

**GIANT ELECTRONICS LTD.**

Title: Alignment Procedure

Revision No.: 02

Model: R1070/R1080

Date: May06, 2005

**A. PCB LEVEL (Test Condition: under CH15, Supply=5.2Vdc)**

| NO  | ITEM                                      | ALIGNMENT METHOD  | REMARK   |
|-----|---|---|--|
| 1.  | LCD display<br>(Should enter test mode)   | <ol style="list-style-type: none"> <li>1. Press and hold the '+' key and 'Menu' key together.</li> <li>2. Turn on the radio power until a good key chirp is heard, and the backlight is on for about 500 ms . finally, the LCD should be display '1<sup>CH</sup>'.</li> <li>3. Press '-' key , then all LCD segments should be anticlockwise displayed.</li> <li>4. Finally, all the LCD segments should be shown for about 500ms as follows: 218<sup>88</sup> .</li> </ol>   |  |
| 2.  | Standby current                           | <ol style="list-style-type: none"> <li>1. Set A-METER, and RX mode.</li> <li>2. Check the standby current &lt;80mA DC.</li> </ol>   |  |
| 3.  | Talk on current<br>(Power supply 5.2V DC) | <ol style="list-style-type: none"> <li>1. Set A-METER, and TX mode @50ohm load.</li> <li>2. Set channel to 15, Check the talk on current &lt;1800mA.</li> <li>3. Set channel to 14, Check the talk on current &lt;800mA.</li> </ol>   |  |
| 4.  | VCO                                       | <ol style="list-style-type: none"> <li>1. Set RX or TX mode</li> <li>2. Check TP503 to provide 0.7~2.3 VDC.</li> <li>3. Adjust L509 to provide <math>2.2 \pm 0.1</math>VDC at TP503 if VCO level are more than 2.4VDC on CH14.</li> </ol>   |  |
| 5.  | TX Power<br>(Power supply 5.2V DC)        | <ol style="list-style-type: none"> <li>1. Set TX mode CH15, Check the transmit Hi-power to provide &lt;3.49W ERP.</li> <li>2. Set CH15 Low power mode, Adjust VR503 to transmit Low-power to provide &lt;0.44W ERP.</li> <li>3. Set TX mode CH14, Check the transmit power to provide &lt;0.44W ERP.</li> </ol>   | Test Voltage is 6.0V   |
| 6.  | TX Frequency                              | <ol style="list-style-type: none"> <li>1. Set TX mode</li> <li>2. Adjust VC501 to provide 462.5500MHz <math>\pm</math> 50Hz.</li> </ol>   |  |
| 7.  | CTCSS Tone Frequency                      | <ol style="list-style-type: none"> <li>1. Set CH15/CODE1 and Tx mode.</li> <li>2. Check CTCSS tone frequency to be within 66.8 Hz to 67.2Hz.</li> </ol>   |  |
| 8.  | TX Modulation & distortion                | <ol style="list-style-type: none"> <li>1. Set AF level at 50mv;1KHz,Adjust VR101 to provide Max TX deviation 2.05KHz to 2.15KHz.</li> <li>2. Check input Mic level in 3~15 mV to provide normal deviation 1.5KHz.</li> <li>3. Check the demodulation distortion &lt;= 6%.</li> <li>4. Audio Frequency Response.                             <ol style="list-style-type: none"> <li>a) Input a 2.0mV 1KHz audio frequency to TP116 and press 'PTT' switch.</li> <li>b) Check the response compare to 1KHz tone.                                     <ol style="list-style-type: none"> <li>i) 500Hz : -6.0 dB to -12.0 dB.</li> <li>ii) 2.5KHz : +1.0 dB to +7.0 dB</li> </ol> </li> </ol> </li> </ol> | FILTER SET:<br>1.1.HPF 50Hz<br>1.2.LPF 15KHz<br>1.3. PK +<br>FILTER SET:<br>1.HPF 300Hz<br>2.LPF 3KHz<br>3. PK + |
| 9.  | CDCSS Frequency                           | <ol style="list-style-type: none"> <li>1. Set TX mode</li> <li>2. Set CH15/CODE39, check Octal Code to be 023</li> </ol>  | FILTER SET:<br>1.Input Level: 0.9KHz   |
| 10. | CTCSS Tone Dev.                           | <ol style="list-style-type: none"> <li>5. Set CH15/CODE1、 AF input level to off, check DEV to be 300Hz~ 650Hz.</li> <li>6. Set CH14/CODE38、 AF input level to off, check DEV to be 300Hz~ 650Hz.</li> </ol>   | FILTER SET:<br>1. <20HZ~300HZ<br>2.750 $\mu$ s De-emp ON<br>7. PK+<br>8. FM DEV. AVG ON                          |

