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**$^{\mathbf{CH}}$'. 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: **18**$^{\mathbf{88.}}$.	
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/CODE1and 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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NO	ITEM	ALIGNMENT METHOD	REMARK
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	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. 2. Check speaker O/P level >85dBspL(30cm distance). 3. Set SG RF level to -60dBm with 1.5kHz Dev.;1kHz AF. 4. Plug the dummy speaker and dummy microphone into audio jet. 5. Rotate the volume switch to the position, which give an output 900+/-50mv. 6. Set SG RF level to -90dBm with 1.5kHz Dev.;1kHz AF. 7. Check the radiated sensitivity correlate to the golden sample. 8. Audio frequency response. a) Set SG RF level to –60dBm with 1.5kHz deviation at 1KHz audio frequency. b) Rotate the volume switch to the position, which give an output 100mV ±5mV (voltage difference of dummy speaker). 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 –20.0dB. 9. Maximum and Minimum Audio Output Power. a) Set SG RF level to –60dBm with 1.5kHz deviation at 1KHz audio frequency. b) Rotate the volume switch to the position, which give a maximum output with distortion <5%. c) Check the voltage difference of dummy speaker >/=900mV. d) Set maximum audio output to 0dB, rotate the volume switch to the position, which give a minimum output. e) Check the voltage difference between of dummy speaker –23dB to -40dB.	
5.	Audio TX Path CH15	1. Check the radiated power correlate to golden sample. 2. Plug the dummy speaker and dummy microphone into audio jet. 3. Standard TX Deviation. a) Input mic level to dummy microphone and press ‘PTT’ switch. b) Check max. Dev. 2.0KHz < max. Dev. < 2.5KHz. c) Check input level in 0.5~10mV to provide normal deviation 1.5KHz. 4. Audio Frequency Response. a) Input a 2.0mv@1KHz audio frequency to dummy microphone and press ‘PTT’ switch. b) Check the response. i) 500Hz : -5.0 dB to –11.0 dB. 2.5KHz : +3.0 dB to +9.0 dB 5.Repeat CH14.	Fliter set : 1.HPF 50Hz 2.LPF 15HHz 3. PK +

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

* 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