20%, 200 VDCW.
C11	19A115028-P111	Mylars dielectric, dipped phen: radial leads, .047 µf ±20%, 200 VDCW.
C12	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C13	5496219-P717	Ceramic disc: temp-comp, radial leads, 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C14	19A115028-P109	Mylars dielectric, dipped phen: radial leads, .022 µf ±20%, 200 VDCW.
C15	19A115028-P114	Mylars dielectric, dipped phen: radial leads, 0.1 µf ±20%, 200 VDCW.
C16	5496219-P421	Ceramic disc: temp-comp, radial leads, 100 pf ±10%, 500 VDCW, temp coef -220 PPM.
C17	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C18 and C19	19A115028-P109	Mylars dielectric, dipped phen: radial leads, .022 µf ±20%, 200 VDCW.
C20	5496267-P14	Tubular, hermetically sealed, tantalum, dry solid: axial leads, 15 µf ±20%, 20 VDCW; sim to Sprague 150D156X0020B2.
C21	19B209243-P9	Polyester dielectric: radial leads, 0.22 µf ±20%, 40 VDCW; sim to Amperex C280AA/P220K.
C22	19A115028-P107	Mylars dielectric, dipped phen: radial leads, .01 µf ±20%, 200 VDCW.
C23	5491000-P1	Tubular, hermetically sealed, electrolytic: axial leads, 30 µf +75% -10%, 25 VDCW; sim to Sprague S45553.
C24	19A115028-P107	Mylars dielectric, dipped phen: radial leads, .01 µf ±20%, 200 VDCW.
C25	5494481-P112	Ceramic disc: radial leads, .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - SUBASSEMBLIES(Cont'd) - - - - - - -
		- - - - - - - -CAPACITORS(Cont'd) - - - - - - - -
C27	19B209243-P7	Polyester dielectric: radial leads, 0.1 µf ±20%, 40 VDCW; sim to Amperex C280AA/P100K.
C28	5496267-P17	Tubular, hermetically sealed, tantalum, dry solid: axial leads, 1 µf ±20%, 35 VDCW; sim to Sprague 150D105X0035A2.
C29	19B209243-P9	Polyester dielectric: radial leads, 0.22 µf ±20%, 40 VDCW; sim to Amperex C280AA/P220K.
C31	19B209243-P5	Polyester dielectric: radial leads, .047 µf ±20%, 40 VDCW; sim to Amperex C280AA/P47K.
C32	19B209243-P9	Polyester dielectric: radial leads, 0.22 µf ±20%, 40 VDCW; sim to Amperex C280AA/P220K.
C33	5496267-P28	Tubular, hermetically sealed, tantalum, dry solid: axial leads, 0.47 µf ±20%, 35 VDCW; sim to Sprague 150D474X0035A2.
C34	19B209243-P9	Polyester dielectric: radial leads, 0.22 µf ±20%, 40 VDCW; sim to Amperex C280AA/P220K.
C35	5496267-P6	Tubular, hermetically sealed, tantalum, dry solid: axial leads, 33 µf ±20%, 10 VDCW; sim to Sprague 150D336X0010B2.
C37*	19A115028-P305	Mylar® dielectric, dipped phen: radial leads, .0068 µf, ±10%, 100 VDCW.
	19A115028-P303	In REV. D and earlier: Mylar® dielectric, dipped phen: radial leads, .0033 µf ±10%, 200 VDCW.
C38	5495670-P10	Tubular, hermetically sealed, electrolytic: axial leads, 100 µf +75% -10%, 15 VDCW; sim to Sprague 30D172A1.
C39	5490008-P143	Silver mica, dipped phen: radial leads, 470 pf ±10%, 300 VDCW; sim to Electro Motive Type DM-15.
C48	5495670-P9	Tubular, hermetically sealed, electrolytic: axial leads, 35 µf +75% -10%, 15 VDCW; sim to Sprague 30D169A1.
C50	5496267-P14	Tubular, hermetically sealed, tantalum, dry solid: axial leads, 15 µf ±20%, 20 VDCW; sim to Sprague 150D156X0020B2.
C52*	4029003-P16	Silver mica, dipped phen: radial leads, .0022 µf ±5%, 500 VDCW; sim to Electro Motive Type DM-20. Deleted by REV. N.
C53*	19A115028-P315	Mylar® dielectric: dipped phen. radial leads, 0.15 µf, ±10%, 200 VDCW,