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|-----|---------------|---|--------|
| 11. | VOX Detector  | <ol style="list-style-type: none"> <li>1. Set VOX level at 1.</li> <li>2. Set AF level at 11 +/- 1 mV,1KHz at <b>TP116</b>.</li> <li>3. Unit start to transmit.</li> <li>4. Set AF level at 10 +/- 1mV,1KHz at <b>TP116</b>.</li> <li>5. Unit stop transmit.</li> <li>6. Set VOX level at 2.</li> <li>7. Set AF level at 8.0 +/-1mV,1KHz at <b>TP116</b>.</li> <li>8. Unit start to transmit.</li> <li>9. Set AF level at 7 .0+/- 1mV,1KHz at <b>TP116</b>.</li> <li>10. Unit stop transmit.</li> <li>11. Set VOX level at 3</li> <li>12. Set AF level at 5.0 +/- 1mV,1KHz at <b>TP116</b>.</li> <li>13. Unit start to transmit.</li> <li>14. Set AF level at 4.0+/- 1mV,1KHz at <b>TP116</b>.</li> <li>15. Unit stop transmit.</li> </ol>  |        |
| 12. | IVOX Detector | As same as item 11  |        |
| 13. | Rx Audio test | <ol style="list-style-type: none"> <li>1. Set RX mode CH7.</li> <li>2. Set SG RF level to -50dBm with 1.5KHz deviation 1KHz modulation Signal.</li> <li>3. Adjust L517 to provide minimum distortion &amp; max output level at <b>TP117</b>.</li> <li>4. Rotate the volume switch to the position, which give a Max audio output at <b>TP117</b>.</li> <li>5. Check Max audio output level &gt;1400mV.</li> <li>6. Check Rx current &lt;150mA.</li> <li>7. Check the 1KHz distortion &lt;= 5%.</li> <li>8. Set SG RF level to -118dBm with 1.5kHz deviation at 1KHz audio frequency.               <ol style="list-style-type: none"> <li>a). Check SINAD sensitivity &lt;= -118dBm. @12dB SINAD at <b>TP117</b>.</li> </ol> </li> <li>9. Audio frequency response.               <ol style="list-style-type: none"> <li>a) Set SG RF level to -50dBm with 1.5kHz deviation at 1KHz audio frequency.</li> <li>b) Rotate the volume switch to the position, which give an output 100mV±5mV at <b>TP117</b>.</li> <li>c) Vary the audio frequency from 300Hz to 3KHz.</li> <li>d) Check the RX response compare to 1KHz tone.                   <ol style="list-style-type: none"> <li>i) 500Hz : -5.0 dB to -11.0 dB.</li> <li>ii) 2.5KHz : -10.0 dB to -20.0dB.</li> </ol> </li> </ol> </li> <li>10. Maximum and Minimum Audio Output Power.               <ol style="list-style-type: none"> <li>a) Set SG RF level to -50dBm with 1.5kHz deviation at 1KHz audio frequency.</li> <li>b) Rotate the volume switch to the position, which give a maximum output .</li> <li>c) Check the voltage at <b>TP117</b> &gt;1400mV.</li> <li>d) Set maximum audio output to 0dB, rotate the volume switch to the position, which give a minimum output.</li> <li>e) Check the minimum voltage -23dB to -40dB at <b>TP117</b></li> </ol> </li> </ol> |        |

