



BONSO ELECTRONICS LTD.

These drawings and specifications are the property of BONSO Electronics Ltd. and shall not be reproduced or copied, or used as reference for design, manufacture, and sale of device without permission.

Model No :GMRS1882

Title: **GMRS1882 Test & Alignment  
Procedure**

Drawing No: GMRS1882-TAP.

Customer : AUDIOVOX

Rev. Date: Feb. 29, 2008

# GMRS1882

## Test and Alignment Procedure

Created by:

Approved by:

Rev. No: 00

For Stage :

Release Date : Feb. 29, 2008

**Page 1 of 8**



**BONSO ELECTRONICS LTD.**

These drawings and specifications are the property of BONSO Electronics Ltd. and shall not be reproduced or copied, or used as reference for design, manufacture, and sale of device without permission.

Model No :GMRS1882	Title: <b>GMRS1882 Test &amp; Alignment Procedure</b>	Drawing No: GMRS1882-TAP.
Customer : AUDIOVOX		Rev. Date: Feb. 29, 2008

## REVISION SHEET

Rev. Code	Rev. Date	Revision	Revised By:
M-00	Feb.29,2008		

Created by:	Approved by:	Rev. No: 00
For Stage :	Release Date : Feb. 29, 2008	<b>Page 2 of 8</b>



**BONSO ELECTRONICS LTD.**

These drawings and specifications are the property of BONSO Electronics Ltd. and shall not be reproduced or copied, or used as reference for design, manufacture, and sale of device without permission.

Model No :GMRS1882

Title: **GMRS1882 Test & Alignment  
Procedure**

Drawing No: GMRS1882-TAP.

Customer : AUDIOVOX

Rev. Date: Feb. 29, 2008

## TABLE OF CONTENT

1. RECOMMENDED EQUIPMENT .....	4
2. TEST PREPARATION .....	4
3. VOLTAGE REGULATOR TEST .....	4
4. VCO ADJUSTMENT .....	4
5. TRANSMITTER FREQUENCY ALIGNMENT .....	5
6. TRANSMITTER OUTPUT POWER CHECK .....	5
7. TRANSMITTER DEVIATION ADJUSTMENT .....	5
8. RECEIVER ALIGNMENT .....	6
9. SQUELCH THRESHOLD AND HYSTERISIS .....	6
10. VOX TEST .....	6
11. LOW BATTERY LEVEL TEST .....	6
12. JACK CHARGING TEST .....	6
13. DESKTOP CHARGING TEST .....	7
14. FREQUENCIES & CODE TABLE .....	7
14.1 FRS & GMRS .....	7
14.2 WX BAND .....	8
14.3 CTCSS CODE .....	8

Created by:

Approved by:

Rev. No: 00

For Stage :

Release Date : Feb. 29, 2008

**Page 3 of 8**



Model No :GMRS1882	Title: <b>GMRS1882 Test &amp; Alignment Procedure</b>	Drawing No: GMRS1882-TAP.
Customer : AUDIOVOX		Rev. Date: Feb. 29, 2008

## 1. RECOMMENDED TEST EQUIPMENT

- 1.1 HP8920A,B Radio Communication Tester or equivalent with Spectrum Analyzer option.
- 1.2 Fluke 187 Digital Voltmeter or equivalent
- 1.3 HPE3615A Power Supply or equivalent

## 2. TEST PREPARATION

- 2.1 Connect a 6.0Vdc power supply to the positive battery terminal input point and the negative battery terminal input point (GND) into the negative terminal.
- 2.3 Connect the HP8920A,B RF Output port to the ANT point.
- 2.4 **SPK (+)** should be connected to the *Audio In Hi* and **SPK (-)** should be connected to the *Audio In Lo* of the HP8920B.
- 2.5 Set the unit at CH1 (462.5625MHz)

## 3. VOLTAGE REGULATOR TEST

- 3.1 MCU Regulator
  - Connect a voltmeter to Pin6 of IC501 (MCU REG) and measure the voltage. The value must be between **TBD**.
- 3.2 RX Regulator
  - Connect a voltmeter to Pin7 of IC501 (RX REG) and measure the voltage. The value must be between **TBD**.
- 3.3 TX Regulator
  - Connect a voltmeter to Pin8 of IC501 (TX REG) and measure the voltage. The value must be between **TBD**.
- 3.4 VCO Regulator
  - Connect a voltmeter to Pin10 of IC501 (VCO REG) and measure the voltage. The value must be between **TBD**.
- 3.5 IC Regulator
  - Connect a voltmeter to Pin11 of IC501 (IC REG) and measure the voltage. The value must be between **TBD**.

