



**HomePortal WLAN Tuning  
Procedure**

Rev.	Description of Change	Date	Originator
A	Initial Release	4/19/02	Jeremy Muir



### 1.0 Purpose

The purpose of this document is to outline the procedure for tuning and on-going compliance testing of the wireless section of the HomePortal line of DSL routers.

### 2.0 Scope

This document covers the wireless versions of the Home/Office Portal line of DSL routers.

### 3.0 Application Documents

The following documents are referenced in this procedure:

1. IEEE 802.11B
2. FCC CFR 47 Part 15

### 4.0 Definitions

- DUT – Device Under Test
- FCC – Federal Communications Commission
- MAC – Media Access Controller
- PA – Power Amplifier
- WLAN – Wireless Local Access Network

### 5.0 Tuning Procedure

Figure 1 shows a flowchart of how the tuning process will take place. 100% of the units in the factory will be tuned using this procedure.

The tuning process has three goals:

1. Ensure proper power output at minimum current consumption.
2. Ensure that emissions within a restricted band meet FCC requirements.
3. Ensure that the spectrum meets the IEEE 802.11B spectral mask requirement.

This is accomplished by an iterative process in which a measurement of the spectrum is made and then the PA bias and/or the TX gain setting is adjusted. This process continues until the spectrum meets all requirements or until the power output is dropped to its minimum value. The spectrum is measured by radiated means. The DUT is placed in a RF shielded box with anechoic foam to minimize reflections. (See figure 2).

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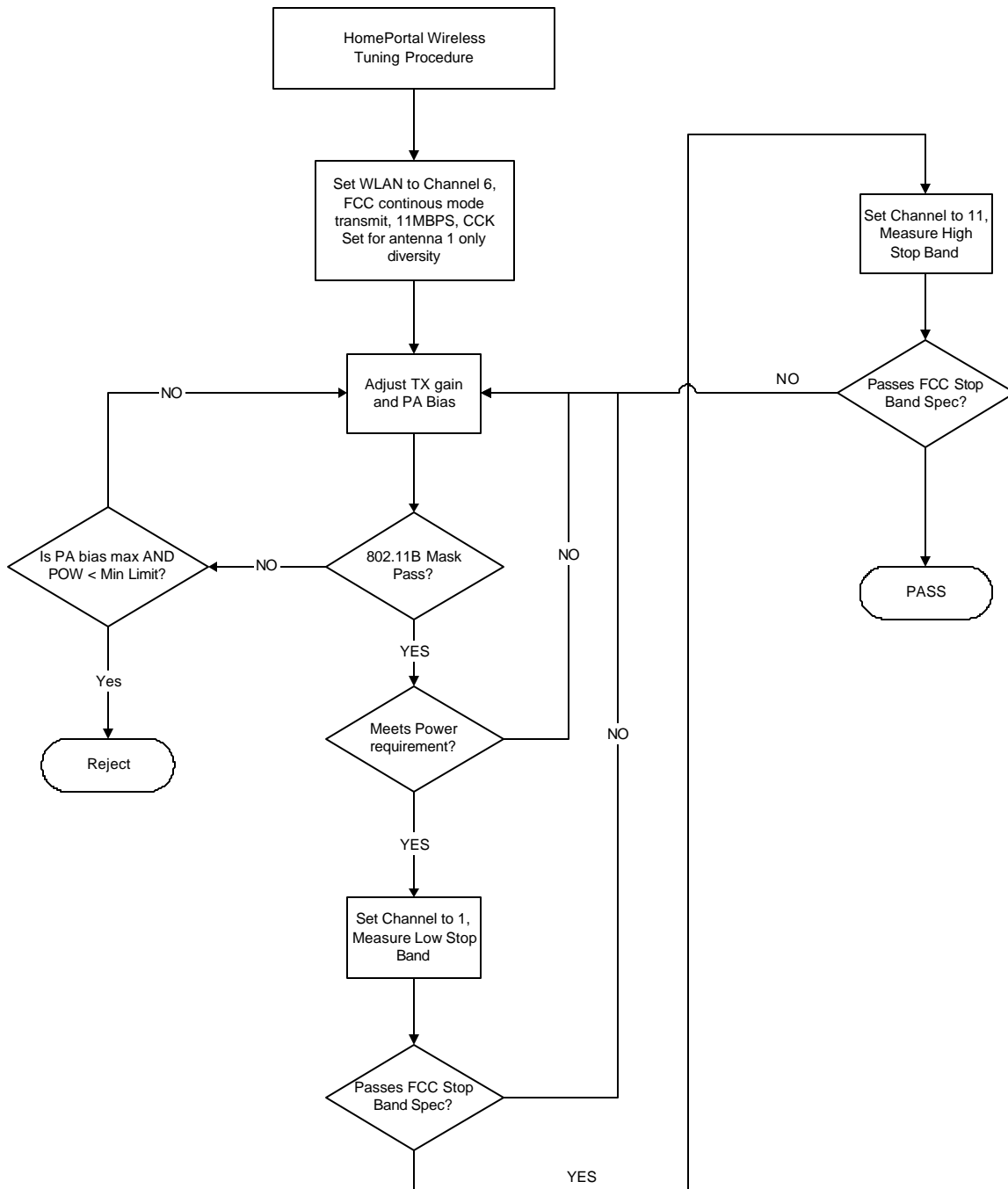


Figure 1 – Tuning Flowchart

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**5.1 Power Measurement**

The output power is measured at the input to the antenna. The power is measured by the PA’s power sense circuitry. The output power is converted to a voltage which is then measured wit a DAQ card. The power output into the antenna is limited to 17.5 dBm maximum and 16.0 dBm minimum.

**5.2 802.11B Spectral Mask Testing**

To test the spectral mask, the UUT will be set to FCC continuous transmit mode on channel 6. The spectrum analyzer will be automatically setup by the test PC to the following parameters:

- Reference Level: 0 dBm
- Resolution Bandwidth: 100kHz
- Video Bandwidth: 30kHz.
- Sweep Time: Auto
- Span: 100 kHz

The spectrum analyzer will be set up for max hold. The waveform will be held for five seconds before a measurement is taken. The waveform will be compared to the required mask and the test PC will determine whether the waveform passes and what action to take next.

**5.3 Restricted Band Testing**

Channels 1 and 11 will be checked for emissions within the restricted bands. The UUT will be set for continous transmit at the worst case rate and modulation. The spectrum analyzer will be setup by the test PC to the following parameters:

- Reference Level: 0 dBm
- Resolution Bandwidth: 100kHz
- Video Bandwidth: 1MHz.
- Sweep Time: Auto
- Span: 100 kHz

The peak of the transmitted spectrum will be measured with the spectrum analyzer’s marker function. Using a delta marker, the difference between the transmit peak and maximum peak in the restricted band will be measured and recorded. This will compared to the specification if FCC Part 15 and the test PC will determines the next step.

**6.0 Sampling Rate**

100% of all units in the factory will be tuned to these parameters. Under no instance will a unit be shipped without passing the tuning parameters.

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