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|-----|----------------------------|--|--------|
| 14. | Noise- Detector            | <ol style="list-style-type: none"> <li>1. Set SG to -120dBm with 1.5KHz deviation., 1KHz AF on CH7.</li> <li>2. Press "Mon" key and Adjust the RF level of SG to make the radio output to 8dB SINAD, then adjust the VR502 to the radio for transient state @ 8dB SINAD.</li> <li>3. Check high state @ 6 to 13dB SINAD.</li> </ol>  |        |
| 15. | CTCSS Tone Detect          | <ol style="list-style-type: none"> <li>1. Set CH15/CODE1 and SG to -60dBm with 67Hz tone frequency, 400Hz deviation.</li> <li>2. Check the Pin22 of IC101 to have square-wave, and low for RF modulation off.</li> <li>3. Repeat item 1 and 2 for code38 (250.3Hz).</li> <li>4. Repeat item 1 ~ 3 for CH14.</li> </ol>   |        |
| 16. | Quiet Noise Detect         | <ol style="list-style-type: none"> <li>1. Set unit to quiet noise mode</li> <li>2. Set CH15/CODE1 and SG to -60dBm with 67Hz tone frequency, 400Hz deviation and 55 Hz audio frequency, 1K deviation..</li> <li>3. 55 Hz tone frequency appear on <b>TP117</b>.</li> </ol>   |        |
| 17. | Normal Batter level Detect | <ol style="list-style-type: none"> <li>1. If the battery voltage level less than 4.25V, the battery icon should be displayed as .</li> <li>2. If the battery voltage level more than 5.4V, the battery icon should be displayed as .</li> <li>3. If the battery voltage level less than 4.05V, the radio should be closed</li> </ol> |        |
| 18. | SCAN                       | <ol style="list-style-type: none"> <li>1. Set SG RF level to -50dBm with 500Hz deviation, 100Hz modulation.</li> <li>2. Press "Mon" key.</li> <li>3. Unit shows channels 9 and code 13.</li> </ol>   |        |

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**B. CASING LEVEL**

| NO | ITEM                | ALIGNMENT METHOD  | REMARK  |
|----|---------------------|---|---|
| 1. | Current Consumption | <ol style="list-style-type: none"> <li>1. Set A-METER. With volume switch OFF, check the OFF current &lt;math&gt;&lt;150 \mu A&lt;/math&gt;.</li> <li>2. With volume switch ON, check the standby current &lt;math&gt;&lt;80mA&lt;/math&gt;. Press 'PTT' switches and check the TX current &lt;math&gt;&lt;1800mA&lt;/math&gt;.</li> </ol>  |   |
| 2. | TX Frequency        | <ol style="list-style-type: none"> <li>1. Check CH15=462.5500MHz+/-500Hz;</li> <li>2. Check CH14 =467.7125MHz+ /-500Hz.</li> </ol>  |   |
| 3. | Noise- Detector     | <ol style="list-style-type: none"> <li>1. Set the distance between antennas of SG and checked unit to 0.3M ~ 0.5M.</li> <li>2. The antennas of SG and checked unit should be parallel to make the electromagnetic field of SG.</li> <li>3. Radiate equally to the antenna of checked unit.</li> <li>4. Set SG to -90dBm with 1.5KHz deviation, 1KHz tone on CH7.</li> <li>5. Adjust VR502 for HIGH state : 6 ~ 13dB SINAD .</li> </ol>  | When adjusting Noise-Det. , Should reduce any interference from other Instruments and body. |
| 4. | Audio RX Path CH7   | <ol style="list-style-type: none"> <li>1. Set SG RF level to -50dBm with 1.5kHz Dev.; 1kHz AF, Rotate the volume switch to the position, which give an Max output.</li> <li>2. Check speaker O/P level &gt;85dBspL(30cm distance).</li> <li>3. Set SG RF level to -60dBm with 1.5kHz Dev.; 1kHz AF.</li> <li>4. Plug the dummy speaker and dummy microphone into audio jet.</li> <li>5. Rotate the volume switch to the position, which give an output 900+/-50mv.</li> <li>6. Set SG RF level to -90dBm with 1.5kHz Dev.; 1kHz AF.</li> <li>7. Check the radiated sensitivity correlate to the golden sample.</li> <li>8. Audio frequency response.               <ol style="list-style-type: none"> <li>a) Set SG RF level to -60dBm with 1.5kHz deviation at 1KHz audio frequency.</li> <li>b) Rotate the volume switch to the position, which give an output 100mV <math>\pm</math>5mV (voltage difference of dummy speaker).</li> <li>c) Vary the audio frequency from 300Hz to 3KHz.</li> <li>d) Check the RX response compare to 1KHz tone.                   <ol style="list-style-type: none"> <li>i) 500Hz: -5.0 dB to -11.0 dB.</li> <li>ii) 2.5KHz: -10.0 dB to -20.0dB.</li> </ol> </li> </ol> </li> <li>9. Maximum and Minimum Audio Output Power.               <ol style="list-style-type: none"> <li>a) Set SG RF level to -60dBm with 1.5kHz deviation at 1KHz audio frequency.</li> <li>b) Rotate the volume switch to the position, which give a maximum output with distortion &lt;math&gt;&lt;6\%&lt;/math&gt;.</li> <li>c) Check the voltage difference of dummy speaker &gt;math&gt;&gt;=900mV&lt;/math&gt;.</li> <li>d) Set maximum audio output to 0dB, rotate the volume switch to the position, which give a minimum output.</li> <li>e) Check the voltage difference between of dummy speaker -10dB to -20dB.</li> </ol> </li> </ol> |   |