	19B209243-P7	In REV. D and earlier: Polyester dielectric: radial leads, 0.1 µf ±20%, 40 VDCW: sim to Amperex C280AA/P100K.
C54	7491930-P3	Tubular, Mylar® dielectric: axial leads, .0047 µf ±20%, 100 VDCW; sim to G-E Type 61F.
C71*	5496267-P28	Tubular, hermetically sealed, tantalum, dry solid, axial leads, 0.47 µf, ±20%, 35 VDCW. Added by REV. J.
C72*	4029003-P207	
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	7777146-P3	Germanium; sim to Type 1N90.
CR3 and CR4	19A115250-P1	Silicon.
CR7	19A115250-P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J24	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	PL-4031476-G1	Choke. Includes:
L4	5491736-P6	Choke: 3.5 mh ±10%, 2.5 ohms DC res max; sim to Aladdin 33-494.
		- - - - - - - - - -TRANSISTORS - - - - - - - - - -
Q1 thru Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q4* and Q5*	19A115552-P1	Silicon, NPN; sim to 2N2712. Changed by REV. J.
Q6 thru Q8	19A115123-P1	Silicon, PNP; sim to Type 2N1024.
Q9	19A115247-P1	Silicon, PNP; sim to Type 2N1024.
Q10	19A115300-P1	Silicon, NPN; sim to Type 2N3053.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P330K	Fixed composition: 33 ohms ±10%, 1/2 w.
R2	3R77-P473K	Fixed composition: 47,000 ohms ±10%, 1/2 w.
R3	3R77-P183J	Fixed composition: 18,000 ohms ±5%, 1/2 w.
R4	3R77-P101K	Fixed composition: 100 ohms ±10%, 1/2 w.
R5	3R77-P472K	Fixed composition: 4700 ohms ±10%, 1/2 w.
R6	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R7	3R77-P473K	Fixed composition: 47,000 ohms ±10%, 1/2 w.
R8	3R77-P183J	Fixed composition: 18,000 ohms ±5%, 1/2 w.
R9	3R77-P101K	Fixed composition: 100 ohms ±10%, 1/2 w.
R10	3R77-P472K	Fixed composition: 4700 ohms ±10%, 1/2 w.
R11	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R12	3R77-P103K	Fixed composition: 10,000 ohms ±10%, 1/2 w.
R13	3R77-P473K	Fixed composition: 47,000 ohms ±10%, 1/2 w.
R14	3R77-P183J	Fixed composition: 18,000 ohms ±5%, 1/2 w.
R15	3R77-P101K	Fixed composition: 100 ohms ±10%, 1/2 w.
R16	3R77-P472K	Fixed composition: 4700 ohms ±10%, 1/2 w.
R17	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R18	3R77-P103K	Fixed composition: 10,000 ohms ±10%, 1/2 w.
R19	3R77-P473K	Fixed composition: 47,000 ohms ±10%, 1/2 w.
R20	3R77-P183J	Fixed composition: 18,000 ohms ±5%, 1/2 w.
R21	3R77-P472K	Fixed composition: 4700 ohms ±10%, 1/2 w.
R23	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R24	3R77-P682K	Fixed composition: 6800 ohms ±10%, 1/2 w.
R25	3R77-P183J	Fixed composition: 18,000 ohms ±5%, 1/2 w.
R26	3R77-P102J	Fixed composition: 1000 ohms ±5%, 1/2 w.
R27	3R77-P683K	Fixed composition: 68,000 ohms ±10%, 1/2 w.
R28	3R77-P222J	Fixed composition: 2200 ohms ±5%, 1/2 w.
R29 and R30	3R77-P753J	Fixed composition: 75,000 ohms ±5%, 1/2 w.
R31	3R77-P512J	Fixed composition: 5100 ohms ±5%, 1/2 w.
R32	3R77-P102J	Fixed composition: 1000 ohms ±5%, 1/2 w.
R34	3R77-P113K	Fixed composition: 11,000 ohms ±10%, 1/2 w.
R36	3R77-P153K	Fixed composition: 15,000 ohms ±10%, 1/2 w.
R37	3R77-P222J	Fixed composition: 2200 ohms ±5%, 1/2 w.
R38	3R77-P751J	Fixed composition: 750 ohms ±5%, 1/2 w.
R39	3R77-P562J	Fixed composition: 5600 ohms ±5%, 1/2 w.
R40	3R77-P113K	Fixed composition: 11,000 ohms ±10%, 1/2 w.
R41	3R77-P204K	Fixed composition: 0.2 megohm ±10%, 1/2 w.
