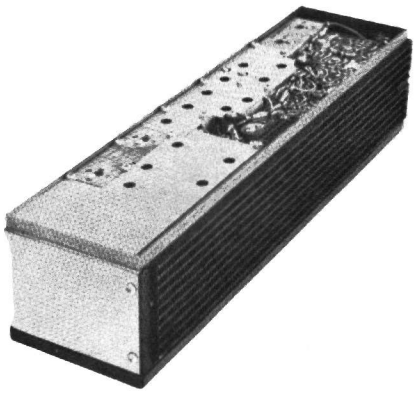
MOBILE RADIO

MASTR® Progress Line

25-50 MHz RECEIVER MODELS 4ER39A10-18



SPECIFICATIONS *

	ER-39-A
FCC Filing Designation	
Frequency Range	25-50 MHz
Audio Output	2 watts at less than 10% distortion
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 kHz channels)
20-db Quieting Method	-100 db at ±15 kHz
Spurious Response	-100 db
First Oscillator Stability	±.0005% (-30°C to +60°C)
Modulation Acceptance	±7 kHz (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 Hz (1000-Hz reference)

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

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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.

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 megahertz 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 stages. 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 18 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 AMPLIFIER (A341)

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 RF cable W441 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 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 three tuned circuits to the base of the first mixer.

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 megahertz. 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.

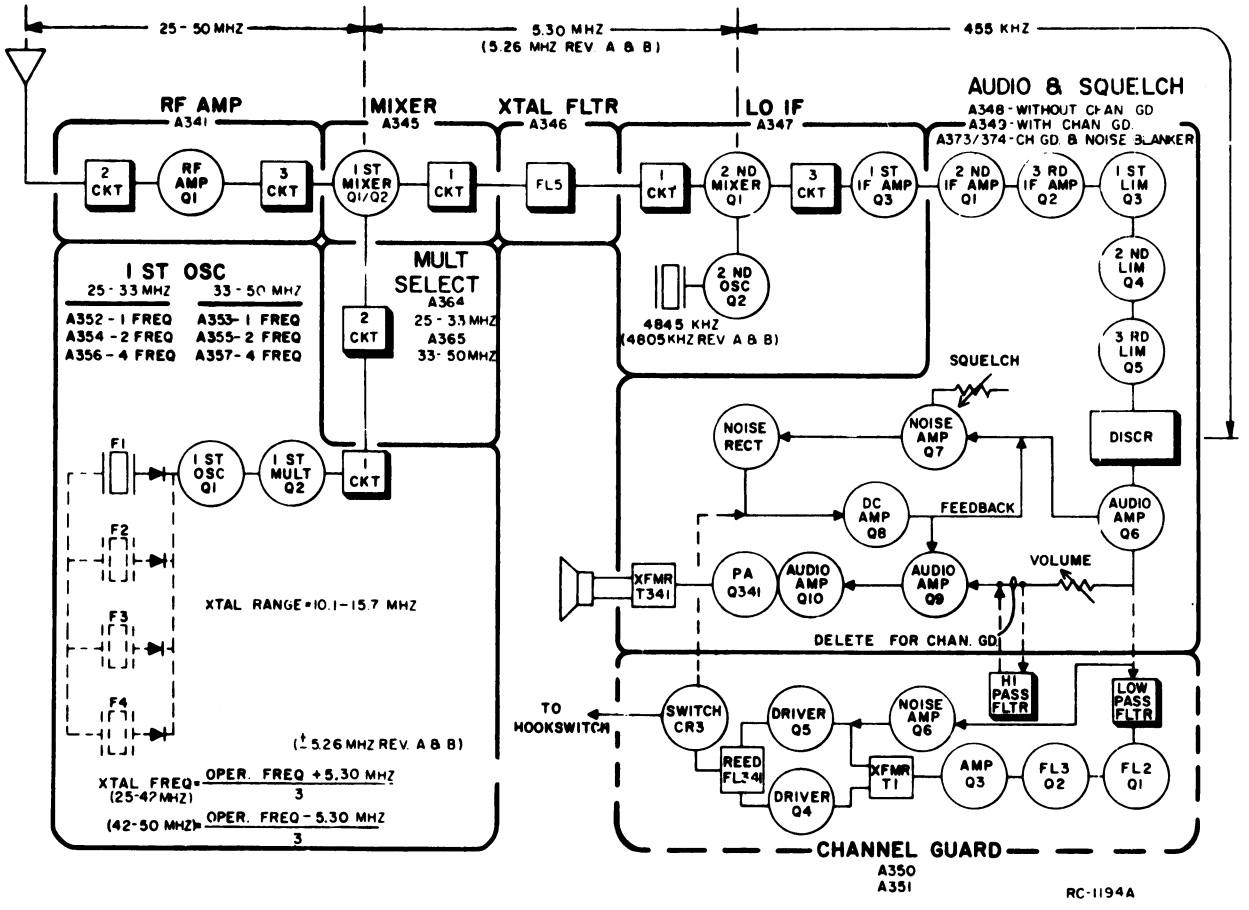


Figure 1 - Receiver Block Diagram

In single frequency receivers, bias for the oscillator transistor 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 addition 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 is transformer-coupled (T3/T4) to multiplier selectivity assembly A364/A365. The 1st multiplier tank is tuned to three times the crystal frequency.

The stage is metered at centralized metering jack J442-4 through metering network CR1, R1, C7 and C8.

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) AND CRYSTAL FILTER (A346)

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

The highly selective crystal filter (FL5) following the 1st mixer provedes 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 4845kHz (4805kHz 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 455kHz 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 (A348)

Following A347-Q3 are two additional RC coupled low IF amplifiers (A348-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 (A348-Q3, -Q4 and -Q5). The 1st limiter is metered at J442-3 through metering network C13, CR2, R18 and C15.

DISCRIMINATOR (A348)

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 455kHz IF signals to recover the audio. The stage is metered at J442-10 through metering network R27 and C22.

1ST AUDIO AMPLIFIER (A348)

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

When audio is present in the incoming signal, it is taken off the emitter of Q6 and connected to the VOLUME control through A348-J9. The VOLUME control arm connects to A348-J8 which feeds the audio signal to the base of the 2nd audio amplifier, Q9. C34, C36, C53, C37 and L4 make up the de-emphasis network. The collector current of Q9 should be adjusted to 650 milliamps to 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 kHz. 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 through R33 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 and causes 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 exists in 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.

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.

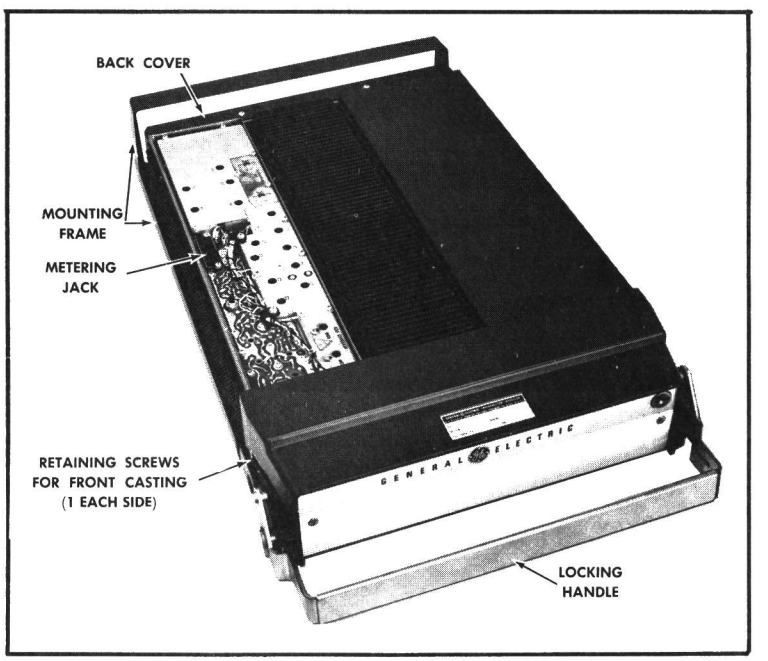


Figure 2 - Removing Top Cover

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.

