Title: **Test Bed Configurations for Conformance Testing**

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Introduction:

This paper describes and illustrates a set of configuration test platforms which could be used for the IEEE802.11 DS-PHY conformance testing. The objective of this paper is to present example scenarios of test platforms, for laboratory testing organizations conducting these tests. The illustrations of the test platforms in this paper typically use, and not limited to off-the-shelf test equipment.

Test Equipment Considerations:

Much of the off-the-shelf test equipment available today for WLANs operating in the 2.4GHz ISM band is general purpose. It is visioned that equipment manufacturers will provide the market with specialized equipment to support the IEEE802.11 WLAN standard, thereafter the standard is released. In the short term conformance lab testing will have to rely on equipment that is either general purpose or custom designed to meet the needs of the standard.

Packetize Data vs Continuous

Much of the conformance testing for the DS-PHY will use both continuous and packetized data. It is our belief at this point that a combination of packetized and continuos tests are required.

Test Bed Configurations

The DS - PHY requires conformance test at RF frequencies as well as tests that verify the format and conformance of data at baseband.

Figures 1 to 4 illustrate examples of test bed configurations that can cover the entire range of required DS-PHY level conformance tests.

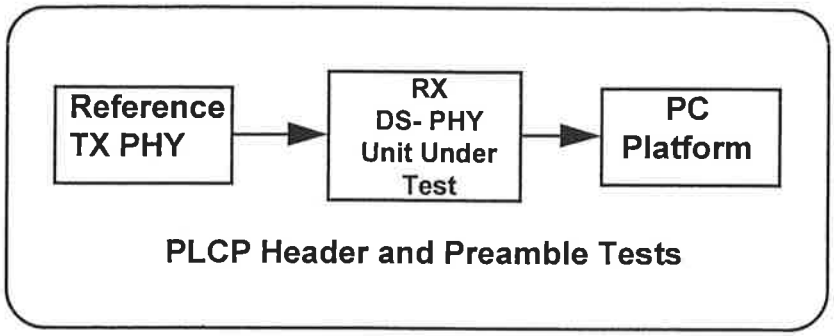

Figure 1.PLCP Header and Preamble Conformance

The configuration illustrated on figure 1, addresses the tests that verify preamble and PLCP conformance using the baseband data.
The tests in this area include verification of proper PLCP header format, proper scrambling and descrambling, and verification of operation under the specified preamble lengths.
This test bed includes a reference transmitter to emulate the various test PLCP header and preamble configurations required.
The tests listed under this category will likely be performed at ambient temperatures.