R44	3R77-P153K	Fixed composition: 15,000 ohms ±10%, 1/2 w.
R45	3R77-P181K	Fixed composition: 180 ohms ±10%, 1/2 w.
R46*	3R77-P333K	Fixed composition: 33,000 ohms ±10%, 1/2 w. Deleted by REV. J.
R47	19B209115-P1	Variable, carbon film: 5000 ohms ±20%, 0.15 w, linear taper; sim to CTS Type UPE-70.
R48	3R77-P222J	Fixed composition: 2200 ohms ±5%, 1/2 w.
R49	3R77-P821K	Fixed composition: 820 ohms ±10%, 1/2 w.
R50	3R77-P392K	Fixed composition: 3900 ohms ±10%, 1/2 w.
R51	19B209022-P15	Wirewound, phen: 1 ohm ±5%, 2 w; sim to IRC Type BWH.
R52	3R77-P152K	Fixed composition: 1500 ohms ±10%, 1/2 w.
R53	5495948-P444	Deposited carbon, epoxy coated: 0.28 megohm ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
R59	3R77-P512K	Fixed composition: 5100 ohms ±10%, 1/2 w.
R62*	3R77-P823J	Fixed composition: 82,000 ohms ±5%, 1/2 w. Deleted by REV. N.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - SUBASSEMBLIES(Cont'd) - - - -
		- - - - - - - -RESISTORS (CONT'D) - - - - - - - -
R65	3R77-P123K	Fixed composition: 12,000 ohms ±10%, 1/2 w.
R66	3R77-P223K	Fixed composition: 22,000 ohms ±10%, 1/2 w.
R68*	3R77-P134J	Fixed composition: 130K, ±10%, 1/2 w.
R70	3R77-P471J	Fixed composition: 470 ohms ±5%, 1/2 w.
R72	3R77-P332J	Fixed composition: 3300 ohms ±5%, 1/2 w.
R74*	3R77-P153K	Fixed composition: 15K, ±10%, 1/2 w. Added by REV. J.
R75*	3R77-P183K	Fixed composition: 18 K, ±10%, 1/2 w. Added by REV. J.
		- - - - - - - - - THERMISTORS - - - - - - - -
RT1	19B209143-P2	Rod: axial leads, 4000 ohms ±10% res, 1 w max; sim to Globar Type 789F-12.
RT2	19B209143-P3	Rod: axial leads, 850 ohms ±10% res, 1 w max; sim to Globar Type 789F.
		- - - - - - - - - TRANSFORMERS - - - - - - -
T1		DISCRIMINATOR ASSEMBLY PL-19C303612-G1
		- - - - - - - - - CAPACITORS - - - - - - - -
C41 and C42	19B209196-P1	Ceramic disc: temp-comp, radial leads, 280 pf ±5%, 500 VDCW, temp coef -115 ±30 PPM.
C45	7489162-P43	Silver mica, dipped phen: radial leads, 470 pf ±5%, 300 VDCW; sim to Electro Motive Type DM-15.
C46	7489162-P35	Silver mica, dipped phen: radial leads, 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C47	5491189-P4	Mylar® dielectric, dipped epoxy: radial leads, .047 µf ±20%, 50 VDCW; sim to Good-All Type 601PE.
		- - - - - - DIODES AND RECTIFIERS - - - - - -
CR5 and CR6	19A115250-P1	Silicon.
		- - - - - - - - - RESISTORS - - - - - - - - -
R56	3R152-P331J	Fixed composition: 330 ohms ±5%, 1/4 w.
R57 and R58	3R152-P473J	Fixed composition: 47,000 ohms ±5%, 1/4 w.
		- - - - - - - - - CAPACITORS - - - - - - - -
C358 thru C365	5493392-P7	Ceramic dielectric, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C367 and C368	5493392-P7	Ceramic dielectric, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C371*	5491601-P116	Tubular, molded: axial leads, 0.62 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A28, 31 and 34). Deleted by REV. K.
C372	5491601-P110	Tubular, molded: axial leads, 0.36 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A29, 32 and 35).
C373	5491601-P116	Tubular, molded: axial leads, 0.62 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A30, 33 and 36).
C377*	5491601-P117	Tubular, molded: axial leads, 0.68 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A28, 31 and 34). Deleted by REV. K.

