Chapter 12 Test Setup Photos

Overview

This section contains test setup photos.

Contents

12.1 Radiated Emissions Test Setup

Radiated emissions measurements shall be made over the frequency range specified by the regulatory agency — in this case, per FCC Part 15, subpart 15.207. Measurements shall be made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This was accomplished using both an automated 360 degree turntable and 1- to 4-meter height antenna positioners. Sixteen azimuth cuts at 22.5 degrees and 1- to 4-meter antenna scans in both polarizations were utilized. The FWAN PCS Base Station was set up in a typical field configuration, as shown in Figure 12.1, with the FWAN PCS Base Station being in the center of the turntable. Proper interconnecting cable was utilized from the FWAN PCS Base Station to the system power supply.

All radiated emissions testing was completed in the following modes of operation:

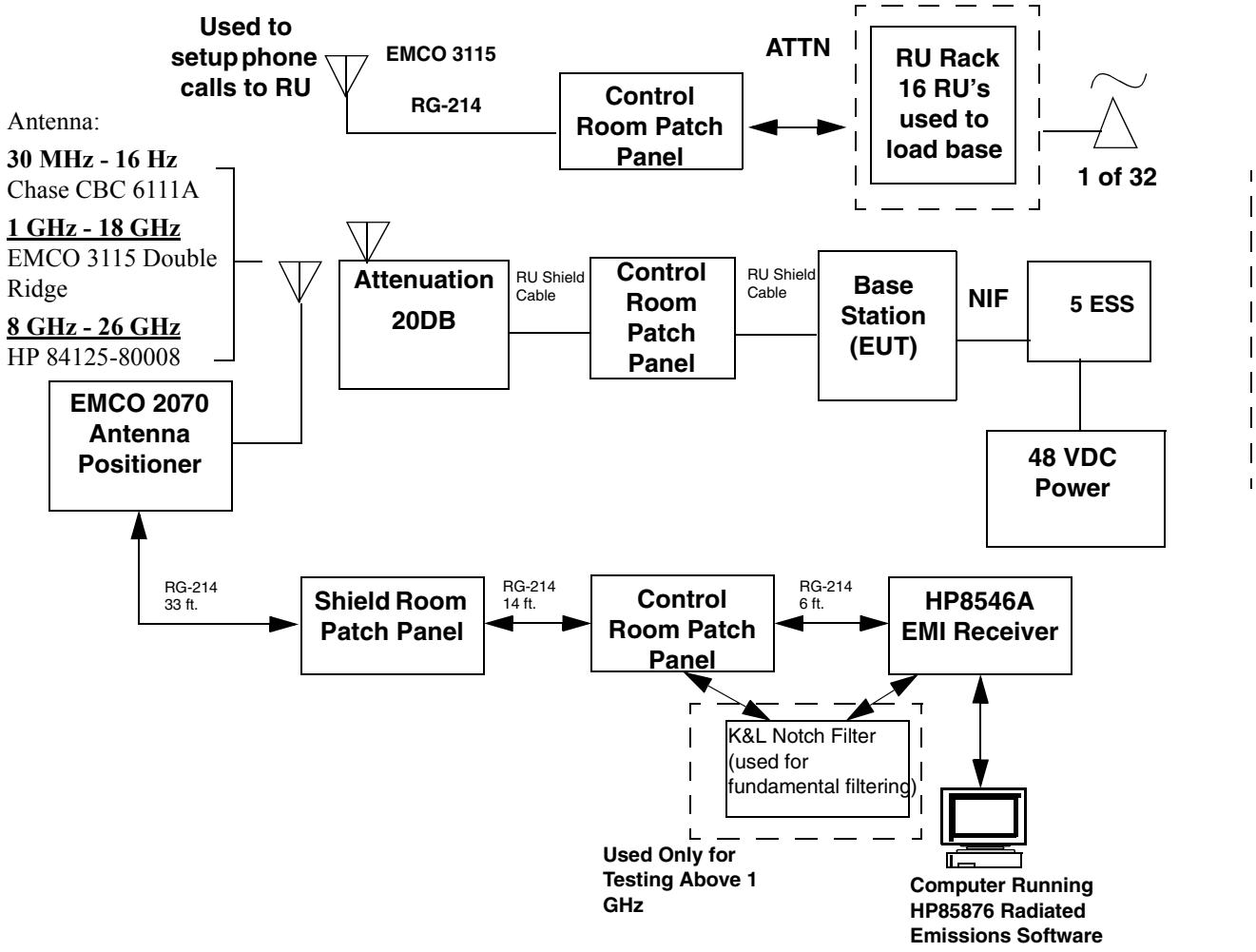
- Completely loaded digital shelf
- 15 voice calls within the same time slot (maximum time slot capacity)
- 60 voice calls on a single sector
- 60 voice calls, 15 voice calls per sector with HSD operation within one sector

