



WVA5000 Chipset Field Test Report

Version 1.2

July 12, 2005

1 Introduction

The difficulties presented by the indoor wireless channel, especially multipath, make it necessary to evaluate any real-world solution in a truly representative environment. The purpose of this field test report is to present measured Amedia's WVA5000 solution range performance in typical office and residence environments. The following channel propagation scenarios have been included in the field test:

Site Index	Name	Description
1	Amedia office & lab	2 nd floor of a two-story office building. Approximately 10,000 square feet. Heavy multipath with lots of moving objects and people. Dynamic channel propagation.
2	Residential home - 1	Two-story, stucco construction (typical southern California). Approximately 2,600 squared feet. Lots of penetration and reflection from home appliances.
3	Residential home - 2	
4	Residential home - 3	

2 Test Setup

The results presented here made use of the two identical WVA5000 core modules as shown in Figure 1. One was used as AP (access point) that was connected to a Tektronix MTX-100 MPEG-2 player as the video source. The other was used as mobile terminal (MT) that was connected to a HDTV flat panel through a TLV200 MPEG-2 decoder.

In this test, three omni-directional antennas were used in both AP and MT. The antenna has an average gain of 1 dBi. The antenna configuration is shown in Figure 1. Throughout the test, the close-loop power control was turn off so that the transmitter power was fixed at +18 dBm. Cable and test connector loss resulted in a receiver noise figure of approximately 10 dB.

Figure 1: Amedia's WVA5000 Chipset Core Module



2.1 Test Methodology

In each test site, the AP (i.e. video sender) was fixed in one location and the MT (i.e. video receiver) was moved to about 20 random locations. At each test location, the placement of the MT followed a random orientation so that there are no advantages for any antenna gain with respect to a particular orientation. Different video rates from 25 Mbps¹ down to 6 Mbps were tested at each test location. The performance was captured for each video rate following the criteria described in the next section.

¹ The video rate for HDTV in US is 19.7 Mbps while the rate in Japan is 20 to 25 Mbps.

2.2 Performance Criteria

Video performance criteria are fundamentally different from data-only performance criteria because video delivery requires that tight QoS constraints on time jitter and latency be maintained. As such, the following criteria were used for WVA5000 system performance.

Video Performance Criteria: Recognizing that different MPEG2 decoders will conceal errors differently and perform differently in general over a wireless link, adopt the criteria that video link must be perfect over a 5 minute time interval and report the maximum video rate supported independent of the PHY mode used.

