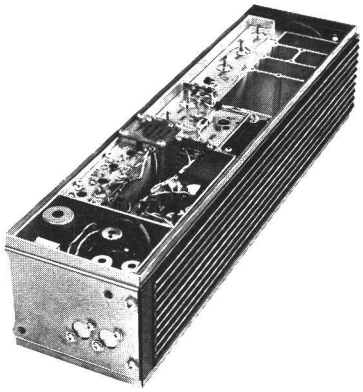
communications

MASTR Progress Line

132-174 MC RECEIVER MODELS 4ER41B10-15 (WIDE BAND)

Maintenance Manual LBI-3706

DF 1085



SPECIFICATIONS *

ER-41-B

FCC Filing Designation	
Frequency Range	132-174
Audio Output	2 watts at less than 10% distortion (using Speaker Model 4EZ16A10)
Sensitivity	
12-db SINAD (EIA Method)	0.40 μv
20-db Quieting Method	0.55 μv
Selectivity	
EIA Two-Signal Method	-85 db (adjacent channel, ±60 KC channels)
20-db Quieting Method	-100 db at ±35 KC
Spurious Response	-100 db
Frequency Stability	±.0005% (-30°C to +60°C)
Modulation Acceptance	±17 KC (wide band)
Squelch Sensitivity	
Critical Squelch	0.2 μv
Maximum Squelch	Greater than 20 db quieting (less than 2 μv)
Intermodulation (EIA)	-60 db
Maximum Frequency Separation	±0.2%
Frequency Response	300 cps = +2.5 to 6.5 db 3000 cps = -13 to -17.5 db

Fil 1085

ER41A+B

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

ER-41-B

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.

DESCRIPTION

General Electric MASTR Progress Line Receiver Type ER-41-B is a double conversion, superheterodyne wide band FM receiver designed for operation on the 132-174 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 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 (A301-A302)

RF Amplifier A301 (132-150.8 MC) or A302 (150.8-174 MC) consists of three tuned helical resonators and an RF amplifier stage (Q1). The RF signal from the antenna is coupled by RF cable to a tap on L301/L304. The tap is positioned to insure the proper impedance match to the antenna. RF energy is coupled through the three coils by openings in the shield walls, to the base of RF amplifier Q1. The output of Q1 is LC coupled through transformer T1/T2 to helical resonators L307/L309 and L308/L310, and then to the 1st mixer. (A327-Q3).

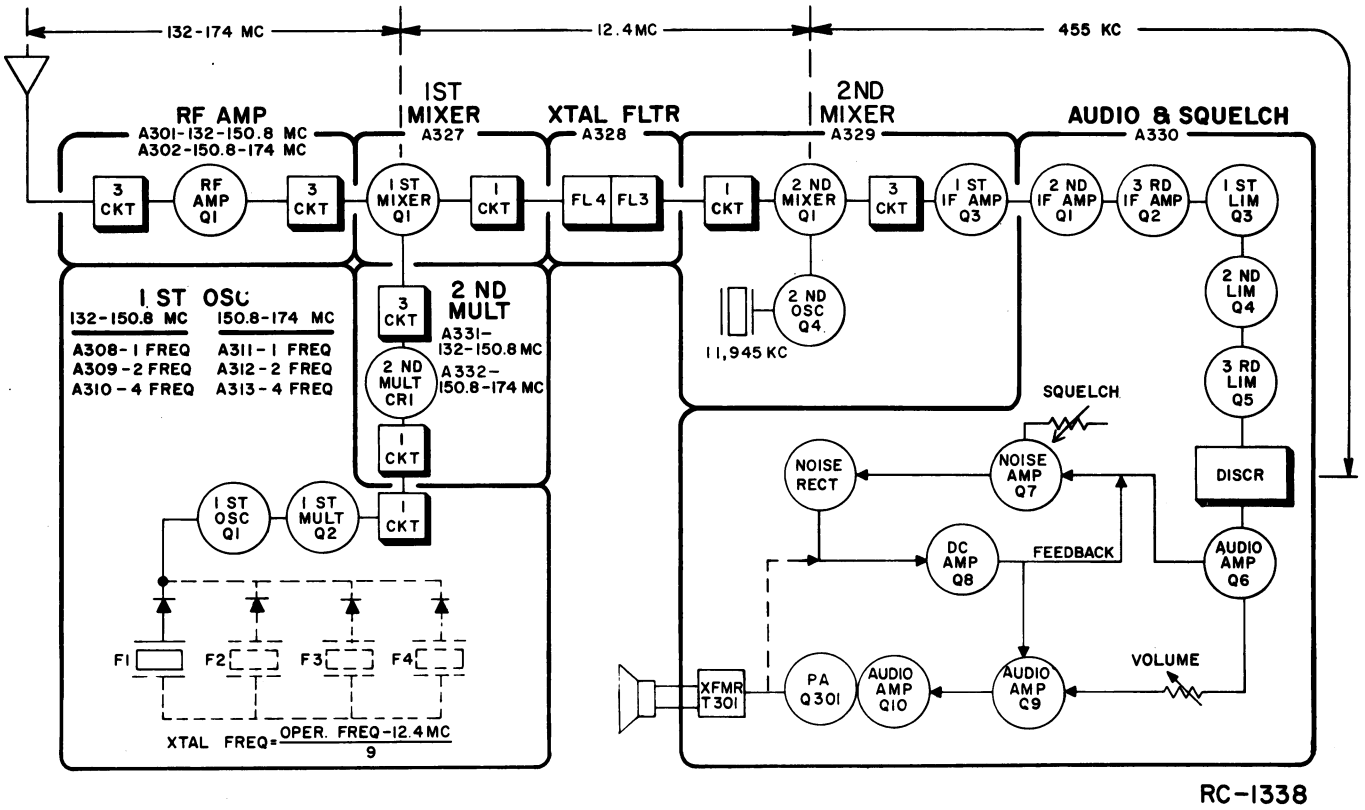


Figure 1 - Receiver Block Diagram

1ST OSCILLATOR AND MULT-1 (A308-A313)

The receiver 1st oscillator operates in a transistorized Colpitts oscillator circuit. The oscillator crystal operates in a fundamental mode at a frequency of approximately 13 to 18 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.

In single-frequency receivers, a jumper from P6 to C311 connects the regulated 10 volts to the crystal circuit, which forward biases diode CR1. Forward biasing the diode reduces its impedance, so that the crystal frequency is applied to the base of oscillator transistor Q1. Feedback for the oscillator is developed across C21/C22. The oscillator output is fed through C24 to the base of the 1st multiplier Q2.

Multi-frequency receivers use only one oscillator transistor, and up to three additional crystal circuits, identical to the F1 crystal circuit, 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.

The output of the 1st multiplier (tripler Q2) is transformer-coupled (T1/T2) to the 2nd multiplier assembly. The 1st multiplier tank is tuned to three times the crystal frequency, and is metered at centralized metering jack J442-4 through metering network CR5, R16, R303 and C32.

2ND MULTIPLIER (A331/A332)

Coupling from the 1st multiplier tank is through A331-T9/T10 to the anode of multiplier diode A306-CR1. Three resonant LC circuits (T11/T12, T13/T14, and T15/T16, follow CR1 and are tuned to nine times the crystal frequency. The 2nd multiplier output is fed through C13/C22 to the base of the first mixer.

1ST MIXER (A327) AND CRYSTAL FILTER (A328)

The RF signal from the RF amplifier and the low-side injection voltage from the 2nd multiplier are applied to the base of 1st mixer Q3. The mixer collector tank (L4 and C3) is tuned to 12.4 megacycles 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 A329-T2 to the base of the 2nd mixer.

2ND OSCILLATOR, 2ND MIXER AND 1ST IF AMPLIFIER (A329)

The 2nd oscillator Q4 operates in a Colpitts oscillator circuit, with feedback supplied through C20. The oscillator frequency is 11,945 KC with the low-side injection voltage 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 (L5, L2, L6). L5, L2 and L6 are required for shaping the nose of the IF waveform, and also reject the undesired output frequencies from the mixer.