While testing the above-mentioned modes of operation, no measurable differences in FCC part 15 emissions were detected. Hence, all following test data was gathered using fully loaded digital shelf with 15 voice calls within the same time slot.

Testing was completed from 30 MHz to 26.5 GHz.

To complete the calls, a test fixture utilizing a rack of sixteen (16) Remote Units (RUs) with four telephones per RU was established. Figure 12.10 shows the RU test rack used to load the Base Station. The rack was designed to hold up to 16 remote units together with all power, RF, and telco connections. This design was necessary in order to load the Base Station with the maximum number of calls on the same time slot and sector. That is, we used 16 remote units, four lines each, for a total of 64 calls.

Figure 12.1 Radiated Emissions Test Setup



12.2 Parts Comprising Equipment Under Test (EUT)

12.2.1 List of Equipment Under Test

Table 12.1 EUT List

Card Name	Serial Number	Revision
SYNC	1999903560DC0052	D8
NIC	0000380047-010402	2
NIC	0000380049-010402	4
WP	0001025493-001026	6
WP	0001025707-010129	6
WP	0001027685-010416	7
WP	0001025476-001026	6
BCP	0001027759-010417	4
BCP	0001027756-010417	4
SBC	0001027746-010417	5
SBC	0001027738-010417	5
SBC	0001027743-010417	5
SBC	0001027741-010417	5
SMP	0001029272-010530	4

12.3 EUT Test Configuration Photos

Figure 12.2 Base, Configuration, Doors Open—Front View

Figure 12.3 Base Configuration, Doors Closed—Side View

Figure 12.4 Base Configuration, Doors Closed—Rear Side View

Figure 12.5 Base Configuration, Rear Panels Removed—Rear View

12.4 Testing Facility and Location

During the month of October, 2001, a series of radio frequency interference measurements were performed on the AT&T Base Station Version B1.8 PCS.

For Class A digital devices/intentional radiator, the tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions from Low – Voltage Electrical and Electronic Equipment in the range of 9kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-1992 (Revision of the ANSI C63.4-1988). These tests were performed by personnel of AT&T WIRELESS SERVICES EMC Laboratory at 9461 Willows Road Redmond, Washington. Additionally FCC Part 15 radiated emissions testing was completed at the same location within an FCC certified 3 meter semi-anechoic shield room.

Figure 12.6 shows the overall control room setup used to acquire test data during radiated and conducted emissions testing. From left to right, the control room is set up as follows: HP8546A receiver, EMCO 2090 dual device controller (turntable and tower), CCTV and controller used to monitor the device under test, and HP Vectra computer, monitor, and printer used to control the EMC measurement software and data acquisition processes.