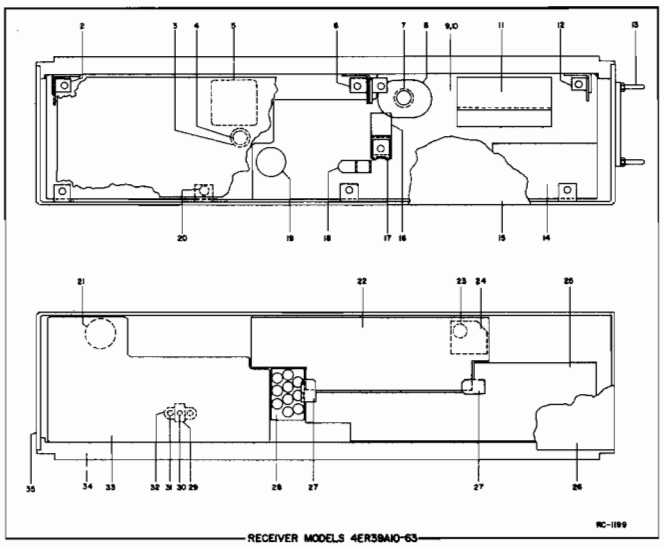
SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - CAPACITORS(Cont'd) - - - -
C378	5491601-P110	Tubular, molded: axial leads, 0.36 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A29, 32 and 35).
C379	5491601-P114	Tubular, molded: axial leads, 0.51 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A30, 33 and 36).
C380	5491601-P115	Tubular, molded: axial leads, 0.56 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A28, 31 and 34).
C381	5491601-P114	Tubular, molded: axial leads, 0.51 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A29, 32 and 35).
C382	5491601-P110	Tubular, molded: axial leads, 0.36 pf ±5%, 500 VDCW; sim to Quality Components Type MC. (Used in Models 4ER39A30, 33 and 36).
C385*	7774750-P4	Fixed ceramic disc: .001 µf, -0, +100%, 500 VDCW. Added by REV. G.
C386*	5491601-P119	Tubular molded: axial leads, 0.82 pf ±5%, 500 VDCW. (Used in Models 4ER39A28, 31, and 34). Added by REV. K.
		- - - - - - JACKS AND RECEPTACLES - - - - - -
J441	19B209122-P1	Connector, coaxial: includes cable (W441), approx 5 inches long.
J442	19B209125-P2	Connector: 18 contacts rated 5 amps min at 1000 VDC max.
J443	PL-19C303426-G1	Connector: 20 pin contacts.
		- - - - - - - - INDUCTORS - - - - - - - - -
L341 thru L346		COIL ASSEMBLY L341 PL-19B204820-G5 (4ER39A28, 31 and 34) L342 PL-19B204820-G6 (4ER39A28, 31 and 34) L343 PL-19B204820-G1 (4ER39A29, 32 and 35) L344 PL-19B204820-G2 (4ER39A29, 32 and 35) L345 PL-19B204820-G3 (4ER39A30, 33 and 36) L346 PL-19B204820-G4 (4ER39A30, 33 and 36)
		- - - - - - - - - CAPACITORS - - - - - - - -
C341	19B209159-P2	Variable, air dielectric, subminiature: approx 1.54-6.9 pf, 750 v peak; sim to EF Johnson 189-3-55. (Used in L341, L343 and L345).
C342	19B209159-P2	Variable, air dielectric, subminiature: approx 1.54-6.9 pf, 750 v peak; sim to EF Johnson 189-3-55. (Used in L342, L344 and L346).
DS301*	19B209067-P1	Lamp. (Added by REV. H.)
		- - - - - - - - - PLUGS - - - - - - - - - -
P304 thru P309	4029840-P2	Contact, electrical: solder coated brass; sim to Amp 42827-2.
P310	4029840-P1	Contact, electrical: solder coated brass; sim to Amp 41854.
P311 thru P320	4029840-P2	Contact, electrical: solder coated brass; sim to Amp 42827-2.
P321	4029840-P1	Contact, electrical: solder coated brass; sim to Amp 41854.
P325	4029840-P2	Contact, electrical: solder coated brass; sim to Amp 42827-2.
P329	4029840-P2	Contact, electrical: solder coated brass; sim to Amp 42827-2.
P337	4029840-P2	Contact, electrical: solder coated brass; sim to Amp 42827-2. (Used in Models 4ER39A31-36).
		- - - - - - - - - TRANSISTORS - - - - - - -
Q341*	19A115527-P1 19A115246-P1	Silicon, NPN. In Rev. E and earlier: Silicon, NPN.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R341	3R152-P822K	Fixed composition: 8200 ohms ±10%, 1/4 w.
R342	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R343* and R344*	3R152-P101K	Fixed composition: 100 ohms, ±10%, 1/4 w. Added by REV. K.
		- - - - - - - - - TRANSFORMERS - - - - - - - - - -
T341*	19B209083-P2	Audio freq. In REV. E and earlier:
	19B209083-P1	Audio freq: Pri 1: 19 ohms ±10% imp at 3 w, 0.866 ohm DC res max, Sec 1: 3.5 ohms ±10% imp at 3 w, 0.222 ohm DC res max.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1	7487425-P7	Miniature, phen: 4 terminals.
		- - - - - - - - - - CABLES - - - - - - - - - -
W441		(Part of J441).
		- - - - - - - - - TUNED CIRCUITS - - - - - - - - -
Z341 thru Z343		COIL ASSEMBLY
		Z341 PL-19B204786-G1 (4ER39A28, 31 and 34) Z342 PL-19B204786-G2 (4ER39A29, 32 and 35) Z343 PL-19B204786-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1*	5496218-P254	Ceramic disc: temp-comp, radial leads, 43 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35). In Models 4ER39A29, 32 and 35 in REV. J and earlier:
	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 35).
C4	5494481-P14	Ceramic disc: radial leads, .002 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
Z347 thru Z349		COIL ASSEMBLY
		Z347 PL-19B204767-G1 (4ER39A28, 31 and 34) Z348 PL-19B204767-G2 (4ER39A29, 32 and 35) Z349 PL-19B204767-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1*	5496218-P254	Ceramic disc: temp-comp, radial leads, 43 pf, ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34). In Models 4ER39A28, 31 and 34 in REV. J and earlier:
