MOBILE RADIO

DESCRIPTION AND MAINTENANCE
MASTR® II 806—825 MHz STATION RECEIVER

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ILLUSTRATIONS

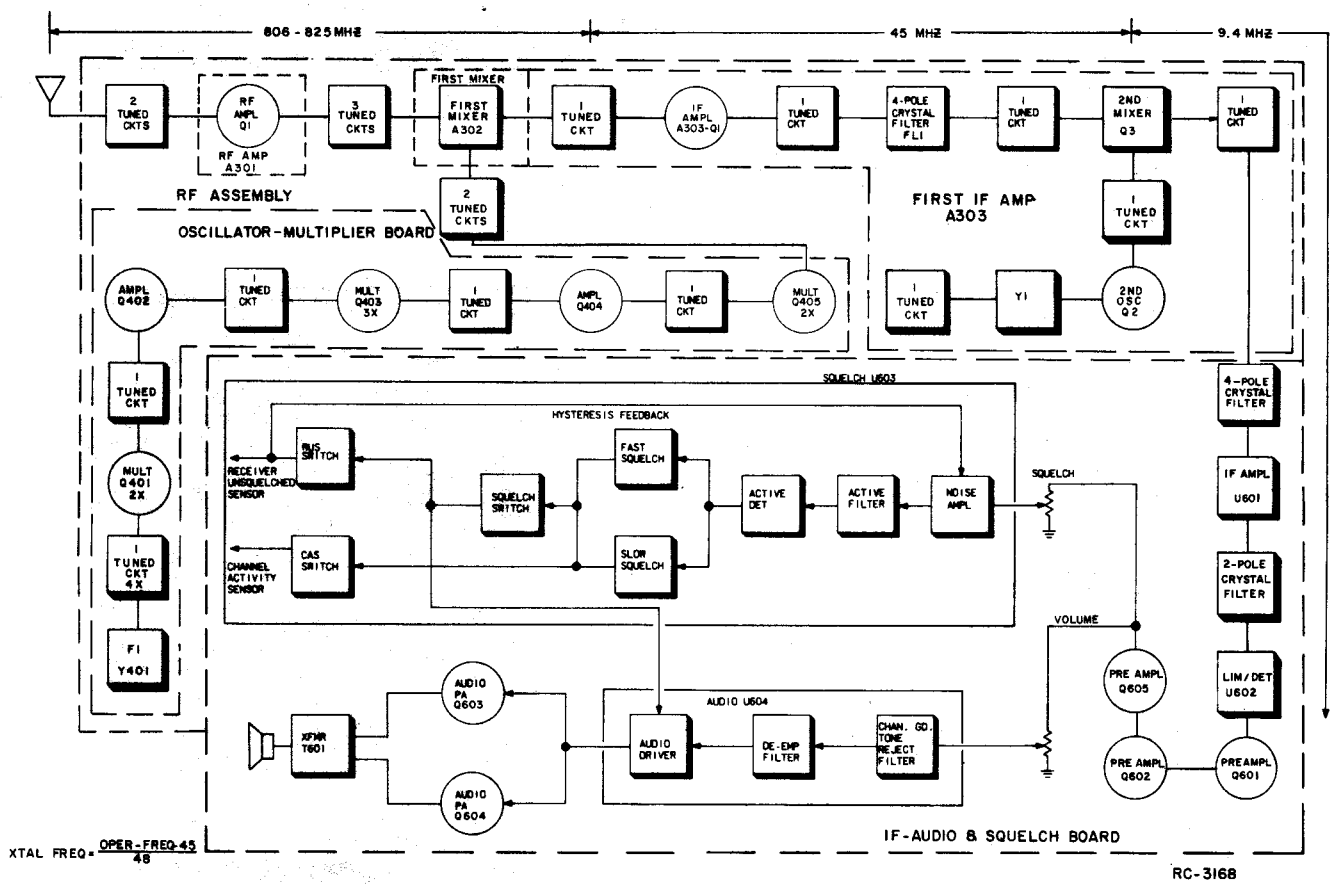

Figure 1 - Receiver Block Diagram

GENERAL ELECTRIC

DESCRIPTION

MASTR® II, 806-825 Megahertz station receivers are double conversion, superheterdyne FM receivers designed for one frequency operation. The solid state receiver utilizes integrated circuits (ICs), monolithic crystal filters and discrete components with each of the crystal filters located between gain stages to provide 80 dB selectivity and maximum protection from de-sensitization and intermodulation.

The receiver consists of the following modules:

- RF Assembly (Includes Mixer and IF-Amplifier)
- Oscillator/Multiplier (Osc/Mult)
- If/Audio and Squelch (IFAS)

Audio, supply voltages and control functions are connected to the system board through P903 on the Osc/Mult board, and P904 on the IFAS board. The regulated +10 Volts is used for all receiver stages except the audio PA stage which operates from the A+ system supply.

Centralized metering jack J601 on the IFAS board is provided for use with GE test Set 4EX3A11 or Test Kit 4EX8K12. The test set meters the oscillator, multiplier, IF Detector and IF amplifier stages. Speaker high and low are metered on the system board metering jack.

A block diagram of the complete receiver is shown in Figure 1.

Refer to the appropriate Maintenance Manual for complete details on each receiver module listed in the Table of Contents.

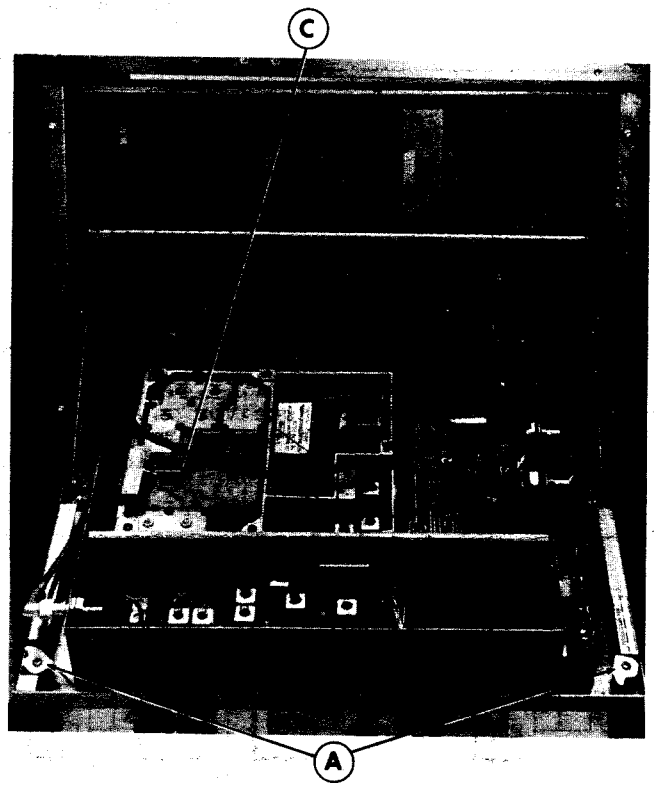

Figure 2 - Access to Receiver (Top & Bottom)

MAINTENANCE

DISASSEMBLY

For a more complete mechanical parts breakdown refer to the station manual. To service the receiver from the front:

1. Turn the two latching knobs (A) counterclockwise to unlatch the Radio Housing Front Door. Refer to Figure 2.
2. Swing the Radio Housing Front Door down as shown.
3. Remove the top cover.