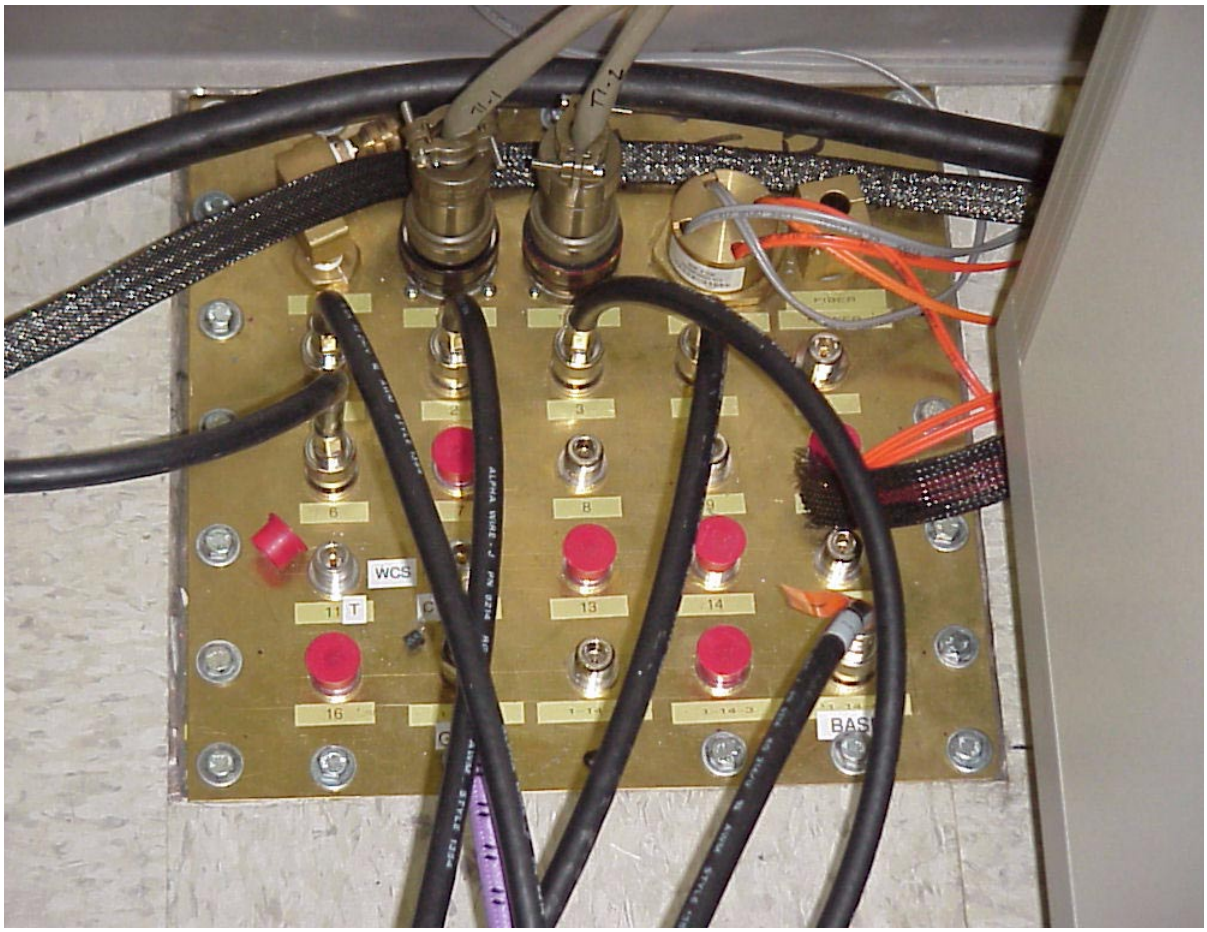
Figure 12.6 3-Meter Shield Room Control Room

All radiated emission measurements were taken in an isolated /shielded control room using a Hewlett Packard 8546A EMI receiver system 12.7

Figure 12.7 3-Meter Control Room

All data/telco and RF enters and exits shield room from this panel

Figure 12.8 3-Meter Control Chamber Access Panel Penetration.



Fiber carries telecom lines into control room and then converts into copper wire.