## 4. VCO ADJUSTMENT

- 4.1 Set the unit at CH1 and connect a digital voltmeter to VCO TP (R502 & C522 connect point).
- 4.2 Press and hold the PTT Button so the unit is in transmit mode.
- 4.3 *Adjust **L306** until the voltmeter reads **1.2 to 1.3Vdc** (without VCO Plate). **L306** is located under the shieldcan.  
**Solder VCO Plate and let temperature stabilize. Recheck TX VCO at CH1, should be **1.0~1.3 Vdc*****
- 4.4 Release the PTT button so the unit will be in receive mode.
- 4.5 Observe the voltage at VCO TP, the voltage should be **0.6~2.5Vdc**.
- 4.6 Set the unit at CH14.
- 4.7 Press and hold the PTT button so the unit is in transmit mode.
- 4.8 Observe the voltage at VCO TP, the voltage should be **1.0~2.5Vdc**.

Created by:	Approved by:	Rev. No: 00
For Stage :	Release Date : Feb. 29, 2008	<b>Page 4 of 8</b>



Model No : GMRS1882

Title: **GMRS1882 Test & Alignment Procedure**

Drawing No: GMRS1882-TAP.

Customer : AUDIOVOX

Rev. Date: Feb. 29, 2008

- 4.9 Release the PTT button so the unit will be in receive mode.
- 4.10 Observe the voltage at VCO TP, the voltage should be **0.6~2.5Vdc**.
- 4.11 Set the unit at WX Mode. Check the WX VCO is **0.6~3.3Vdc** at all CH1~10.

*NOTE : Above Specifications are measured with VCO Plate soldered.*

## 5. TRANSMITTER FREQUENCY ALIGNMENT

- 5.1 Set the unit at CH1. Press and hold the PTT button so the unit will be in transmit mode.
- 5.2 Adjust CT501 trimmer capacitor until such that the output frequency is equal to the channel frequency with maximum error of +/-200Hz (OQA Limit of +/-800Hz). Production will control as follows:
- PCBA Alignment : +/-200Hz
  - Casing Test : +/-500Hz
  - OQA Limit : +/-800Hz

## 6. TRANSMITTER OUTPUT POWER CHECK

- 6.1 Set the unit at CH1. Set the Power Supply at 5Vdc. Power is at Hi condition (use short cable)
- 6.2 Press and hold the PTT button so the unit is in transmit mode. Make sure Battery Voltage is at 5Vdc during PTT.
- 6.3 Transmit Power should be **>1.0W**.
- 6.4 Set the unit at CH14, only Power Lo condition could be checked.
- 6.5 Press and hold the PTT button so the unit is in transmit mode. Ensure the TX Power is within **1.0 ~1.8W**.

## 7. TRANSMITTER DEVIATION ADJUSTMENT

- 7.1 Connect an audio generator (600ohms) to the microphone terminal pads. The audio frequency should be set at 1KHz with a level of 200mVrms.
- 7.2 Connect an FM Deviation Meter (on the HP8920B) on ANT point. Set the monitor to read *(Pk to Pk)/2* deviation. Set *Filter 1* to 25Hz and *Filter 2* to 15KHz. *De-emphasis* should be set to Off.
- 7.3 Press and hold the PTT button so the unit will be in transmit mode.
- 7.4 Adjust VR601 and observe the reading at the Deviation Meter, the reading should be between **2.2 to 2.3KHz**. Checking at all condition (w/o CTCSS) should be **2.0~2.8KHz**.
- 7.5 Decrease the audio generator level until the deviation reads +/-1.5KHz. The generator level should be between **3 to 10mV**.
- 7.6 Check that the transmit audio distortion is less than 5%.
- 7.7 Set the CTCSS to Code 1. Turn OFF the audio generator. Press and hold the PTT button so the unit will be in transmit mode.
- 7.8 Confirm that the CTCSS Code modulation is between **0.4 to 0.7KHz**
- 7.9 Set the CTCSS to Code 38. Press the PTT button so the unit will be in transmit mode.

Created by:

Approved by:

Rev. No: 00

For Stage :

Release Date : Feb. 29, 2008

**Page 5 of 8**



7.10 Confirm that the CTCSS Code modulation is between 0.4 to 0.7KHz.

## 8. RECEIVER OUTPUT CHECK

8.1 Set the RF Generator level to -47dBm. The generator should be set for 1.5KHz deviation at 1KHz modulation.

8.2 Set *Filter 1* to 25Hz and *Filter 2* to 15kHz.

8.3 Connect Audio Analyzer to SPK(+ & - Point)

8.4 Set the unit Volume Level to maximum.

8.5 Check the maximum Audio Output Level, should be >1.5V (w/ load).

8.6 Set the Volume at 500mV Output. Confirm that the RX Distortion is less than 5%.

8.7 Reduce the RF Generator signal level until a 12dB SINAD reading is achieved. The RF Generator level should be less than -120dBm (nominal -123dBm).

