**Exhibit 6: Test Report**

**TEST REPORT FROM:**

COMMUNICATION CERTIFICATION LABORATORY
1940 W. Alexander Street
Salt Lake City, Utah
84119-2039

Type of Report: Certification

TEST OF: PTB600

FCC ID: IYGPTB600

To FCC PART 15.247, Subpart C

Test Report Serial No: 73-6763

Applicant:

Spectralink Corporation
5755 Central Avenue
Boulder, CO 80301

Date(s) of Test: March 15 - 16, 1999

Issue Date: March 19, 1999

Equipment Receipt Date: February 23, 1999

**CERTIFICATION OF ENGINEERING REPORT**

This report has been prepared by Communication Certification Laboratory to determine compliance of the device described below with the requirements of FCC PART 15.247, Subpart C. This report may be reproduced in full, partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

- Applicant: Spectralink Corporation
- Manufacturer: Spectralink Corporation
- Brand Name: SPECTRALINK
- Model Number: PTB600
- FCC ID: IYGPTB600

On this 19th day of March 1999, I, individually, and for Communication Certification Laboratory, certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

COMMUNICATION CERTIFICATION LABORATORY

_____
Checked by: William S. Hurst, P.E.
Vice President

_____
Tested by: Roger J. Midgley
EMC Engineering Manager

## SECTION 1. CLIENT INFORMATION AND RESPONSIBLE PARTY:

### 1.1 Client Information:

Company Name: Spectralink Corporation
5755 Central Avenue
Boulder, CO 80301

Contact Name: John Chabon
Title:

## SECTION 2. EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification of EUT:

Trade Name: SPECTRALINK
Model Name or Number: PTB600
Serial Number: N/A
Options Fitted: None
Country of Manufacture: U.S.A.

### 2.2 Description of EUT:

See theory of operation (Exhibit 12). This report covers the transmitter only the receiver is covered under a separate verification report.

### 2.3 Modification Incorporated/Special Accessories on EUT:

There were no modifications or special accessories required to comply with the specification.

### 2.4 EUT and Support Equipment:

The FCC ID numbers for all the EUT and support equipment used during the test (including inserted cards) are listed below:

| Brand Name<br>Model Number<br>Serial No. | FCC ID Number | Description | Name of Interface Ports/Interface Cables |
|---|---|---|---|
| BN: SPECTRALINK<br>MN: PTB600<br>SN: N/A | IYGPTB600 | Frequency Hopping Spread Spectrum Handset (EUT) | N/A |

## SECTION 3. TEST SPECIFICATION, METHODS & PROCEDURES

### 3.1 Test Specification:

Title: FCC PART 15.247, Subpart C (47 CFR 15).

Limits and methods of measurement of radio interference characteristics of radio frequency devices. Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

Purpose of Test: The tests were performed to demonstrate Initial compliance.

### 3.2 Methods & Procedures:

### 3.2.1 § 15.247

(a) Operation under the provisions of this section is limited to frequency hopping and direct sequence spread spectrum intentional radiators that comply with the following provisions:

(1) Frequency hoping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system-hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitting signals.

(i) Frequency hopping systems operating in the 902 - 928 MHz band shall use at least 50 hopping frequencies. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

(ii) Frequency hopping systems operating in the 2400 – 2483.5 MHz and the 5725 – 5850 MHz bands shall use at least 75 hopping frequencies. The maximum allowed 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

(2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

(b) The maximum peak output power of the transmitter shall not exceed 1 watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) In any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in § 15.209 (a), whichever results in the lesser attenuation. All other emissions outside these bands shall not exceed the general radiated emission limits specified in § 15.209 (a).

(d) For direct sequence system, the transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

(e) The processing gain of a direct sequence system shall be at least 10 dB. The processing gain shall be determined from the ratio in dB of the signal to noise ratio with the system spreading code turned off to the signal to noise ratio with the system spreading code turned on, as measured at the demodulated output of the receiver.

(f) Hybrid systems that employ a combination of both direct sequence and frequency hopping modulation techniques shall achieve a processing gain of at least 17 dB from the combined techniques. The frequency hopping operation of the hybrid system, with the direct sequence operation turned off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period equal to the number of hopping frequencies employed multiplied by 0.4. The direct sequence operation of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

NOTE: Spread spectrum systems are sharing these bands on a non-interference basis with systems supporting critical Government requirements that have been allocated the usage of these bands, secondary only to ISM equipment operated

under the provisions of part 18 of this chapter. Many of these Government systems are airborne radiolocation systems that emit a high EIRP, which can cause interference to other users. Also, investigations of the effect of spread spectrum interference to U.S. Government operations in the 902-928 MHz band may require a future decrease in the power limits allowed for spread spectrum operation.

**3.2.2 § 15.207 Conducted Limits**

(a) For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with the provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

(b) The following option may be employed if the conducted emissions exceed the limits in paragraph (a) of this section when measured using instrumentation employing a quasi-peak detector function: If the level of the emission measured using the quasi-peak instrumentation is 6 dB, or more, higher than the level of the same emission measured with instrumentation having an average detector and a 9 kHz minimum bandwidth, that emission is considered broadband and the level obtained with the quasi-peak detector may be reduced by 13 dB for comparison to the limits. When employing this option, the following conditions shall be observed:

(1) The measuring instrumentation with the average detector shall employ a linear IF amplifier.

(2) Care must be taken not to exceed the dynamic range of the measuring instrument when measuring an emission with a low duty cycle.