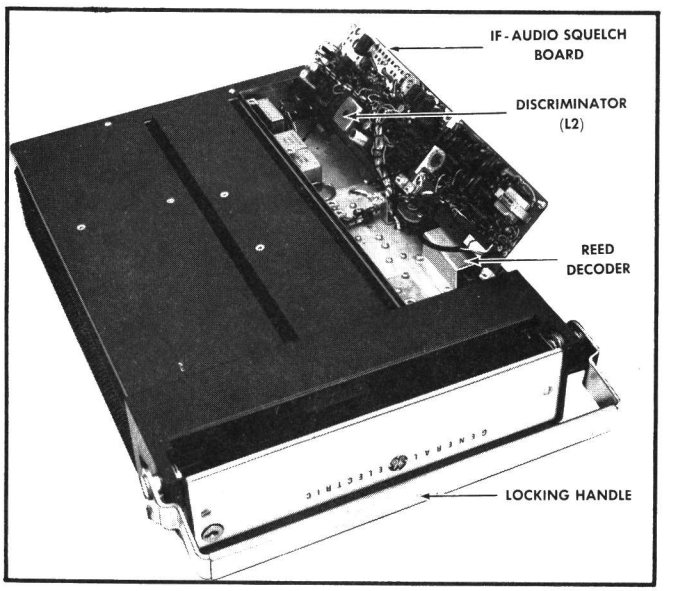


Figure 3 - Removing Bottom Cover

To remove the receiver from the system frame—

1. Loosen the two Phillips-head retaining screws in front casting (see Figure 2), 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.

FRONT END ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Model 4EX3A10 (or 20,000 ohms-per-volt Multimeter with a 1-volt scale).
2. A 455 kHz and 25-50 MHz signal source. Connect a one-inch piece of insulated wire no larger than .065-inch diameter to generator output probe.

PRILIMINARY 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. 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 0.55 volts. If using Multimeter, connect leads to J442-1 (AUDIO-PA) and J442-8 (System Negative).

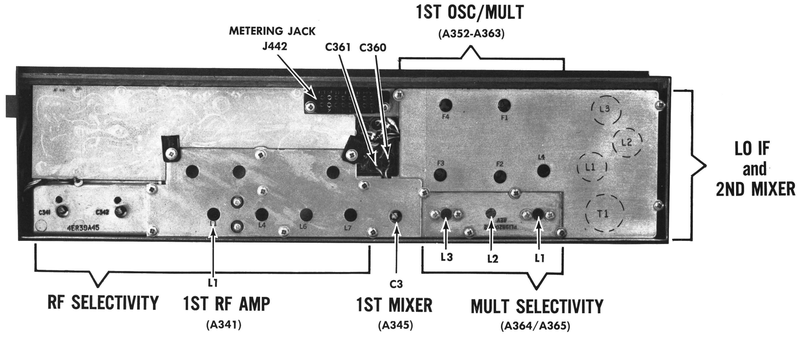
NOTE

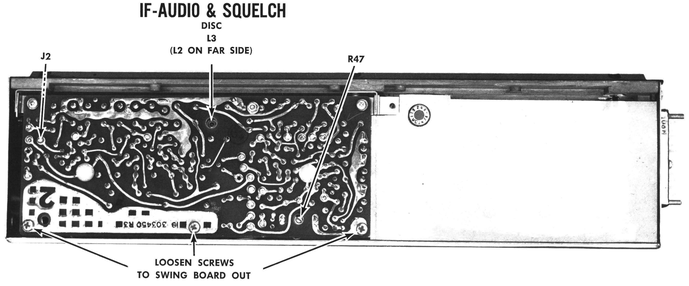
The adjustment of R47 should be made within 20 seconds after power is applied to the receiver. This will result in a reading of approximately 0.65 volts after the unit is fully warmed up.

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).
5. Disable Channel Guard (Models 4EK39A19-27 & 46-54 only).

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 (on MULT SELECTIVITY)	See Procedure	Tune L4 on 1st OSC/MULT and L1 on MULT SELECTIVITY for maximum meter reading. Then tune L2 for minimum meter reading. Change voltage scale if necessary.
			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	L1 (1st RF Amp), L6, L7, C341 and C342 (RF SELECTIVITY)	Maximum	Apply an on-frequency signal to the antenna jack, keeping below saturation. Tune L1, L5, L7, C341, and C342 for maximum meter reading.
4.	"	"	L4 (1st OSC/MULT) and L1 and L2 (MULT SELECTIVITY)	Maximum	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.
			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 For proper frequency control of the receiver, it is recommended that all frequency adjustments be made when the equipment is at a temperature of approximately 75°F. In no case should frequency adjustments be made when the equipment is outside the temperature range of 50° to 90°F.





COMPLETE RECEIVER ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Model 4EX3A10 (or 20,000 ohms-per-volt Multimeter with a 1-volt scale).
2. A 455 kHz and 25-50 MHz 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 kHz, align the unit on channel F1. If the frequency spacing is greater than 200 kHz, align the receiver on the center frequency.
3. 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 0.55 volts. If using Multimeter, connect leads to J442-1 (AUDIO-PA) and J442-8 (System Negative).

NOTE

The adjustment of R47 should be made within 20 seconds after power is applied to the receiver. This results in a reading of approximately 0.65 volts after the unit is fully warmed up.

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. Disable the Channel Guard.

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 kHz 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. Then alternately apply a 445-kHz and 465-kHz 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 on 1st OSC/MULT and L1 on MULT SELECTIVITY 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 AMPLIFIER & SELECTIVITY		
4.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal adjacent to L7. Adjust the signal generator for discriminator zero.
5.	B (2nd IF AMP)	Pin 2	L7 and L6 (RF SELECTIVITY)	Maximum	Apply an on-frequency signal and tune for maximum meter reading as shown below, keeping signal below saturation. Apply Signal Generator Probe to: — Tune: L6 — L7; L1 — L6
6.	"	"	C341, C342 and L1 (1st RF Amp)	Maximum	Apply an on-frequency signal to the antenna jack. Tune C341, C342 and L1 for maximum meter reading, keeping signal below saturation.
7.	"	"	L1 (1st RF Amp) L6, L7, C341, and C342 (RF SELECTIVITY)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L1, L6, L7, C341 and C342 for maximum meter reading.
8.	"	"	L3 (MULT SELECTIVITY)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L2 & L3 (on MULT SELECTIVITY) for maximum meter reading.
			LO IF & 2ND MIXER		
9.	"	"	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.
10.	B (2nd IF AMP)	Pin 2	T1 (2nd MIXER)	Maximum	Apply an on-frequency signal as in Step 8, and tune T1 for maximum meter reading, keeping signal below saturation.
11.	"	"	L1, L2 and L3 (LO IF)	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 L2 at Points A and C—Peak L2.
			FREQUENCY ADJUSTMENT		
12.	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 For proper frequency control of the receiver, it is recommended that all frequency adjustments be made when the equipment is at a temperature of approximately 75°F. In no case should frequency adjustments be made when the equipment is outside the temperature range of 50° to 90°F.

