




# GIANT ELECTRONICS LTD.


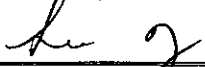

Title: ALIGNMENT PROCEDURE

Model: T5100F (US)

Document No.: ENG-T5100-08-01		Signature	Name	Title
	Prepared by		G.SHAM	A.E
	Reviewed by		L.PANG	ENG
Page No.	1 / 6	Approved by		A.CHEUNG A.M

Distribution List:


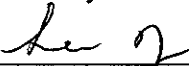

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GIANT ELECTRONICS LTD.			
Title: Alignment Procedure			
Model: T5100 (US)		Page: 2 / 6	
Document No.: ENG-T5100-08-01		Issued date: FEB01,01	
Prepared by: Gary Sham 		Checked by: Leo Pang 	Approved by: Andrew Cheung 
A. PCB LEVEL (Test Condition: under CH1)			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	LCD display (Should enter test mode)	<ol style="list-style-type: none"> <li>1. Press and hold the '+' key and '-' 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 m S . finally, the LCD should be display '1<sup>CH</sup>'</li> <li>3. Press 'DOWN' 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: 18<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;50mA DC.</li> </ol>	
3.	Talk on current	<ol style="list-style-type: none"> <li>1. Set A-METER, and TX mode</li> <li>2. Check the talk on current &lt;500mA DC</li> </ol>	
4.	RX VCO	<ol style="list-style-type: none"> <li>1. Set RX mode CH14</li> <li>2. Adjust L113 to provide 1.9 VDC± 0.1VDC at TP04 on CH1</li> <li>3. Check TP04 to provide 0.5~2.0 VDC on CH1</li> </ol>	*
5.	TX VCO	<ol style="list-style-type: none"> <li>1. Set TX mode on CH1</li> <li>2. Check TP04 to provide 0.5 ~ 2.0VDC on CH1</li> <li>3. Check TP04 to provide 1.4 ~ 2.0 VDC on CH14</li> </ol>	*
6.	TX Power	<ol style="list-style-type: none"> <li>1. Set TX mode CH1</li> <li>2. Check transmit power to provide 25 ~ 28dBm</li> </ol>	
7.	TX Frequency	Adjust C144 to provide 462.5625MHz ± 300Hz	
8.	TX Modulation & distortion	<ol style="list-style-type: none"> <li>1. Set AF level at 25mv;1KHz, Adjust VR101 to provide max TX deviation 2.1KHz to 2.2KHz.</li> <li>2. Check input mic level in 0.5~10 mV to provide normal deviation 1.5KHz</li> <li>3. Check the demodulation distortion &lt;= 5%</li> <li>4. Audio Frequency Response <ol style="list-style-type: none"> <li>a) Input a 2.0mV 1KHz audio frequency to TP05 and press 'PTT' switch.</li> <li>b) Check the response compare to 1KHz tone <ol style="list-style-type: none"> <li>i) 500Hz : -5.0 to -11dB.</li> <li>ii) 2K5Hz : +9 to +4dB</li> </ol> </li> </ol> </li> </ol>	