The low IF signal is coupled through C14 to the base of the 1st low IF amplifier Q2. The output of Q3 is RC coupled to the base of the 2nd IF amplifier.

2ND IF AMPLIFIERS AND LIMITERS (A330)

Following A329-Q3 are two additional RC coupled low IF amplifiers (A330-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 (A330-Q3, Q4 and -Q5). First limiter metering is provided at J442-3 through metering network C13, CR2, R18 and C15.

DISCRIMINATOR (A330)

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 (A330)

The output of the discriminator is fed to the 1st audio amplifier (A6). 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 A330-J9. The VOLUME control arm connects to A330-J8 which feeds the audio signal to the base of the 2nd audio amplifier, Q9. C34, 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. 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 Q301. 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 T301 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 (C64 and L1) 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 Q301 are DC coupled, Q10 and Q301 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.

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 a 3 to 5 db without the squelch closing. This limits squelch "flutter" or "picket-fence" operation.

MAINTENANCE

DISASSEMBLY

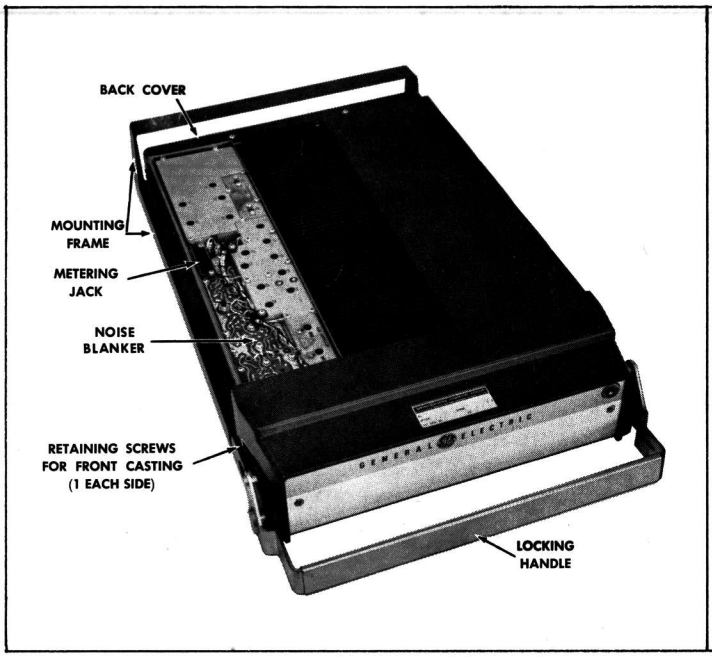


Figure 2 - Removing Top Cover

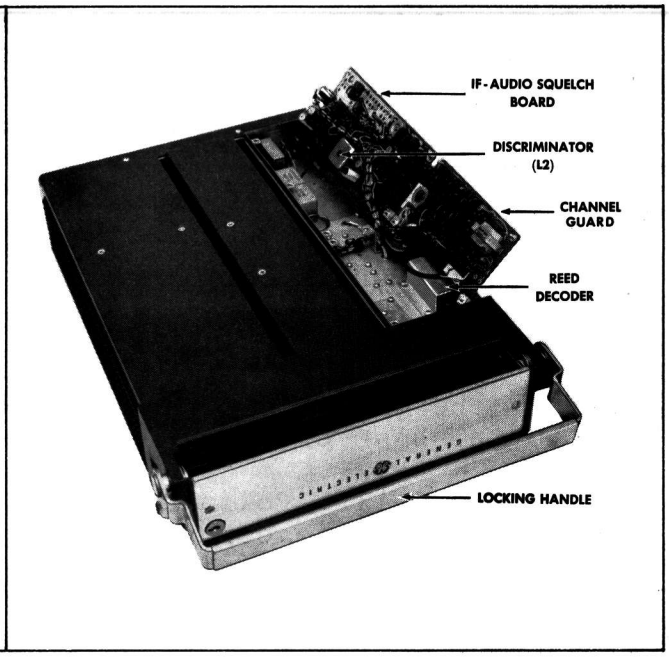


Figure 3 - Removing Bottom Cover

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.

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).
2. A 132-174 MHz signal source. Connect a one-inch piece of insulated wire no larger than .065 inch 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 the TEST 1 position.
2. With VOLUME control full counterclockwise and Test Set in position G, adjust R47 on IF-AUDIO & SQUELCH Board for reading of 0.55 volts. If using Multimeter, connect leads to J442-1 (AUDIO-PA) and J442-8 (System Negative).

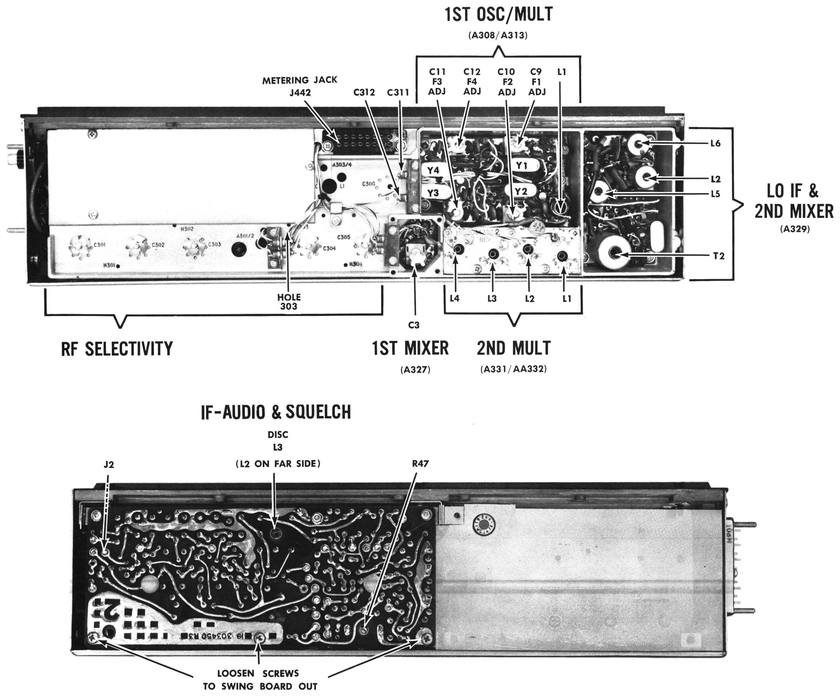
NOTE

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 C311 to C312.
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 AND MULTIPLIERS		
1.	D (MULT-1)	Pin 4	L1 (on 1st OSC/MULT) and L1 (on 2nd MULT)	See Procedure	Tune L1 (1st OSC/MULT) for maximum meter reading. Then tune L1 (2nd MULT) for minimum meter reading.
2.	E (MULT-2)	Pin 5	L1 (on 1st OSC/MULT) and L1 (on 2nd MULT)	Maximum	Tune L1 (1st OSC/MULT) for L1 (2nd MULT) for maximum meter reading.
3.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal into Hole 304. Adjust the signal generator for discriminator zero.
4.	B (2nd IF AMP)	Pin 2	L2, L3 and L4 (on 2nd MULT)	Maximum	Apply an on-frequency signal as above. Tune L2, L3 and L4 for maximum meter reading, keeping signal below saturation.
			RF SELECTIVITY		
5.	B (2nd IF AMP)	Pin 2	C301, C302, C303, C304, and C305	Maximum	Apply an on-frequency signal to the antenna jack. Tune C301 through C305 for maximum meter reading, keeping signal below saturation.
			FREQUENCY ADJUSTMENT		
6.	A (DISC)	Pin 10	C9 on 1st OSC/MULT (C10, C11 and 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 and 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).
2. A 455-kHz and 132-174 MHz signal source. Connect a one-inch piece of insulated wire no larger than .065 inch to generator output probe.
3. Two 5,000 ohm resistors for tuning low IF coils. *

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect Test Set Model 4EX3A10 to receive centralized metering jack J442 and set meter sensitivity switch to the TEST 1 position.
2. Set crystal trimmer C9 on 1st OSC/MULT board to mid-capacity. In multi-frequency receivers, set C10, C11 or C12 to mid-capacity as required.
3. In multi-frequency receivers 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.
4. With VOLUME control full counterclockwise and Test Set in position G, adjust R47 on the 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.