* 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

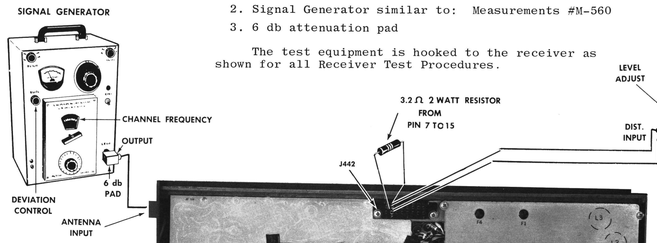
These Test Procedures are designed to help you service a receiver that is operating---but not properly. The problems encountered could be low power, poor sensitivity, distortion, limiter not operating properly, and low gain. By following the sequence of test steps starting with Step 1, the defect can 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

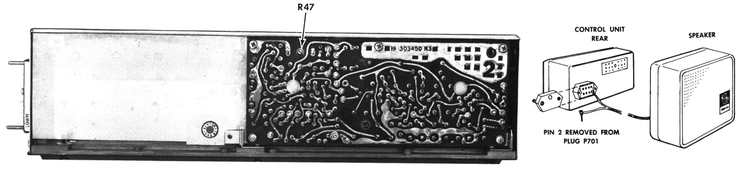
for test hookup shown:

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 hertz ±3.3 kHz 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):

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.

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).

6. Deviation control reading for the 12-db difference is the Modulation Acceptance Bandwidth of the receiver. It should be more than ±7 kHz (but less than ±9 kHz).

SERVICE CHECK

If the Modulation Acceptance Bandwidth test does not indicate the proper width, make gain measurements as shown on the Receiver Troubleshooting Procedure.

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. Refer to Receiver Alignment Procedure for BIAS ADJ. 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 kHz.

STEP 3- VOLTAGE RATIO READINGS

EQUIPMENT REQUIRED:

1. RF VOLTMETER (SIMILAR 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 HERTZ SIGNAL WITH 3.3 KHZ.

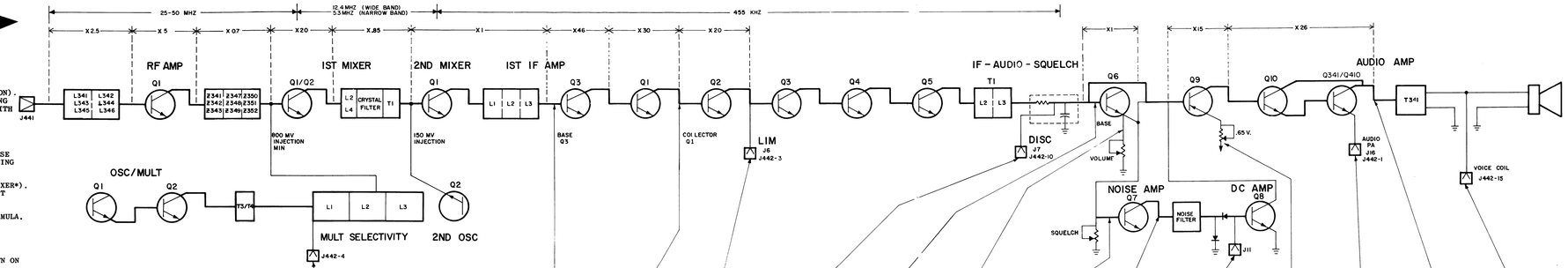
PROCEDURE:

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.

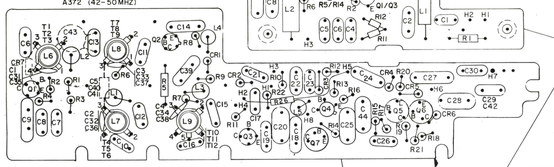
SIGNAL GENERATOR INPUT. MAINTAIN SETTING AT DISCRIMINATOR ZERO		UNMODULATED	UNMODULATED	10 MICROVOLT UNMODULATED	STANDARD SIGNAL-(1000 MICROVOLTS AT RCVR FREQ MOD BY 1KHZ AT 3.3 KHZ (NB) OR 10 KHZ (WB) DEV	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	NO SIGNAL	NO SIGNAL	NO SIGNAL	STANDARD 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 2 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 0.65 VDC (SEE ALIGNMENT PROCEDURE)	0.65 VDC (SEE ALIGNMENT PROCEDURE)	7.0 VAC	2.53 VAC

* NEG. LEAD OF VTVM TO -10 V.

RC-1207C

NOISE BLANKER

A370 (25-33 MHZ)
A371 (33-42 MHZ)
A372 (42-50 MHZ)

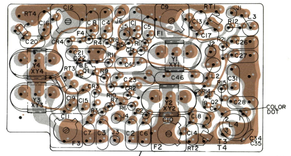


NOISE LEVEL SHUT-OFF

A376

1ST OSCILLATOR/MULTIPLIER

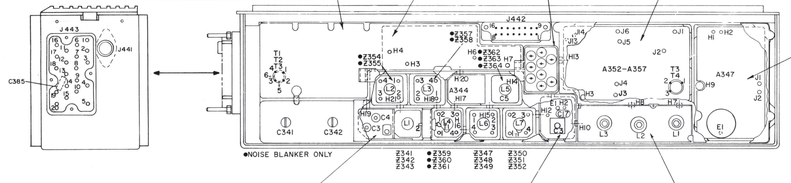
25-33 MHZ 33-50 MHZ
A352 — 1 FREQ — A353
A354 — 2 FREQ — A355
A356 — 4 FREQ — A357



(19B204412, Sh. 1, Rev. 3)
(19B204412, Sh. 2, Rev. 0)

TRANSISTOR	EMITTER		BASE		COLLECTOR	
A376/272	+	−	+	−	+	−
Q1	200Ω	360Ω	1.6K	360Ω	360Ω	500Ω
Q2	100Ω	360Ω	1.5K	65Ω	360Ω	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	6K
A376-Q1	2K	2K	3K	3K	3.5K	6K
A376-Q2	0	0	1K	3K	3.5K	6K

TOP VIEW



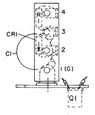
●NOISE BLANKER ONLY

1ST RF AMP

A341

2ND RF AMP

A344



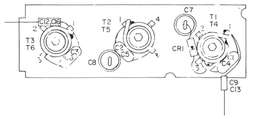
(NOISE BLANKER ONLY)

1ST MIXER

A350/A345

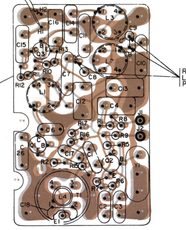
MULTIPLIER-SELECTIVITY

A364 (25-33 MHZ)
A365 (33-50MHZ)



2ND MIXER

A347



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

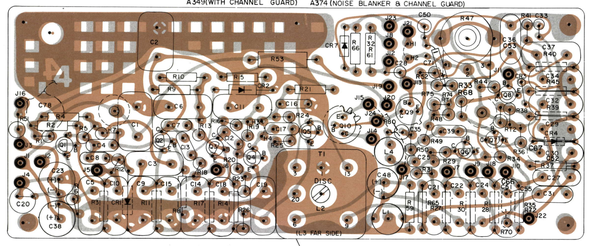
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

OUTLINE DIAGRAM

25 — 50 MHz, MASTR RECEIVER
MODELS 4ER39A10-18

IF-AUDIO & SQUELCH BOARD

A348(WITHOUT CHANNEL GUARD) A373 (NOISE BLANKER
A349(WITH CHANNEL GUARD) A374 (NOISE BLANKER & CHANNEL GUARD)