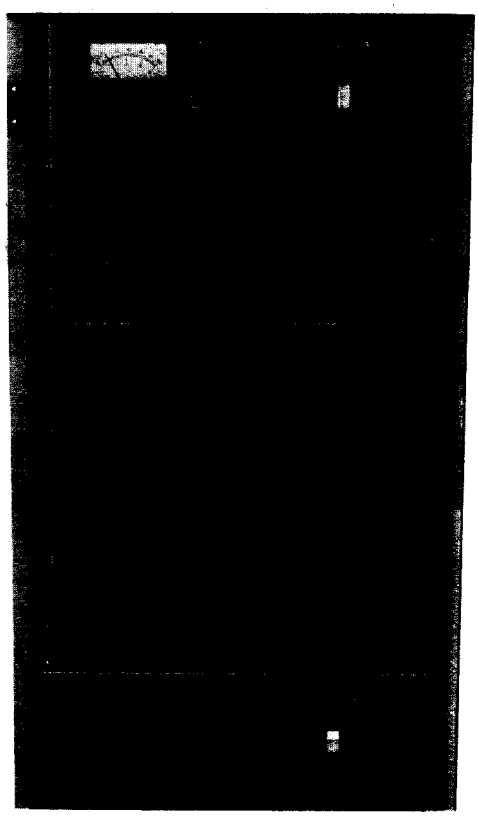

Figure 3 - Access to Wing Nut Holding Receiver Frame

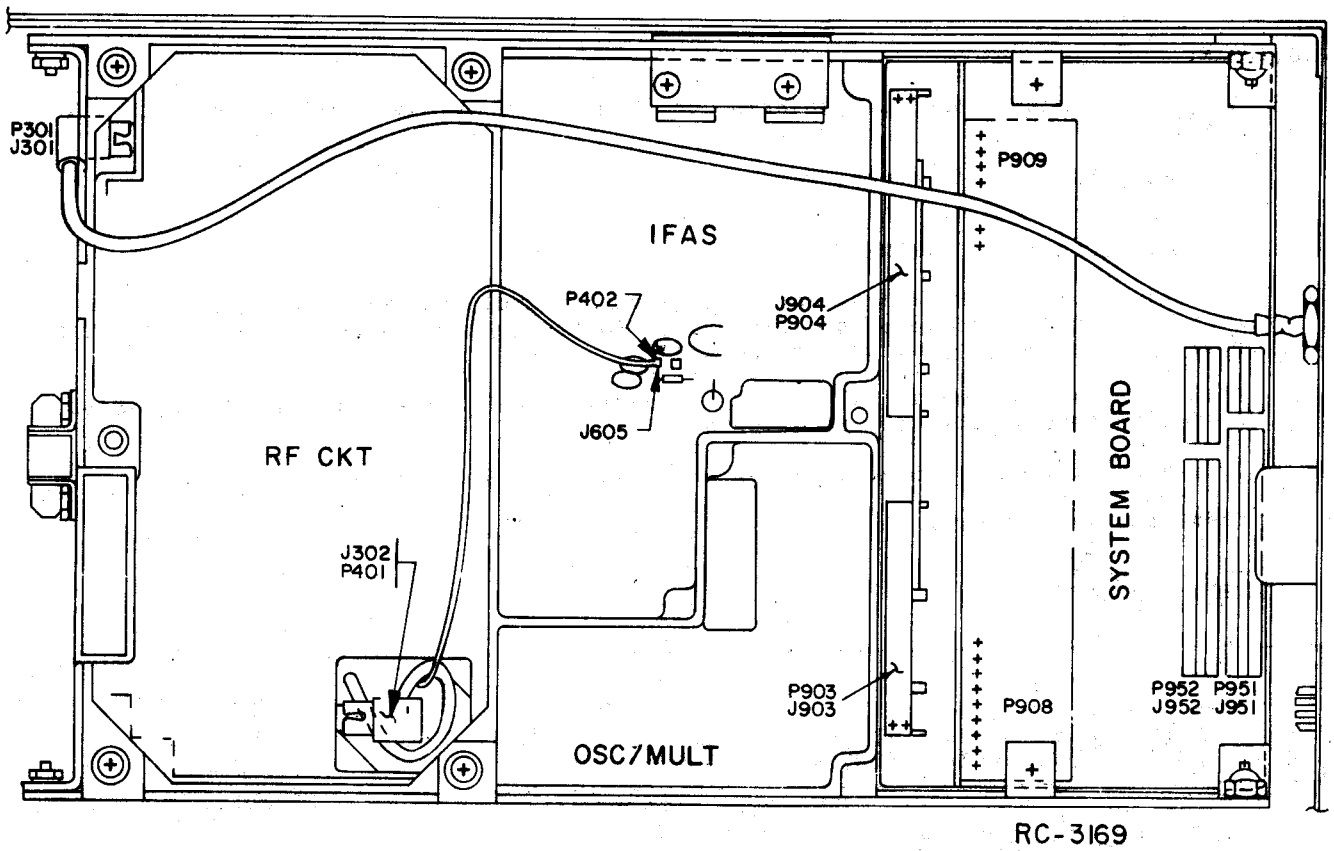

Figure 4 - Receiver Module Location

To service the receiver from the bottom or to remove any of the receiver boards:

1. Remove the wing nut (B) on the Radio Housing Front Door. Refer to Figure 3.
2. Turn the two latching knobs (A) counterclockwise to unlatch the Radio Housing Front Door. Refer to Figure 2.
3. Swing the Radio Housing Front Door down as shown.
4. Remove the top cover.
5. Grasp the Receiver Housing Handle at (C) and swing the Housing out to reveal the bottom side of the receiver.
6. Refer to Figure 4 for Receiver Module location.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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Printed in U.S.A.

FRONT END ALIGNMENT

EQUIPMENT

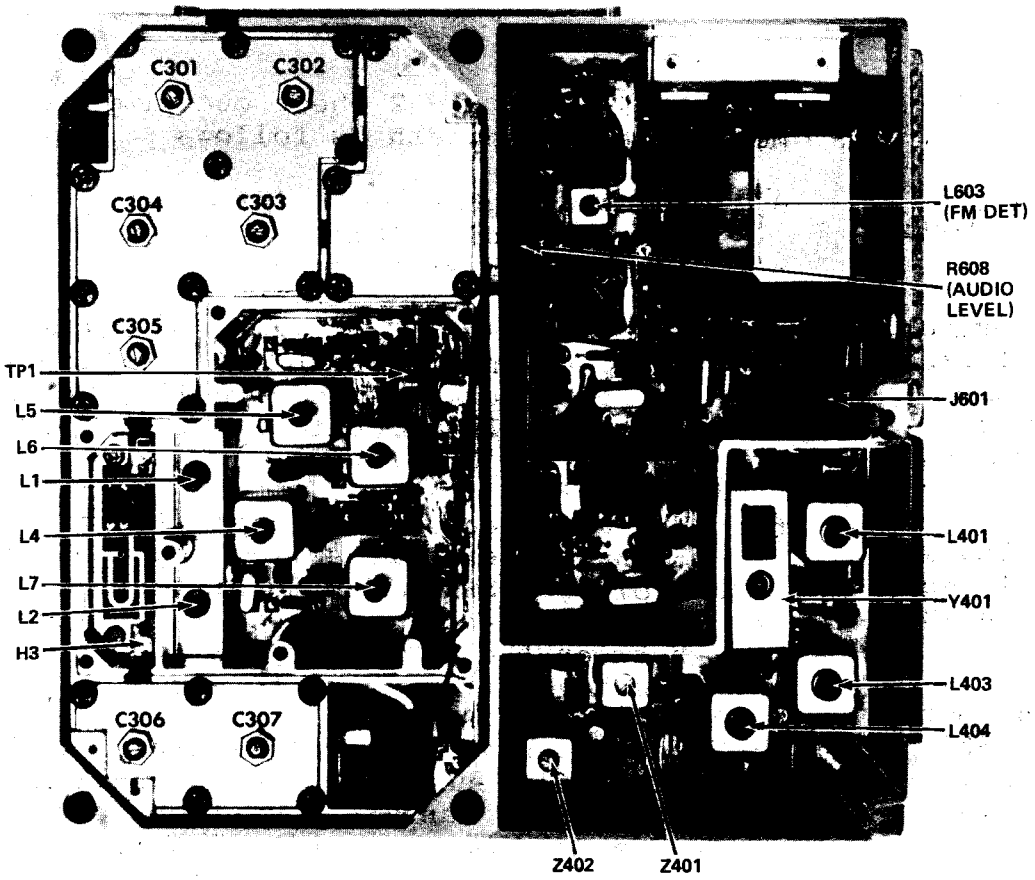
1. GE Test Set Models 4EX3A11, 4EX8K12, or 20,000 ohms-per-Volt multimeter with a 1-Volt scale.
2. A 806-825 MHz signal source.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect black plug from Test Set to Receiver Centralized Metering Jack J601, and red plug to system board metering jack J905. Set meter sensitivity switch to the TEST 1 position (or 1-Volt position on 4EX8K12).
2. With Test Set in Position J, check for regulated +10 Volts. If using multimeter, measure between J905-3 (+) and J905-9 (-).
3. If using multimeter, connect the negative lead to J601-9 (A-).
4. Disable Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION		TUNING CONTROL	METER READING	PROCEDURE
	GE Test Set	Multimeter - at J601-9	TUNING CONTROL		
			OSCILLATOR/MULTIPLIER		
1.	C (MULT-1)	Pin 3	L401, L403 & L404	Maximum	Tune L401, L403 & L404 for maximum meter reading.
2.	D (MULT-2)	Pin 4	Z401 & Z402	See Procedure	Tune Z401 for a peak then tune Z402 for a dip. Repeak Z401 for a maximum meter reading.
3.	F (MULT-3)	Pin 7	C306, C307, Z401 & Z402	See Procedure	Tune C307 for a peak and then C306 for a dip (C306 & C307 on RF Assembly) Readjust Z401 and Z402 for a peak.
			RF SELECTIVITY		
4.	B IF AMP	Pin 1	C301 thru C305, A303-L1	Maximum	Apply an on-frequency signal to the antenna jack. Increase the generator level until about 10 dB of noise quieting occurs. Then tune C301 through C305 and L1 (IF AMP) for best quieting, decreasing the level of the generator as the quieting improves to maintain about 10-20 dB of noise quieting. Repeat these adjustments until no further noise quieting improvement can be achieved.