5. With Test Set in position J, check for regulated +10 volts. If using Multimeter, measure from C311 to C312.
6. 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
			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 slug) and L3 (bottom slug) on IF AUDIO & SQUELCH board.	1.7 v Max.	Loosen screws and swing IF AUDIO & SQUELCH board open, and set GE Test Set to TEST 3 position. 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.
			OSCILLATOR AND MULTIPLIERS		
3.	D (MULT-1)	Pin 4	L1 (on 1st OSC/MULT) and L1 (on 2nd MULT)	See Procedure	Tune L1 (1st OSC/MULT) for maximum meter reading. Then tune L1 (2nd MULT) for minimum meter reading.
4.	E (MULT-2)	Pin 5	L1 (on 1st OSC/MULT) and L1 (on 2nd MULT)	Maximum	Tune L1 (1st OSC/MULT) and L1 (2nd MULT) for maximum meter reading.
5.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal into Hole 304. Adjust the signal generator for discriminator zero.
6.	B (2nd IF AMP)	Pin 2	L2, L3 and L4 (on 2nd MULT)	Maximum	Apply an on-frequency signal as above. Tune L2, L3 and L4 for maximum meter reading, keeping signal below saturation.
			RF SELECTIVITY		
7.	B (2nd IF AMP)	Pin 2	C302, C303, C304 and C305	Maximum	Apply signal as above, keeping below saturation. Tune C302 through C305 for maximum meter reading as shown below: Insert Generator Probe In: / Tune 1. Hole 304 / C305 2. Hole 303 / C304 3. Hole 302 / C303 4. Hole 301 / C302
8.	B (2nd IF AMP)	Pin 2	C301, C302, C303, C304, C305	Maximum	Apply an on-frequency signal to the antenna jack. Tune C301 through C305 for maximum meter reading, keeping signal below saturation.
			MIXERS & LO IF*		
9.	B (2nd IF AMP)	Pin 2	C3 (on 1st MIXER)	Maximum	Apply an on-frequency signal as above, and tune C3 for maximum meter reading, keeping signal below saturation.
10.	"	"	T2 (on 2nd MIXER)	Maximum	Apply an on-frequency signal as above, and tune T2 for maximum meter reading, keeping signal below saturation.
11.	B (2nd IF AMP)	Pin 2	L5, L2 and L6 (on 2nd MIXER)	Maximum	With one end of the 5,000 ohm resistors to ground, load and peak as follows: Load L2 at point B--Peak L5 and L6. Load L5 and L6 at Points A and C--Peak L2.
			FREQUENCY ADJUSTMENT		
12.	A (DISC)	Pin 10	C9 (on 1st OSC/MULT) C10, C11 and 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.

ALIGNMENT PROCEDURE

132 — 174 MHz, MASTR WIDE BAND RECEIVER
MODELS 4ER41B10-15

TEST PROCEDURES

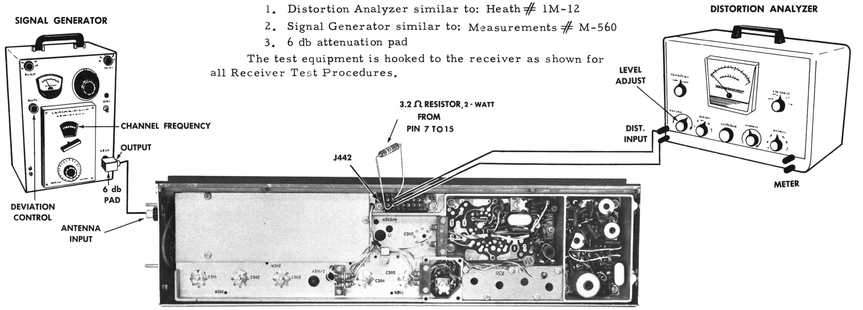
These Test Procedures are designed to help you to service a receiver that is operating---but not properly. The problems encountered could be low power, poor sensitivity, distortion, limiter not operating properly, and low gain. By following the sequence of test steps starting with Step 1, the defect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

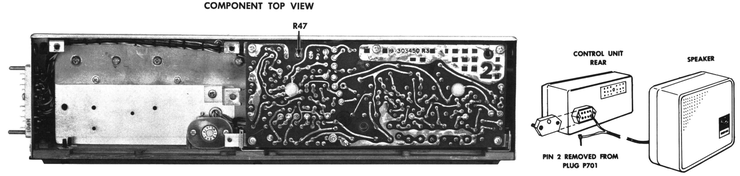
for test hookup shown:

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 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 ±10 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 0.40 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 0.40 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 ±17 KC (but less than ±20 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 & 5 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 Y2.
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 (Q301) output current at J442-1. If reading is low -- a. Refer to Receiver Alignment Procedure for BIAS ADJ (R47). b. Check Q301. Check unsquelched voltage readings in Audio section (Refer to Receiver Schematic Diagram).
IMPROPER SQUELCH OPERATION	Check voltage and resistance readings of Squelch circuit (Refer to Receiver Schematic Diagram).
DISCRIMINATOR IDLING TOO FAR OFF ZERO	See if discrimination 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 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.

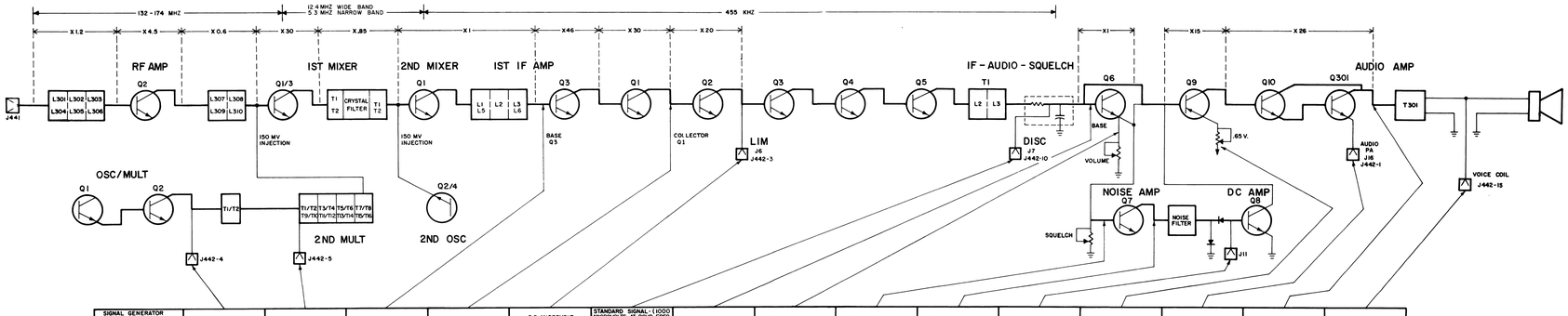
STEP 2- SIMPLIFIED VTVM GAIN CHECKS

EQUIPMENT REQUIRED:

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

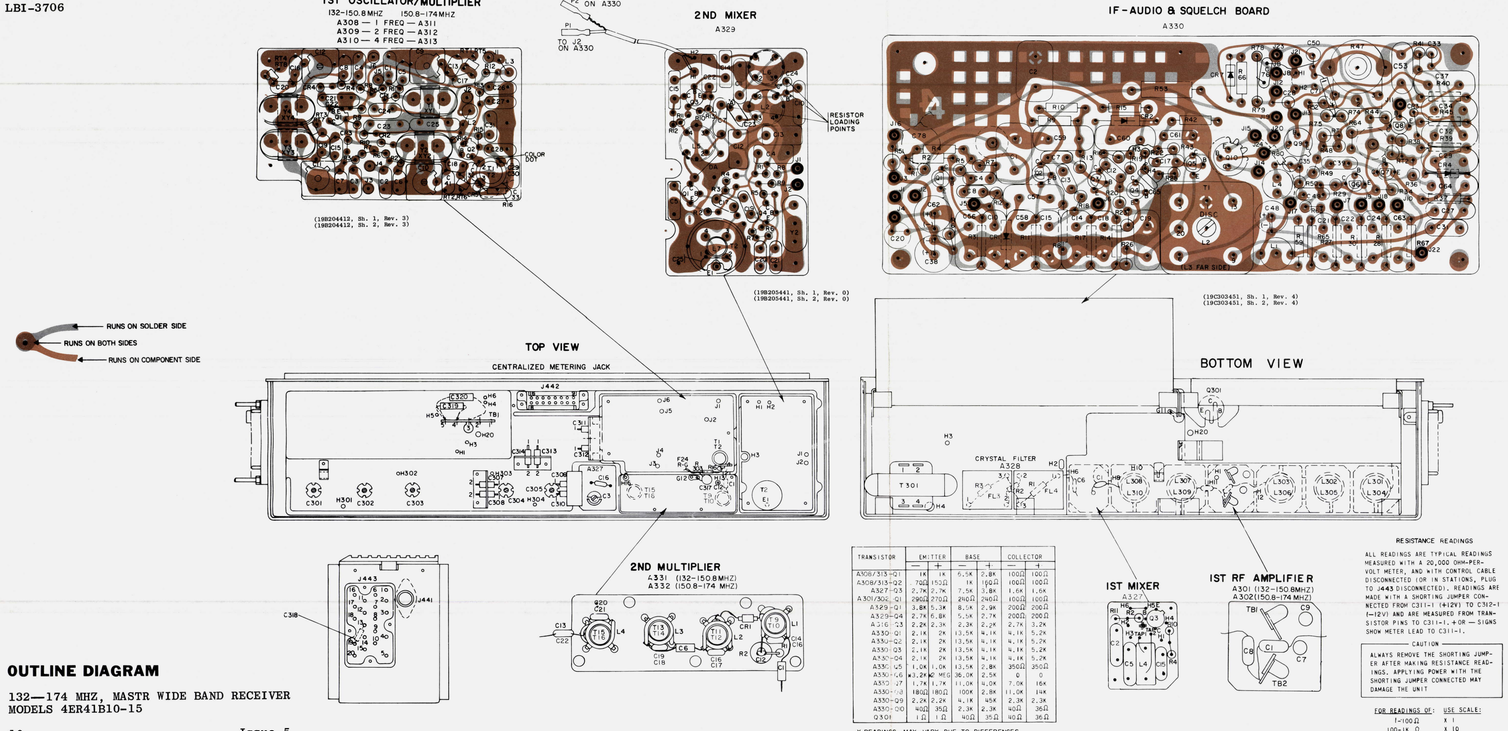
PRELIMINARY STEPS:

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 BE ARROWS.



SIGNAL GENERATOR INPUT. MAINTAIN SETTING AT DISCRIMINATOR ZERO			UNMODULATED	UNMODULATED	0.5 MICROVOLT UNMODULATED	STANDARD SIGNAL (1000 MICROVOLTS AT 145 MHz FREQ MOD BY 1KHZ AT 3.3 KHZ DEV (NB) OR 10KHZ (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 IN FULL COUNTER-CLOCKWISE POSITION			ADJUST VOLUME CONTROL FOR RATED 2 WATT OUTPUT ACROSS 3.2 OHM LOAD
READING	1.0 VDC	0.4 VDC	GENERATOR OUTPUT SHOULD BE APPROX. 150 MICROVOLTS	GENERATOR OUTPUT SHOULD BE APPROX. 30 MICROVOLTS	2.5 VDC	0.1 VAC	0.5 VAC	0.5 VAC	0.07 VAC	2.5 VDC	2.0 VDC	ADJUST FOR 0.65 VDC (SEE ALIGNMENT PROCEDURE)	0.65 VDC (SEE ALIGNMENT PROCEDURE)	8.5 VAC	2.53 VAC

RC-1218C



TRANSISTOR	EMITTER		BASE		COLLECTOR	
	—	+	—	+	—	+
A308/313-Q1	1K	1K	6.5K	2.8K	100Ω	100Ω
A308/315-Q2	70Ω	150Ω	1K	150Ω	100Ω	100Ω
A327-Q3	2.7K	2.7K	7.5K	3.8K	1.6K	1.6K
A301/302-Q1	290Ω	270Ω	290Ω	240Ω	100Ω	100Ω
A329-Q1	3.8K	5.3K	8.1K	2.9K	200Ω	200Ω
A329-Q4	2.7K	5.8K	5.5K	2.7K	200Ω	200Ω
A316-Q3	2.2K	2.3K	2.3K	2.2K	2.7K	3.2K
A330-Q1	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A330-Q2	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A330-Q3	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A330-Q4	2.1K	2K	13.5K	4.1K	4.1K	5.2K
A330-Q5	1.0K	1.0K	13.5K	2.8K	350Ω	350Ω
A330-Q6	∞3.2K	∞ MEG	36.0K	2.5K	0	0
A330-Q7	1.7K	1.7K	11.0K	4.0K	7.0K	16K
A330-Q8	180Ω	180Ω	100K	2.8K	11.0K	14K
A330-Q9	2.2K	2.2K	4.1K	45K	2.3K	2.3K
A330-Q10	40Ω	35Ω	2.3K	2.3K	40Ω	36Ω
Q301	1Ω	1Ω	40Ω	35Ω	40Ω	36Ω

* READINGS MAY VARY DUE TO DIFFERENCES IN TRANSISTORS.

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 C311-1 (+12V) TO C312-1 (-12V) AND ARE MEASURED FROM TRANSISTOR PINS TO C311-1, +OR — SIGNS SHOW METER LEAD TO C311-1.

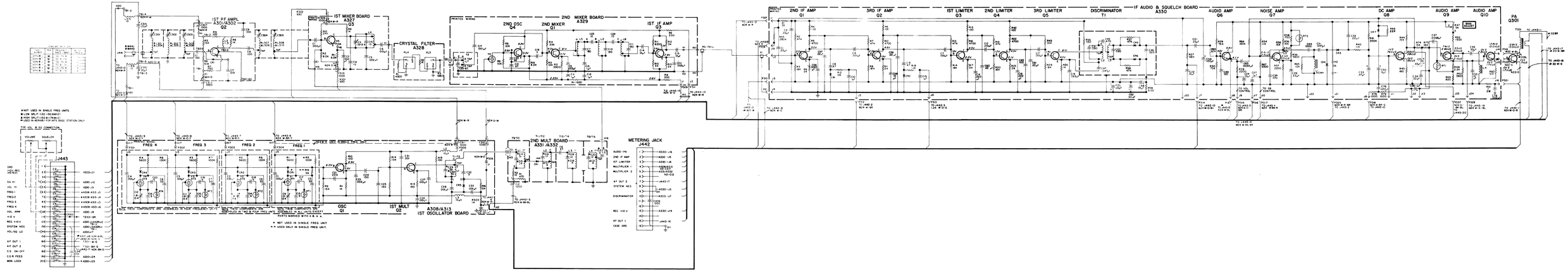
CAUTION

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:
1-100 Ω	X 1
100-1K Ω	X 10
1K-50K Ω	X 1,000
50K Ω	X 100,000

OUTLINE DIAGRAM

132—174 MHZ, MASTR WIDE BAND RECEIVER
MODELS 4ER41B10-15



(19B620758, Rev. 15)

DO NOT ATTEMPT TO MAKE PARTS EQUIVALENT PERFORMANCE. WITH A MEMBER OF ANY SERIES. PART SHOULD BE MADE ONLY WITH A STATEMENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

VOLTAGE READINGS
ALL READINGS ARE TYPICAL VOLTAGES MADE WITH A 20,000 OHM PER VOLT METER, WITH NO SIGNAL APPLIED TO RECEIVER. CONTROL KNOBS CLOCKWISE (CW) MAXIMUM CONTROL FULLY COUNTERCLOCKWISE (CCW) MINIMUM CONTROL FULLY CLOCKWISE.