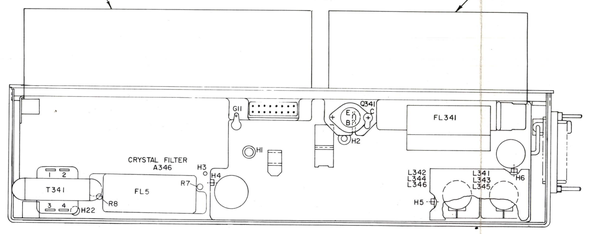
(19C303451, Sh. 1, Rev. 4)
(19C303451, Sh. 2, Rev. 4)

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	600Ω	600Ω
A34(-Q1	450Ω	270Ω	800Ω	450Ω	350Ω	350Ω
A347-Q1	3.8K	5.3K	8.0K	2.9K	200Ω	200Ω
A347-Q2	2.7K	6.8K	5.5K	2.7K	200Ω	200Ω
A 347-Q3	2.2K	2.3K	2.3K	2.2K	2.7K	3.2K
A348/374-Q1	2.1K	0K	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	350Ω	350Ω
A348/376-Q6	3.2K	2 MEG	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	16K
A348/374-Q9	2.2K	2.2K	4.1K	45K	2.3K	2.3K
A348/374-Q10	★ MΩ	35Ω	2.2K	2.3K	40Ω	36Ω
Q34	★ 1Ω	★ 1Ω	40Ω	35Ω	40Ω	36Ω

★ READINGS MAY VARY DUE TO DIFFERENCES IN TRANSISTORS.

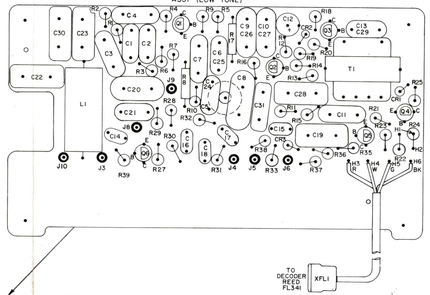
(19B620741, Rev.27)

BOTTOM VIEW



CHANNEL GUARD

A350 (HI TONE)
A351 (LOW TONE)



TRANSISTOR	EMITTER		BASE		COLLECTOR	
A350/351	+	−	+	−	+	−
Q1	56Ω	56Ω	8.3K	14.5Ω	6.5K	8.3K
Q2	270Ω	270Ω	8K	50Ω	5K	5.5K
Q3	1K	1K	75K	3K	1K	1K
Q4	0	0	14K	45Ω	1K	1K
Q5	0	0	14K	45Ω	1K	1K
Q6	20Ω	20Ω	4.5K	85Ω	2K	2K

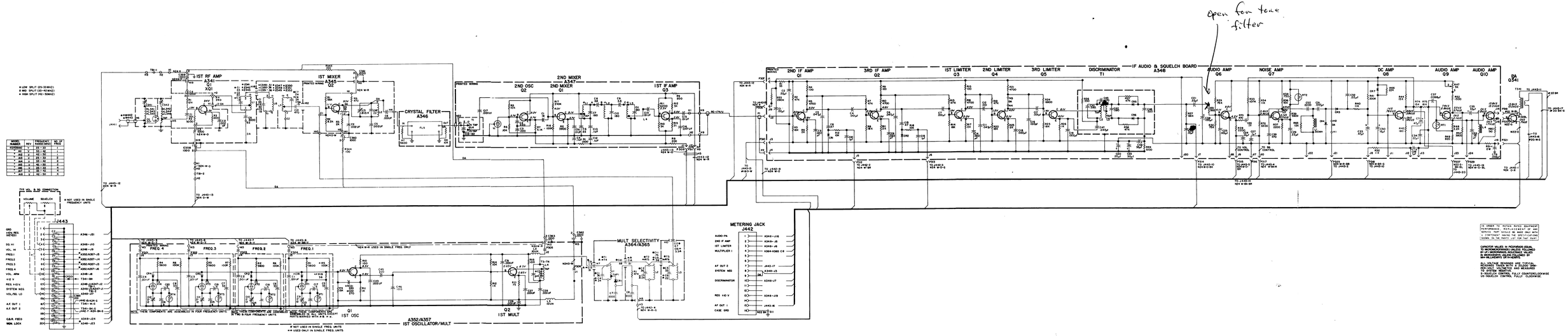
RESISTANCE READINGS

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



(198620716, Rev. 32)

SCHEMATIC DIAGRAM

25 — 50 MHz, MASTR RECEIVER
MODELS 4ER39A10-18

PARTS LIST

LBI3537E

25-50 MHz RECEIVER
MODELS 4ER39A10 - 4ER39A18
19E320080G1-G8

SYMBOL	GE PART NO.	DESCRIPTION
A341		RF AMPLIFIER ASSEMBLY 19B204772G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5434481P12	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C2	5494481P14	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C3 and C4	5493392P7	Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A116859P1	Silicon, NPN; sim to Type 2N5032 or 2N3570.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P123K	Composition: 12K ohms ±10%, 1/4 w.
R2	3R152P302J	Composition: 3K ohms ±5%, 1/4 w.
R3	3R152P102K	Composition: 1K ohms ±10%, 1/4 w.
R4	3R152P391K	Composition: 390 ohms ±10%, 1/4 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XQ1	5490277P5	Transistor: 3 contacts rated at 1 amp at 400 VRMS; sim to Alcon 1213L3.
A345		FIRST MIXER ASSEMBLY 19B204430G2
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C2	5494481P114	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C3	5491271P106	Variable, sub-miniature: approx 2.1-12.7 pf, 350 v peak; sim to EF Johnson 189.
C4*	5496218P247	Ceramic disc: 22 pf ±5%, 500 VDCW, temp coef -80 PPM. Deleted by REV N.
C5	5494481P114	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C6	5494481P12	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C18*	5496218P247	Ceramic disc: 22 pf ±5%, 500 VDCW, temp coef -80 PPM.
		In Models of REV N and earlier:
	5496218P244	Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -80 PPM. Added by REV N.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1	4038104P1	Lug: solder dipped brass.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L2	19A121082G2	Toroidal coil.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q2	19A115245P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P563J	Composition: 56K ohms ±5%, 1/4 w.
R2	3R152P82J	Composition: 8.2K ohms ±5%, 1/4 w.
R3	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R4*	3R152P102J	Composition: 1K ohms ±5%, 1/4 w. Deleted by REV K.
R5	3R152P390J	Composition: 39 ohms ±5%, 1/4 w.
R9*	3R152P471K	Composition: 470 ohms ±10%, 1/4 w. Added by REV K.

