

GIANT ELECTRONICS LTD.			
Title: Alignment Procedure			
Model: T4800,T4900			
A. PCB LEVEL (Test Condition: under CH15)			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	LCD display (Should enter test mode)	1. Press and hold the ‘+’ key and ‘Menu’ key together. 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 ^{CH} ’. 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: 18⁸⁸ .	
2.	Standby current	1. Set A-METER, and RX mode. 2. Check the standby current <45mA DC.	
3.	Talk on current	1. Set A-METER, and TX mode @50ohm load. 2. Check the talk on current <400mA DC.	
4.	VCO	1. Set RX or TX mode 2. Check TP103 to provide 0.8 ~ 2.3VDC. 3. Adjust L113 to provide 2.0 ± 0.1VDC at TP103 if VCO level are more than 2.3VDC on CH14.	
5.	TX Power	1. Set TX mode CH15, check transmit power to provide <=0.52W GMRS (ERP) 2. Set TX mode CH14, check transmit power to provide <=0.47W FRS (ERP)	
6.	CTCSS Tone Frequency	1.set CH15/CODE1. 2.Set Tx mode. 3.Check TP140 to be within 66.8Hz to 67.2Hz.	
7.	TX Frequency	Adjust C159 to provide 462.5500MHz ± 50Hz.	
8.	CTCSS Tone Dev.	1. Set CH15/CODE1、 AF input level to off, check DEV to be 350Hz~ 600Hz. 2. Set CH14/CODE38、 AF input level to off, check DEV to be 350Hz~ 600Hz.	FILTER SET: 1.50HZ~3KHZ 2.750µs De-emp ON 3. PK+ 4. FM DEV. AVG ON
9.	TX Modulation & distortion	1.Set AF level at 25mv;1KHz,Adjust VR101 to provide Max TX deviation 2.25KHz to 2.35KHz. 2.Check input Mic level in 0.5~10 mV to provide normal deviation 1.5KHz. 3.Check the demodulation distortion <= 5%. 5. Audio Frequency Response. a) Input a 2.0mV 1KHz audio frequency to TP116 and press ‘PTT’ switch. b) Check the response compare to 1KHz tone. i) 500Hz : -5.0 dB to -11.0 dB. ii) 2.5KHz : +3.0 dB to +9.0 dB .	Fliter set : 1.HPF 50Hz 2.LPF 15KHz 3. PK + All input at TP116

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10.	Rx Audio test	1. Set RX mode CH7. 2. Set SG RF level to -50dBm with 1.5KHz deviation 1KHz modulation Signal. 3. Adjust L114 to provide minimum distortion & max output level at TP117. 4. Rotate the volume switch to the position, which give a Max audio output at TP117. 5. Check Max audio output level >1500mV. 6. Check Rx current <150mA. 7. Check the 1KHz distortion <= 5%. 8. Set SG RF level to -119dBm with 1.5kHz deviation at 1KHz audio frequency. a). Check SINAD sensitivity <= -119dBm. @12dB SINAD at TP117. 9. Audio frequency response. a) Set SG RF level to -50dBm with 1.5kHz deviation at 1KHz audio frequency. b) Rotate the volume switch to the position, which give an output 100mV±5mV at TP117. c) Vary the audio frequency from 300Hz to 3KHz. d) Check the RX response compare to 1KHz tone. i) 500Hz : +5.0 dB to +14.0 dB. ii) 2.5KHz : -12.0 dB to -20.0 dB. 10. Maximum and Minimum Audio Output Power. a) Set SG RF level to -50dBm with 1.5kHz deviation at 1KHz audio frequency. b) Rotate the volume switch to the position, which give a maximum output . c) Check the voltage at TP117 >=1500mV. d) Set maximum audio output to 0dB, rotate the volume switch to the position, which give a minimum output. e) Check the minimum voltage -23dB to -40dB at TP117	
11.	Noise- Detector	1. Set SG to -120dBm with 1.5KHz deviation., 1KHz AF on CH7. 2. Adjust VR102 for transient state @ 10dB SINAD. 3. Check high state @9 to 13dB SINAD.	
12.	CTCSS tone Detect	1. Set CH15/CODE1 and SG to -122dBm with 67Hz tone frequency, 400Hz deviation. 2. Check the Pin31 of IC105 to have square-wave, and low for RF modulation off. 3. Repeat item 1 and 2 for code38(250.3Hz). 4. Repeat item 1 and 3 for CH14.	

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13.	Normal Batter level Detect	1. Provide 1.5V DC at BP102. 2. Battery level : 4.18+/-0.15V level 1, 3.8+/-0.15V level 2, level 3: 2.88+/-0.15V. 3. Disconnect 1.5V DC at BP102. 4. Battery level : 3.85+/-0.15V level 1, 3.4+/-0.15V level 2, level 3: 2.88+/-0.15V.	
14.	SCAN (For T4900 only)	1. Set SG RF level to -50dBm with 500Hz deviation, 100Hz modulation. 2. Press "Mon" key. 3. Unit shows channels 9 and code 13.	