|                               |                   |
|-------------------------------|-------------------|
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|    |   |   |  |
|----|---|---|--|
| 5. | Audio TX Path CH15  | <ol style="list-style-type: none"> <li>1. Check the radiated power correlate to golden sample.</li> <li>2. Plug the dummy speaker and dummy microphone into audio jet.</li> <li>3. Standard TX Deviation. <ol style="list-style-type: none"> <li>a) Input mic level to dummy microphone and press 'PTT' switch.</li> <li>b) Check max. Dev. 1.8KHz &lt; max. Dev. &lt; 2.5KHz.</li> <li>c) Check input level in 3~15mV to provide normal deviation 1.5KHz.</li> </ol> </li> <li>4. Audio Frequency Response. <ol style="list-style-type: none"> <li>a) Input a 2.0mv@1KHz audio frequency to dummy microphone and press 'PTT' switch.</li> <li>b) Check the response. <ol style="list-style-type: none"> <li>iii) 500Hz : -6.0 dB to -12.0 dB.</li> <li>2.5KHz : +1.0 dB to +7.0 dB</li> </ol> </li> </ol> </li> <li>5.Repeat CH14.</li> </ol>  | Filter set :<br>1.HPF 300Hz<br>2.LPF 3KHz<br>3. PK + |
| 6. | Function check and Intercom function (between sample and production unit) | <ol style="list-style-type: none"> <li>1. Turn on the radio power, the back-light should be on For a while and a good key chirp should be heard at the same time.</li> <li>2. The LCD display should be clear, not miss the segment when pressing '+' and '-' or '-' key, the key tone should also be heard clearly.</li> <li>3. Set channel of the sample and production unit CH=11.</li> <li>4. Press 'PTT' switch to intercom between sample and Production unit, the LED should be light.</li> <li>5. The sound quality between both should be clear and no metal sound.</li> <li>6. Press 'CALL' key, the call tone should be heard clearly each other.</li> <li>7. Change channel of the production unit to CH=12, then Press 'PTT' switch of sample.</li> <li>8. Any noise should not be heard from the speaker of Production unit.</li> <li>9. Press any key, the dead problem should not occur.</li> <li>10.Set CH1/code5, SG to be CH1/code4 and code6, check the speaker mute.</li> <li>11.Set CH1/code37, SG to be CH1/code36 and code38, check the speaker mute.</li> <li>12. Repeat item 10 and 11 for CH14.</li> </ol> |  |

| <b>C. CHARGER CASING</b> |                |   |        |
|--------------------------|----------------|---|--------|
| NO                       | ITEM           | ALIGNMENT METHOD  | REMARK |
| 1                        | Charge current | 1. Connect the Charger base and the Plug-in adaptor by inserting the pin into the rear of Charger base, the charge current should be more 140 mA and the LED on the adaptor should glow continuously. |        |

\* Remark:

TX mode :

1. Press and hold PTT button

RX mode :

1. Release PTT button

Power supply:      Min. DC      4.4V  
                             Normal DC    5.2V  
                             Max DC      6.0V

--- End ---