

ALIGNMENT PROCEDURE

UHF

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Prepared by : _____

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| 1. TRANSIMITTER ALIGNMENT (TEST CONDITION: USE 7.4VDC 1.2A SUPPLY) | | | |
|---|---|---|---------|
| NO. | ITEM | ALIGNMENT METHOD (WITH PRODUCTION SPEC.) | REMARKS |
| 1.1 | Check LCD | <ol style="list-style-type: none"> Switch on the power (SW451), check all segments should display clearly & correctly. Check the current should be <60mA. | |
| 1.2 | Rx / Tx VCO | <ol style="list-style-type: none"> Connect a voltmeter between CV test point and ground Check Rx VCO should be 2.2+/- 0.3V on Frequency 455MHz. Connect PTT button to ground. Check Tx VCO should be 2.2+/- 0.3V on Frequency 455MHz. Release PTT button. Press and hold the MON button monitor green light will be on. | |
| 1.3 | Tx Frequency | <ol style="list-style-type: none"> Connect PPT button to ground and select frequency 455MHz Adjust VC2 until Tx frequency should be 455MHz+/- 0.30kHz. | |
| 1.4 | Tx Power | <ol style="list-style-type: none"> Connect PPT button to ground and select frequency 440MHz and frequency 470MHz Check Tx power should be <36dBm at Ant point | |
| 1.5 | Tx Modulation Check CTCSS Tone Dev. Check CTCSS Freq. Error Check Max. Deviation | <ol style="list-style-type: none"> Connect PTT button to ground and Select frequency 455MHz Apply 4mVrms with 1kHz at mic input. Adjust VR552 until the frequency deviation 2.0k +/- 0.1 kHz and check distortion should less than 5%. And also check if Tx frequency response as below: 300Hz = 1+/- 0.2kHz. and 1.5kHz = 3.0kHz +/- 0.2kHz. Select frequency 440MHz with Code 1, 12, 38 , the CTCSS Dev = 0.6 +0/-0.15 kHz Select frequency 470MHz with code 1, 12,38, the CTCSS Dev = 0.6 +0/- 0.15kHz Check CTCSS Code 12 should be 100Hz+/-0.2%. Increased mic input signal to +40dB, check max deviation should less than 2kHz and less than 2.5k with CTCSS. | |
| 1.6 | Tx FM Noise | <ol style="list-style-type: none"> Connect PPT button to ground. Connect 220uF E.Cap to mic input and ground. Check FM noise should less than 300Hz at frequency 440MHz and frequency 470MHz. | |
| 1.7 | Current Drain at max. Dev | <ol style="list-style-type: none"> Connect PTT button to ground and selected frequency 455MHz. Check Tx current should less than 1600 mA with max deviation. | |

| 2. RECIEVER ALIGNMENT (TEST CONDITION: USE 7.4VDC 3A SUPPLY) | | | |
|---|--|---|---------|
| NO. | ITEM | ALIGNMENT METHOD (WITH PRODUCTION SPEC.) | REMARKS |
| 2.1 | Check Rx Audio Level Rated Audio Output Power | <ol style="list-style-type: none"> Set RF generator to 455MHz and set RF output to -47dBm with 1.5kHz deviation/1kHz. Terminated speaker point with 8 ohm load. Set speaker output level to 1.0V of unit. Check distortion should be less then 3%. Set speaker output level to 1.5Vrms. Check distortion should be less then 4.5%. Set speaker output level to max. Check distortion should <10%. | |

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|-----|--|--|--|
| 2.2 | Check Rx Audio Response | <ol style="list-style-type: none"> 1. Set RF generator to 455MHz and set RF output to -47dBm with 1.5kHz deviation/1kHz. 2. Set speaker output to 1.0V of unit with input signal is 1kHz as reference point (0dB). 3. Check Freq. Response : 300Hz = $-2 \pm 3\text{dB}$ and 2.5kHz = $-6 \pm 3\text{dB}$ | |
| 2.3 | Rx Sensitivity | <ol style="list-style-type: none"> 1. Set RF generator to 455MHz and set RF output to -47dBm with 1.5kHz deviation/1kHz. 2. Set speaker output to 1.0V of unit and decrease RF output level to 12 dB sinad. 3. Check RF output level of RF generator should less than -123dBm. 4. Set RF generator to CH15 with 2.5kHz dev/1kHz and decrease RF output level to 12 dB sinad. 5. The RF output level should less than -123dBm. | |
| 2.4 | S/N ratio | <ol style="list-style-type: none"> 1. Set RF generator to 455MHz and set RF output to -47dBm without modulation. 2. Set speaker output to max of unit. 3. Check (speaker output) S/N ratio should be $>40\text{dB}$. | |
| 2.5 | Rx Audio with CTCSS Check RX Sens. with CTCSS Check CTCSS Tone Decoder | <ol style="list-style-type: none"> 1. Select 455MHz with CTCSS Code 12. 2. Apply -47dBm RF signal with 1.5kHz deviation/1kHz and external input of RF Gen with 0.6kHz deviation/100Hz as CTCSS code. 3. A 1kHz signal will be heard from speaker. 4. Set speaker output to 1.0V and decrease RF level to 8dB sinad. 5. The speaker should be on. 6. Increase RF output level to -47dBm and change the external input Freq. of RF Gen. to 200Hz. 7. The speaker should be off. | |

3. DC CURRENT DRAIN

(TEST CONDITION: USE 7.4VDC 3A SUPPLY ONLY)

| NO. | ITEM | ALIGNMENT METHOD (WITH PRODUCTION SPEC.) | REMARKS |
|-----|-----------------------------------|--|---------|
| 3.1 | Check Battery Low | <ol style="list-style-type: none"> 1. Set the power supply to $5.1\text{V} \pm 0.15\text{V}$. Battery low icon should be flashing. | |
| 3.2 | Check Standby Current (squelched) | <ol style="list-style-type: none"> 1. Check the standby current should less than 60mA (squelched). | |
| 3.3 | Max . Audio Output | <ol style="list-style-type: none"> 1. Adjust speaker volume to set speaker output level $>1.0\text{V}$ and distortion 5%. 2. Check current should less than 200mA. | |
| 3.4 | Check charging current | <ol style="list-style-type: none"> 1. Switch off the unit. Check charging current should less than $300 \pm 30\text{mA}$ with 9Vdc/800mA DC adaptor. | |

Notice: The other functional tests, please referred to PX- UHF Operation Specification.

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