SYMBOL	GE PART NO.	DESCRIPTION
A346*		CRYSTAL FILTER ASSEMBLY 19B204619G3
		Used in Units of REV C. Units of REV B or earlier used Crystal Filter Assembly 19B204614G1.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL5*	19B206692G1	Bandpass.
		In Models of REV H and earlier:
	5491188P101	Polyester: 0.01 µf ±20%, 50 VDCW.
	19C904094G4	Bandpass.
FL6*	19C904094G4	Bandpass. Deleted by REV S.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1*	3R152P432K	Composition: 4.3K ohms ±10%, 1/4 w. Deleted by REV S.
R2*	3R152P102K	Composition: 1K ohms ±10%, 1/4 w. Deleted by REV S.
R7*	3R152P562K	Composition: 5.6K ohms ±10%, 1/4 w. Added by REV S.
R8*	3R152P103K	Composition: 10K ohms ±10%, 1/4 w. Added by REV S.
		In Models of REV B or earlier:
	4033513P4	Contact, electrical: sim to Bead Chain LB3-3.
A346*		CRYSTAL FILTER ASSEMBLY 19B204618G1 (REV H and earlier)
L1*	19A115711P4	Transformer, freq: 455 KHz; sim to Automatic Mfg. Ex12973.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL1 and FL2	19C904094G1	Bandpass.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P432K	Composition: 4.3K ohms ±10%, 1/4 w.
R2	3R152P102K	Composition: 1K ohms ±10%, 1/4 w.
A347		SECOND MIXER ASSEMBLY 19B204433G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
L4*		(Part of L3). Deleted by REV L.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	4029840P2	Contact, electrical; sim to Amp 42827-2.
P2	4029840P1	Contact, electrical; sim to Amp 41854.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A115245P1	Silicon, NPN.
Q2	19A115889P1	Silicon, NPN.
Q3	19A115123P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P152K	Composition: 1.5K ohms ±10%, 1/4 w.
R2	3R152P302K	Composition: 3.0K ohms ±10%, 1/4 w.
R3*	3R152P103K	Composition: 10K ohms ±10%, 1/4 w. Deleted by REV D.
R4*	3R152P333K	Composition: 33K ohms ±10%, 1/4 w. Deleted by REV D.
R5 and R6	3R152P103K	Composition: 10K ohms ±10%, 1/4 w.
R7	3R152P512J	Composition: 5.1K ohms ±5%, 1/4 w.
R8 and R9	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R10	3R152P302J	Composition: 3K ohms ±5%, 1/4 w.
R11	3R152P62J	Composition: 6.2K ohms ±5%, 1/4 w.
R12	3R152P302J	Composition: 3K ohms ±5%, 1/4 w.
R13	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R15*	3R152P153K	Composition: 15K ohms ±10%, 1/4 w. Added by REV D. Deleted by REV S.
R16*	3R152P104K	Composition: 100K ohms ±10%, 1/4 w. Added by REV D.
R17*	3R152P394K	Composition: 390K ohms ±10%, 1/4 w. Added by REV D.

SYMBOL	GE PART NO.	DESCRIPTION
C12* and C13*	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
		In Models of REV K and earlier:
	5491188P106	Polyester: 0.01 µf ±20%, 50 VDCW.
C14* and C15*	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
		In Models of REV K and earlier:
	5491188P101	Polyester: 0.01 µf ±20%, 50 VDCW.
C16*	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
		In Models of REV K and earlier:
	5491188P104	Polyester: .047 µf ±20%, 50 VDCW.
C17	*19A116055P20	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C26*	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW. Added by REV R.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1	4038104P1	Lug: solder dipped brass.
		- - - - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 and J2	4033513P4	Contact, electrical: sim to Bead Chain LB3-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1*	19A115711P4	Transformer, freq: 455 KHz; sim to Automatic Mfg. Ex12973.
		In Models of REV K and earlier:
	19C903646G1	Coil. Includes tuning slug 716051992.
L2*	19A115711P3	Transformer, freq: 455 KHz; sim to Automatic Mfg. Ex12972.
		In Models of REV K and earlier:
	19A116080P12	Polyester: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C8	5496219P17	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C9	19A115028P109	Polyester: 0.022 µf ±20%, 200 VDCW.
C10	19A115028P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C11	19A115028P111	Polyester: 0.047 µf ±20%, 200 VDCW.
C12	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C13	5496219P17	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C14	19A115028P109	Polyester: 0.022 µf ±20%, 200 VDCW.
C15	19A115028P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C16	5962199421	Ceramic disc: 100 pf ±10%, 500 VDCW, temp coef +220 PPM.
C17	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C18 and C19	19A115028P109	Polyester: 0.022 µf ±20%, 200 VDCW.
C20*	19A115680P103	Electrolytic: 20 µf +150% -10%, 25 VDCW; sim to Hallory Type YTX.
		In REV S and earlier:
	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C21	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C22	19A115028P107	Polyester: 0.01 µf ±20%, 200 VDCW.
C23	5491000P1	Electrolytic: 30 µf +75% -10%, 25 VDCW; sim to Sprague Type D25J39.
C24	19A116080P107	Polyester: 0.01 µf ±20%, 200 VDCW.
C25	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C27	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C28	5496267P17	Tantalum: 1 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C29	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C31	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C32	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C33	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C34	19A116080P6	Polyester: 0.22 µf ±20%, 50 VDCW.
C35	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T1		COIL ASSEMBLY 19B204414G1
	19A115028P303	Polyester: 0.0033 µf ±10%, 200 VDCW.
		In Models of REV D and earlier:
	19A115028P303	Polyester: 0.0033 µf ±10%, 200 VDCW.
C38	19A115680P107	Electrolytic: 100 µf +150% -10%, 15 VDCW; sim to Mallory Type TYX.
C39	5490308P143	Silver mica: 470 pf ±10%, 30Q VDCW; sim to Electro Motive Type DM-15.
C48	5493670P9	Electrolytic: 35 µf +75% -10%, 15 VDCW; sim to Sprague Type 30D.
C50	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C52	4029003P16	Silver mica: .0022 µf ±5%, 500 VDCW; sim to Electro Motive Type DM-20.
C53*	19A115028P315	Polyester: 0.15 µf ±10%, 200 VDCW.
		In Models of REV D and earlier:
	19A120924P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C55	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C71*	5496237P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D. Added by REV J.
C78*	5494481P114	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV Y.
		- - - - - - DIODES AND RECTIFIERS - - - - -
CR1 and CR2	4038056P1	Germanium, fast recovery, Reverse voltage 20 volts, Fwd. current 40 ma.
CR3 and CR4	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR7	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J24	4033513P4	Contact, electrical: sim to Bead Chain LB3-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	4031476G1	Choke.
L4	5491736P6	Choke: 3.5 mh ±10% and at 1 KHz, 2.5 ohms DC res max; sim to Aladdin 33-494.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q3	19A115123P1	Silicon, NPN.
Q4* and Q5*	19A115552P1	Silicon, NPN; sim to 2N2714.
		In Models of REV H and earlier:
	19A115123P1	Silicon, NPN.
Q6	19A115123P1	Silicon, NPN.
Q7	19A115889P1	Silicon, NPN.
Q8	19A115123P1	Silicon, NPN.
Q9	19A115247P1	Silicon, PNP; sim to Type 2N1024.
Q10	19A115300P2	Silicon, NPN; sim to Type 2N3053.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P330K	Composition: 33 ohms ±10%, 1/2 w.
R2	3R77P473K	Composition: 47K ohms ±10%, 1/2 w.
R3	3R77P183J	Composition: 18K ohms ±5%, 1/2 w.
R4	3R77P101K	Composition: 100 ohms ±10%, 1/2 w.
R5	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R6	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R7	3R77P183K	Composition: 18K ohms ±10%, 1/2 w. Added by REV P.
R8	3R77P183J	Composition: 18K ohms ±5%, 1/2 w.
R9	3R77P101K	Composition: 100 ohms ±10%, 1/2 w.
R10	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R11	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R12	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R13	3R77P473K	Composition: 47K ohms ±10%, 1/2 w.