Figure 12.9 T1 Fiber Optic Lines

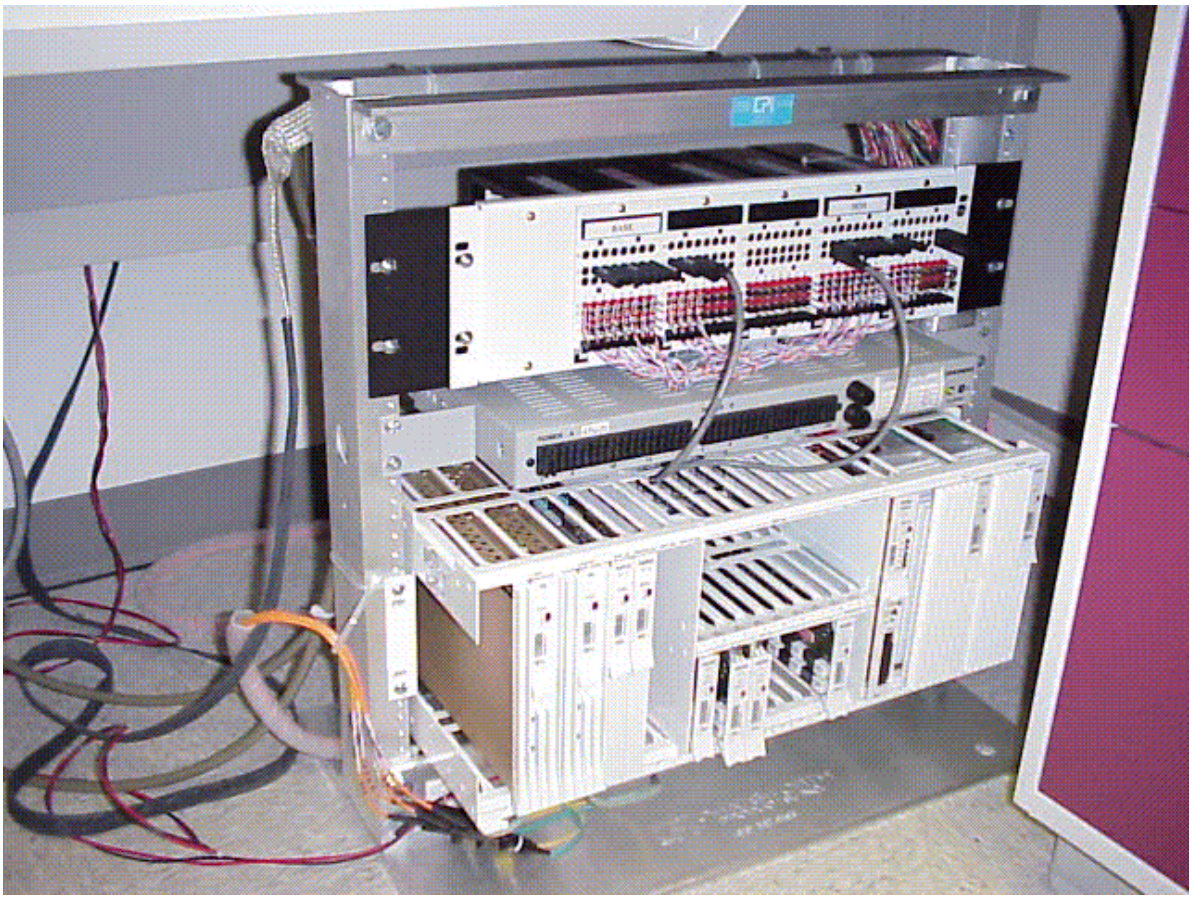


Figure 12.10RU Test Rack

Figure 12.11 shows a close-up view of the setup shown in Figure 12.10.