	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - TUNED CIRCUITS(Cont'd) - - - - - - -
Z350* thru Z352*		COIL ASSEMBLY
		Z350 19B204784-G4 (4ER39A28, 31 and 34) In Models 4ER39A28, 31 and 34 in REV. J and earlier: 19B204784-G1 (4ER39A28, 31 and 34)
		Z351 19B204784-G5 (4ER39A29, 31 and 35) In Models 4ER39A29, 32 and 35 in REV. J and earlier: 19B204784-G2 (4ER39A28, 32 and 35)
		Z352 19B204784-G6 (4ER39A30, 33, and 36) In Models 4ER39A30, 33 and 36 in REV. J and earlier: 19B204784-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	5496218-P262	Ceramic disc: temp-comp, radial leads, 91 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C3 and C4	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C5 and C6	5496218-P251	Ceramic disc: temp-comp, radial leads, 33 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).
Z353* thru Z355*		COIL ASSEMBLY
		Z353 PL-19B204767-G1 (4ER39A28, 31 and 34) Deleted by REV. K.
		Z354 PL-19B204767-G2 (4ER39A29, 32 and 35) Z355 PL-19B204767-G3 (4ER39A30. 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).
Z356* thru Z358*		COIL ASSEMBLY
		Z356 PL-19B204783-G1 (4ER39A28, 31 and 34) Deleted by REV. K.
		Z357 PL-19B204783-G2 (4ER39A29, 32 and 35) Z358 PL-19B204783-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).
Z359 thru Z361		COIL ASSEMBLY
		Z359 PL-19B204785-G1 (4ER39A28, 31 and 34) Z360 PL-19B204785-G2 (4ER39A29, 32 and 35) Z361 PL-19B204785-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1*	5496218-P254	Ceramic disc: temp-comp, radial leads, 43 pf ±5%, 500 VDCW, temp-coef -80 PPM.. (Used in Models 4ER39A28, 31 and 34) In Models 4ER39A28, 31 and 34 in REV. J and earlier:
	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - TUNED CIRCUITS(Cont'd) - - - - - - -
		- - - - - - - - - CAPACITORS - - - - - - - - - -
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).
C4	5494481-P14	Ceramic disc: radial leads, .002 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
Z362 thru Z364		COIL ASSEMBLY Z362 PL-19B204787-G1 (4ER39A28, 31 and 34) Z363 PL-19B204787-G2 (4ER39A29, 32 and 35) Z364 PL-19B204785-G3 (4ER39A30, 33 and 36)
		- - - - - - - - - CAPACITORS - - - - - - - - - -
C1*	5496218-P254	Ceramic disc: temp-comp, radial leads, 43 pf, ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34). In Models 4ER39A28, 31 and 34 in REV. J and earlier:
	5496218-P257	Ceramic disc: temp-comp, radial leads, 56 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A28, 31 and 34).
C2	5496218-P250	Ceramic disc: temp-comp, radial leads, 30 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A29, 32 and 35).
C3	5496218-P245	Ceramic disc: temp-comp, radial leads, 18 pf ±5%, 500 VDCW, temp coef -80 PPM. (Used in Models 4ER39A30, 33 and 36).
C4	5494481-P14	Ceramic disc: radial leads, .002 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - -RESISTORS - - - - - - - - - -
R1	3R152-P431K	Fixed composition: 430 ohms ±10%, 1/4 w.
		MECHANICAL PARTS (SEE RC-1199)
2	PL-19B204583-G3	Hinge.
3	4035439-P1	Transistor heat sink: approx 1/4 x 1/2 inches dia; sim to Birtcher 3AL-635-2R. (Used iith Q10 in A374).
4	4036555-P1	Washer insulator: nylon. (Used with Q9 and Q10 in A374).
5	4032187-P1	Can: approx 1-1/8 x 1-1/8 x 1-1/8 inches. (Used iith T1 ib A374).
6	PL-19B204583-G1	Hinge.
7	19A121284-P1	Mica insulator: approx 11/16 inch dia. (Used with Q341).
8	19A121283-P1	Transistor support. (Used with Q341).
9	19E500812-P1	Chassis: approx 13-3/4 x 3 x 1-1/2 inches. (Used in Models 4ER39A29, 30, 32, 33, 35 and 36).
10	19E500812-P2	Chassis: approx 13-3/4 x 3 x 1-1/2 inches. (Used in Models 4ER39A28, 31 and 34).
11	PL-19A121229-G1	(Not used).
12	PL-19B204583-G2	(Not used).
13	19A121676-P1	Guide pin: approx 1 x 1/8 inches dia. with 4-40 mounting thread.
14	19B204673-P1	Cover: approx 2-5/8 x 1-3/8 x 1/32 inches thick.
15	19C303385-P1	Mobile Receiver Buttom cover.
16	19A121297-P1	Angle: approx 1-5/16 x 1 x 1/2 inches.
17	7160861-P4	Nut, spring clip: sim to Tinnerman C6452-8Z-157.
18	4029851-P6	Cable clamp: nylon; sim to Weckesser 5/16-4.
19	N529P23C	Plug button: approx 15/16 inch dia.

