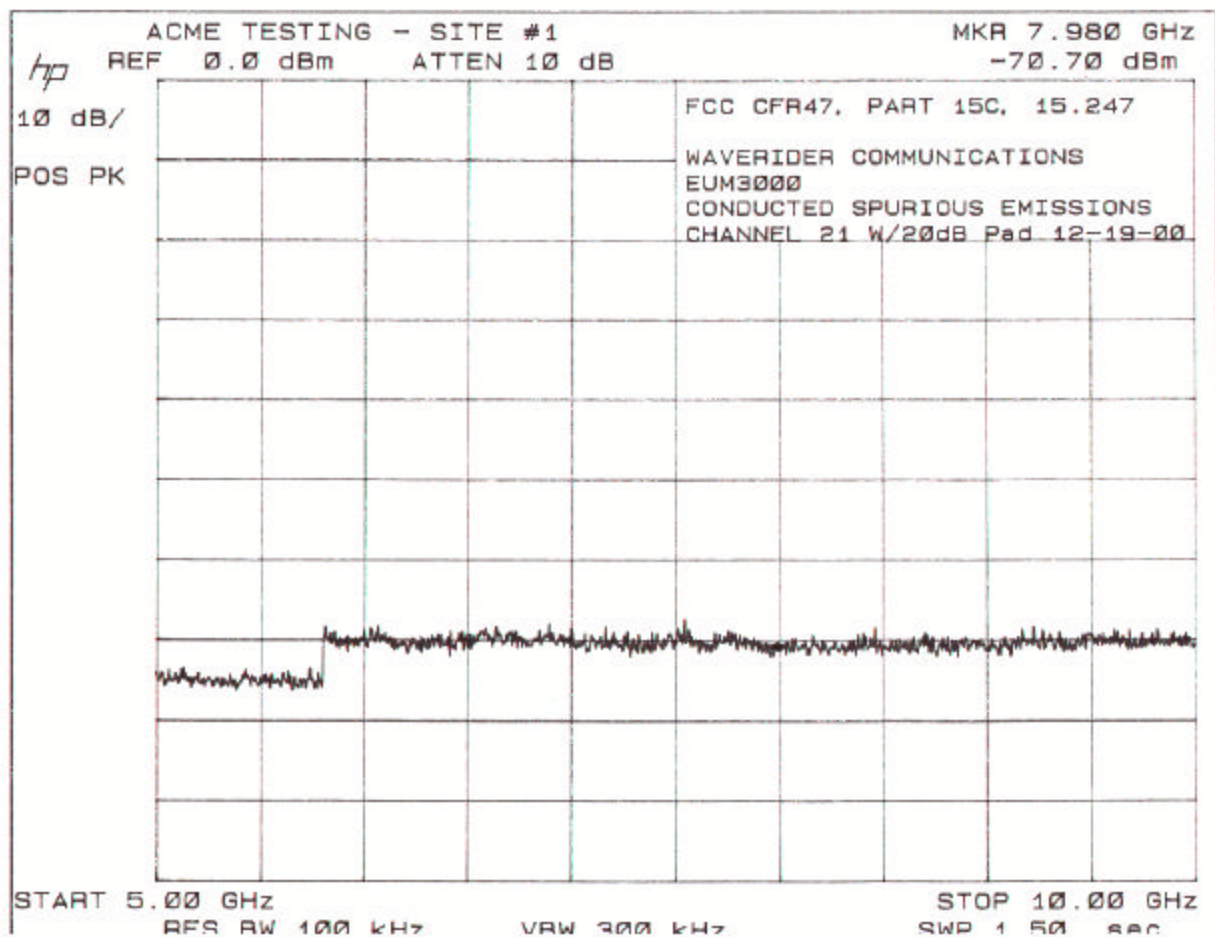
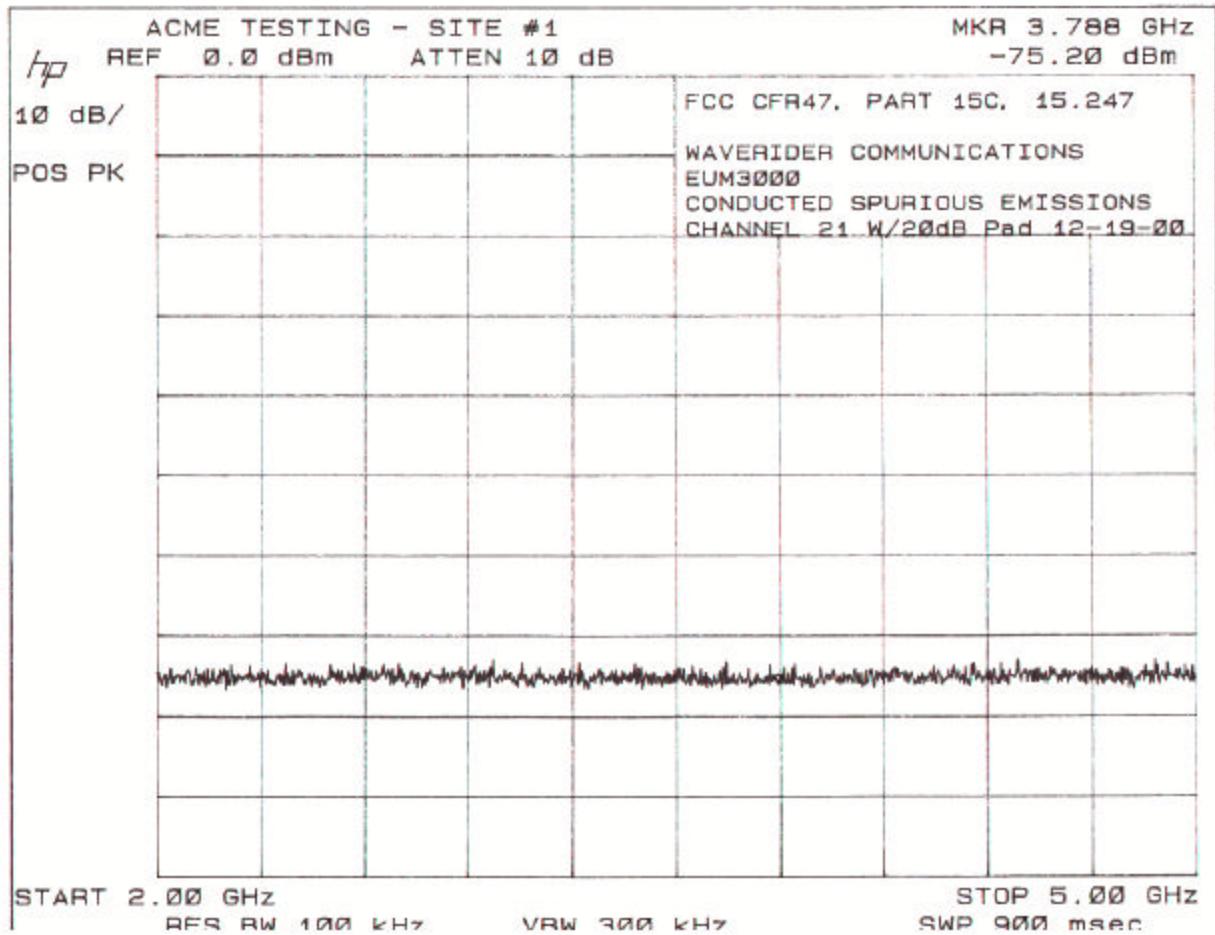