8.8 Set the unit to WX Mode. Set the RF Generator to WX CH1 (162.550MHz). Repeat procedure 9.7 and confirm WX Sensitivity is <-115dBm at 12dB SINAD.

## 9. SQUELCH THRESHOLD AND HYSTERISIS

9.1 Set unit same as 9.1.

9.2 Set the RF Generator level to -124dBm.

9.3 Adjust VR501 until the unit squelches (RX Off).

9.4 Slowly increase the RF Signal Generator level until the unit un-squelches (RX On), confirm that the sensitivity is between 6~14dB SINAD.

## 10. VOX TEST

10.1 Set the unit into VOX Mode (Level 3). The VOX icon should be displayed on the LCD.

10.2 Connect an audio generator into the microphone terminal. The audio frequency should be set for 1KHz frequency with a level of 1mVrms and the output should be turned off.

10.3 Turn on the output of the audio generator.

10.4 Increase the Audio Generator level until unit goes into TX Mode.

10.5 Check the Generator level, it should be between 1.5~5.0mV.

## 11. LOW BATTERY LEVEL TEST

11.1 Set the unit into receive mode or standby mode.

11.2 Set the Power Supply voltage to 4.6Vdc.

11.3 Slowly decrease the Power Supply Voltage until the Low Battery icon appears and blink in the LCD Display.

11.4 Observe the Power Supply Level. The level must be 3.8 to 4.2Vdc.

## 12. JACK CHARGING TEST

12.1 Connect a fully charged Ni-MH Battery (~5.2Vdc) into the unit.

12.2 Set the Power Supply to 9Vdc.

12.3 Insert the Charger Jack into the Microphone Jack.

12.4 Monitor the current on the Battery (+) line.

**BONSO ELECTRONICS LTD.**

These drawings and specifications are the property of BONSO Electronics Ltd. and shall not be reproduced or copied, or used as reference for design, manufacture, and sale of device without permission.

Model No :GMRS1882

Title: **GMRS1882 Test & Alignment  
Procedure**

Drawing No: GMRS1882-TAP.

Customer : AUDIOVOX

Rev. Date: Feb. 29, 2008

12.5 Confirm that the Charging Current is within **65~85mA**.

### 13. DESKTOP CHARGING TEST ( for DESKTOP Charger Checking only)

13.1 Connect a fully charged Ni-MH Battery Pack (~5.2Vdc) into the unit.

13.2 Mount the unit at the DESKTOP CHARGER.

13.3 Monitor the current on the **Charger Adaptor (+)** line.

13.4 Confirm the Charging Current for a single unit is **170~220mA**, and for 2 units is **160~220mA**. The Charger LED should be RED.

13.5 Wait for the Charger to turn normal charger. Confirm that the Battery Voltage should be **>5.2V**.

### 14. FREQUENCIES & CODE TABLE

#### 14.1 FRS & GMRS

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	462.5625	12	467.6625
2	462.5875	13	467.6875
3	462.6125	14	467.7125
4	462.6375	15	462.5500
5	462.6625	16	462.5750
6	462.6875	17	462.6000
7	462.7125	18	462.6250
8	467.5625	19	462.6500
9	467.5875	20	462.6750
10	467.6125	21	462.7000
11	467.6375	22	462.7250

#### 14.2 WX BAND

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	162.550	6	162.500
2	162.400	7	162.525
3	162.475	8	162.650
4	162.425	9	162.775
5	162.450	10	163.275

**BONSO ELECTRONICS LTD.**

These drawings and specifications are the property of BONSO Electronics Ltd. and shall not be reproduced or copied, or used as reference for design, manufacture, and sale of device without permission.

Model No :GMRS1882

Title: **GMRS1882 Test & Alignment  
Procedure**

Drawing No: GMRS1882-TAP.

Customer : AUDIOVOX

Rev. Date: Feb. 29, 2008

**14.3 CTCSS CODE**

CODE NO.	FREQ. (Hz)	CODE NO.	FREQ. (Hz)
1	67.0	20	131.8
2	71.9	21	136.5
3	74.4	22	141.3
4	77.0	23	146.2
5	79.7	24	151.4
6	82.5	25	156.7
7	85.4	26	162.2
8	88.5	27	167.9
9	91.5	28	173.8
10	94.8	29	179.9
11	97.4	30	186.2
12	100.0	31	192.8
13	103.5	32	203.5
14	107.2	33	210.7
15	110.9	34	218.1
16	114.8	35	225.7
17	118.8	36	233.6
18	123.0	37	241.8
19	127.3	38	250.3

Created by:

Approved by:

Rev. No: 00

For Stage :

Release Date : Feb. 29, 2008

**Page 8 of 8**