SYMBOL	G-E PART NO	DESCRIPTION
		MECHANICAL PARTS(Cont'd)
20	19A115461-P2	Spring washer: approx 1/4 inch dia; sim to Shakeproof 3597-04-00. (Used with T1 in A347).
21	4034262-P5	Can: approx 1-3/16 x 3/4 dia; sim to Hudson Tool and Die HV-1236-2. (Used with T1 in A347).
22	19B204672-P1	Cover: approx 6 inches max length x 1-7/8 inches max width.
23	7162414-P1	Mounting ring, transistor socket: approx. 7/16 inch dia; sim to Elco 757. (Used with Q1 in A341).
24	19B204917-P1	Support: approx 1-1/4 inches max length x 1 inch max width. (Used with A341).
25	19B204719-P1	(Not used).
26	19C303385-P2	Mobile Receiver top cover.
	19C303495-G3	Station Receiver top cover, (except Repeaters and Vertical Mount stations).
	19C303676-G2	Station Receiver top cover, (Repeaters and Vertical Mount stations).
27	4029851-P3	Cable clamp: nylon; sim to Weckesser 1/8-4.
28	19A121383-P1	Support: approx 1-3/16 x 7/8 x 1/32 inches.
29	4033089-P1	Clip. (Part of XY1-4 in A352-357).
30	19B200525-P8	Rivet. (Part of XY1-4 in A352-357).
31	4033751-P1	Electrical contact: sim to Methode 752 V (PB). (Part of XY1-4 in A352-357).
32	4039307-P1	Crystal cocket. (Part of XY1-4 in A352-357).
33	19C303547-P1	Cover: approx 5-3/4 inches max length x 3-1/4 inches max width.
34	PL-19C303394-G1	Heat sink: approx 14-9/16 x x-7/32 x 13/32 inches thick.
35	PL-19C303389-G1	Chassis: approx 14-1/2 x 3/1/2 x 3-7/32 inches.