SYMBOL	GE PART NO.	DESCRIPTION
R14	3R77P183J	Composition: 18K ohms ±5%, 1/2 w.
R15	3R77P103K	Composition: 100 ohms ±10%, 1/2 w.
R16	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R17	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R18	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R19	3R77P473K	Composition: 47K ohms ±10%, 1/2 w.
R20	3R77P183J	Composition: 18K ohms ±5%, 1/2 w.
R21	3R77P473K	Composition: 4.7K ohms ±10%, 1/2 w.
R23	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R24	3R77P682K	Composition: 6.8K ohms ±10%, 1/2 w.
R25	3R77P183J	Composition: 18K ohms ±5%, 1/2 w.
R26	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R27	3R77P683K	Composition: 68K ohms ±10%, 1/2 w.
R28	3R77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R29	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R30 and R35	3R77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R31	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R32	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R33*	3R77P104K	Composition: 100K ohms ±10%, 1/2 w. Added by REV W.
R34	3R77P113J	Composition: 11K ohms ±5%, 1/2 w.
R36	3R77P153K	Composition: 15K ohms ±10%, 1/2 w.
R37	3R77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R38	3R77P75IJ	Composition: 750 ohms ±5%, 1/2 w.
R39	3R77P562J	Composition: 5.6K ohms ±5%, 1/2 w.
R40	3R77P113J	Composition: 11K ohms ±5%, 1/2 w.
R41	3R77P204J	Composition: 200K ohms ±5%, 1/2 w.
R44	3R77P153K	Composition: 15K ohms ±10%, 1/2 w.
R45	3R77P181K	Composition: 180 ohms ±10%, 1/2 w.
R46*	3R77P333K	Composition: 33K ohms ±10%, 1/2 w. Deleted by REV P.
R47	19B209115P1	Variable, carbon film: 5K ohms ±20%, 0.15 w, sim to CTS Type CM-20.
R48	3R77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R49	3R77P821K	Composition: 820 ohms ±10%, 1/2 w.
R50	3R77P392K	Composition: 3.9K ohms ±10%, 1/2 w.
R51	19B209022P15	Wirewound, phen: 1 ohm ±5%, 2 w; sim to IRC Type BWH.
R52	3R77P152K	Composition: 1.5K ohms ±10%, 1/2 w.
R53	19A116278P444	Metal film: 280K ohms ±2%, 1/2 w.
R59	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R65	3R77P132K	Composition: 12K ohms ±10%, 1/2 w.
R66	3R77P223K	Composition: 22K ohms ±10%, 1/2 w.
R70	3R77P471J	Composition: 470 ohms ±5%, 1/2 w.
R71*	3R77P913J	Composition: 91K ohms ±5%, 1/2 w. Deleted by REV N.
R72	3R77P332J	Composition: 3.3K ohms ±5%, 1/2 w.
R74*	3R77P153K	Composition: 15K ohms ±10%, 1/2 w. Added by REV J.
R75*	3R77P183K	Composition: 18K ohms ±10%, 1/2 w. Added by REV J.
R80*	3R77P511J	Composition: 510 ohms ±5%, 1/2 w. Added by REV P.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	19B209143P2	Rod: 4000 ohms ±10% res, 1 w max; sim to Global Type 789F-12.
RT2	19B209143P3	Rod: 850 ohms ±10% res, 1 w max; sim to Global Type 789F.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T1		DISCRIMINATOR ASSEMBLY 19C320612G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C41 and C42	19B209196P1	Ceramic disc: 280 pf ±5%, 500 VDCW, temp coef -115 ±30 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
C45	7498162P43	Silver mica: 470 pf ±5%, 300 VDCW; sim to Electro Motive Type DM-15.
C46	7498162P35	Silver mica: 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C47	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR5 and CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
L2 and L3	19A121533G1	Coil.
R56	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R57 and R58	3R152P473J	Composition: 47K ohms ±5%, 1/4 w.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	716051991	Tuning slug.
A352 thru A357		FIRST OSCILLATOR ASSEMBLY A352 19B204419G10 (4ER39A10) A353 19B204419G16 (4ER39A11, 12) A354 19B204419G14 (4ER39A13) A355 19B204419G17 (4ER39A14, 15) A356 19B204419G15 (4ER39A16) A357 19B204419G18 (4ER39A17, 18)
RT1 thru RT4	19B209284P5	Disc: 43 ohms res nominal at 25°C, color code green.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T3* and T4*		COIL ASSEMBLY T3 19B205414G1 (4ER39A10, 14-16) In Models of REV J and earlier: 19B204763G1 (4ER39A10,14-16) T4 19B204416G2 (4ER39A11-13, 17, 18) In Models of REV J and earlier: 19B204763G2 (4ER39A11-13, 17, 18)
C1 thru C12	5491219P1	Variable, sub-miniature: approx 2.1-12.7 pf, 750 v peak; sim to EF Johnson 189.
C13 thru C16	5491219P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C17 thru C20	19C000685P93	Ceramic disc: 5 pf ±0.1 pf, 500 VDCW, temp coef 0 PPM.
C21	5496219P771	Ceramic disc: 220 pf ±5%, 500 VDCW, temp coef -750 PPM.
C22	5496219P773	Ceramic disc: 270 pf ±5%, 500 VDCW, temp coef -750 PPM.
C23	5494481P114	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C24*	5496008P31	Silver mica: 150 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. Deleted by REV K.
C25*	5496219P467	Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef -220 PPM. Deleted by REV K.
C26 thru C28	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C31	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C45*	5496008P35	Silver mica: 220 pf ±5%, 500 VDCW. Added by REV K.
C46*	5496219P563	Ceramic disc: 100 pf ±5%, 500 VDCW, temp coef +330 PPM. Added by REV N.
CR1 thru CR3	19A115603P1	Silicon.
CR4	19A115603P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J6	4033513P4	Contact, electrical: sim to Bead Chain LB3-3.
L2 and L3	7488079P16	Choke, RF: 10 µh ±5% and at 660 ma, 0.6 ohm DC res; sim to Jeffers 4421-7K.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TRANS...
Q1 and Q2	19A115330P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 thru R4	3R152P562J	Composition: 5.6K ohms ±5%, 1/4 w.
R5 thru R8	3R152P104K	Composition: 100K ohms ±10%, 1/4 w.
R9	3R152P153J	Composition: 15K ohms ±5%, 1/4 w.
R10	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R11 and R12	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R13*	3R152P151J	Composition: 150 ohms ±5%, 1/4 w. Deleted by REV K.
R14	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R15	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R19*	3R152P360J	Composition: 35 ohms ±5%, 1/4 w. Added by REV K.
R21*	3R152P750J	Composition: 75 ohms ±5%, 1/4 w. Added by REV K.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1 thru RT4	19B209284P5	Disc: 43 ohms res nominal at 25°C, color code green.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T3* and T4*		COIL ASSEMBLY T3 19B205414G1 (4ER39A10, 14-16) In Models of REV J and earlier: 19B204763G1 (4ER39A10,14-16) T4 19B204416G2 (4ER39A11-13, 17, 18) In Models of REV J and earlier: 19B204763G2 (4ER39A11-13, 17, 18)
C1 thru C4	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C5 thru C8	5496219P751	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -750 PPM.
C9 thru C12	5491271P106	Variable, sub-miniature: approx 2.1-12.7 pf, 350 v peak; sim to EF Johnson 189.
C13 thru C16	5491219P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C17 thru C20	19C000685P93	Ceramic disc: 5 pf ±0.1 pf, 500 VDCW, temp coef 0 PPM.
C21	5496219P771	Ceramic disc: 220 pf ±5%, 500 VDCW, temp coef -750 PPM.
C22	5496219P773	Ceramic disc: 270 pf ±5%, 500 VDCW, temp coef -750 PPM.
C23	5494481P114	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C24*	5496008P31	Silver mica: 150 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. Deleted by REV K.
C25*	5496219P467	Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef -220 PPM. Deleted by REV K.
C26 thru C28	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C31	5494481P112	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C45*	5496008P35	Silver mica: 220 pf ±5%, 500 VDCW. Added by REV K.
C46*	5496219P563	Ceramic disc: 100 pf ±5%, 500 VDCW, temp coef +330 PPM. Added by REV N.
CR1 thru CR3	19A115603P1	Silicon.
CR4	19A115603P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J6	4033513P4	Contact, electrical: sim to Bead Chain LB3-3.
L2 and L3	7488079P16	Choke, RF: 10 µh ±5% and at 660 ma, 0.6 ohm DC res; sim to Jeffers 4421-7K.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
		NOTE: When reordering give GE Part Number and specify exact frequency desired.
Y1 thru Y4		25-42 MHz crystal freq = (OF +5.70 MHz) / 9
		42-50 MHz crystal freq = (OF +5.70 MHz) / 8
Y1 thru Y4	19B206176P1	Quartz: freq range 10586.666 to 12753.333 KHz, temp range -30°C to +85°C. (33-43 MHz).
Y1 thru Y4	19B206176P2	Quartz: freq range 12753.333 to 15753.333 KHz, temp range -30°C to +85°C. (43-52 MHz).
Y1 thru Y4	19B206176P3	Quartz: freq range 12246.666 to 16246.666 KHz, temp range -30°C to +85°C. (42-50 MHz).
A364* and A365*		MULTIPLIER SELECTIVITY ASSEMBLY A364 19B205324G1 (4ER39A10, 13 and 16) A365 19B205325G2 (4ER39A11,12,14,15,17,18)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	5496218P252	Ceramic disc: 36 pf ±5%, 500 VDCW, temp coef -80 PPM.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
C3	5496218P251	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4 and C5	5496218P248	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef -80 PPM.
C6	5496218P247	Ceramic disc: 22 pf ±5%, 500 VDCW, temp coef -80 PPM.
