GIANT ELECTRONICS LTD

Title:	**Alignment Procedure**				
Model:	**FV525**				
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GIANT ELECTRONICS LTD.

Title: Alignment Procedure

Model: FV525 | Test voltage: 4.2Vdc

A. PCB LEVEL (Test Condition: under CH4)

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: .	
2.	Standby current	1. Set A-METER, and RX mode. 2. Check the standby current <45mA. 3. Check the Sleep current <30mA	
3.	Talk on current	1. Set A-METER, and TX mode @50ohm load. 2. Check the TX current <900mA@4.2Vdc. 3. Set channel to 14. 4. Check the TX current <500mA@4.2Vdc.	
4.	VCO	1. Set RX or TX mode 2. Check TP103 to provide 0.7 ~ 2.4VDC. 3. Adjust L113 to provide 1.8 ± 0.1Vdc at TP103 if VCO level are more than 2.2Vdc on CH14.	
5.	TX Power	1. Set TX mode CH4. 2. Check transmit power to provide < 0.15W ERP 3. Set TX mode channel 14. 4. Adjust VR 1 to provide <0.1 W ERP.	Test voltage is 4.5V DC.
6.	CTCSS Tone Frequency	1.Set CH1/CODE1. 2.Set Tx mode. 3.Check the code signal should be within 66.8Hz to 67.2Hz.	FILTER SET: 1. 20Hz~300Hz
7.	TX Frequency	Adjust C159 to provide 462.5625MHz ± 50Hz.	
8.	CTCSS Tone Dev.	1. Set CH1/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. 20Hz~300Hz 2. 750μs De-emp ON 3. PK+/- Max 4. FM DEV. AVG ON
9.	CDCSS TX	1. Set TX mode 2. Set CH15/CODE121 3. Check the detector (HP8920B with decoder) display 754 Octal Code 4. Set CH4/CODE39, check Octal Code to be 023	FILTER SET: 1. 20Hz~300Hz 2. 750μs De-emp ON 3. PK+/- Max 4. Input Level: 0.6KHz
10.	TX Modulation & distortion	1.Set AF level at 50mV; 1KHz, Adjust VR101 to provide Max TX deviation 2.1KHz to 2.2KHz. 2. Check the max deviation with code 1 (or code 38), it should be ≤2.5KHz 3. Without code check input Mic level (TP116) in 3~15 mV to provide normal deviation 1.5KHz. 4.Check the demodulation distortion <5% 5. Audio Frequency Response. a) Input a 6.0mV 1KHz audio frequency to TP116 and press 'PTT' switch. b) Check the response compare to 1KHz tone. i) 500Hz: -10.0 dB to –4.0 dB. ii) 2.5KHz: 2 dB to +12.0 dB.	Item1, 2, 3&5 set: 1. HPF 50Hz 2. LPF 15KHz 3. PK+/- Max 4. 2.750μs De-emp ON Item 4 set: 1. HPF 300Hz 2. LPF 3KHz 3. PK+/- Max 4. 2.750μs De-emp ON

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Model: FV525			
A. PCB LEVEL (Test Condition: under CH4)			
NO	ITEM	ALIGNMENT METHOD	REMARK
11.	VOX Detector	Input and test 1KHz AF signal at TP116. **1**. Set VOX level at 1. Unit start to transmit: ≥ 12.0 mV Unit stop transmit: ≤9.0 mV **2**. Set VOX level at 2. Unit start to transmit: ≥ 8.0 mV Unit stop transmit: ≤ 6.0 mV **3**. Set VOX level at 3. Unit start to transmit: ≥ 5.0 mV Unit stop transmit: ≤ 3.0 mV	
12.	Rx Audio test	1. Set RX mode CH7. 2. Set SG RF level to –50dBm with 1.5KHz deviation 1KHz modulation Signal. 3. Rotate the volume switch to the position, which give a Max audio output at TP117. 4. Check Max audio output level >1400mV. 5. Check Rx current <150mA. 6. Check the 1KHz distortion <= 5%. 7. Set SG RF level to –119dBm with 1.5kHz deviation at 1KHz audio frequency. a). Check SINAD sensitivity <= -119dBm. @12dB SINAD at TP117. 8. 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 700mV±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 11.0 dB. ii) 2.5KHz: -25.0 dB to –15.0 dB. 9. 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 >1400mV. d) Set maximum audio output to 0 dB, rotate the volume switch to the position, which give a minimum output. e) Check the minimum voltage -23dB to -40dB at TP117	
13.	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 @7 to 17dB SINAD.	

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Title: Alignment Procedure			
Model: FV525			
A. PCB LEVEL (Test Condition: under CH4)			
NO	ITEM	ALIGNMENT METHOD	REMARK
14.	CTCSS tone Detect	1. Set CH4/CODE1and SG to –120dBm 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 code 38 (250.3Hz). 4. Repeat item 1 to 3 for CH14.	
16.	Quiet tone Detect	1.Set unit to quiet tone ON mode. 2.Set CH4 and SG to –60dBm with 1KHz frequency, 500Hz deviation and 55Hz tone, 400Hz DEV. 4. Check 1KHz signal will appear on TP 117.	
17.	CDCSS Tone Detect	1. Set CH4/CODE121 and SG to –60dBm with 1KHz/1.5K Dev, 754 Octal encoder/400Hz Dev. 2. Check the speaker output (1KHz signal) should be continued. 3. Repeat item 1 and 2 for code 39(023 Octal Code). 4. Repeat item 1 ~ 3 for CH14.	
18.	Normal Batter level Detect	1. Battery level: 2. Level 1: 3.90+/-0.15V, 3. Level 2: 3.55+/-0.15V, 4. Level 3: 3.20+/-0.15V, 5. Power off: 3.15+/-0.15V, 6. Power on: 3.18+/-0.15V.	
19.	SCAN	1. Set SG RF 467.5875MHz / –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)**

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Title: Alignment Procedure			
Mol: FV525			
B. CASING LEVEL			
NO	ITEM	ALIGNMENT METHOD	REMARK
1.	Current Consumption	1. Set A-METER. With volume switch OFF, check the OFF current <80 μ A. 2. With volume switch ON, check the standby current <45mA. 3. Press 'PTT' switches and check the TX current <800mA @ Ch15 and <500mA @Ch14.	Battery Voltage" 4.2Vdc
2.	TX Frequency	1. Check CH1=462.5625MHz+/-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: 7~17dB SINAD.	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
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 >83dBspL (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 700mV ±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 11.0 dB. ii) 2.5KHz: -25.0 dB to –15.0 dB 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 0 dB, 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 3~15mV to provide normal deviation 1.5KHz. 4. Audio Frequency Response. a) Input a 6.0mv@1KHz audio frequency to dummy microphone and press 'PTT' switch. b) Check the response. i) 500Hz: -10.0 dB to -4.0 dB. 2.5KHz: 2.0 dB to 12.0 dB 5.Repeat CH14.	Filter set: 1.HPF 50Hz 2.LPF 15HHz 3.PK +/- Max

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Title: Alignment Procedure			
Model: FV525			
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 code 6, 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 DC4.2V; Max DC4.5V

_____ End_____

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