Figure 12.11Setup of the 16 Remote Units

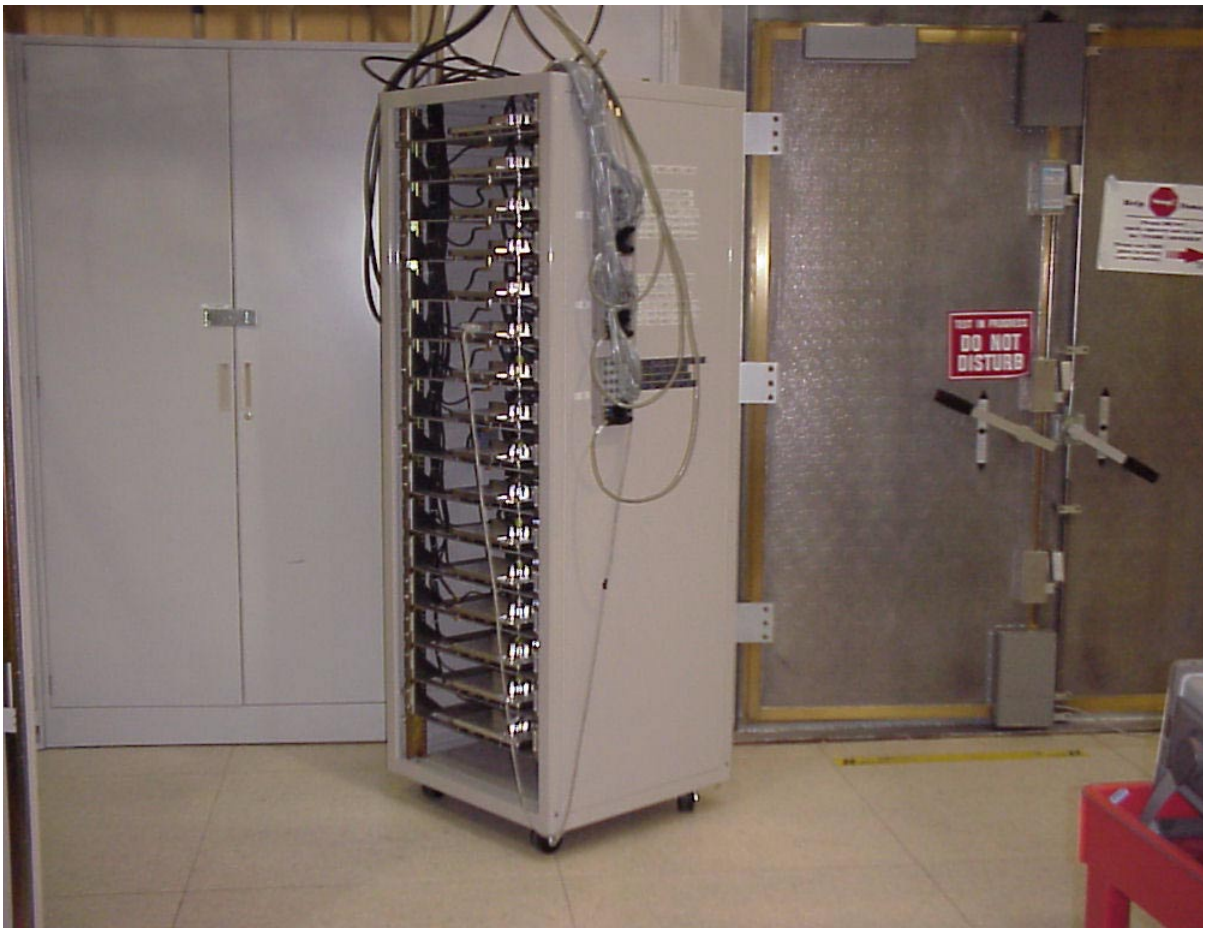


Figure 12.12 shows the test setup for radiated emissions testing in the range from 1GHz - 26GHz. An EMCO 3115 horn antenna is shown here during the 1GHz - 3.5GHz testing phase, horizontal polarization (additional high frequency waveguide antennas were used for testing above 3.5GHz). Also shown is the HP 84300A E62 microwave intentional radiator system in the background, with a portable laptop serving as the software control and data capturing system.

Figure 12.12HP 84300A E62 Microwave Intentional Radiator System

Figure 12.13 shows the 3 Meter Chamber EMCO Antenna Tower which was controlled with the EMCO 2090 to vary the receive antenna height from one to four meters. Also shown is the Chase CBL6111A 30MHz to 1000MHz Biconical - Log Periodic receive antenna, used for radiated emissions testing at a distance of three meters from the device under test.

Figure 12.13Radiated Emission 30MHz - 1GHz Test Setup