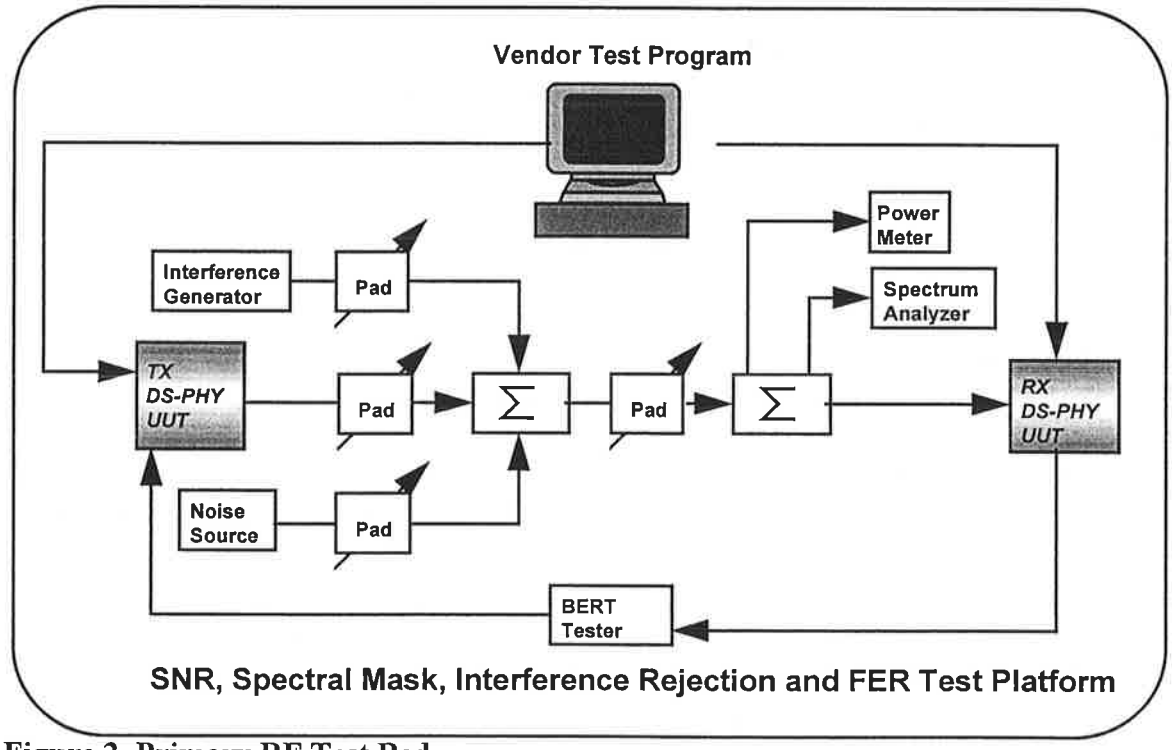

Figure 2. Primary RF Test Bed

The configuration illustrated in figure 2, illustrates the primary test configuration recommended for the RF and modulation performance tests. This test bed is recommend because all of its components are commercially available at the present.

This test bed implies that a Bit Error (BER) Tester is going to be utilized. The IEEE802.11 standard defines a PACKETIZED system and a Frame Error Rate (FER) Tester can be substituted. The BER tester remains as a recommendation since the writers of this paper have not identified a commercially available FER tester that will cover the range of the required tests. The tests that can be covered under this test bed include receiver sensitivity, Tx spectral mask and interference tests. Figures 3 and 4 are expansions of this primary RF test bed that allow for the remaining RF and modulation accuracy tests.

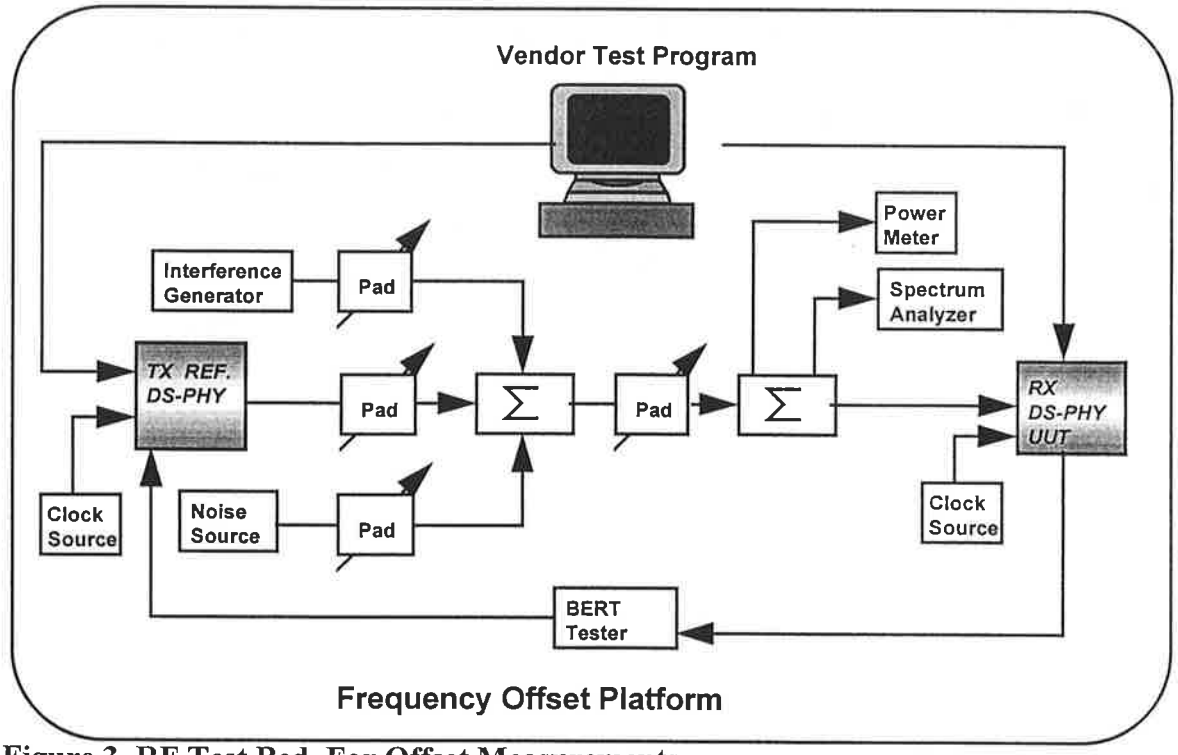

Figure 3. RF Test Bed For Offset Measurements.