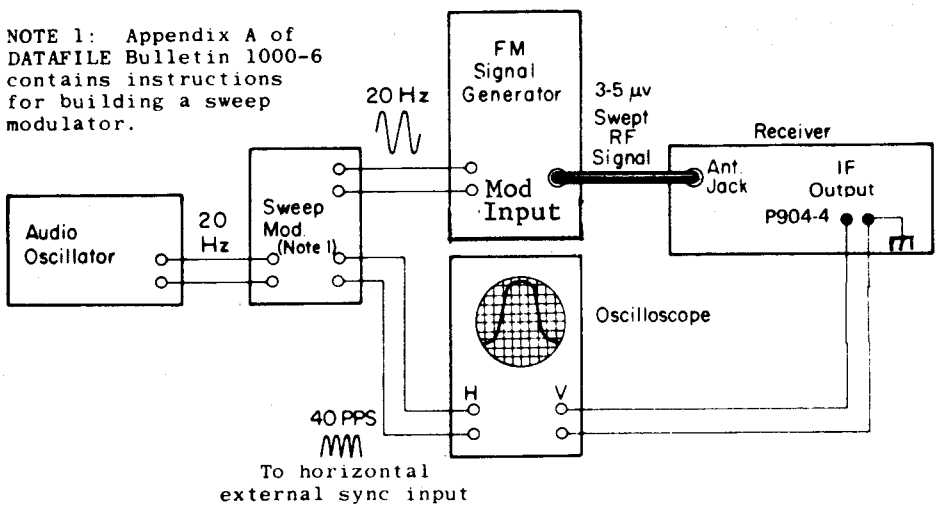


Figure 5 - Test Setup for 20-Hz Double-Trace Sweep Alignment

ICOM FREQUENCY ADJUSTMENT

First, check the frequency to determine if any adjustment is required. The frequency should be set with a frequency meter or counter with an absolute accuracy that is 5 to 10 times better than the tolerance to be maintained, and with the entire radio as near as possible to an ambient temperature of 27.5°C (81.5°F).

MASTR II ICOMs should be reset only when the frequency shows deviation in excess of the following limits:

A. ±0.2 PPM, when the radio is at 27.5°C (81.5°F).

B. 1 PPM at any other temperature within the range of -30°C to +85°C (-22°F to +185°F).

If an adjustment is required, pry up the cover on the top of the ICOM to expose the trimmer, and use one of the following procedures:

If the radio is at an ambient temperature of 27.5°C (81.5°F), set the oscillator for the correct operating frequency.

If the radio is not at an ambient temperature of 27.5°C, setting errors can be minimized as follows:

A. To hold the setting error to ±0.1 PPM (which is considered reasonable for 1 PPM ICOMs):

1. Maintain the radio at 27.5°C (±5°C) and set the oscillator to desired frequency, or -

2. Maintain the radio at 27.5°C (±10°C) and offset the oscillator, as a function of actual temperature, by the amount shown in the chart below.

For example: Assume the ambient temperature of the radio is 18.5°C (65.4°F). At that temperature, the curve shows a correction factor of 0.44 PPM. (At 806 MHz, 1 PPM is 761 Hz. At 825 MHz, 1 PPM is 780 Hz).

With the operating frequency of 825 MHz, set the oscillator for a reading of 343 Hz (0.44 x 780 Hz) higher than the licensed operating frequency. If a negative correction factor is obtained (at temperatures above 27.5°C), set the oscillator for the indicated PPM lower than the licensed operating frequency.

This example assumes the measurement is made at the injection frequency (FR -45) at H3 on the 1st mixer.