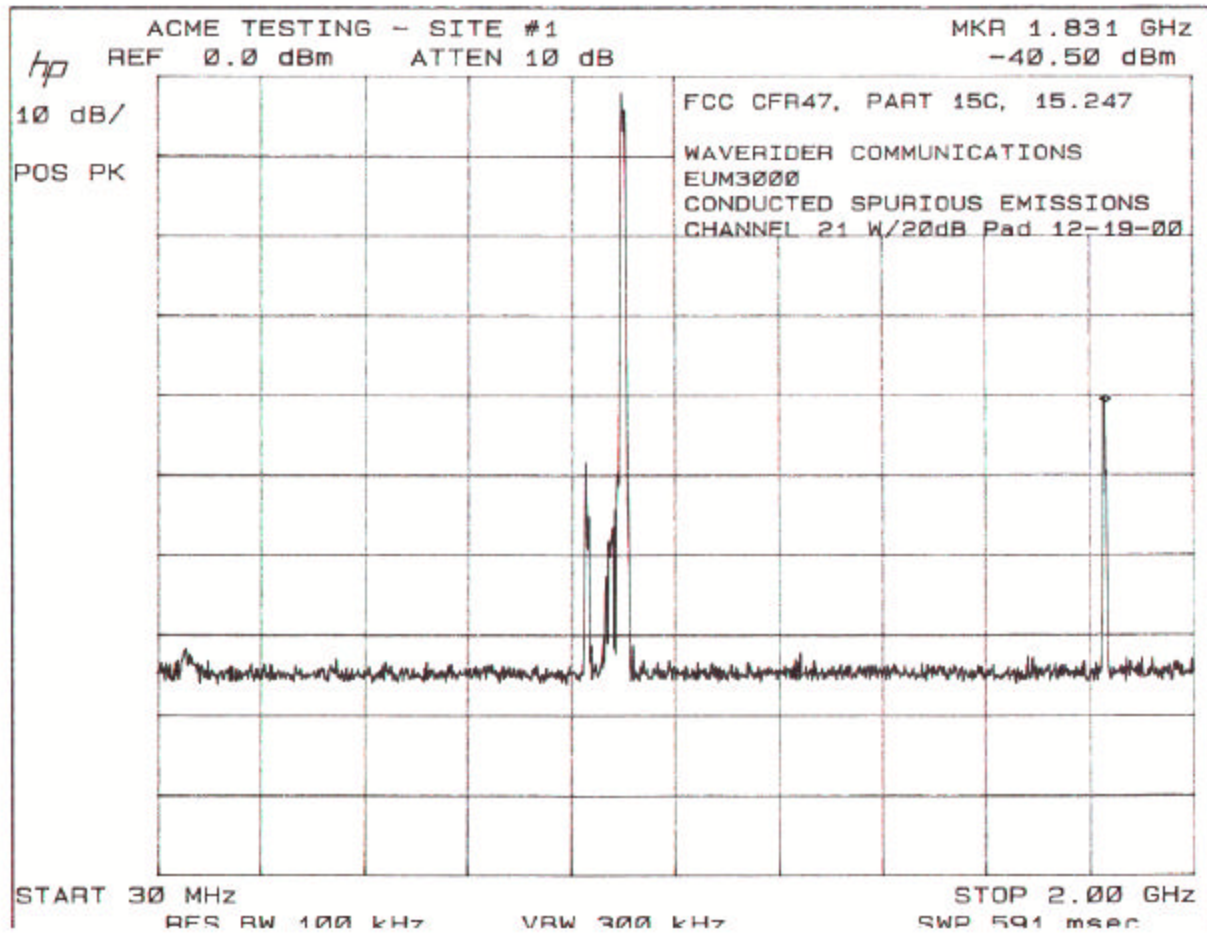