CAPACITOR VALUES IN MICROFARADS (EQUAL TO MICROMICROFARADS UNLESS FOLLOWED BY MFD OR MF). RESISTOR VALUES ARE IN MICROHMS (MEGOHMS) UNLESS FOLLOWED BY K (KILOHMS) OR OHMS.

SCHEMATIC DIAGRAM

132—174 MHZ, MASTR WIDE BAND RECEIVER
MODELS 4ER41B10-15

PARTS LIST

LBI-3680E

132-174 MHz RECEIVER
MODELS 4ER41B10-15
(19E500810 G37-42)
REV M

SYMBOL	G-E PART NO.	DESCRIPTION
A301* and A302*		RF AMPLIFIER ASSEMBLY 19C303414-G5 Added by Rev B.
		- - - - CAPACITORS - - - -
C1	7489162-P127	Silver mica: 100 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C7	5493392-P7	Ceramic, feed-thru: .001 µf +100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C.
C8	7489162-P127	Silver mica: 100 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C9	5493392-P7	Ceramic, feed-thru: .001 µf +100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C.
		- - - - DIODES AND RECTIFIERS - - - -
CR1	4038642-P1	Germanium.
		- - - - INDUCTORS - - - -
L2	7488079-P7	Choke, RF: 1.5 µh ±10%, 0.5 ohms DC res max, sim to Jeffers 4411-10.
		- - - - TRANSISTORS - - - -
Q2	19A115342-P1	Silicon, NPN.
		- - - - RESISTORS - - - -
R5	3R152-P153K	Composition: 1500 ohms ±10%, 1/4 w.
R6	3R152-P512J	Composition: 5100 ohms ±5%, 1/4 w.
R7	3R152-P751J	Composition: 750 ohms ±5%, 1/4 w.
R8	3R152-P102K	Composition: 1000 ohms ±10%, 1/4 w.
R9	3R152-P101K	Composition: 100 ohms ±10%, 1/4 w.
		- - - - TERMINAL BOARDS - - - -
TB1 and TB2	7487424-P15	Miniature, phen: 2 terminals.
A301* and A302*		RF AMPLIFIER A301 19C303414-G1 (4ER41B10, 12, 14) A302 19C303414-G2 (4ER41B11, 13, 15) Deleted by Rev B.
		- - - - CAPACITORS - - - -
C1	7489162-P127	Silver mica: 100 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C2 and C3	5493392-P107	Ceramic, stand-off: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
		- - - - DIODES AND RECTIFIERS - - - -
CR1	4038642-P1	Germanium.
		- - - - TRANSISTORS - - - -
Q1	19A115342-P1	Silicon, NPN.
		- - - - RESISTORS - - - -
R1	3R152-P333J	Composition: 33,000 ohms ±5%, 1/4 w.
R2	3R152-P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R3	3R152-P471J	Composition: 470 ohms ±5%, 1/4 w.
R4	3R152-P101K	Composition: 100 ohms ±10%, 1/4 w.
		- - - - TRANSFORMERS - - - -
T1 and T2		COIL T1 19A121076-G1 (4ER41B10, 12, 14) T2 19A121076-G2 (4ER41B11, 13, 15)
		- - - - CAPACITORS - - - -
C4	5496218-P244	Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -80 PPM.
C5	5496218-P241	Ceramic disc: 10 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C6	5496218-P239	Ceramic disc: 8 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
	5491798-P5	Tuning slug.
		- - - - TERMINAL BOARDS - - - -
TB1	7487424-P15	Miniature, phen: 2 terminals.
		- - - - SOCKETS - - - -
XQ1	5490277-P5	Transistor, phen: 3 contacts; sim to Alcon 1213LL2.
A308 thru A313		FIRST OSCILLATOR A308 19B204419-G1 (4ER41B10) A309 19B204419-G2 (4ER41B12) A310 19B204419-G3 (4ER41B14) A311 19B204419-G4 (4ER41B11) A312 19B204419-G5 (4ER41B13) A313 19B204419-G6 (4ER41B15)
		- - - - CAPACITORS - - - -
C1 thru C4	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C5 thru C8	5496219-P751	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -750 PPM.
C9 thru C12	5491271-P106	Variable, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5.
C13 thru C16	5496219-P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C17 thru C20	19C300685-P93	Ceramic disc: 5 pf ±0.1 pf, 500 VDCW, temp coef 0 PPM.
C21	5496219-P771	Ceramic disc: 220 pf ±5%, 500 VDCW, temp coef -750 PPM.
C23	5494481-P114	Ceramic disc: .002 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C24	5490008-P31	Silver mica: 150 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C25	5496219-P467	Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef -220 PPM.
C26 thru C28	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C31	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - DIODES AND RECTIFIERS - - - -
CR1 thru CR4	19A115348-P1	Silicon.
		- - - - JACKS AND RECEPTACLES - - - -
J1 thru J6	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - 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 thru R4	3R152-P562J	Composition: 5600 ohms ±5%, 1/4 w.
R5 thru R8	3R152-P104K	Composition: 0.1 megohm ±10%, 1/4 w.
R9	3R152-P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R10	3R152-P101K	Composition: 100 ohms ±10%, 1/4 w.
R11 and R12	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R13	3R152-P151J	Composition: 150 ohms ±5%, 1/4 w.
R14	3R152-P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R15	3R152-P101K	Composition: 100 ohms ±10%, 1/4 w.
R19	3R152-P360J	Composition: 36 ohms ±5%, 1/4 w.
		- - - - THERMISTORS - - - -
RT1 thru RT4	19B209284-P5	Disc: 43 ohms nominal, color code green.
		- - - - TRANSFORMERS - - - -
T1 and T2		COIL T1 19B204421-G1 (4ER41B10, 12, 14) T2 19B204421-G2 (4ER41B11, 13, 15)
		- - - - CAPACITORS - - - -
C29	5496218-P253	Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -80 PPM.
C30	5496218-P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C32	5496218-P34	Ceramic disc: 3 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C33	5494481-P12	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - DIODES AND RECTIFIERS - - - -
CR5	19A115250-P1	Silicon.
		- - - - INDUCTORS - - - -
L1	19A121093-P1	Coil.
		- - - - RESISTORS - - - -
R16	3R152-P103K	Composition: 10,000 ohms ±10%, 1/4 w.
	5491798-P5	Tuning slug.
		- - - - SOCKETS - - - -
XY1 thru XY4		Refer to Mechanical Parts (RC-1341).
		- - - - CRYSTALS - - - -
		When reordering give GE Part No. and specify exact freq needed.
		Crystal freq = (OF -12.4 MHz) ÷ 9.
Y1 thru Y4	19B206576-P8	Quartz: freq range 13288.888 to 15377.777 KHz, temp range -30°C to +85°C.
Y1 thru Y4	19B206576-P9	Quartz: freq range 15377.778 to 17955.555 KHz, temp range -30°C to +85°C.
A327		FIRST MIXER 19B204430-G5
		- - - - CAPACITORS - - - -
C1	5494481-P14	Ceramic disc: .002 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C2	5494481-P114	Ceramic disc: .002 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C3	5491271-P106	Variable, subminiature: approx 1.98-12.4 pf, 750 v peak; sim to EF Johnson 189-6-5.
C5	5494481-P114	Ceramic disc: .002 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C6	5494481-P12	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C15 and C16	5496218-P244	Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - TERMINALS - - - -
E1	4038104-P1	Lug.
		- - - - INDUCTORS - - - -
L4	19A121082-G4	Toroidal coil.
		- - - - TRANSISTORS - - - -
Q3*	19A116032-P1	Silicon, NPN. In Rev. L and earlier:
	19A115440-P1	Silicon, NPN.
		- - - - RESISTORS - - - -
R2	3R152-P822J	Composition: 8200 ohms ±5%, 1/4 w.
R4	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R10	3R152-P243J	Composition: 24,000 ohms ±5%, 1/4 w.
R11	3R152-P622J	Composition: 6200 ohms ±5%, 1/4 w.
A328		CRYSTAL FILTER 19B204616-G5
		- - - - FILTERS - - - -
FL3	PL-19C304094-G2	Bandpass.
FL4	PL-19C304094-G3	Bandpass.
		- - - - RESISTORS - - - -
R1	3R152-P432J	Composition: 4300 ohms ±5 %, 1/4 w.
R2	3R152-P102K	Composition: 1000 ohms ±10%, 1/4 w.
R3	3R152-P682K	Composition: 6800 ohms ±10%, 1/4 w.
A329		SECOND MIXER 19B204438-G2
		- - - - CAPACITORS - - - -
C4	19B209243-P7	Polyester: 0.1 µf ±20%, 40 VDCW.
C5	19B209243-P4	Polyester: .033 µf ±20%, 40 VDCW.
C7	5496219-P369	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C10 and C11	5496219-P369	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C12 and C13	19B209243-P7	Polyester: 0.1 µf ±20%, 40 VDCW.
C14 and C15	19B209243-P1	Polyester: .01 µf ±20%, 40 VDCW.
C17	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C19	5490008-P1	Silver mica: 5 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C20	5493366-P82G	Silver mica: 82 pf ±2%, 100 VDCW; sim to Electro Motive Type DM-15.
C21	5493366-P47G	Silver mica: 47 pf ±2%, 100 VDCW; sim to Electro Motive Type DM-15.
C22	19B209243-P6	Polyester: 0.1 µf ±20%, 40 VDCW.
C23 and C24	5496218-P41	Ceramic disc: 10 pf ±0.25 pf, 500 VDCW, temp coef -0 PPM.
		- - - - TERMINALS - - - -
E1	4038104-P1	Lug.
		- - - - JACKS AND RECEPTACLES - - - -
J1 and J2	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - INDUCTORS - - - -
L2	19C311181-G6	Coil. Includes tuning slug 4038368-P1.
L5	19C311181-G8	Coil. Includes tuning slug 4038368-P1.
L6	19C311181-G9	Coil. Includes tuning slug 4038368-P1.
		- - - - PLUGS - - - -
P1	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P2	4029840-P1	Contact, electrical: sim to AMP 41854.
		- - - - TRANSISTORS - - - -
Q1	19A115245-P1	Silicon, NPN.
Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115245-P1	Silicon, NPN.
		- - - - RESISTORS - - - -
R1	3R152-P152K	Composition: 1500 ohms ±10%, 1/4 w.