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Title: Alignment Procedure			
Model: T5100 (US)		Page: 3 / 6	
Document No.: ENG-T5100-08-01		Issued date: FEB01,01	
Prepared by: Gary Sham		Checked by: Leo Pang	Approved by: Andrew Cheung
A. PCB LEVEL (Test Condition: under CH1)			
NO	ITEM	ALIGNMENT METHOD	REMARK
9.	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 1.5 KHz deviation 1KHz modulation Signal.</li> <li>3. Adjust L114 to provide minimum distortion &amp; max output level at TP124</li> <li>4. Rotate the volume switch to the position, which give an Max audio output at TP124.</li> <li>5. Check Max audio output level &gt;1100mv</li> <li>6. Check Rx current &lt;150mA</li> <li>7. Check the 1KHz distortion &lt;= 3.5%</li> <li>8. Set SG RF level to -119dBm with 1.5kHz deviation at 1KHz audio frequency.               <ol style="list-style-type: none"> <li>a). Check SINAD sensitivity &lt;= -119dBm@ 12dBSINAD at TP124</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 TP124.</li> <li>c) Vary the audio frequency from 300Hz -3KHz.</li> <li>d) Check the RX response compare to 1KHz tone.                   <ol style="list-style-type: none"> <li>i) 500Hz : +3.0 to +7.0 dB</li> <li>ii) 2K5Hz : -10 to -6 dB</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 TP124 &gt;=1100mV</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 -23 to -40dB at TP124</li> </ol> </li> </ol>	
10.	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. Adjust VR102 for transient state @ 10dB SINAD</li> <li>3. Check high state @8 to 12dBSINAD</li> </ol>	
11.	Low Battery Detect	<ol style="list-style-type: none"> <li>1. Low Battery, 4.0+/-0.1V level 1, 3.3+/-0.1V level2, level3+/-0.1V(speaker output beep tone and indicate LED flash).</li> </ol>	

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Title: Alignment Procedure			
Model: T5100 (US)		Page: 4 / 6	
Document No.: ENG-T5100-08-01		Issued date: FEB01,01	
Prepared by: Gary Sham 		Checked by: Leo Pang 	Approved by: Andrew Cheung 
<b>B. CASING LEVEL</b>			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	Current Consumption	<ol style="list-style-type: none"> <li>1. Set A-METER.</li> <li>2. With volume switch OFF, check the OFF current &lt;10 <math>\mu</math>A.</li> <li>3. With volume switch ON, check the standby current &lt;50mA.</li> <li>4. TX Current               <ol style="list-style-type: none"> <li>a) Press 'PTT' switch and check the TX current &lt;500mA.</li> </ol> </li> </ol>	
2.	TX Frequency	<ol style="list-style-type: none"> <li>1. Check CH1=462.5625MHz<math>\pm</math> 500 Hz ;</li> <li>2. Check CH14 =467.7125 MHz<math>\pm</math> 500 Hz .</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 equably 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 VR102 for HIGH state : 10<math>\pm</math> 2dBSINAD .</li> </ol>	When adjusting Noise-Det. , Should reduce any interference from other Instruments and body.

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# GIANT ELECTRONICS LTD.

Title: Alignment Procedure

Model: T5100 (US)

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Document No.: ENG-T5100-08-01

Issued date: Feb01,01

Prepared by: Gary Sham




Checked by: Leo Pang

Approved by: Andrew Cheung

## B. CASING LEVEL

NO	ITEM	ALIGNMENT METHOD	REMARK
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 0.5kHz deviation at 1KHz audio frequency.</li> <li>b) Rotate the volume switch to the position, which give an output 100mV ±5mV (voltage difference of dummy speaker).</li> <li>c) Vary the audio frequency from 300Hz -3KHz.</li> <li>d) Check the RX response compare to 1KHz tone.                                     <ol style="list-style-type: none"> <li>i) 500Hz : +3 to +7dB</li> <li>ii) 2k5Hz : -10 to -6dB</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;5%.</li> <li>c) Check the voltage difference of dummy speaker &gt;/=900mV.</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 -23 to -40dB.</li> </ol> </li> </ol>	
5.	Audio TX Path CH1	<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 0.5~10mV 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>i) 500Hz : -5 to -11dB.</li> <li>2K5Hz : +9 to +4 dB</li> </ol> </li> </ol> </li> <li>5.Repeat CH14</li> </ol>	

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Title: Alignment Procedure			
Model: T5100 (US)		Page: 6 / 6	
Document No.: ENG-T5100-08-01		Issued date: Feb01,01	
Prepared by: Gary Sharp 		Checked by: Leo Pang 	Approved by: Andrew Cheung 
<b>B. CASING LEVEL</b>			
NO	ITEM	ALIGNMENT METHOD	REMARK
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 backlight 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> </ol>	

\* Remark:

TX mode :

1. Press and hold PTT button

RX mode :

1. Release PTT button

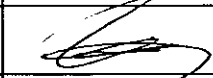


Power supply: Min DC 3.5v; Max DC4.5v

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# GIANT ELECTRONICS LTD.