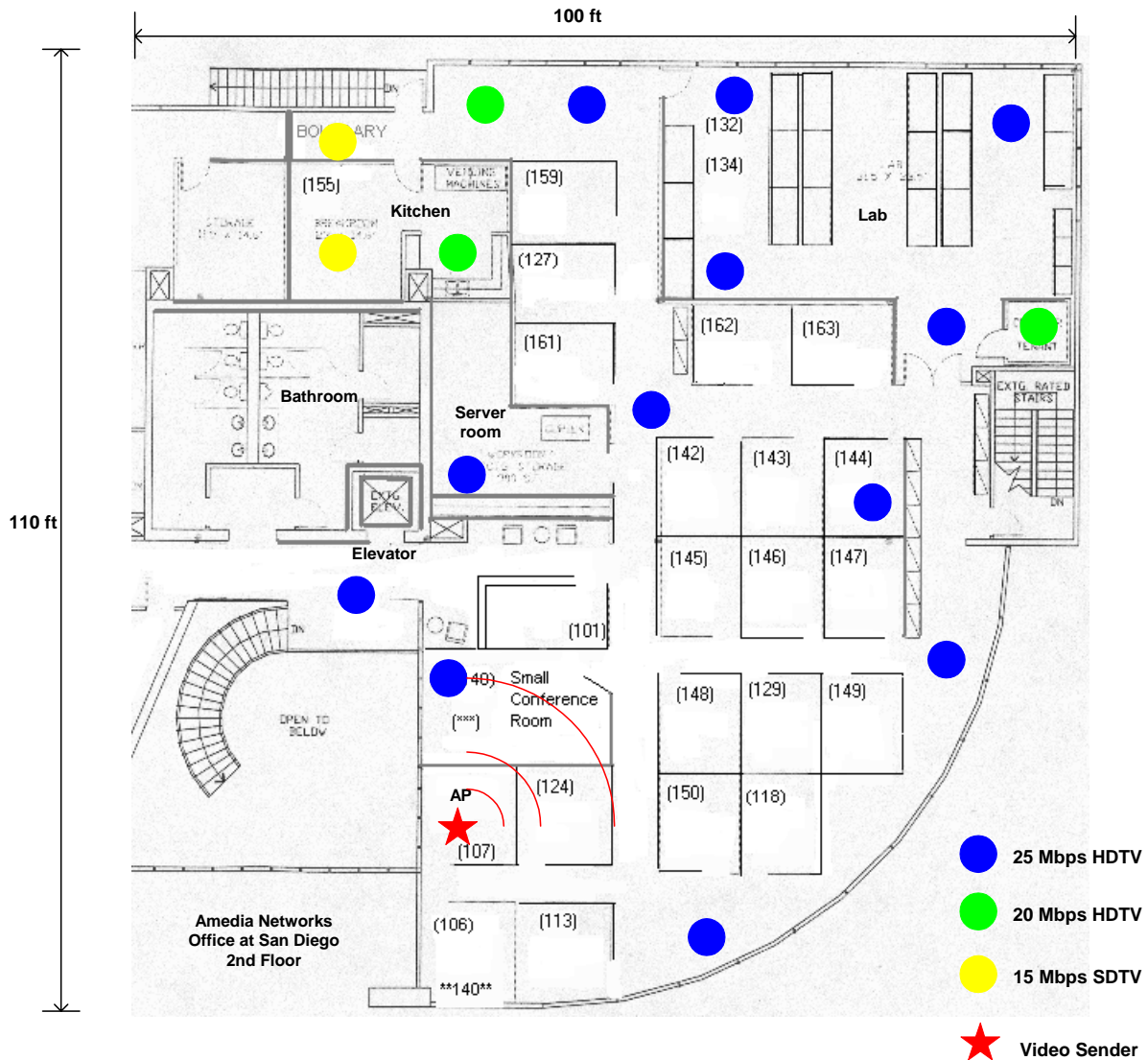
Note that due to QoS related margins that are necessarily associated with video, the actual throughput rate at any given measurement point is always higher than the video payload throughput. In the case of HDTV stream operating at 25 Mbps, it is necessary to allocate a minimum of 32 Mbps of data throughput.

3 Field Test Results

3.1 Site 1 Test Results: Office and Lab Environment

The supported MPEG2 video rate versus MT location is shown with a color-key overlaid on the office floor plan in Figure 2. The link coverage is quite remarkable in that 20 Mbps HDTV stream is deliverable to most of the locations in this 110 ft x100 ft office space except for two collection points that are shadowed by the elevator well. Even in this area, 15 Mbps SDTV stream can be easily maintained.