R2	3R152-P392K	Composition: 3900 ohms ±10%, 1/4 w.
R3	3R152-P103K	Composition: 10,000 ohms ±10%, 1/4 w.
R4	3R152-P333K	Composition: 33,000 ohms ±10%, 1/4 w.
R5 and R6	3R152-P103K	Composition: 10,000 ohms ±10%, 1/4 w.
R8 and R9	3R152-P201J	Composition: 200 ohms ±5%, 1/4 w.
R10	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R11	3R152-P622J	Composition: 6200 ohms ±5%, 1/4 w.
R12	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R13	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R14	3R152-P822J	Composition: 8200 ohms ±5%, 1/4 w.
		- - - - TRANSFORMERS - - - -
T2		COIL 19B204414-G2
		- - - - CAPACITORS - - - -
C25	5496218-P258	Ceramic disc: 62 pf ±5%, 500 VDCW, temp coef -80 PPM.
	5491798-P3	Tuning slug.
		- - - - CRYSTALS - - - -
Y2	19A110398-P1	Quartz: freq 11945 KHz ±.002% at 25°C, temp range -30°C to +75°C.
A330		IF/AUDIO 19D402327-G5
		- - - - CAPACITORS - - - -
C1	19A115028-P116	Polyester: 0.22 µf ±20%, 200 VDCW.
C2	5491189-P108	Polyester: 0.22 µf ±20%, 50 VDCW.
C4	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C7	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C8	5496219-P717	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C10	19A115028-P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C12	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C13	5496219-P717	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C14	19A115028-P109	Polyester: .022 µf ±20%, 200 VDCW.
C15	19A115028-P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C17	5494481-P112	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C18 and C19	19A115028-P109	Polyester: .022 µf ±20%, 200 VDCW.
C20*	19A115680-P103	Electrolytic: 20 µf +150% -10%, 25 VDCW; sim to Mallory Type TT. (Added by Rev J).
C21	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C22	19A115028-P107	Polyester: .01 µf ±20%, 200 VDCW.
C24	19A115028-P107	Polyester: .01 µf ±20%, 200 VDCW.
C27	19B209243-P7	Polyester: 0.1 µf ±20%, 40 VDCW.
C28	5496267-P17	Tantalum: 1 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C29	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C31	19B209243-P5	Polyester: .047 µf ±20%, 50 VDCW.
C32	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C33	5496267-P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C34	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C35	5496267-P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C37	19A115028-P305	Polyester: .0068 µf ±10%, 200 VDCW.
C38	19A115680-P107	Electrolytic: 100 µf +150% -10%, 15 VDCW; sim to Mallory Type TT.
C39	5490008-P143	Silver mica: 470 pf ±10%, 300 VDCW; sim to Electro Motive Type DM-15.
C48	5495670-P9	Electrolytic: 35 µf +75% -10%, 15 VDCW; sim to Sprague 30D.
C49	5496219-P822	Ceramic disc: 120 pf ±10%, 500 VDCW, temp coef -1500 PPM.
C50	5496267-P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C53*	19A115028-P315	Polyester: 0.15 µf ±10%, 200 VDCW. (Deleted by Rev C). (Added by Rev H).
C56	19A115028-P102	Polyester: .0022 µf ±20%, 200 VDCW.
C57	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C58	19A115028-P107	Polyester: .01 µf ±20%, 200 VDCW.
C59 thru C61	19B209243-P17	Polyester: 0.22 µf ±20%, 250 VDCW.
C62*	5491000-P1	Electrolytic: 30 µf +75% -10%, 25 VDCW; sim to Sprague D25379. In Models of Rev H and earlier:
	5496267-P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C63	19A115028-P103	Polyester: .0033 µf ±20%, 200 VDCW.
C64	4029003-P8	Silver mica: .001 µf ±5%, 500 VDCW; sim to Electro Motive Type DM-20.
C65	5496218-P821	Ceramic disc: 100 pf ±10%, 500 VDCW, temp coef -1500 PPM.
C71	5496267-P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C76*	19B209243-P3	Polyester: .022 µf ±20%, 50 VDCW. In Models of Rev G and earlier:
	19B209243-P7	Polyester: 0.1 µf ±20%, 50 VDCW. (Added by Rev C).
C77*	19B209243-P6	Polyester: .068 µf ±20%, 50 VDCW. (Added by Rev C). (Deleted by Rev H).
C78*	5494481-P114	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. (Added by Rev L).
		- - - - DIODES AND RECTIFIERS - - - -
CR1 and CR2	4038056-P1	Germanium.
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	4031476-G1	Choke.
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 Type 2N2714.
Q6	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q7	19A115889-P1	Silicon, NPN; sim to Type 2N2712.
Q8	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115247-P1	Silicon, PNP; sim to Type 2N1024.
Q10	19A115300-P1	Silicon, NPN; sim to Type 2N3053.
		- - - - RESISTORS - - - -
R1	3R77-P330K	Composition: 33 ohms ±10%, 1/2 w.
R2	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R3	3R77-P183J	Composition: 18,000 ohms ±5%, 1/2 w.
R4	3R77-P101K	Composition: 100 ohms ±10%, 1/2 w.
R5	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R6	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
R7	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R8	3R77-P183J	Composition: 18,000 ohms ±5%, 1/2 w.
R9	3R77-P101K	Composition: 100 ohms ±10%, 1/2 w.
R10	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R11	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
R12	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R13	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R14	3R77-P183J	Composition: 18,000 ohms ±5%, 1/2 w.
R15	3R77-P101K	Composition: 100 ohms ±10%, 1/2 w.
R16	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R17	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
R18	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R19	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R20	3R77-P183J	Composition: 18,000 ohms ±5%, 1/2 w.
R22	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R23	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
R25	3R77-P183J	Composition: 18,000 ohms ±5%, 1/2 w.
R26	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w.
R27	3R77-P683K	Composition: 68,000 ohms ±10%, 1/2 w.
R28	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
R29 and R30	3R77-P753J	Composition: 75,000 ohms ±5%, 1/2 w.
R32*	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w. (Deleted by Rev C).
R34	3R77-P113J	Composition: 11,000 ohms ±5%, 1/2 w.
R36	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R37	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
R38	3R77-P751J	Composition: 750 ohms ±5%, 1/2 w.
R39	3R77-P562J	Composition: 5600 ohms ±5%, 1/2 w.
R40	3R77-P113J	Composition: 11,000 ohms ±5%, 1/2 w.
R41	3R77-P204J	Composition: 0.2 megohm ±5%, 1/2 w.
R42	3R77-P101K	Composition: 100 ohms ±10%, 1/2 w.
R43*	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
	3R77-P473K	In Models of Rev F and earlier: Composition: 47,000 ohms ±10%, 1/2 w.
R44	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R45	3R77-P181K	Composition: 180 ohms ±10%, 1/2 w.
R47	19B209115-P1	Variable, carbon film: 5000 ohms ±20%, 0.15 w; sim to CTS Type UPE-70.
R48	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
R49	3R77-P821K	Composition: 820 ohms ±10%, 1/2 w.
R50	3R77-P392K	Composition: 3900 ohms ±10%, 1/2 w.
R51	19B209022-P15	Wirewound: 1 ohm ±5%, 2 w; sim to IRC Type BWH.
R52	3R77-P152K	Composition: 1500 ohms ±10%, 1/2 w.
R53	5495948-P444	Deposited carbon: 0.28 megohm ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R59	3R77-P512J	Composition: 5100 ohms ±5%, 1/2 w.
R63	3R77-P623J	Composition: 62,000 ohms ±5%, 1/2 w.
R64*	3R77-P184K	Composition: 0.18 megohm ±10%, 1/2 w.
	3R77-P224K	In Models of Rev D and earlier: Composition: 0.22 megohm ±10%, 1/2 w.
R65	3R77-P123K	Composition: 12,000 ohms ±10%, 1/2 w.
R66	3R77-P223K	Composition: 22,000 ohms ±10%, 1/2 w.
R67	3R77-P332J	Composition: 3300 ohms ±5%, 1/2 w.
R74	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R75	3R77-P183K	Composition: 18,000 ohms ±10%, 1/2 w.
R78* and R79*	3R152-P102K	Composition: 1000 ohms ±10%, 1/4 w. (Added by Rev C).
R80*	3R152-P511J	Composition: 510 ohms ±5%, 1/4 w. (Added by Rev D).
		- - - - THERMISTORS - - - -
RT1	19B209143-P2	Rod: 4000 ohms ±10%, 1 w max; sim to Globar Type 789F-12.
RT2	19B209143-P3	Rod: 850 ohms ±10%, 1 w max; sim to Globar Type 789F.
		- - - - TRANSFORMERS - - - -
T1		DISCRIMINATOR 19C303612-G1
		- - - - CAPACITORS - - - -
C41 and C42	19B209196-P1	Ceramic disc: 280 pf ±5%, 500 VDCW, temp coef -115 ±30 PPM.
C45	7489162-P43	Silver mica: 470 pf ±5%, 300 VDCW; sim to Electro Motive Type DM-15.
C46	7489162-P35	Silver mica: 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C47	5491189-P4	Polyester: .047 µf ±20%, 50 VDCW.
		- - - - DIODES AND RECTIFIERS - - - -
CR5 and CR6	19A115250-P1	Silicon.
		- - - - INDUCTORS - - - -
L2 and L3	19A121532-G1	Coil.
		- - - - RESISTORS - - - -
R56	3R152-P331J	Composition: 330 ohms ±5%, 1/4 w.
R57 and R58	3R152-P473J	Composition: 47,000 ohms ±5%, 1/4 w.