Title: ALIGNMENT PROCEDURE

Model: T5200 (US)

Document No.:	ENG-T5200-08-01	Signature	Name	Title
	Prepared by		Gary Sham	A.E
	Reviewed by		Leo Pang	ENG
Page No.	1 / 6	Approved by		Andrew Cheung A.M


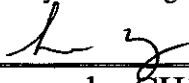

Distribution List:

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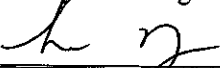

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Title: Alignment Procedure			
Model: T5200 (US)		Page: 2 / 6	
Document No.: ENG-T5200-08-01		Issued date: Feb01,01	
Prepared by: Gary Sham		Checked by: Leo Pang	Approved by: Andrew Cheung
<b>A. PCB LEVEL (Test Condition: under CH1)</b>			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	LCD display (Should enter test mode)	1. Press and hold the '+' key and '-' key together. 2. Turn on the radio power until a good key chirp is heard, and the backlight is on for about 500 m S . finally, the LCD should be display '1 <sup>CH</sup> ' 3. Press 'DOWN' key , then all LCD segments should be anticlockwise displayed. 4. Finally, all the LCD segments should be shown for about 500mS as follows: 18 <sup>88</sup>	
2.	Standby current	1. Set A-METER, and RX mode 2. Check the standby current <50mA DC.	
3.	Talk on current	1. Set A-METER, and TX mode 2. Check the talk on current <500mA DC	
4.	RX VCO	1. Set RX mode CH14 2. Adjust L113 to provide 1.9 VDC± 0.1VDC at TP04 on CH14 3. Check TP04 to provide 0.5 ~ 2.0 VDC on CH1	
5.	TX VCO	1. Set TX mode on CH1 2. Check TP04 to provide 0.5 ~ 1.4 VDC on CH1 3. Check TP04 to provide 1.4 ~ 2.0 VDC on CH14	
6.	TX Power	1. Set TX mode CH1 2. Check transmit power to provide 25 ~ 28dBm	
7.	CTCSS Tone Frequency	1.set CH1/code1, 2.Set Tx mode, 3.Check Tp113 to be within 66.8Hz to 67.2Hz.	
8.	TX Frequency	Adjust C144 to provide 462.5625MHz ± 300Hz	
9.	CTCSS Tone Dev.	1. Set CH1/CODE1 、 AF input level to off,check DEV to be 350Hz~ 600Hz, 2. Set CH1/CODE38 、 AF input level to off,check DEV to be 350Hz~ 600Hz	
10.	TX Modulation & distortion	3. Set AF level at 25mv;1KHz,Adjust VR101 to provide max TX deviation 2.1KHz to 2.2KHz. 4. Check input mic level in 0.5~10 mV to provide normal deviation 1.5KHz 5. Check the demodulation distortion <= 5% 6. Audio Frequency Response a) Input a 2.0mV 1KHz audio frequency to TP05 and press 'PTT' switch. b) Check the response compare to 1KHz tone i) 500Hz : -5.0 to -11.0dB. ii) 2K5Hz : +4.0 to +9.0dB	

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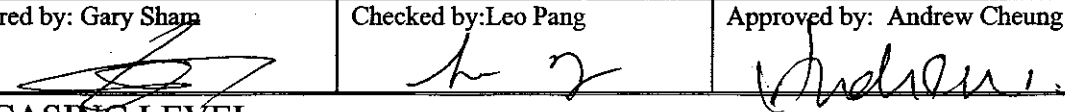