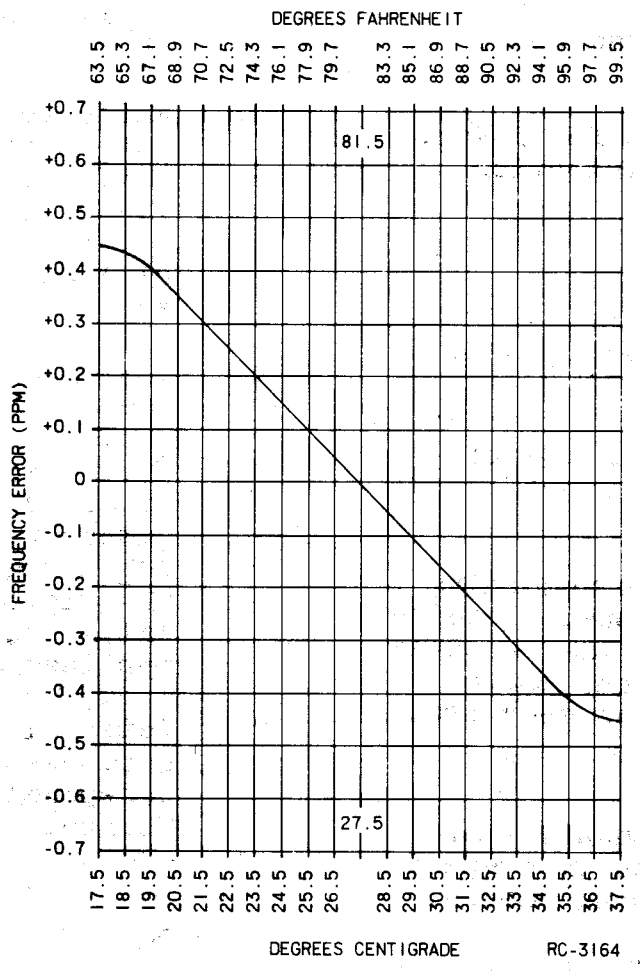


Figure 6 - Frequency Characteristics Vs. Temperature

COMPLETE RECEIVER ALIGNMENT

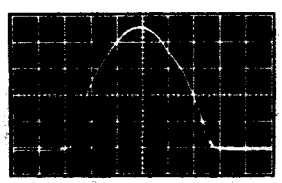
EQUIPMENT REQUIRED

1. GE Test Models 4EX3A11, 4EX8K12 (or 20,000 ohms-per-Volt multimeter with a 1-Volt scale).
2. A 806-825 MHz signal source (Cushman CE-6A or equivalent).
3. A VTVM.
4. Distortion Analyzer.
5. Frequency Counter.
6. RF Voltmeter.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect the black plug from the Test Set to receiver metering jack J601, and the red plug to system board metering jack J905. Set the meter sensitivity switch to the Test 1 (or 1-Volt position on the 4EX8K12).
2. With the Test Set in Position J, check for regulated +10 Volts. With multimeter, measure from J905-3 to J905-9.
3. If using multimeter, connect the negative lead to J601-9 (A-).
4. Disable the Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set	METERING POSITION: Multimeter - at J601-9	TUNING CONTROL	METER READING	PROCEDURE
			FM DETECTOR		
1.	A (FM DET)	Pin 2	L603	0.38 Volt	With no signal applied, adjust L603 for a meter reading of approximately 0.38 Volt.
			OSCILLATOR-MULTIPLIER		
2.	C (MULT-1)	Pin 3	L401, L403 & L404	Maximum	Tune L401, L403 & L404 for maximum meter reading.
3.	D (MULT-2)	Pin 4	Z401 & Z402	See Procedure	Tune Z401 for a peak then tune Z402 for a dip. Repeak Z401 for a maximum meter reading.
4.	F (MULT-3)	Pin 7	C306, C307, Z401 & Z402	See Procedure	Tune C307 for a peak and then C306 for a dip (C306 & C307 on RF assembly) Re-adjust Z401 and Z402 for a peak.
			RF SELECTIVITY		
5.			L6	See Procedure	Connect RF voltmeter to TP1. Adjust L6 for maximum meter reading.
6.			L5	See Procedure	Connect counter to TP1. Adjust L5 for 35.600 MHz (±100 Hz).
7.	B IF AMP	Pin 1	C301 thru C305, A303-L1.	Maximum	Apply an on-frequency signal to the antenna jack. Increase the generator level until about 10 dB of noise quieting occurs. Then tune C301 through C305 and L1 (IF AMP) for best quieting, decreasing the level of the generator as the quieting improves to maintain about 10-20 dB of noise quieting. Repeat these adjustments until no further noise quieting improvement can be achieved.
8.			L603, R608	See Procedure	Remove the Test set metering plug from J601. Apply a 100 microvolt signal with 1 kHz modulation and 3 kHz deviation to the antenna jack. Tune L603 for maximum voltage at 1.0 kHz and adjust R608 for 1 Volt RMS measured with a VTVM at P904-11 (VOL/SQ HI) and P904-17 (A-).
			MIXER & IF		
	The mixer and IF circuits have been aligned at the factory and will normally require no further adjustment. If adjustment is necessary, use the procedure outlined in STEP 10. NOTE: Refer to DATAFILE BULLETIN 1000-6 (IF Alignment of Two-Way Radio FM Receivers) for helpful suggestions on how to determine when IF Alignment is required.				
9.			L2 and L4		Connect scope, signal generator, and probe as shown in Figure 5. Set signal generator level for 3 to 5 μV and modulate with 10 kHz at 20 Hz. With probe between J601-1 and A-, tune L2 and L4 for double trace as shown on scope pattern. 
10.				See Procedure	Check to see that modulation acceptance bandwidth is greater than ±7 kHz.
			SQUELCH ADJUST		
11.			R953		Set SQUELCH ADJUST control (R953) to open with a 6 dB SINAD signal. (12 dB SINAD signal when receiver is used in GE-MARC V Applications). (Approximately 30° counterclockwise of critical squelch position).

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 the "Service Check" listed problem. Additional corre included in the Troublesho Before starting with the R dures, be sure the receive aligned to the proper oper

TEST EQUIPMENT REQUIRED

- Distortion Analyzer similar to:

  Heath IM-12

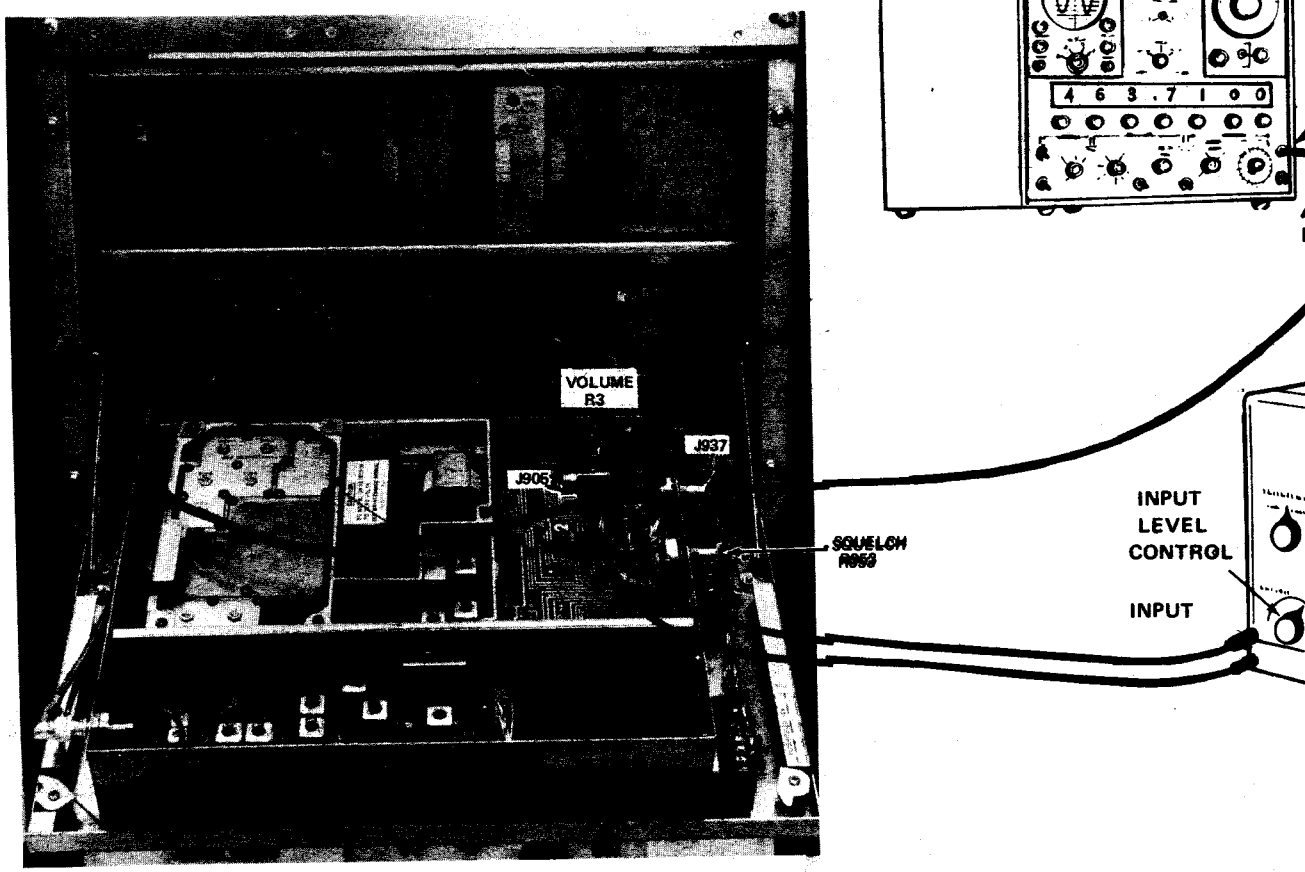
- Signal Generator similar to:

  Cushman CE-6A

- 40-dB attenuation pad, and 8.0-ohm, 15-Watt resistor

PRELIMINARY AD

1. Connect the test equ ver as shown for all receiver Test Proced
2. Turn the SQUELCH con for all steps of the
3. Turn on all of the e warm up for 20 minut



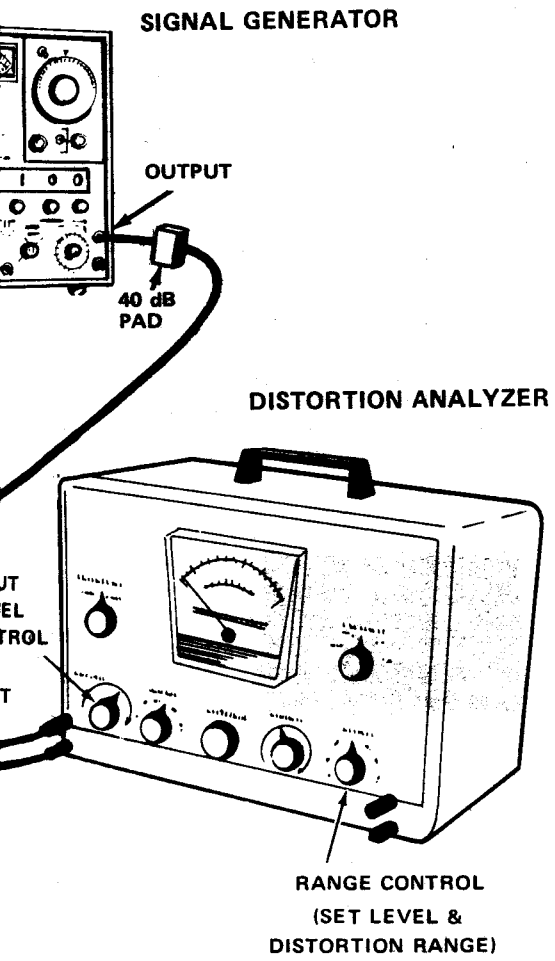
e is pin-pointed, refer to
' listed to correct the
al corrective measures are
oubleshooting Procedure.
th the Receiver Test Proce-
receiver is tuned and
per operating frequency.

Y ADJUSTMENTS

est equipment to the recei-
for all steps of the
Procedure.

LCH control fully clockwise
of the Test Procedure.

f the equipment and let it
0 minutes.



STEP 1
AUDIO POWER OUTPUT AND DISTORTION

TEST PROCEDURE

Measure Audio Power Output as follows:

A. Apply a 1,000-microvolt, on-frequency test signal modulated by 1,000 hertz with ±3.0 kHz deviation to antenna jack J937.

B. Disconnect speaker lead by unplugging P1102 from J1 on the back of the mother Board of the control shelf. If a service speaker is present, put the switch in the OFF position.

Connect an 8.0-ohm, 15-Watt load resistor from J905-1 to J905-2 on the System Jack. Connect the Distortion Analyzer input across the resistor as shown.

With 5-Watt Speaker: Extended Local Control.

Adjust the Volume Control R3 for 5-Watt output 6.4 VRMS using the Distortion analyzer as a VTVM.

OR

With 1-Watt Service Speaker

Set the service speaker switch in the OFF position.

Adjust the VOLUME control for 1-Watt output 2.9 VRMS using the Distortion Analyzer as a VTVM.

C. Make distortion measurements according to manufacturer's instructions. Reading should be less than 3%. If the receiver sensitivity is to be measured, leave all controls and equipment as they are.

SERVICE CHECK

If the distortion is more than 3%, or maximum audio output is less than specified above, make the following checks.

D. Regulator voltage---low voltage will cause distortion. (Refer to Receiver Schematic Diagram for voltages).

E. Audio Gain (Refer to Receiver Troubleshooting Procedure).

F. FM Detector Alignment (Refer to Receiver Alignment on reverse side of page).

STEP 2
USABLE SENSITIVITY
(12-dB SINAD)

If STEP 1 checks out properly, measure the receiver sensitivity as follows:

A. Apply a 1000-microvolt, on-frequency signal modulated by 1000 Hz with 3.0-kHz deviation to J937.

B. Place the RANGE switch on the Distortion Analyzer in the 200 to 2000-Hz distortion range position (1000-Hz filter in the circuit). Tune the filter for minimum reading or null on the lowest possible scale (100%, 30%, etc.)

C. Place the RANGE switch to the SET LEVEL position (filter out of the circuit) and adjust the input LEVEL control for a +2 dB reading on a mid range (30%).

D. While reducing the signal generator output, switch the RANGE control from SET LEVEL to the distortion range until a 12-dB difference (+2 dB to -10 dB) is obtained between the SET LEVEL and distortion range positions (filter out and filter in).

E. The 12-dB difference (Signal plus Noise and Distortion to noise plus distortion ratio) is the "usable" sensitivity level. The sensitivity should be less than rated 12 dB SINAD specifications with an audio output of at least 2.5 Watts (4.5 Volts RMS across the 8.0-ohm receiver load using the Distortion Analyzer as a VTVM) or 0.5 Watts (1.4 VRMS) for service speaker application.

F. Leave all controls as they are and all equipment connected if the Modulation Acceptance Bandwidth test is to be performed.

SERVICE CHECK

If the sensitivity level is more than rated 12 dB SINAD, check the alignment of the RF stages as directed in the Alignment Procedure, and make the gain measurements as shown on the Troubleshooting Procedure.

STEP
MODULATION
BANDWIDTH (IF

If STEPS 1 and 2 che
measure the bandwidth as

A. Set the Signal Gener
the microvolt readin
12-dB SINAD measurem

B. Set the RANGE contro
Analyzer in the SET
Hz filter out of the
the input LEVEL cont
ing on the 30% range

C. While increasing the
Signal Generator, sw
trol from SET LEVEL
u until a 12-dB differ
between the SET LEVE
readings (from +2 dB

D. The deviation contro
12-dB difference is
Acceptance Bandwidth
It should be more th

SERVICE

If the Modulation Ac
test does not indicate th
gain measurements as show
Troubleshooting Procedure

STEP 3
MODULATION ACCEPTANCE BANDWIDTH (IF BANDWIDTH)

If STEPS 1 and 2 check out properly, measure the bandwidth as follows:

A. Set the Signal Generator output for twice the microvolt reading obtained in the 12-dB SINAD measurement.

B. Set the RANGE control on the Distortion Analyzer in the SET LEVEL position (1000-Hz filter out of the circuit), and adjust the input LEVEL control for a +2 dB reading on the 30% range.

C. While increasing the deviation of the Signal Generator, switch the RANGE control from SET LEVEL to distortion range until a 12-dB difference is obtained between the SET LEVEL and distortion range readings (from +2 dB to -10 dB).

D. The deviation control reading for the 12-dB difference is the Modulation Acceptance Bandwidth of the receiver. It should be more than ±7 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 I - QUICK CHECKS

TEST SET CHECKS

These checks are typical voltage readings measured with GE Test Set Model 4EX3A11 in the Test 1 position, or Model 4EX8K12 in the 1-Volt position.

METERING POSITION	Reading With No Signal In
A (FM DET)	Approximately 0.38 VDC
B (IF AMP)	0.0
C (MULT-1)	0.9 VDC
D (MULT-2)	0.7 VDC
F (Mult-3)	0.5 VDC
J (Reg. +10 Volts at System Metering jack)	+10 VDC

STEP 4-VOLTA

EQUIPMENT REQUIRED:

1. RF VOLTMETER (SIMILAR TO BOO TYPE MV-18C.
2. SIGNAL ON RECEIVER FREQUENC FREQUENCY CAN BE DETERMINED USE 1,000 HERTZ SIGNAL WITH 3.

