GIANT ELECTRONICS LTD.

Title: Alignment Procedure

Model: T6525

A. PCB LEVEL (Test Condition: under CH14)

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: 2**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 <550mA DC.	
4.	VCO	1. Set RX or TX mode 2. Check TP503 to provide 0.6~2.3VDC . 3. Adjust L509 to provide 2.2 ± 0.1VDC at TP503 if VCO level are more than 2.4VDC on CH14.	
5.	TX Power	1. Set TX mode CH14, Check transmit power to provide 23.2dBm ERP	Test voltage DC:4.5V
6.	TX Frequency	1. Set TX mode 2. Adjust VC501 to provide 467.7125MHz ± 50Hz.	
7.	CTCSS Tone Frequency	1. Set CH14/CODE1 and Tx mode. 2. Check CTCSS tone frequency to be within 66.8Hz to 67.2Hz.	
8.	CDCSS Frequency	1. Set TX mode 2. Set CH14/CODE99 3. Adjust VR501 to provide 503 Octal Code 4. Set CH14/CODE39, check Octal Code to be 023	FILTER SET: 1.Input Level: 0.9KHz
9.	CTCSS Tone Dev.	1. Set CH14/CODE1、AF input level to off, check DEV to be 300Hz~ 650Hz. 2. Set CH14/CODE38、AF input level to off, check DEV to be 300Hz~ 650Hz.	FILTER SET: 1.50HZ~300HZ 2.750μs De-emp ON 3. PK+ 4. FM DEV. AVG ON
10.	TX Modulation & distortion	1.Set AF level at 50mv;1KHz,Adjust VR101 to provide Max TX deviation 2.25KHz to 2.35KHz. 2.Check input Mic level in 5~15 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 .	FILTER SET: 1.HPF 50Hz 2.LPF 15KHz 3. PK +

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NO	ITEM	ALIGNMENT METHOD	REMARK
11.	VOX Detector	1. Set VOX level at 1. 2. Set AF level at 14.2 +/- 0.2 mV,1KHz at TP116. 3. Unit start to transmit. 4. Set AF level at 10.8 +/- 0.2mV,1KHz at TP116. 5. Unit stop transmit. 6. Set VOX level at 2. 7. Set AF level at 8.4 +/- 0.2mV,1KHz at TP116. 8. Unit start to transmit. 9. Set AF level at 5.8 +/- 0.2mV,1KHz at TP116. 10. Unit stop transmit. 11. Set VOX level at 3 12. Set AF level at 4.0 +/- 0.2mV,1KHz at TP116. 13. Unit start to transmit. 14. Set AF level at 2.7 +/- 0.2mV,1KHz at TP116. 15. Unit stop transmit.	
12.	IVOX Detector	1. Set VOX level at 1. 2. Set AF level at 14.2 +/- 0.2 mV,1KHz at TP116. 3. Unit start to transmit. 4. Set AF level at 10.8 +/- 0.2mV,1KHz at TP116. 5. Unit stop transmit. 6. Set VOX level at 2. 7. Set AF level at 8.4 +/- 0.2mV,1KHz at TP116. 8. Unit start to transmit. 9. Set AF level at 5.8 +/- 0.2mV,1KHz at TP116. 10. Unit stop transmit. 11. Set VOX level at 3 12. Set AF level at 4.0 +/- 0.2mV,1KHz at TP116. 13. Unit start to transmit. 14. Set AF level at 2.7 +/- 0.2mV,1KHz at TP116. 15. Unit stop transmit	
13.	Rx Audio test	1. Set RX mode CH7. 2. Set SG RF level to –50dBm with 1.5KHz deviation 1KHz modulation Signal. 3. Adjust L517 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.	

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NO	ITEM	ALIGNMENT METHOD	REMARK
		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) 700Hz : -2 dB to -12.0 dB. ii) 2.0KHz : -15.0 dB to –25.0 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 -21dB to -40dB at TP117 11. Set WX mode, Set SG RF level to –116dBm with 3KHz deviation at 1KHz audio frequency. a). Check SINAD sensitivity <= -116dBm. @12dB SINAD at TP117.	
14.	Noise- Detector	1. Set SG to –120dBm with 1.5KHz deviation., 1KHz AF on CH7. 2. Press ”Mon” key and Adjust VR502 for transient state @ 9 dB SINAD. 3. Check high state @6 to13dB SINAD.	

A. PCB LEVEL (Test Condition: under CH14)

NO	ITEM	ALIGNMENT METHOD	REMARK
15.	CTCSS Tone Detect	1. Set CH14/CODE1 and SG to –60dBm with 67Hz tone frequency, 400Hz deviation. 2. Check the Pin22 of IC101 to have square-wave, and low for RF modulation off. 3. Repeat item 1 and 2 for code38(250.3Hz). 4. Repeat item 1 ~ 3 for CH14.	
16.	CDCSS Tone Detect	1. Set CH14/CODE99 and SG to –60dBm with 503 Octal Code tone frequency, 400Hz deviation. 2. Check the Pin22 of IC101 to have square-wave, and low for RF modulation off. 3. Repeat item 1 and 2 for code39(023 Octal Code). 4. Repeat item 1 ~ 3 for CH14.	
17.	Quiet Noise Dectect	1. Set unit to quiet noise mode 2. Set CH14/CODE1and SG to –60dBm with 67Hz tone frequency, 400Hz deviation and 55 Hz audio frequency, 1K deviation.. 3. 55 Hz tone frequency appear on TP117.	
18.	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.	
19.	SCAN	1. Set SG RF level to –50dBm with 500Hz deviation, 100Hz modulation. 2. Press "Mon" key. 3. Unit shows channels 9 and code 13.	
20.	Battery charging current	1. Switch to charger unit ,check the battery and the unit charging current @3.6V battery:(coordinate 100 Ohm load) 2. Adaptor input voltage 120V: 45±8mA. 3. Adaptor input voltage 108V: 40±8mA. 4. Adaptor input voltage 132V: 50±8mA.	**(for charger)**
		5.	

B. CASING LEVEL

NO	ITEM	ALIGNMENT METHOD	REMARK
1.	Current Consumption	1. Set A-METER. With volume switch OFF, check the OFF current <50 μ A. 2. With volume switch ON, check the standby current <45mA. Press 'PTT' switches and check the TX current <550mA 3. With vibrate ON,check the current <150mA.	
2.	TX Frequency	1. Check CH1 =462.5625 MHz+/-500Hz; 2. Check CH14 =467.7125 MHz+ /-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 VR502 for HIGH state : 6 ~ 13dB SINAD .	When adjusting Noise-Det. , Should reduce any interference from other Instruments and body.

B. CASING LEVEL

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. Check the radiated sensitivity correlate to the golden sample. 9. 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) 700Hz : -2.0 dB to -12.0 dB. ii) 2.0KHz : -15.0 dB to –25.0dB. 10. 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 –21dB to -45dB.	
5.	Audio TX Path CH14	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 +

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 3.57v; Normal DC4.2v; Max DC4.5v