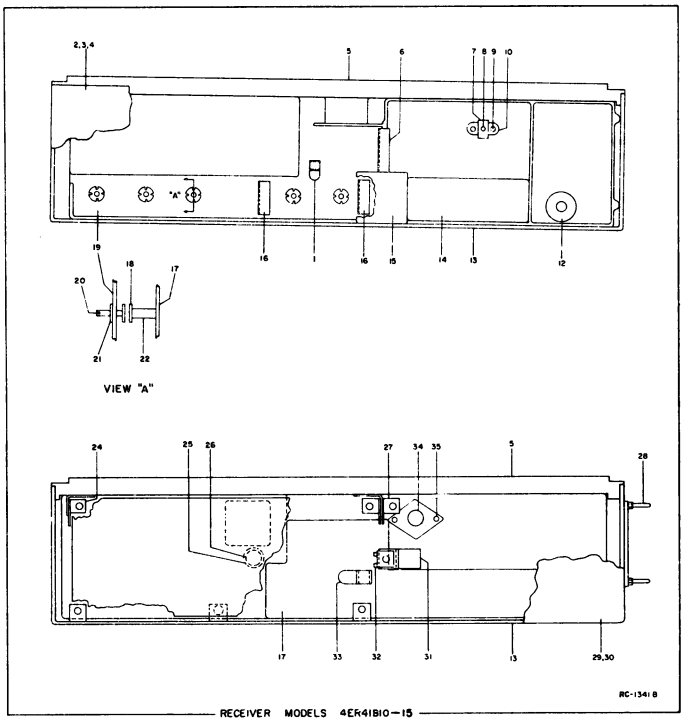
 *COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	G-E PART NO	DESCRIPTION
A331 and A332		MULTIPLIER A331 19B204423-G3 (4ER41B10, 12, 14) A332 19B204423-G4 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	5491601-P120	Molded: 1 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
C6	5491601-P107	Molded: 0.27 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
C12	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C13	5496218-P34	Ceramic disc: 3 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C22	5491601-P123	Molded: 1.5 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1	19A122650-P1	Silicon.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152-P471J	Composition: 470 ohms ±5%, 1/4 w.
R2	3R152-P100J	Composition: 10 ohms ±5%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T9 and T10		COIL T9 19A121109-G3 (4ER41B10, 12, 14) T10 19A121109-G4 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C14	5496218-P256	Ceramic disc: 51 pf ±5%, 500 VDCW, temp coef -80 PPM.
C15	5496218-P253	Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A121108-P1	Coil.
	5491798-P5	Tuning slug.
T11 and T12		COIL T11 19A121095-G3 (4ER41B10, 12, 14) T12 19A121095-G4 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C16	5496218-P242	Ceramic disc: 12 pf ±5%, 500 VDCW, temp coef -80 PPM.
C17	5496218-P239	Ceramic disc: 8 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L2	19A121094-P1	Coil.
	5491798-P5	Tuning slug.
T13 and T14		COIL T13 19A121097-G3 (4ER41B10, 12, 14) T14 19A121097-G4 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C18	5496218-P242	Ceramic disc: 12 pf ±5%, 500 VDCW, temp coef -80 PPM.
C19	5496218-P239	Ceramic disc: 8 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L3	19A121096-P1	Coil.
	5491798-P5	Tuning slug.