C7 and C8	5493392P107	Ceramic feed-thru: 470 pf +100% - 0%, 500 VDCW.
C9	5491601P123	Phenolic: 1.5 pf ±5%, 500 VDCW.
C10	5491601P117	Phenolic: 0.68 pf ±5%, 500 VDCW.
C11	5491601P118	Phenolic: 0.75 pf ±5%, 500 VDCW.
C12	5491601P132	Phenolic: 4.7 pf ±5%, 500 VDCW.
C13	5491601P137	Phenolic: 0.91 pf ±5%, 500 VDCW.
C14	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW.
C15	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C16	5491601P130	Phenolic: 3.3 pf ±5%, 500 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	4038056P1	Germanium, fast recovery, 20 Reverse volts, Fwd. current 40 mA.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P473K	Composition: 47K ohms ±10%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T1	19B205325G2	Coil. Includes:
	5491798P4	Tuning slug.
T2 and T3	19B205325G1	Coil. Includes:
	5491798P4	Tuning slug.
T4	19B205325G2	Coil. Includes:
	5491798P4	Tuning slug.
T5 and T6	19B205325G1	Coil. Includes:
	5491798P4	Tuning slug.
		In Models of REV J and earlier:
A364* and A365*		MULTIPLIER SELECTIVITY ASSEMBLY A364 19B204782G1 (4ER39A10, 13 and 16) A365 19B204782G2 (4ER39A11,12, 14,15,17,18)
		- - - - - - - - - - CAPACITORS - - - - - - - -
C5 and C6	5493392P7	Ceramic feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C7 and C8	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C10 and C11	5491601P117	Phenolic: 0.68 pf ±5%, 500 VDCW.
C13 and C14	5491601P130	Phenolic: 3.3 pf ±5%, 500 VDCW.
		- - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	7777146P3	Germanium; sim to Type 1N90.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P392K	Composition: 3.9K ohms ±10%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T1 thru T4		COIL ASSEMBLY T1 19B204780G1 (4ER39A10, 13 and 16) T2 19B204780G2 (4ER39A10, 13 and 16) T3 19B204780G3 (4ER39A11,12,14,15,17,18) T4 19B204780G4 (4ER39A11,12,14,15,17,18)
		- - - - - - - - - - CAPACITORS - - - - - - - -
C1 and C2	5496218P252	Ceramic disc: 36 pf ±5%,500 VDCW, temp coef -80 PPM.
C3 and C4	5496218P248	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef -80 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19A121510P1	Coil. Includes:
	5491798P4	Tuning slug.
L2	19A121510P2	Coil. Includes:
	5491798P4	Tuning slug.
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C349	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
C350 and C351	5491601P110	Phenolic: 0.36 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
C358 thru C363	5493392P7	Ceramic feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C335*	7774750P4	Ceramic disc: .001 µf +100% -0%, 500 VDCW. Added by REV G.
		- - - - - - - - DIODES AND RECTIFIERS - - - - -
CR391*	4037822P1	Silicon, 1000 mA, 400 PIV. Added by REV V.
		- - - - - - JACKS AND RECEPTACLES - - - - - -
J441	19B209122P1	Connector, coaxial: includes cable (W441), approx 5 inches long.
J442	19B205689G2	Connector: 18 contacts rated at 5 amps min at 1000 VDC max.
J443	19C303426G1	Connector: 20 pin contacts.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L341 thru L346		COIL ASSEMBLY L341 19B204820G5 (4ER39A10, 13 and 16) L342 19B204820G6 (4ER39A10, 13 and 16) L343 19B204820G1 (4ER39A11, 14 and 17) L344 19B204820G2 (4ER39A11, 14 and 17) L345 19B204820G3 (4ER39A12, 15 and 18) L346 19B204820G4 (4ER39A12, 15 and 18)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C341	19B209159P3	Variable, sub-miniature: approx 1.70-6.9 pf, 750 v peak; sim to EF Johnson 189. (Used in L341, L343 and L345).
C342	19B209159P3	Variable, sub-miniature: approx 1.70-6.9 pf, 750 v peak; sim to EF Johnson 189. (Used in L342, L344 and L346).
		- - - - - - - - - INDICATING DEVICES - - - - - - - - -
DS301*	19B209067P1	Lamp, glow: 0.3 ma; sim to GE NE-2T. Added by REV H.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P304 thru P309	4029340P2	Contact, electrical; sim to Amp 42827-2.
P310	4029840P1	Contact, electrical; sim to Amp 41854.
P311 thru P320	4029840P2	Contact, electrical; sim to Amp 42827-2.
P321	4029840P1	Contact, electrical; sim to Amp 41854.
P325	4029840P2	Contact, electrical; sim to Amp 42827-2.
P329	4029840P2	Contact, electrical; sim to Amp 42827-2.
P337	4029840P2	Contact, electrical; sim to Amp 42827-2.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q341*	19A115527P1	Silicon, NPN. (Replacement for 19A115246P1 used in some revisions).
	19A115246P1	Silicon, NPN.
		In Models of REV E and earlier:
	19A115527P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R343* and R344*	3R152P101K	Composition: 100 ohms ±10%, 1/4 w. Added by REV K.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T341*	19B209083P2	Audio freq: Pri 1: 19 ohms ±10% imp at 3 w. Sec 1: 3.5 ohms ±10% imp at 3 w.
		In Models of REV E and earlier:
	19B209083P1	Audio freq: Pri 1: 19 ohms ±10% imp at 3 w. Sec 1: 3.5 ohms ±10% imp at 3 w.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7487424P7	Miniature, phen: 4 terminals.
		- - - - - - - - - - CABLES - - - - - - - - - -
W441		(Part of J441).
W442	19B205634G6	Coaxial: approx 5 inches long.
W443	19B205634G3	Coaxial: approx 5 inches long.
		- - - - - - - - TUNED CIRCUITS - - - - - - - -
Z341 thru Z343		COIL ASSEMBLY Z341 19B204786G1 (4ER39A10, 13 and 16) Z342 19B204786G2 (4ER39A11, 14 and 17) Z343 19B204786G3 (4ER39A12, 15 and 18)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1*	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
		In Models of REV J and earlier:
	5496218P257	Ceramic disc: 56 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4	5494481P14	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P1	Tuning slug. (Used in Z341).
	5491798P4	Tuning slug. (Used in Z342).
	5491798P5	Tuning slug. (Used in Z343).
Z347 thru Z349		COIL ASSEMBLY Z347 19B204767G1 (4ER39A10, 13 and 16) Z348 19B204767G2 (4ER39A11, 14 and 17) Z349 19B204767G3 (4ER39A12, 15 and 18)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1*	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
		In Models of REV J and earlier:
	5496218P257	Ceramic disc: 56 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P1	Tuning slug. (Used in Z347).
	5491798P4	Tuning slug. (Used in Z348).
	5491798P5	Tuning slug. (Used in Z349).
Z350* thru Z352*		COIL ASSEMBLY Z350 19B204784G4 (4ER39A10, 13 and 16) Z351 19B204784G5 (4ER39A11, 14 and 17) Z352 19B204784G6 (4ER39A12, 15 and 18)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C7 and C8	5496218P248	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef -80 PPM.
C9	5496218P244	Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -80 PPM.
C10	5494481P7	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P1	Tuning slug. (Used in Z350).
	5491798P4	Tuning slug. (Used in Z351).
	5491798P5	Tuning slug. (Used in Z352).
		In Models of REV J and earlier:
Z350 thru Z352		COIL ASSEMBLY Z350 19B204784G1 (4ER39A10, 13 and 16) Z351 19B204784G2 (4ER39A11, 14 and 17) Z352 19B204784G3 (4ER39A12, 15 and 18)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	5496218P262	Ceramic disc: 91 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3 and C4	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
C5 and C6	5495218P231	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P4	Tuning slug.
		MECHANICAL PARTS (SEE RC1199)
2	19B204583G3	Hinge.
3	4035439P1	Transistor heat sink; sim to Birtcher 3AL-635-2R. (Used with Q10 in A348).
4	4036555P1	Insulator, washer: nylon. (Used with Q9 and Q10 in A348).
5	4032187P1	Can. (Used with T1 in A348).
6	19B204583G1	Hinge.
7	19A115784P1	Mica insulator. (Used with Q341).
8	19A121989P1	Bushing. (Used with Q341).
9	19E500812P1	Chassis. (Used in Models 4ER39A11, 12, 14, 15, 17 and 18).
10	19E500812P2	Chassis. (Used in Models 4ER39A10, 13 and 16).
11	19A121229G1	(Not Used).
12	19B204583G2	(Not Used).
13	19A121676P1	Guide pin.
14	19B204673P1	Cover.
15	19C303495G4	Station Receiver, Bottom Cover.
	19C303385P1	Mobile Receiver, Bottom Cover.
16	19A121297P1	Angle.
17	7160861P4	Nut, spring clip: sim to Tinnerman C6452-8Z-157.
18	4029851P6	(Not Used).
19	N529P27C	Plug button.
20	19A115461P2	Spring washer; sim to Shakeproof 3597-04-00.
21	4034252P5	Can; sim to Hudson Tool and Die HV-1236-2. (Used with T1 in A347).
22	19B204672P1	Cover.
23	7162414P1	Mounting ring, transistor socket; sim to Elco 757. (Used with Q1 in A341).
24	19B204917P1	Support. (Used with A341).
25	19B204719P1	Plate.
26	19C303495G3	Station Receiver Top Cover (except Repeaters and VM Stations).
	19C303676G2	Station Receiver Top Cover (Repeaters and VM Stations).
	19C303385P2	Mobile Receiver Top Cover.
27	4029851P3	Cable clamp: nylon; sim to Weckesser 1/8-4.
28	19A121383P1	Support.
29	4033089P1	Clip. (Part of XY1-4 in A352-357).
30	19B200525P9	Rivet. (Part of XY1-4 in A352-357).
31	19A115793P1	Electrical contact; sim to Methode 752 V (PB). (Part of XY1-4 in A352-357).
32	19C311172P1	Crystal socket. (Part of XY1-4 in A352-357).
33	19C303547P1	Cover.
34	19C303394G1	Heat sink.
35	19C303389G1	Chassis.