RECEIVER MODELS 4ER39A10-63

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 & B - These revisions were incorporated into initial shipments.

REV. C - To minimize chance of interference, IF frequency changed from 5.26 MC to 5.30 MC. Changed crystal filter A346 and A347-Y1.

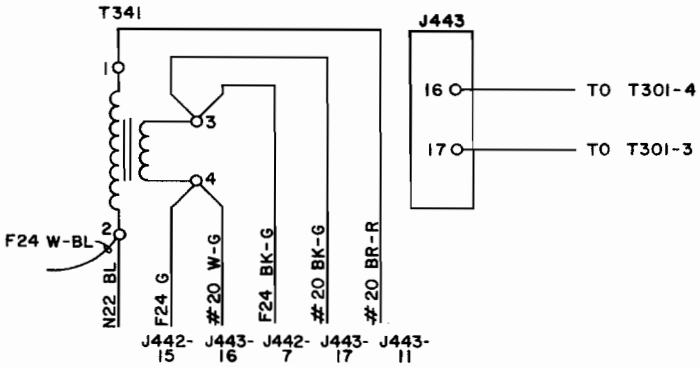
REV. D - To improve receiver performance in areas of high signal level. Deleted R3 and R4. Added R15, R16 and R17 on 2nd Mixer Board Q347.

REV. E - To improve audio response. Changed C37 and C53 on IF Audio Board A373.