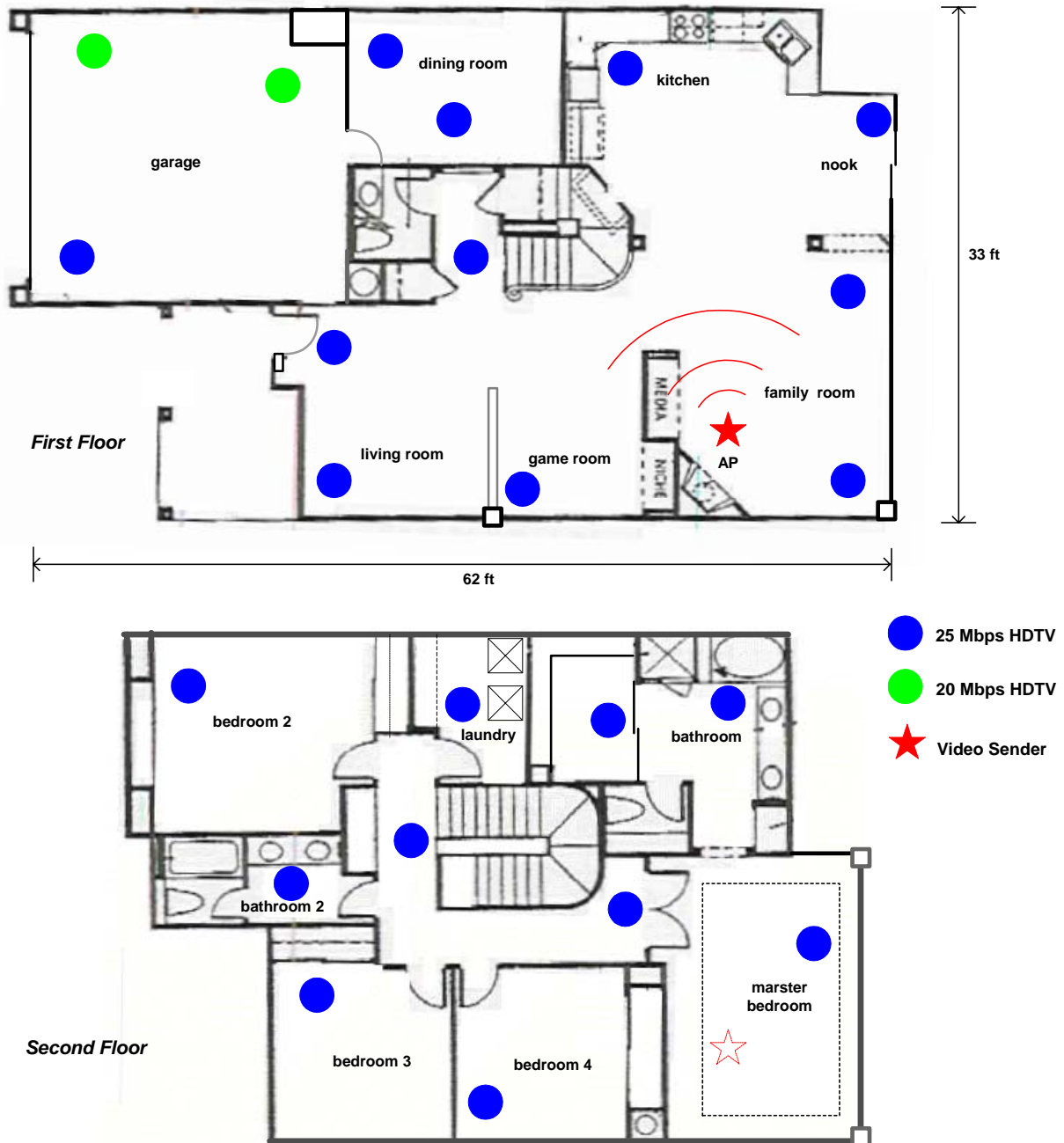
Figure 2 Supported MPEG2 video rate versus location (Amedia's office, second floor)



3.2 Site 2 Test Results: Residential Home Environment

The supported MPEG2 video rate versus MT location is shown with a color-key overlaid on the two-story house floor plan in Figure 3. The link coverage is very remarkable in that 25 Mbps HDTV stream is deliverable everywhere within the home. Even in the garage, 20 Mbps HDTV stream can be easily maintained.

Figure 3 Supported MPEG2 video rate versus location – Home #1



4 Appendix: Common MPEG-2 Video Rates

Table 1 Standard Digital Video Throughput Rates

Video Type	Rate, Mbps	Comments
SDTV	3 - 6	Normally taken to be 6 Mbps
DVD	10	
US-HDTV	19.7	Maximum of all US-HDTV rates
Japan - HDTV	20 - 25	