

DATE <u>5/8/57</u>	TMC SPECIFICATION NO. S -333
SH. <u>1</u> OF <u>6</u>	
COMPILED BY <u>P. L. K.</u>	TITLE: <u>GSB-1 MARK II TEST PROCEDURE</u>
APPROVED <u>P. L. K. HJT</u>	JOB

I. PURPOSE:

This Specification covers the complete test procedure for the GSB-1. The GSB-1, when used with any receiver which provides a nominal 455 Kc. I.F. output will demodulate AM, SSB, CW and FS signals.

II. DESCRIPTION OF CONTROLS:

- A. Audio Gain Control affects the output level of the Audio Amplifier. Complete counter clockwise operation shuts the GSB-1 off.
- B. Sideband Lower/Upper places the 1st oscillator for proper relation of a sideband to the bandpass filter. In the Upper position, the oscillator frequency is 472 KC, in the Lower position, it is 438 KC.
- C. Bandsread varies the 1st oscillator over a nominal ± 3 KC. from its 472 KC or 438 KC.
- D. AM/SSB switch turns the 17 KC oscillator on in SSB position.
- E. The noise limiter, when ON, filters pulse noise from both peaks of the audio signal.
- F. AVC
 1. ON/OFF switch places or removes AVC control voltage from 1st I.F. amplifier.
 2. Slow/Fast switch changes time constant of AVC circuit.
- G. Phone Jack - When phone plug is inserted in jack, the audio output is removed from the terminals E1 at rear of chassis.

III. TEST EQUIPMENT REQUIRED:

- A. R.F. signal generator - 455 KC.
- B. Audio generator - H.P. 200 G
- C. VTVM Hewlett Packard H.P. 410 B
- D. ACVTVM - Heathkit or Daven
- E. 600 ohm - 10 watt resistor
- F. .01 μ fd. 400 volt capacitor
- G. Oscilloscope
- H. Eput Counter

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IV. PROCEDURE:

A. Power Supply - Line cord disconnected.

1. Check for short to ground on C36 A, B, C, D.

B. Power Supply - Line cord connected.

Power ON - Line voltage set to 115 VAC

1. Measure with D.C. VTVM B + voltage as follows:

- A. C36A + 290
- C36B + 260
- C36C + 225
- C36D + 250

- B. Pin 1 of V8
- AM/SSB on AM + 150 V
- AM/SSB on SSB + 150 V

2. Measure AC filament voltages on pin 4 and 9 of V10 - Should be between 6.0 and 6.6 volts.

C. Audio Amplifier Check

- 1. Connect Audio Generator through .01 μ fd capacitor to pin 7 of V5.
- 2. AM/SSB switch in AM position.
- 3. Audio Gain - Fully clockwise
- 4. Noise Limiter - OFF
- 5. 600 ohm load resistor across E1 - 600 ohm terminals.
- 6. Oscilloscope and AC - VTVM across 600 ohm load resistor.
- 7. Adjust Audio Generator output at 1 KC to obtain maximum undistorted output across 600 ohm load. Voltage across 600 ohm load should be greater than 24.5 volts.
- 8. Input voltage to V5 should be less than .05 volts.
- 9. Keeping Audio Generator voltage constant at above voltage, change frequency and note GSB-1 output voltage.

<u>FREQUENCY</u>	<u>E OUTPUT</u>
1 KC	24.5
5 KC	5.0
17 KC	0.2

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10. With Audio Generator set to 1 KC switch noise limiter ON, GSB-1 output should drop by no more than
11. Plug in head phones. Output across 600 ohm load should disappear and appear in headphones.

D. 17 KC OSCILLATOR ADJUSTMENT

1. Set Audio Generator to 17,000 cps and generator output of 10.0 volts.
2. Connect CRO to pin 5 of V5.
3. Place AM/SSB switch in SSB position.
4. Adjust C2₁ to obtain zero beat pattern on CRO.
5. Measure with DC VTVM
 - A. Pin 2, V3 - 35 V. \pm 5
 - B. Pin 1, V5 - 10 V. \pm 2
6. Set Audio Generator to 18,000 cps. and input voltage of .1.
7. Note output voltage across 600 ohm load should be 24.5 V.
8. Remove Audio Generator.
9. Measure 17 KC output across 600 ohm load. With Audio Gain control fully on - output should be less than 5 V. Decreasing Audio Gain decreases output.

E. FIRST OSCILLATOR ADJUSTMENT

1. Connect R.F. Signal Generator to pin 7 of V2. Set frequency to 472.00 KC.
2. Connect CRO to pin 5 of V2.
3. Turn UPPER/LOWER switch to UPPER.
4. Tune slug of L₁ (available from top of chassis) to obtain a zero beat on CRO.
5. Set R.F. Signal Generator to 438.00 KC.
6. Set UPPER/LOWER switch to LOWER.

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7. Adjust C 16 to obtain a zero beat on CRO. (available from top of chassis.)
8. Measure with D.C. VTVM in both UPPER and LOWER positions.
Pin 1 of V4 11.0 ± 1.0
Pin 1 of V2 11.0 ± 1.0

F. BANDSPREAD CHECK

Vary Bandspread control to both plus and minus positions. Determine oscillator frequency with zero beat method. Shift of oscillator should check against dial within ± 100 cps in both UPPER and LOWER positions.

G. FILTER CHECK

1. Connect Audio Generator to pin 7 of V2.
2. Connect AC VTVM to pin 7 of V5.
3. Tune Generator between 17 and 20 KC to obtain a peak and set output to obtain 0.8 volts on meter.
4. Check Bandpass Filter characteristics as follows:
17.30 and 19.80 KC - 6db ± 1db
16.80 and 20.30 KC -40db ± 1db

H. SENSITIVITY CHECK

1. Connect R.F. Signal Generator to I.F. input jack.
2. AVC OFF.
3. AM/SSB on AM.
4. Bandspread on center zero.
5. Tune Generator to approximately 455 KC, modulated 100 % at 1 KC and adjust its output to give GSB output of 25 volts.
6. Change sideband and retune generator with out changing its output. GSB-1 output should be the same.

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7. Generator input should be .1 volt \pm .05.
8. Remove generator modulation.
9. Place AM/SSB in SSB operation.
10. Adjust signal generator frequency to give GSB-1 output frequency of approximately 1 KC. Adjust signal generator output to give GSB-1 output of 25 volts. Input should be less than .04 volt.
11. Change sidebands and recheck step 10.

I. AVC CHECK

1. Increase generator input to 1 volt.
2. Reduce Audio Gain to 25.0 volt output.
3. Switch AVC ON in FAST position. Note rate of output drop.
4. Switch AVC OFF in SLOW position.
5. Switch AVC ON in SLOW position. Note rate of output drop should be slower than step 3.

J. HUM CHECK

1. Remove generator.
2. Switch AM/SSB to AM.
3. Audio Gain fully ON.
4. Output should be below .15 volt.

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THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, NEW YORK

Test data sheet GSE-1

Part of TMC Specification S-333

Serial Number	_____
17 KC Osc.	_____
472 KC Osc.	_____
438 KC Osc.	_____
Dial Calibration	_____
Sensitivity AM	_____
SSB	_____
Audio Output Line	_____
Speaker taps	_____
Phones	_____
Controls Bandspread	_____
Sideband Upper/Lower	_____
Audio Gain	_____
AVC On/Off	_____
Fast/Slow	_____
Noise Limiter	_____

Tested By _____

Date _____