## 11. Radiated Spurious Emissions

### 11.1 Regulation

15.247 I In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 11.2 Test Equipment

- ⇒ Spectrum Analyzer (yellow): Hewlett-Packard 8566B, Serial Number 2403A06519, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001
- ⇒ RF Preselector (yellow): Hewlett-Packard 85685A, Serial Number 2648A00392, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001
- ⇒ Quasi Peak Adapter (yellow): Hewlett-Packard 85650A, Serial Number 2521A-00689, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001
- ⇒ Line Impedance Stabilization Network: EMCO 3825/2, Serial Number 9002-1601, Calibrated: 2 January 2000, Calibration due Date: 2 January 2001
- ⇒ Broadband Biconical Antenna (red) (20 MHz to 200 MHz): EMCO 3110, Serial Number 1115, Calibrated: 26 December 2000, Calibration due Date: 26 December 2001
- ⇒ Broadband Log Periodic Antenna (red) (200 MHz to 1000 MHz): EMCO 3146, Serial Number 2853, 26 December 2000, Calibration due Date: 26 December 2001
- ⇒ EUT Turntable Position Controller: Rothenbuhler Engineering, Custom, No Calibration Required
- ⇒ Antenna Mast: Compliance Design, model M100/200, No Calibration Required
- ⇒ Pyramidal Horn Antenna: EMCO 3160-10, Serial Number 9708-1055, Calibration Not Required
- ⇒ 2 GHz to 10 GHz Low Noise Preamplifier: Milliwave 593-2898, Serial Number 2494, Calibrated: 5 May 2000, Calibration Due Date: 5 May 2001
- ⇒ Double Ridge Guide Horn Antenna: EMCO 3115, Serial Number 9807-5534, Calibrated: 30 December 2000, Calibration due Date: 30 December 2001
- ⇒ 8 – 22GHz Preamplifier: MITEQ AFS4-35LN, Serial Number 484280, Calibrated: 3 January 2000,

Calibration Due Date: 3 January 2001

### 11.3 Test Procedures

For tabletop equipment, the EUT is placed on a 1 meter by 1.5 meters wide and 0.8 meter high nonconductive table that sits on a flush mounted metal turntable. Floor standing equipment is placed directly on the flush mounted metal turntable. The EUT is connected to its associated peripherals with any excess I/O cabling bundled to approximately 1 meter.