Figure 3, illustrates a variation of the primary RF test bed to accomplish the measurements in regard to frequency and clock offsets. This test bed introduces a reference transmitter as well as programmable clock and frequency sources to generate the test range of offsets at the reference transmitter and to monitor the compliance of the receiver under test given these offset variations.

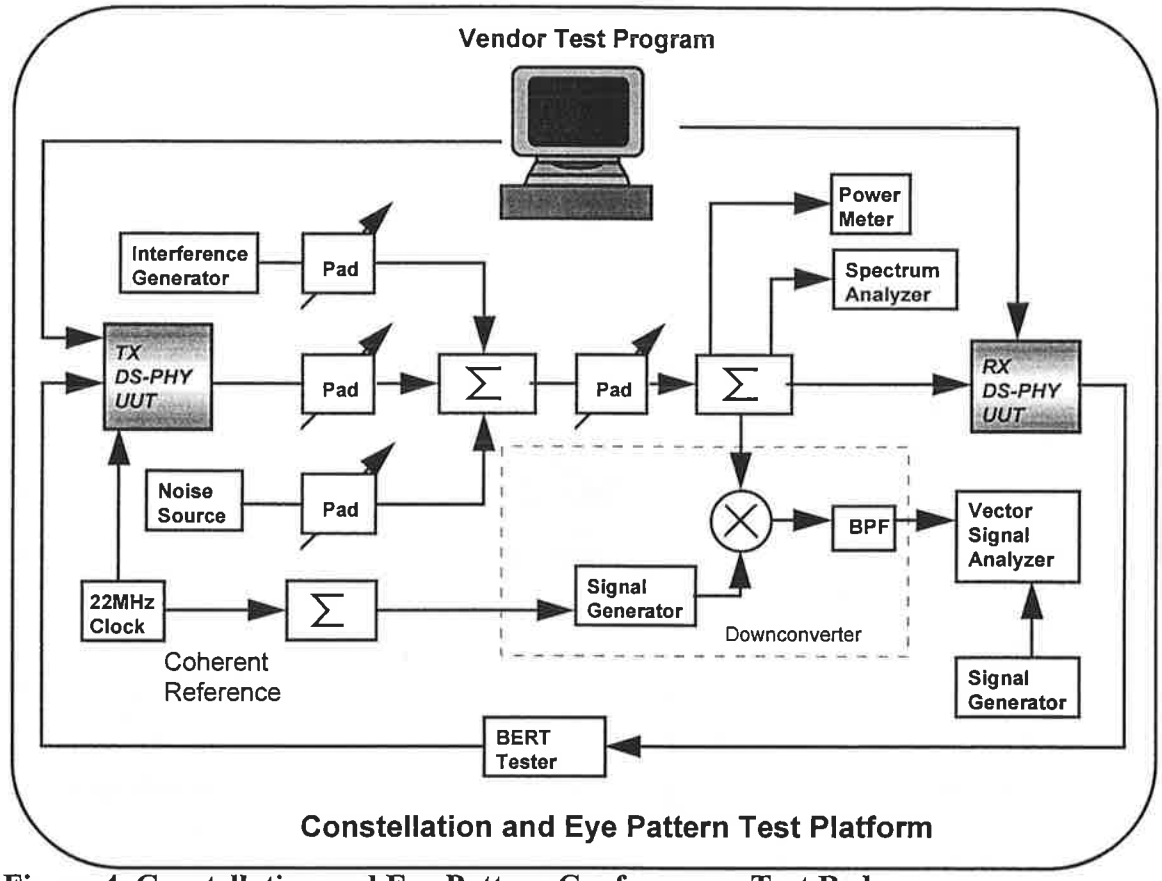

Figure 4. Constellation and Eye Pattern Conformance Test Bed

Figure 4, illustrates an extension of the primary RF test bed to include a reference receiver. This receiver is to provide the downconverted waveforms of the Tx under test to a vector analyzer capable of displaying Eye Patterns and Constellation Diagrams. The vector analysis equipment are suitable to perform the modulation accuracy tests as required per the DS-PHY Specification Draft.

Off-the-Shelf Equipment.

A set of commercially available equipment that can satisfy the test bed requirements as illustrated on the block diagrams of figures 1 through 4 include:

- HP 8657 B and HP 8780 A - signal generators,
- HP 8165 A- clock generator,
- HP 8981 - signal vector analyzer.

Other equipment and manufacturers might also be available. The specific models listed on this paper are to be used as reference.