PROCEDURE:

1. APPLY PROBE TO INPUT OF STAG PEAK RESONANT CIRCUIT OF STA VOLTAGE READING (E_1).
2. MOVE PROBE TO INPUT OF FOLLO FIRST RESONANT CIRCUIT THEN AND TAKE READING (E_2).
3. CONVERT READINGS BY MEANS OF VOLTAGE RATIO = $\frac{E_2}{E_1}$
4. CHECK RESULTS WITH TYPICAL VO

SYMPTOM CHECKS

SYMPTOM	PROCEDURE
NO SUPPLY VOLTAGE	• Check power connections, continuity of supply leads. Check fuse and replace if blown. Check receiver for short circuits.
NO REGULATED 10-VOLTS	• Check the 117-Volt supply. Then check 10-Volt regulator circuit. (See Troubleshooting Procedure for 10-Volt Regulator).
LOW IF AMP READING	• Check supply voltages and then check oscillator readings at P904-1 & -2 as shown in STEP 2. • Make SIMPLIFIED VTVM GAIN CHECKS from Mixer through IF Amplifier stages as shown in STEP 2.
LOW OSCILLATOR/MULTIPLIER READINGS	• Check alignment of Oscillator/Multiplier chain. (Refer to Front End Alignment Procedure). • Check voltage readings of Oscillator/Multiplier chain (Q401, Q402, Q403, Q404 and Q405).
LOW RECEIVER SENSITIVITY	• Check Front End Alignment. (Refer to Receiver Alignment Procedure). • Check antenna connections, cable and antenna switch. • Check both Oscillator injection voltages. • Check voltage readings of IF Amplifiers. • Make SIMPLIFIED GAIN CHECKS (STEP 2).
IMPROPER SQUELCH OPERATION	• Check voltages on Schematic Diagram. • Make gain and waveform checks with noise. • Make gain and waveform checks with 6 kHz signal. • Check discrete components in the squelch circuit Replace IC circuit U603.
LOW OR DISTORTED AUDIO	• Check voltages on Schematic Diagram. • Make gain and waveform checks. • Check receiver and alignment and FM DET output. • Check Q601, Q602, Q605 and other discrete components. • Replace IC circuit U604.

OLTAGE RATIO READINGS →

AR TO BOONTON MODEL 91-CA OR MILLIVAC

FREQUENCY (BELOW SATURATION). CORRECT
TERMINED BY FM DET READING OF 0.38 VDC.
AL WITH 3.0 KHz DEVIATION.

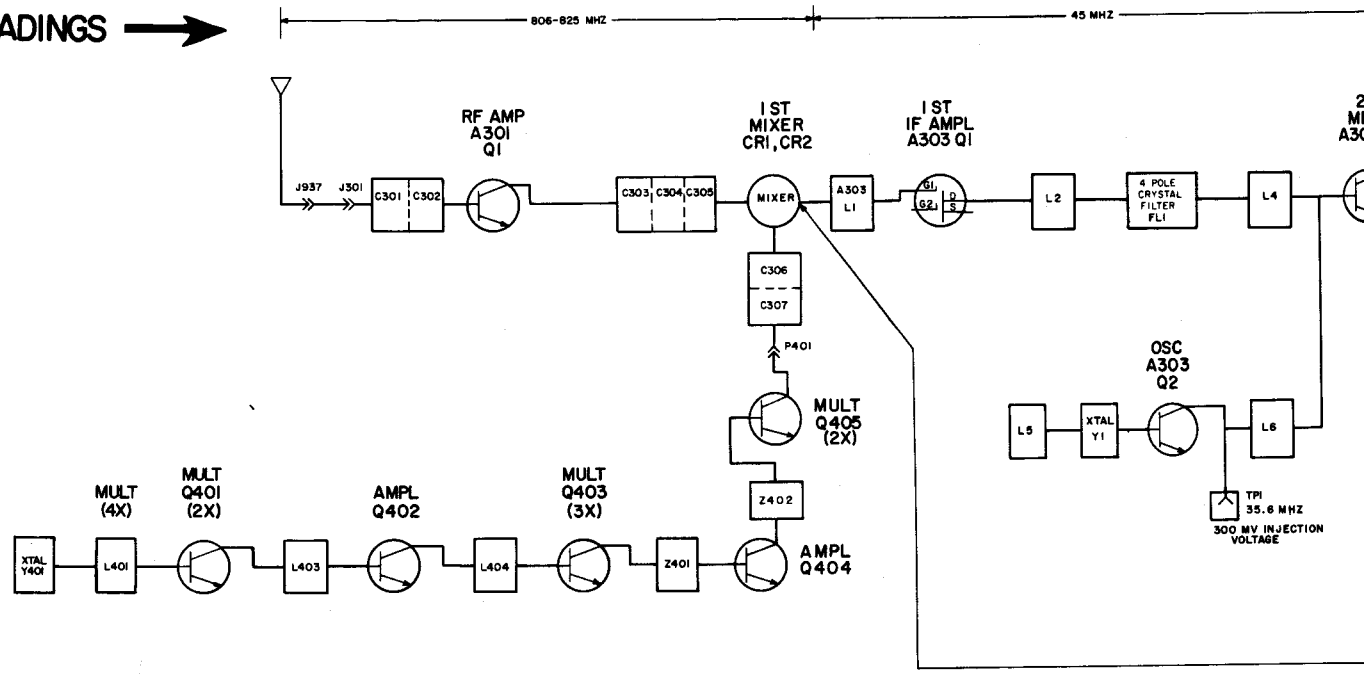
T OF STAGE (FOR EXAMPLE, SOURCE OF RF AMP).
IT OF STAGE BEING MEASURED AND TAKE

OF FOLLOWING STAGE (MIXER). REPEAK
JIT THEN PEAK CIRCUIT BEING MEASURED
2).

MEANS OF THE FOLLOWING FORMULA.

$= \frac{E_2}{E_1}$

TYPICAL VOLTAGE RATIOS SHOWN ON DIAGRAM.