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.

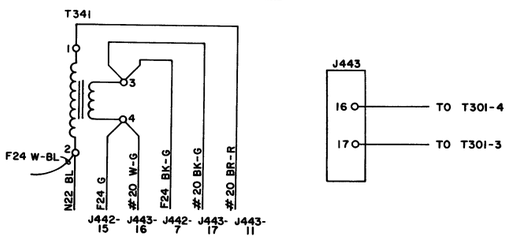
REV. C - To minimize chance of interference, IF frequency changed from 5.26 MC to 5.30 MC. Changed crystal filter A346 and A347-Y1.

REV. D - To improve receiver performance in areas of high signal level. On 2nd Mixer Board A347, replaced R3 and R4 with R16 and R17, and added R15.

REV. E - To improve audio response. Changed C37 and C53.

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

WAS



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

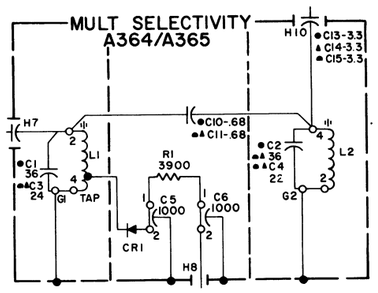
REV. H - To improve RF burnout protection of front-end air capacitor and RF transistor. Added neon lamp DS301 across L341/L343/L345 in 1st RF Amplifier A341.

REV. J - To provide better temperature compensation for low IF circuitry. 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 on IF/Audio Board A348. Changed C7, C10, and C11 on 2nd Mixer Board A347.

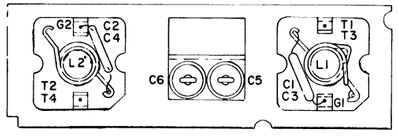
REV. K - To improve spurious rejection. Changed C1 on coil assemblies Z341 and Z347. Changed core on coil assemblies Z341, Z342, Z347, and Z348. Changed coil assemblies Z350, Z351, and Z352. Added R343 and R344. Changed R4 to R9 on 1st Mixer Board A345. Changed C1 to C48, C2 to C49, C3 to C50, C4 to C51, C24 to C45, C25 to C46, R13 to R21, T3 and T4 on 1st Oscillator Assembly A352/A357. Changed Multiplier Selectivity Board A364/A365.

Multiplier Selectivity Was

Schematic



Outline



Changed RF Alignment. Front End Alignment Step 1 and Receiver 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 Alignment Step 8 Tuning Control was "L4 (1st OSC/MULT) and L1 and L2 (MULT SELECTIVITY)", and Procedure was "Apply and 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 temperature characteristics. Changed C4, C5, C7 through C16, L1, L2, L3, deleted L4, and changed L5 to L4 on 2nd Mixer Board.

REV. M - To improve squelch performance. Deleted R71 and added R33 to the IF/Audio Board A348.

REV. N - To provide mid-range tuning of tank circuit on First Mixer Assembly A345. Deleted C4 and added C18.

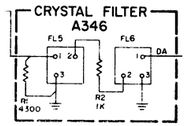
REV. P - To improve circuit D.C. bias stability of AUDIO AMP Q10. Added R80.

REV. R - To reduce receiver lock-up in areas of high RF signal level. Deleted C5 and added C26 on the 2nd Mixer Board A347.

REV. S - To simplify manufacturing and provide better selectivity. Changed C18 in 1st Mixer A345. Deleted R15 in 2nd Mixer A347. Changed FL5; deleted FL6, R1 and R2; and added R7 and R8 in Crystal Filter A346.

Crystal Filter Schematic

WAS



REV. T - To improve performance in positive ground applications. Changed C20.

REV. U - To increase reliability of audio circuit. Added CR301.

REV. V - To improve operation. Added C78 to A348.