Preview tests are performed to determine the “worst case” mode of operation. With the EUT operating in “worst case” mode, emissions from the unit are maximized by adjusting the polarization and height of the receive antenna and rotating the EUT on the turntable. Manipulating the system cables also maximizes EUT emissions.

#### Radiated Emissions Test Characteristics

|                                           |                                                              |
|-------------------------------------------|--------------------------------------------------------------|
| Frequency range                           | 30 MHz – 10000 MHz<br><b>15.205 RESTRICTED BANDS ONLY</b>    |
| Test distance                             | 3 m                                                          |
| Test instrumentation resolution bandwidth | 120 kHz (30 MHz – 1000 MHz)<br>1 MHz (1000 MHz – 10,000 MHz) |
| Receive antenna scan height               | 1 m – 4 m                                                    |
| Receive antenna polarization              | Vertical/Horizontal                                          |

**11.4 Test Results**

## With PATCH Antenna

| Emission Number | Frequency (MHz) | EUT Emission (dBuV/m) | Spec limit (dBuV/m) | Delta to the limit dB | Detector Function (Peak, Quasi-Peak) | Polarity (Vertical/Horizontal) | Antenna Height (cm) | Table Azimuth (deg.) | Comments   |
|-----------------|-----------------|-----------------------|---------------------|-----------------------|--------------------------------------|--------------------------------|---------------------|----------------------|------------|
| 1               | 2659.8          | 55.3                  | 74                  | -18.7                 | PK                                   | H                              | 170                 | 70                   | CHANNEL 11 |
| 2               | 2714.74         | 44.5                  | 74                  | -29.5                 | PK                                   | H                              | 215                 | 190                  | CHANNEL 1  |
| 3               | 2714.82         | 44.3                  | 74                  | -29.7                 | PK                                   | V                              | 100                 | 190                  | CHANNEL 1  |
| 4               | 2744.82         | 49.2                  | 74                  | -24.8                 | PK                                   | H                              | 160                 | 140                  | CHANNEL 11 |
| 5               | 2744.9          | 47.6                  | 74                  | -26.4                 | PK                                   | V                              | 150                 | 20                   | CHANNEL 11 |
| 6               | 2774.86         | 48.8                  | 74                  | -25.2                 | PK                                   | V                              | 120                 | 145                  | CHANNEL 21 |
| 7               | 2774.88         | 53.3                  | 74                  | -20.7                 | PK                                   | H                              | 190                 | 150                  | CHANNEL 21 |
| 8               | 2775.94         | 45.5                  | 54                  | -8.5                  | AVG                                  | H                              | 190                 | 150                  | CHANNEL 21 |
| 9               | 3619.74         | 54.4                  | 74                  | -19.6                 | PK                                   | H                              | 170                 | 359                  | CHANNEL 1  |
| 10              | 3619.82         | 54                    | 74                  | -20                   | PK                                   | V                              | 115                 | 0                    | CHANNEL 1  |
| 11              | 3619.87         | 45.7                  | 54                  | -8.3                  | AVG                                  | H                              | 170                 | 359                  | CHANNEL 1  |
| 12              | 3619.95         | 46.9                  | 54                  | -7.1                  | AVG                                  | V                              | 115                 | 0                    | CHANNEL 1  |
| 13              | 3659.8          | 54.4                  | 74                  | -19.6                 | PK                                   | V                              | 150                 | 2                    | CHANNEL 11 |