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Title: Alignment Procedure			
Model: T4800,T4900			
B. CASING LEVEL			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	Current Consumption	1. Set A-METER. With volume switch OFF, check the OFF current <10 μ A. 2. With volume switch ON, check the standby current <50mA. Press 'PTT' switches and check the TX current <400mA.	
2.	TX Frequency	1. Check CH15=462.5500MHz+/-500Hz; 2. Check CH14 =467.7125MHz+ /-500Hz.	
3.	Noise- Detector	1. Set the distance between antennas of SG and checked unit to 0.3M ~ 0.5M . 2. The antennas of SG and checked unit should be parallel to make the electromagnetic field of SG . 3. radiate equably to the antenna of checked unit . 4. Set SG to -90dBm with 1.5KHz deviation, 1KHz tone on CH7 . 5. Adjust VR102 for HIGH state : 9 ~ 13dB SINAD .	When adjusting Noise-Det. , Should reduce any interference from other Instruments and body.

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NO	ITEM	ALIGNMENT METHOD	REMARK
4.	Audio RX Path CH7	<div>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.</div> <div>2. Check speaker O/P level >85dBspL(30cm distance).</div> <div>3. Set SG RF level to -60dBm with 1.5kHz Dev.;1kHz AF.</div> <div>4. Plug the dummy speaker and dummy microphone into audio jet.</div> <div>5. Rotate the volume switch to the position, which give an output 900+/-50mv.</div> <div>6. Set SG RF level to -90dBm with 1.5kHz Dev.;1kHz AF.</div> <div>7. Check the radiated sensitivity correlate to the golden sample.</div> <div>8. Audio frequency response.<div>a) Set SG RF level to -60dBm with 1.5kHz deviation at 1KHz audio frequency.</div><div>b) Rotate the volume switch to the position, which give an output 100mV ±5mV (voltage difference of dummy speaker).</div><div>c) Vary the audio frequency from 300Hz to 3KHz.</div><div>d) Check the RX response compare to 1KHz tone.<div>i) 500Hz : + 5.0 dB to +14.0 dB.</div><div>ii) 2.5KHz : -12.0 dB to -20.0dB.</div></div></div> <div>9. Maximum and Minimum Audio Output Power.<div>a) Set SG RF level to -60dBm with 1.5kHz deviation at 1KHz audio frequency.</div><div>b) Rotate the volume switch to the position, which give a maximum output with distortion <5%.</div><div>c) Check the voltage difference of dummy speaker >/=900mV.</div><div>d) Set maximum audio output to 0dB, rotate the volume switch to the position, which give a minimum output.</div><div>e) Check the voltage difference between of dummy speaker -23dB to -40dB.</div></div>	
5.	Audio TX Path CH15	<div>1. Check the radiated power correlate to golden sample.</div> <div>2. Plug the dummy speaker and dummy microphone into audio jet.</div> <div>3. Standard TX Deviation.<div>a) Input mic level to dummy microphone and press 'PTT' switch.</div><div>b) Check max. Dev. 2.0KHz < max. Dev. < 2.5KHz.</div><div>c) Check input level in 0.5~10mV to provide normal deviation 1.5KHz.</div></div> <div>4. Audio Frequency Response.<div>a) Input a 2.0mv@1KHz audio frequency to dummy microphone and press 'PTT' switch.</div><div>b) Check the response.<div>i) 500Hz : -5.0 dB to -11.0 dB.</div><div>2.5KHz : +3.0 dB to +9.0 dB</div></div></div> <div>5.Repeat CH14.</div>	<div>Fliter set :</div> <div>1.HPF 50Hz</div> <div>2.LPF</div> <div>15HHz</div> <div>3. PK +</div>

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B. CASING LEVEL			
NO	ITEM	ALIGNMENT METHOD	REMARK
6.	Function check and Intercom function (between sample and production unit)	<div>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.</div> <div>2. The LCD display should be clear , not miss the segment when pressing '+' and '-' or '-' key , the key tone should also be heard clearly.</div> <div>3. Set channel of the sample and production unit CH=11.</div> <div>4. Press 'PTT' switch to intercom between sample and Production unit , the LED should be light.</div> <div>5. The sound quality between both should be clear and no metal sound .</div> <div>6. Press 'CALL' key , the call tone should be heard clearly each other .</div> <div>7. Change channel of the production unit to CH=12 , then Press 'PTT' switch of sample.</div> <div>8. Any noise should not be heard from the speaker of Production unit.</div> <div>9. Press any key , the dead problem should not occur .</div> <div>10. Set CH1/code5,SG to be CH1/code4 and code6,check the speaker mute.</div> <div>11. Set CH1/code37,SG to be CH1/code36 and code38, check the speaker mute.</div> <div>12. Repeat item 10 and 11 for CH14.</div>	

* 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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