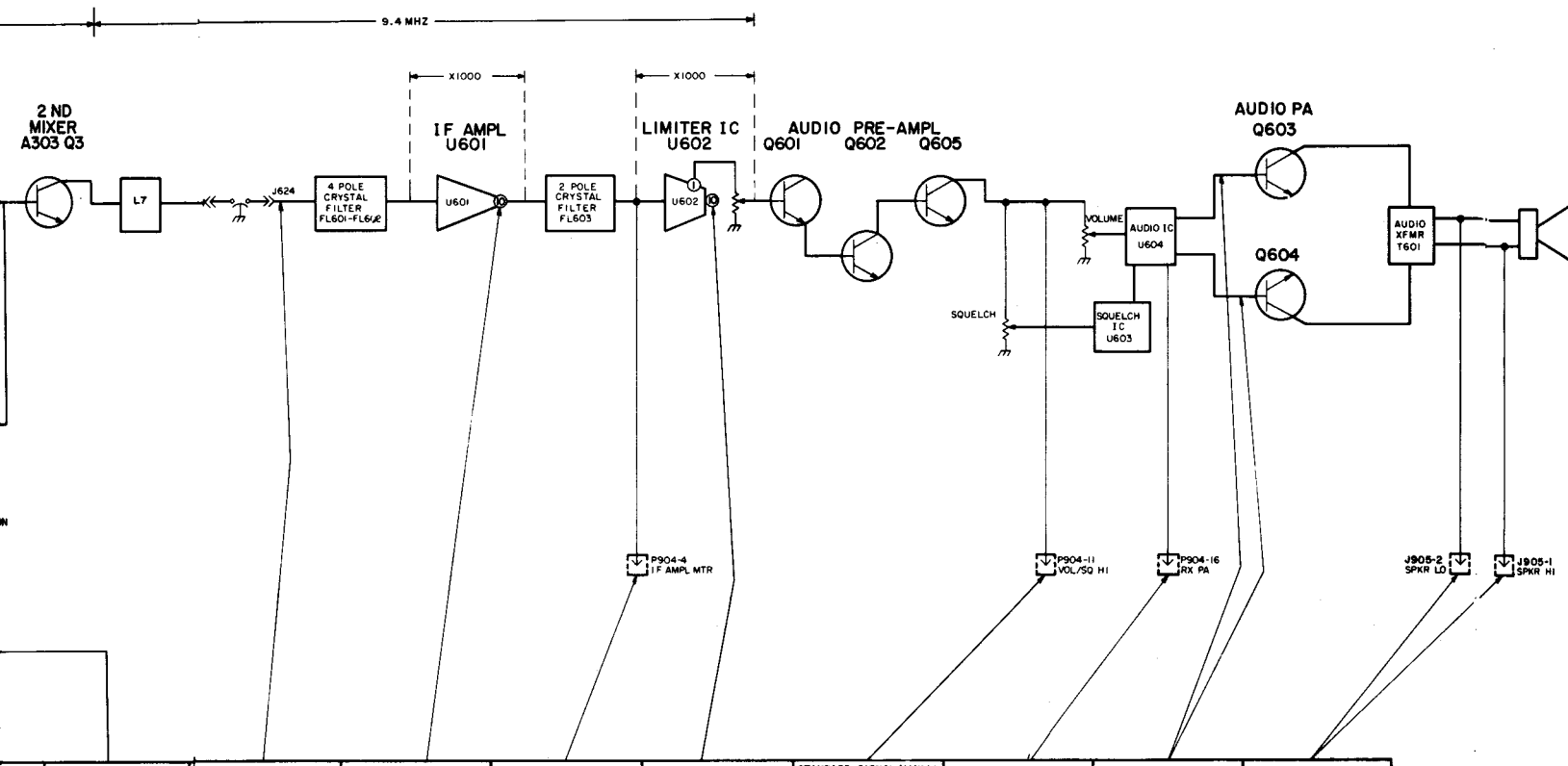


STEP 2-SIMPLIFIED GAIN CHECKS →

EQUIPMENT REQUIRED:
1. VTVM - AC & DC
2. SIGNAL GENERATOR
3. RF VOLTMETER

PRELIMINARY STEPS:
1. SET VOLUME R3 CONTROL FOR 6.4 VOLTS ACROSS 8-OHM LOAD. IF THIS CANNOT BE OBTAINED, SET TO APPROX. 70% OF MAX. ROTATION.
2. SET SQUELCH CONTROL FULLY COUNTERCLOCKWISE.
3. RECEIVER SHOULD BE PROPERLY ALIGNED.
4. CONNECT METER BETWEEN A- AND POINTS INDICATED BY ARROW.

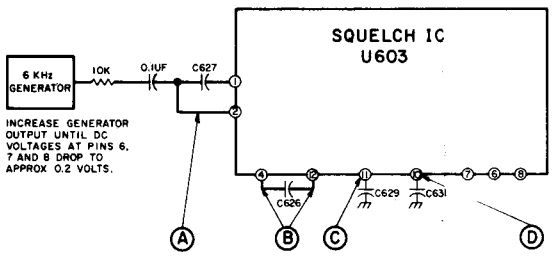
SET SIGNAL GENERATOR TO CORRECT RF FREQUENCY AND APPLY TO A301-J1.
PROCEDURE
READING



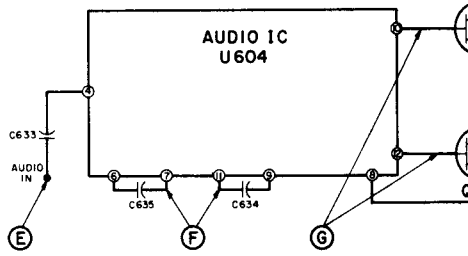
ERATOR REQUENCY (I-J).	UNMODULATED	UNMODULATED	UNMODULATED	UNMODULATED	NO SIGNAL INPUT	STANDARD SIGNAL (1 MILLIVOLT AT RECEIVER FREQ MODULATED BY 1 KHz WITH 3.0 KHz DEVIATION)	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL
E	SET GENERATOR OUTPUT AT 30 MV.	SET GENERATOR OUTPUT AT 1000 MICROVOLTS	INCREASE GENERATOR OUTPUT FROM ZERO UNTIL U601 SATURATES AS MEASURED WITH RF VOLTMETER	INCREASE GENERATOR OUTPUT FROM ZERO TO 40 MICROVOLTS	SHOULD BE IN SATURATION AT ALL TIMES				WITH SPEAKER DISCONNECTED, CONNECT VTVM OR SCOPE ACROSS 8-OHM LOAD CONNECTED BETWEEN J905-1 AND J905-2
	RF VOLTMETER READING SHOULD BE APPROX. 100 MV.	RF VOLTMETER READING SHOULD BE APPROX 200 MILLIVOLTS	GENERATOR OUTPUT SHOULD BE APPROX 20 MICROVOLTS	VTVM READING SHOULD BE APPROX 0.2 VDC	RF VOLTMETER READING SHOULD BE APPROX 0.6 V RMS	VTVM READING SHOULD BE APPROX 1.0 VAC	VTVM READING SHOULD BE APPROX 0.12 VAC	VTVM READING SHOULD BE APPROX 4.4 VAC	6.4 VAC

STEP 3-AUDIO & SQUELCH WAVEFORMS

EQUIPMENT REQUIRED:
1. OSCILLOSCOPE CONNECTED BETWEEN A- AND POINTS INDICATED BY ARROW.
2. SIGNAL GENERATOR (CUSHMAN CE-6A OR EQUIVALENT.
3. 6 KHz GENERATOR

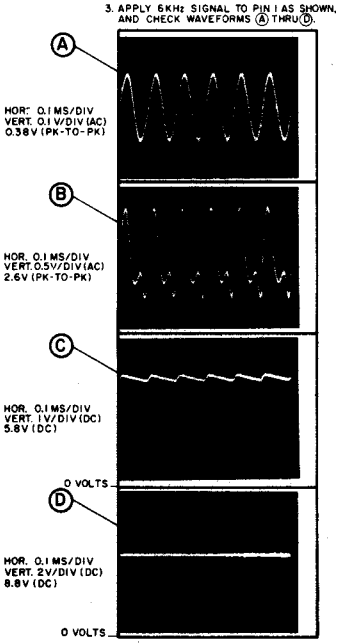


INCREASE GENERATOR OUTPUT UNTIL DC VOLTAGES AT PINS 6, 7 AND 8 DROP TO APPROX 0.2 VOLTS.



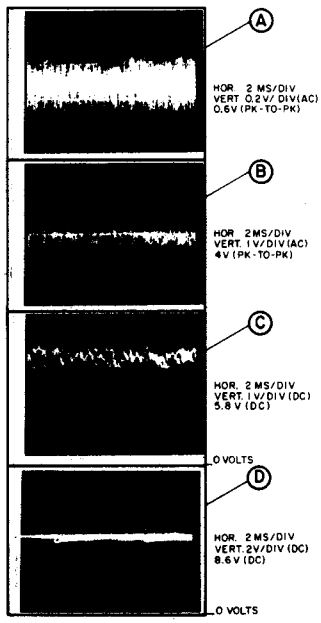
SQUELCH CIRCUIT CHECKS WITH 6 KHz SIGNAL:

PRELIMINARY STEPS
1. QUIET RECEIVER WITH A 1000 MICROVOLT, UNMODULATED SIGNAL.
2. SET SQUELCH CONTROL TO APPROX MID-RANGE.
3. APPLY 6KHz SIGNAL TO PIN 1 AS SHOWN, AND CHECK WAVEFORMS (A) THRU (D).