## With OMNI DIRECTIONAL Antenna

| Emission Number | Frequency (MHz) | EUT Emission (dBuV/m) | Spec Limit (dBuV/m) | Delta to the limit dB | Detector Function (Peak, Quasi-Peak) | Polarity (Vertical/Horizontal) | Antenna Height (cm) | Table Azimuth (deg.) | Comments   |
|-----------------|-----------------|-----------------------|---------------------|-----------------------|--------------------------------------|--------------------------------|---------------------|----------------------|------------|
| 1               | 2714.96         | 42.9                  | 74                  | -31.1                 | PK                                   | V                              | 145                 | 20                   | CHANNEL 1  |
| 2               | 2714.98         | 45.7                  | 74                  | -28.3                 | PK                                   | H                              | 195                 | 150                  | CHANNEL 1  |
| 3               | 2744.86         | 47.9                  | 74                  | -26.1                 | PK                                   | V                              | 100                 | 160                  | CHANNEL 11 |
| 4               | 2745.00         | 47.7                  | 74                  | -26.3                 | PK                                   | H                              | 175                 | 145                  | CHANNEL 11 |
| 5               | 2774.64         | 49.6                  | 74                  | -24.4                 | PK                                   | V                              | 270                 | 170                  | CHANNEL 21 |
| 6               | 2774.86         | 50.9                  | 74                  | -23.1                 | PK                                   | H                              | 185                 | 145                  | CHANNEL 21 |
| 7               | 3619.68         | 49.2                  | 74                  | -24.8                 | PK                                   | V                              | 180                 | 359                  | CHANNEL 1  |
| 8               | 3619.94         | 50.6                  | 74                  | -23.4                 | PK                                   | H                              | 200                 | 70                   | CHANNEL 1  |
| 9               | 3659.82         | 54.6                  | 74                  | -19.4                 | PK                                   | V                              | 145                 | 0                    | CHANNEL 11 |
| 10              | 3659.82         | 58.7                  | 74                  | -15.3                 | PK                                   | H                              | 195                 | 90                   | CHANNEL 11 |
| 11              | 3659.84         | 50.6                  | 54                  | -3.4                  | AVG                                  | H                              | 195                 | 90                   | CHANNEL 11 |
| 12              | 3659.96         | 49.9                  | 54                  | -4.1                  | AVG                                  | V                              | 145                 | 0                    | CHANNEL 11 |
| 13              | 3699.76         | 60.3                  | 74                  | -13.7                 | PK                                   | V                              | 115                 | 180                  | CHANNEL 21 |
| 14              | 3699.76         | 61.8                  | 74                  | -12.2                 | PK                                   | H                              | 200                 | 100                  | CHANNEL 21 |
| 15              | 3699.86         | 50.7                  | 54                  | -3.3                  | AVG                                  | V                              | 115                 | 180                  | CHANNEL 21 |
| 16              | 3700.00         | 52.0                  | 54                  | -2.0                  | AVG                                  | H                              | 200                 | 100                  | CHANNEL 21 |
| 17              | 4524.96         | 43.7                  | 74                  | -30.3                 | PK                                   | H                              | 155                 | 60                   | CHANNEL 1  |
| 18              | 4525.02         | 41.8                  | 74                  | -32.2                 | PK                                   | V                              | 100                 | 359                  | CHANNEL 1  |
| 19              | 4574.56         | 46.1                  | 74                  | -27.9                 | PK                                   | V                              | 120                 | 0                    | CHANNEL 11 |
| 20              | 4574.94         | 48.6                  | 74                  | -25.4                 | PK                                   | H                              | 155                 | 110                  | CHANNEL 11 |
| 21              | 4624.66         | 49.0                  | 74                  | -25.0                 | PK                                   | H                              | 200                 | 180                  | CHANNEL 21 |
| 22              | 4625.26         | 46.2                  | 74                  | -27.8                 | PK                                   | V                              | 130                 | 355                  | CHANNEL 21 |









## **12. Peak Power Spectral Density**

### **12.1 Regulation**

For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### **12.2 Test Equipment**

⇒ Spectrum Analyzer (yellow): Hewlett-Packard 8566B, Serial Number 2403A06519, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001

⇒ RF Preselector (yellow): Hewlett-Packard 85685A, Serial Number 2648A00392, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001

### **12.3 Test Procedures**

The RF output of the EUT is connected to the RF input port of the RF preselector through a 20 dB pad. The following measurements were made with a RBW = 3 kHz, VBW = 10 kHz and Sweep Time = 667 seconds.

### **12.4 Test Results**

Maximum peak power spectral density of channel 1 is 7.8 dBm.

Maximum peak power spectral density of channel 11 is 7.7 dBm.

Maximum peak power spectral density of channel 21 is 8 dBm.



## 12.5 Graphical Data

