

# **ALIGNMENT PROCEDURE**

**PX-777**

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**1. TRANSMITTER ALIGNMENT (TEST CONDITION: USE 7.2VDC 1.2A SUPPLY)**

NO.	ITEM	ALIGNMENT METHOD (WITH PRODUCTION SPEC.)	REMARKS
1.1	Check LCD	<ol style="list-style-type: none"> <li>Switch on the power ( SW451), check all segments should display clearly &amp; correctly.</li> <li>Check the current should be &lt;60mA.</li> </ol>	
1.2	Rx / Tx VCO	<ol style="list-style-type: none"> <li>Connect a voltmeter between CV test point and ground</li> <li>Check Rx VCO should be 2.2+/- 0.3V on Frequency 161MHz.</li> <li>Connect PTT button to ground.</li> <li>Check Tx VCO should be 2.2+/- 0.3V on Frequency 161MHz.</li> <li>Release PTT button. Press and hold the MON button monitor green light will be on.</li> </ol>	
1.3	Tx Frequency	<ol style="list-style-type: none"> <li>Connect PPT button to ground and select frequency 161MHz</li> <li>Adjust VC2 until Tx frequency should be 161MHz+/- 0.30kHz.</li> </ol>	
1.4	Tx Power	<ol style="list-style-type: none"> <li>Connect PPT button to ground and select frequency 150MHz and frequency 174MHz</li> <li>Check Tx power should be &lt;36dBm at Ant point</li> </ol>	
1.5	Tx Modulation Check CTCSS Tone Dev. Check CTCSS Freq. Error Check Max. Deviation	<ol style="list-style-type: none"> <li>Connect PTT button to ground and Select frequency 161MHz</li> <li>Apply 4mVrms with 1kHz at mic input.</li> <li>Adjust VR552 until the frequency deviation 2.0k +/- 0.1 kHz and check distortion should less than 5%.</li> <li>And also check if Tx frequency response as below:            300Hz = 1+/- 0.2kHz. and 1.5kHz = 3.0kHz +/- 0.2kHz.</li> <li>Select frequency 400MHz with Code 1, 12, 38 , the CTCSS Dev = 0.6 +/-0.15 kHz</li> <li>Select frequency 470MHz with code 1, 12,38, the CTCSS Dev = 0.6 +/-0.15kHz</li> <li>Check CTCSS Code 12 should be 100Hz+/-0.2%.</li> <li>Increased mic input signal to +40dB, check max deviation should less than 2kHz and less than 2.5k with CTCSS.</li> </ol>	
1.6	Tx FM Noise	<ol style="list-style-type: none"> <li>Connect PPT button to ground.</li> <li>Connect 220uF E.Cap to mic input and ground.</li> <li>Check FM noise should less than 300Hz at frequency 150MHz and frequency 174MHz.</li> </ol>	
1.7	Current Drain at max. Dev	<ol style="list-style-type: none"> <li>Connect PTT button to ground and selected frequency 161MHz.</li> <li>Check Tx current should less than 1600 mA with max deviation.</li> </ol>	

**2. RECIEVER ALIGNMENT (TEST CONDITION: USE 7.2VDC 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"> <li>Set RF generator to 161MHz and set RF output to -47dBm with 1.5kHz deviation/1kHz.</li> <li>Terminated speaker point with 8 ohm load.</li> <li>Set speaker output level to 1.0V of unit. Check distortion should be less than 3%.</li> <li>Set speaker output level to 1.5Vrms. Check distortion should be less than 4.5%.</li> <li>Set speaker output level to max. Check distortion should &lt;10%.</li> </ol>	

2.2	Check Rx Audio Response	<ol style="list-style-type: none"> <li>Set RF generator to 161MHz and set RF output to <math>-47\text{dBm}</math> with <math>1.5\text{kHz}</math> deviation/<math>1\text{kHz}</math>.</li> <li>Set speaker output to <math>1.0\text{V}</math> of unit with input signal is <math>1\text{kHz}</math> as reference point (<math>0\text{dB}</math>).</li> <li>Check Freq. Response : <math>300\text{Hz} = -2 \pm 3\text{dB}</math> and <math>2.5\text{kHz} = -6 \pm 3\text{dB}</math></li> </ol>	
2.3	Rx Sensitivity	<ol style="list-style-type: none"> <li>Set RF generator to 161MHz and set RF output to <math>-47\text{dBm}</math> with <math>1.5\text{kHz}</math> deviation/<math>1\text{kHz}</math>.</li> <li>Set speaker output to <math>1.0\text{V}</math> of unit and decrease RF output level to <math>12\text{ dB}</math> sinad.</li> <li>Check RF output level of RF generator should less than <math>-123\text{dBm}</math>.</li> <li>Set RF generator to CH15 with <math>2.5\text{kHz}</math> dev/<math>1\text{kHz}</math>.and decrease RF output level to <math>12\text{ dB}</math> sinad.</li> <li>The RF output level should less than <math>-123\text{dBm}</math>.</li> </ol>	
2.4	S/N ratio	<ol style="list-style-type: none"> <li>Set RF generator to 161MHz and set RF output to <math>-47\text{dBm}</math> without modulation.</li> <li>Set speaker output to max of unit.</li> <li>Check (speaker output) S/N ratio should be <math>&gt;40\text{dB}</math>.</li> </ol>	
2.5	Rx Audio with CTCSS  Check RX Sens. with CTCSS  Check CTCSS Tone Decoder	<ol style="list-style-type: none"> <li>Select 161MHz with CTCSS Code 12.</li> <li>Apply <math>-47\text{dBm}</math> RF signal with <math>1.5\text{kHz}</math> deviation/<math>1\text{kHz}</math> and external input of RF Gen with <math>0.6\text{kHz}</math> deviation/<math>100\text{Hz}</math> as CTCSS code.</li> <li>A <math>1\text{kHz}</math> signal will be heard from speaker.</li> <li>Set speaker output to <math>1.0\text{V}</math> and decrease RF level to <math>8\text{dB}</math> sinad.</li> <li>The speaker should be on.</li> <li>Increase RF output level to <math>-47\text{dBm}</math> and change the external input Freq. of RF Gen. to <math>200\text{Hz}</math>.</li> <li>The speaker should be off.</li> </ol>	

### 3. DC CURRENT DRAIN

(TEST CONDITION: USE  $7.2\text{VDC}$   $3\text{A}$  SUPPLY ONLY)

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

*Notice: The other functional tests, please referred to PX-777 Operation Specification.*

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