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Document No.: ENG-T5200-08-01		Issued date: Feb01,01	
Prepared by: Gary Sham 		Checked by: Leo Pang 	Approved by: Andrew Cheung 
A. PCB LEVEL (Test Condition: under CH1)			
NO	ITEM	ALIGNMENT METHOD	REMARK
11.	Rx Audio test	<ol style="list-style-type: none"> <li>1. Set RX mode CH7</li> <li>2. Set SG RF level to -50dBm with 1.5 KHz deviation 1KHz modulation Signal.</li> <li>3. Adjust L114 to provide minimum distortion &amp; max output level at TP124</li> <li>4. Rotate the volume switch to the position, which give an Max audio output at TP124.</li> <li>5. Check Max audio output level &gt;1100mv</li> <li>6. Check Rx current &lt;150mA</li> <li>7. Check the 1KHz distortion &lt;= 3.5%</li> <li>8. Set SG RF level to -119dBm with 1.5kHz deviation at 1KHz audio frequency.               <ol style="list-style-type: none"> <li>a). Check SINAD sensitivity &lt;= -119dBm@ 12dBSINAD at TP124</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 TP124.</li> <li>c) Vary the audio frequency from 300Hz -3KHz.</li> <li>d) Check the RX response compare to 1KHz tone.                   <ol style="list-style-type: none"> <li>i) 500Hz : +3.0 to +7.0 dB</li> <li>ii) 2k5Hz : -6.0 to -10 dB</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 TP124 &gt;=1100mV</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 -35dB ±5dB at TP124</li> </ol> </li> </ol>	
12.	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. Adjust VR102 for transient state @ 10dB SINAD</li> <li>3. Check high state @8 to 12dBSINAD</li> </ol>	
13.	CTCSS tone Detect	<ol style="list-style-type: none"> <li>1. Set CH1/CODE1 and SG to -122dBm with 67Hz tone frequency, 400Hz deviation.</li> <li>2. Check the Pin25 of IC106 to be low, and high for RF off.</li> <li>3. Repeat item 1 and 2 for code38(250.3Hz)</li> <li>4. Repeat item 1 and 3 for CH14.</li> </ol>	
14.	Low Battery Detect	<ol style="list-style-type: none"> <li>1. Low Battery, 4+/-0.1V level1, 3.3+/-0.1V level2, 2.3.0+/-0.1V level3 (speaker output beep tone and indicate LED flash).</li> </ol>	

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Prepared by: Gary Sham 		Checked by: Leo Pang 	
Approved by: Andrew Cheung 			
<b>B. CASING LEVEL</b>			
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 <math>&lt;10 \mu A</math>.</li> <li>2. With volume switch ON, check the standby current <math>&lt;50mA</math>. Press 'PTT' switch and check the TX current <math>&lt;500mA</math>.</li> </ol>	
2.	TX Frequency	<ol style="list-style-type: none"> <li>1. Check CH1 = <math>462.5625MHz \pm 500 Hz</math> ;</li> <li>2. Check CH14 = <math>467.7125 MHz \pm 500 Hz</math> .</li> </ol>	
3.	Noise- Detector	<ol style="list-style-type: none"> <li>1. Set the distance between antennas of SG and checked unit to <math>0.3M \sim 0.5M</math> .</li> <li>2. The antennas of SG and checked unit should be parallel to make the electromagnetic field of SG</li> <li>3. radiate equably to the antenna of checked unit .</li> <li>4. Set SG to <math>-90dBm</math> with <math>1.5KHz</math> deviation, <math>1KHz</math> tone on CH7 .</li> <li>5. Adjust VR102 for HIGH state : <math>10 \pm 2dB SINAD</math> .</li> </ol>	When adjusting Noise-Det. , Should reduce any interference from other Instruments and body.

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B. CASING LEVEL			
NO	ITEM	ALIGNMENT METHOD	REMARK
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 backlight 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>	

\* Remark:

**TX mode :**

1. Press and hold PTT button

**RX mode :**

1. Release PTT button

**Power supply: Min DC 3.5v; Normal DC4.0v; Max DC4.5v**

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