REV. F - On single frequency units deleted CR1, R5 and added R19 to 1st Oscillator Board A352/A357. To incorporate improved transistor and transformer. Changed Q341 and T341.

Schematic Diagram

Was



REV. G - To eliminate audio howling caused by feedback within receiver cabling. Added C385.

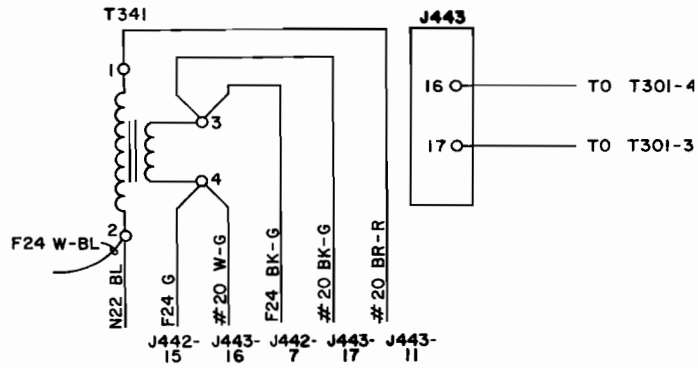
REV. H - To improve RF burnout protection or front-end air capacitor and RF transistor. Added neon lamp DS301 across L341/L343/L345 in 1st RF Amplifier A341.

REV. J - To provide better temperature compensation for low IF circuitry. Changed C7, C10 and C11 on 2nd Mixer board. To reduce variation in discriminator output and reduce audio rumble produced when volume control is at minimum and squelch near critical. Changed Q4 and Q5. Deleted R46. Added R74, R75, and C71 in IF/Audio Board A373.

REV. K - To improve spurious rejection. Changed C1 on coil assemblies A341, Z347, Z359, Z362. Changed core on coil assemblies Z341, Z342, Z347, Z348, Z354, Z357, Z359, Z360, Z362, Z363. Changed coil assemblies Z350, Z351, Z352. Added R343 and R344. Replaced R4 with R9 and R5 with R12 on 1st Mixer Board A345. Replaced C24 with C45, C25 with C46, R13 with R21, and changed T3 and T4 on 1st Oscillator Assembly A352/A357. Deleted Z353, Z356, C371, C377, and added C386 to the 25-33 MC models. Changed Multiplier Selectivity Board A364/A365.

Multiplier Selectivity Schematic

WAS



Multiplier Selectivity Outline Diagram

WAS

Changed RF Alignment. Front End Alignment Step 1 and Complete Receiver and Noise Blanker Alignment Step 3. Tuning Control was "L4 (on 1st OSC/MULT) and L1 and L2 (on MULT SELECTIVITY)", and Procedure was "Tune L4 on 1st OSC/MULT and L1 on MULT SELECTIVITY for maximum meter reading. Tune L2 for minimum meter reading. Change voltage scale if necessary". Front End Alignment Step 4 and Complete Receiver and Noise Blanker Alignment Step 8. Tuning Control was "L4 (1st OSC/MULT) and L1 and L2 (MULT SELECTIVITY)", and Procedure was "Apply an on-frequency signal as above, keeping below saturation. Tune L4 (on 1st OSC/MULT) and L1 and L2 (on MULT SELECTIVITY) for maximum meter reading."

REV. L - To improve blanker performance during hi-level signals. Deleted S1, added Q7 and CR7, changed C20, C24, C25, C28, C30, C39, Q1 thru Q6 on Noise Blanker Board A370/A372. Added Noise Level Shut-off Board A376. Changed 1st Mixer Board to A369.

To improve RF burnout protection of 1st RF Noise Blanker Transistor. Changed R1 on Noise Level Shut-off Assembly A376.

REV. M - To improve temperature characteristics. Changed C4, C5, C7 through C16, L1, L2, L3, deleted L4, and changed L5 to L4 on 2nd Mixer Board.

REV. N - To improve squelch sensitivity. Changed R62 to R68 on the IF/Audio and Squelch Board.