SYMBOL	G-E PART NO	DESCRIPTION
T15 and T16		COIL T15 19A121111-G3 (4ER41B10, 12, 14) T16 19A121111-G4 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C20	5496218-P242	Ceramic disc: 12 pf ±5%, 500 VDCW, temp coef -80 PPM.
C21	5496218-P239	Ceramic disc: 8 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L4	19A121110-P1	Coil.
	5491798-P5	Tuning slug.
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C315* and C316*	5496267-P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D. Deleted by Rev F.
C317	5494481-P12	Ceramic disc: .001 µf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C318	7774750-P4	Ceramic disc: .001 µf +100% -0%, 500 VDCW.
C319*	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. (Added by Rev F).
C320*	19A115680-P3	Electrolytic: 20 µf +150% -10%, 25 VDCW; sim to Mallory Type TT. In Models of Rev F thru Rev H:
	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR301	4037822-P1	Silicon. (Added by Rev K).
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J442	19B205689-G2	Connector: 18 contacts.
J443	19C303426-G1	Connector: 20 pin contacts.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L315* and L316*	7488079-P16	Choke, RF: 10 µh ±10%, 0.6 ohm DC res max; sim to Jeffers 4421-7. Added by Rev F.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P301 thru P309	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P310	4029840-P1	Contact, electrical: sim to AMP 41854.
P311 thru P320	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P321	4029840-P1	Contact, electrical: sim to AMP 41854.
P325	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P329	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P337	4029840-P2	Contact, electrical: sim to AMP 42827-2.
		- - - - - - - - - TRANSISTORS - - - - - - - - - -
Q301	19A115527-P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R301 and R302	3R152-P681K	Composition: 680 ohms ±10%, 1/4 w.
R303	3R152-P102K	Composition: 1000 ohms ±10%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T301	19B209083-P2	Audio freq: 0.3-3 KHz freq range, Pri 1: 19 ohms ±10% imp., 0.866 ohm DC res max, Sec 1: 3.5 ohms ±10% imp., 0.222 ohm DC res max.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1	7487424-P7	Miniature, phen: 4 terminals.

SYMBOL	G-E PART NO	DESCRIPTION
		RF CIRCUIT 19C303472-G1 (4ER41B10, 12, 14) 19C303472-G2 (4ER41B11, 13, 15)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C301 thru C305		Refer to Mechanical Parts (RC-1341).
C307 and C308	19B209135-P1	Ceramic, feed-thru: .001 µf +150% -0%, 500 VDCW.
C311 and C312	19B209135-P1	Ceramic, feed-thru: .001 µf +150% -0%, 500 VDCW.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J441		(Part of W441, 442).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L301	19B204461-G4	Coil.
L302	19B200616-P2	Coil.
L303	19B204461-G4	Coil.
L304	19B204461-G1	Coil.
L305	19B200616-P1	Coil.
L306	19B204461-G1	Coil.
L307*	19B204461-G13	Coil.
	19B204461-G4	In Models of Rev A: Coil.
L308	19B204461-G6	Coil.
L309*	19B204461-G14	Coil.
	19B204461-G3	In Models of Rev A: Coil.
L310	19B204461-G5	Coil.
		- - - - - - - - - - CABLES - - - - - - - - - -
W441	19B205634-G2	Coaxial: includes connector (J441), approx 5 inches long.
W442	19B205634-G4	Coaxial: includes connector (J441), approx 5 inches long.
		METERING COVER 19C303676-G2
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 thru C5	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C10 and C11	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C13	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C15	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1002	19B205689-G2	Connector: 18 contacts.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P442	19B204727-P1	Connector: 18 contacts.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P471K	Composition: 470 ohms ±10%, 1/2 w.

SYMBOL	G-E PART NO	DESCRIPTION
		MECHANICAL PARTS (SEE RC-1341)
1	7145451-P1	Cable clamp.
2	19C303385-P2	Top cover (Mobile).
3	19C303495-G3	Top cover (Station).
4	19C303676-G2	Top cover (Metering). (See Metering Cover).
5	19C303394-G1	Heat sink.
6	19A121221-P1	Angle support. (Used with C307, 308 in RF Circuit, 19C303472-G1, 2).
7	4033089-P1	Clip. (Part of XY1-4 in A308-313).
8	19B200525-P9	Rivet. (Part of XY1-4 in A308-313).
9	19A115793-P1	Electrical contact. (Part of XY1-4 in A308-313).
10	19C311172-P1	Crystal socket. (Part of XY1-4 in A308-313).
11	4038844-G1	(Not used).
12	4034252-P5	Can. (Part of T2 in A329).
13	19C303389-G1	Chassis.
14	19B204396-P1	Support. (Used in A331, 332).
15	19A121071-P1	Plate.
16	19A121222-P1	Angle support. (Used with C311, 312 in RF Circuit, 19C303472-G1, 2).
17	19B216070-P1	RF plate.
18	4036765-G2	Screw: 6-32 threads. (Part of C301-305 in RF Circuit, 19C303472-G1, 2).
19	19D402607-P1	RF chassis.
20	4036765-G4	Screw: 6-32 threads. (Part of C301-305 in RF Circuit, 19C303472-G1, 2).
21	7117825-P1	Spring, washer;sim to Tinnerman C4578B-632-24. (Part of C301-305 in RF Circuit, 19C303472-G1,2).
22	4036899-P4	Ceramic insulator; sim to Centralab 3BX845C. (Part of C301-305 in RF Circuit, 19C303472-G1, 2).
23		(Not used).
24	19B204583-G3	Hinge.
25	4035439-P1	Transistor heat sink; sim to Birtcher 3AL-635-2R. (Used with Q10 in A330).
26	4036555-P1	Washer insulator: nylon. (Used with Q9, 10 in A330).
27	19B204583-G2	Hinge.
28	19A121676-P1	Guide pin.
29	19C303385-P1	Bottom cover (Mobile).
30	19C303495-G4	Bottom cover (Station).
31	19A121297-P1	Angle.
32	7160861-P4	Spring clip nut: sim to Tinnerman C6452-8Z-157.
33	4029851-P6	Cable clamp: nylon; sim to Weckesser 5/16-4.
34	19A115784-P1	Insulator. (Used with Q301).
35	19A121989-P1	Bushing. (Used with Q301).



RECEIVER MODELS 4ER41B10—15

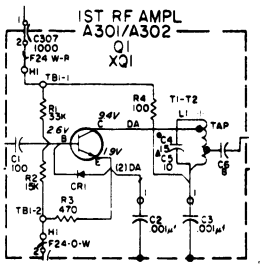
PRODUCTION CHANGES

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 - This revision was incorporated into initial shipments.

REV. B - To increase reliability of the RF Amplifier. Changed A301/A302 and L307/L309.

A301/A302 was:



REV. C - To improve 3000 cps audio response of IF/AUDIO BOARD A330. Added C76, C77, R78 and R79. Deleted C53 and R32.

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

REV. E - To improve receiver squelch hysteresis and audio squelch tail. Changed R64.

REV. F - To standardize manufacturing procedures. Deleted C315 & C316. Added C319, C320, L315 and L316.

REV. G - To improve audio sensitivity. Changed R43 on IF/AUDIO BOARD A330.

REV. H - To standardize manufacturing procedures. Changed C76, deleted C77 and added C53 on IF/AUDIO BOARD A330.

REV. J - To eliminate capacitor failures in positive ground installations. Added C20 and changed C62 on A330. Changed C320.

REV. K - To protect the PA transistor (Q301) from negative voltage spikes. Added CR301 in 12-volt supply line.

REV. L - To eliminate high frequency oscillations in the receiver PA caused by the use of a higher gain PA transistor. Added C78 from A330-J16 to ground.

REV. M - To facilitate the procurement of parts. Changed Q3 in 1st Mixer.

ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and G-E Part Number.

Service parts may be obtained from Authorized G-E Communication Equipment Service Stations or through any G-E Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. G-E Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

MAINTENANCE MANUAL

LBI-3706

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PRINTED IN U.S.A.

DF-1085