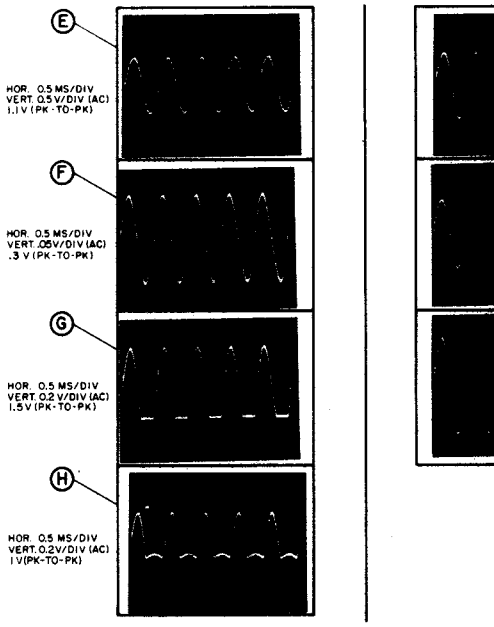
SQUELCH CIRCUIT CHECK WITH NOISE:

PRELIMINARY STEPS
1. NO INPUT SIGNAL APPLIED.
2. SET SQUELCH CONTROL FOR CRITICAL SQUELCH.
3. CHECK WAVEFORMS (A) THRU (D).



AUDIO CIRCUIT CHECK WITH STANDARD SIGN (1000 MICROVOLTS AT RECEIVER FREQ: MODULATED BY 1 KHz WITH 3.0 KHz DEVIAT

PRELIMINARY STEPS
1. SET VOLUME CONTROL FOR 6.4 VOLTS ACROSS 8-OHM, 12 WATT LOAD.
2. SET SQUELCH CONTROL FULLY COUNTERCLOCKWISE.
3. CHECK WAVEFORMS (E) THRU (L).



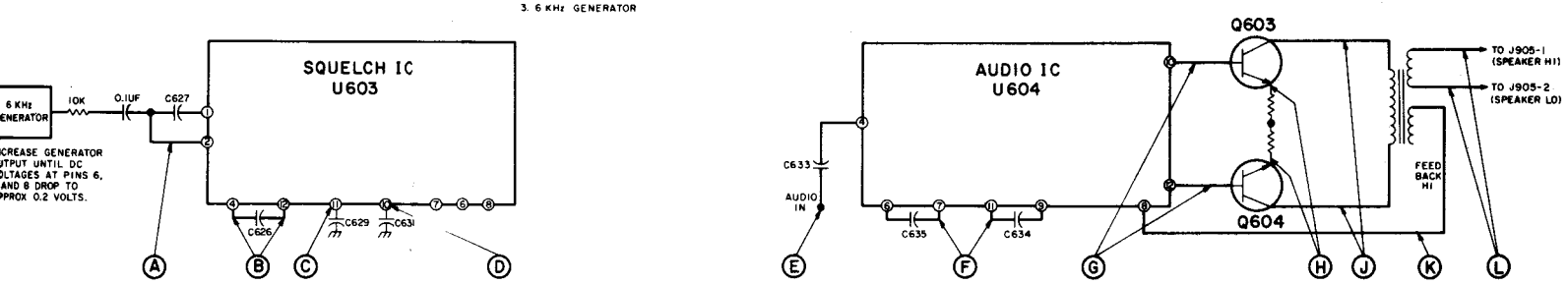
TROUBLESHOO

806—825 MHz MASTR II

Issue 1

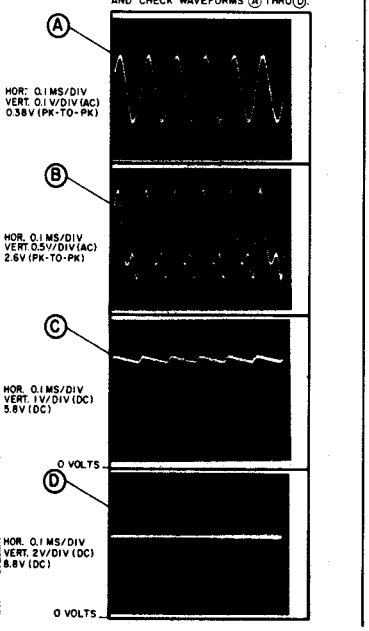
STEP 3-AUDIO & SQUELCH WAVEFORMS

EQUIPMENT REQUIRED:
1. OSCILLOSCOPE CONNECTED BETWEEN A- AND POINTS INDICATED BY ARROW.
2. SIGNAL GENERATOR (CUSHMAN CE-6A OR EQUIVALENT.
3. 6 KHz GENERATOR



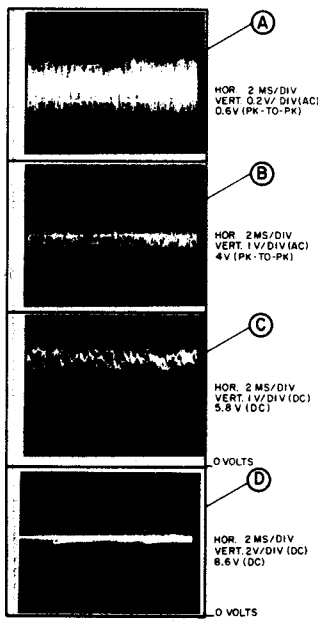
SQUELCH CIRCUIT CHECKS WITH 6 KHz SIGNAL:

PRELIMINARY STEPS
1. QUIET RECEIVER WITH A 1000 MICROVOLT, UNMODULATED SIGNAL.
2. SET SQUELCH CONTROL TO APPROX MID-RANGE.
3. APPLY 6KHz SIGNAL TO PIN 1 AS SHOWN, AND CHECK WAVEFORMS (A) THRU (D).



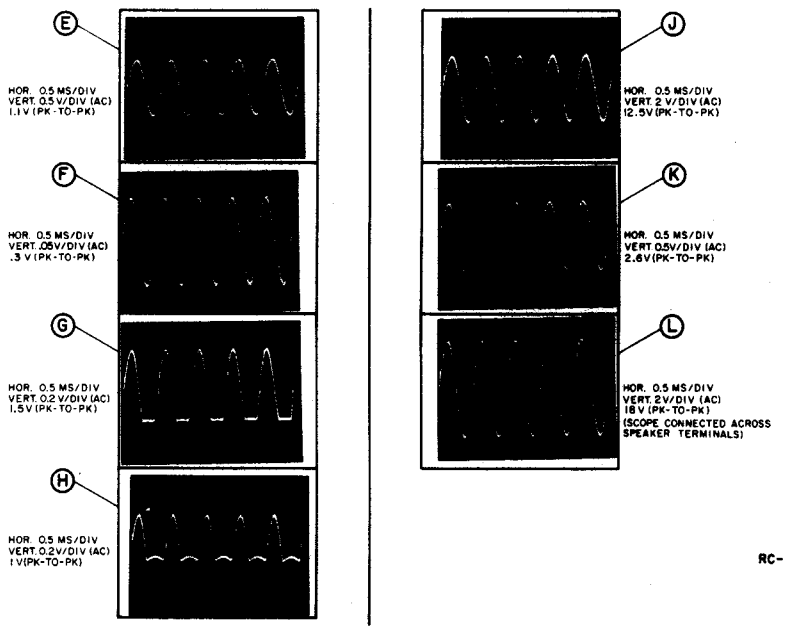
SQUELCH CIRCUIT CHECK WITH NOISE:

PRELIMINARY STEPS
1. NO INPUT SIGNAL APPLIED.
2. SET SQUELCH CONTROL FOR CRITICAL SQUELCH.
3. CHECK WAVEFORMS (A) THRU (D).



AUDIO CIRCUIT CHECK WITH STANDARD SIGNAL (1000 MICROVOLTS AT RECEIVER FREQ: MODULATED BY 1 KHz WITH 3.0 KHz DEVIATION)

PRELIMINARY STEPS
1. SET VOLUME CONTROL FOR 6.4 VOLTS ACROSS 8-OHM, 12 WATT LOAD.
2. SET SQUELCH CONTROL FULLY COUNTERCLOCKWISE.
3. CHECK WAVEFORMS (E) THRU (L).



RC-3170