(3) The test report required for verification of for an application for a grant of equipment authorization shall contain all details supporting the use of this option.

(c) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operation as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §§ 15.205, 15.209, 15.221, 15.223, 15.225 or 15.227, as appropriate.

(d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operation while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

### 3.2.3 Test Procedure

The testing was performed according to the procedures in ANSI C63.4 (1992). Testing was performed at CCL's anechoic chamber located in Salt Lake City, Utah. This site has been fully described in a report submitted to the FCC, and was accepted in a letter dated March 6, 1996 (31040/SIT).

CCL participates in the National Voluntary Laboratory Accreditation Program (NVLAP) and has been accepted under NVLAP Lab Code:100272-0, which is effective until September 30,1999.

For radiated emissions testing that is performed at distances closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

## SECTION 4. OPERATION OF EUT DURING TESTING.

### 4.1 Operating Environment:

Power Supply: Operates via DC battery
AC Mains Frequency: N/A

### 4.2 Operating Modes:

Each mode of operation was exercised to produce worst case emissions. The worst case emissions were with the PTB600 running in the following mode. The PTB600 was placed in the transmit mode with the same type of modulation that would normally be used during normal operation.

### 4.3 Configuration & Peripherals:

The PTB600 was placed on the table in the transmit mode with the same type of modulation that would normally be used during normal operation.

## SECTION 5. SUMMARY OF TEST RESULTS:

### 5.1 FCC PART 15.247, Subpart C

#### 5.1.1 Summary of Tests:

| Section | Test Performed | Frequency Range (MHz) | Result |
|---|---|---|---|
| 15.247 (a)(1) | Hopping Channel Carrier Frequencies | 2400 – 2483.5 | Complied |
| 15.247 (a)(1)(ii) | Emission Bandwidth | 2400 – 2483.5 | Complied |
| 15.247 (b)(1) | Peak Output Power | 2400 – 2483.5 | Complied |
| 15.247 (C) | Antenna Conducted Spurious Emissions | 30 to 25,000 | Complied |
| 15.247 (C) | Radiated Spurious Emissions | 30 to 25,000 | Complied |
| 15.207 | Line Conducted Emissions (Hot Lead to Ground) | 0.45 to 30 | Not Applicable |
| 15.207 | Line Conducted Emissions (Neutral Lead to Ground) | 0.45 to 30 | Not Applicable |

### 5.2 Result

In the configuration tested, the EUT complied with the requirements of the specification.

## SECTION 6. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS:

### 6.1 General Comments:

This section contains the test results only. Details of the test methods used, etc., can be found in Appendix B of this report.

### 6.2 Test Results

#### 6.2.1 § 15.247 (a) (1) Hopping Channel Carrier Frequencies

The PTB600 is designed to meet the requirements of IEEE 802.11 standard for wireless local area networks (WLANs). This standard specifics that the transmit and receive frequency of both the handset and base station hop in unison using a pseudo ransom set of 79 channels (See list of channels in Exhibit 12); therefore, the PTB600 complies with this section, (See Theory of Operation in Exhibit 12).

#### 6.2.2 § 15.247 (a) (1) (ii)

**Measurement Data Emission Bandwidth:**

A diagram of the test configuration is enclosed in Appendix A and a list of reference codes for test equipment used is enclosed in Appendix B.

Test equipment used: 1, 3 and 4.

| Frequency (MHz) | Measured Emission Bandwidth (kHz) |
|---|---|
| 2402.0 | 964.0 |
| 2434.0 | 994.0 |
| 2479.0 | 980.0 |

**RESULT**

In the configuration tested, the 20 dB bandwidth was less than 1 MHz; therefore, the EUT complied with the requirements of the specification (see spectrum analyzer plots in Appendix C).

**Demonstration of Compliance – Average Time of Occupancy:**

The PTB600 transmits on each of a specific channel for 560

μsec every 100 msec. The total time of occupancy on any frequency within 30 seconds is 168 msec (30 sec / 100 msec = 300 transmissions in 30 seconds, 300 X 560 μsec = 168 msec). This is less than 400 msec; therefore, the PTB600 complies with this requirement (see spectrum analyzer plots in Appendix C).

**6.2.3 § 15.247 (b) (1) Peak Output Power:**

**Measurement Data:**

The maximum peak output power measured for this device was 110.0 mW or 20.4 dBm. Shown below is the measured peak output power. The maximum directional gain of the antenna is less than 6 dBi; therefore, the maximum output power is not required to be reduced from the value measured.

A diagram of the test configuration is enclosed in Appendix A and a list of reference codes for test equipment used is enclosed in Appendix B.

Test equipment used: 1, 3 and 4.

| Frequency (MHz) | Measured Output Power (dBm) | Measured Output Power (mW) |
|---|---|---|
| 2402.0 | 19.7 | 93.3 |
| 2434.0 | 20.2 | 105.0 |
| 2479.0 | 20.4 | 110.0 |

**RESULT**

In the configuration tested, the EUT complied with the requirements of the specification.

**6.2.4 § 15.247 (c) Spurious Emissions:**

**Measurement Data Antenna Conducted Emissions:**

The frequency range from 30 MHz to the tenth harmonic of the highest fundamental frequency was investigated to measure any

antenna-conducted emissions. Shown in Appendix C are plots with the PTB600 tuned to the upper and lower band edges. These demonstrate compliance with the provisions of this section.

A diagram of the test configuration is enclosed in Appendix A and a list of reference codes for test equipment used is enclosed in Appendix B.

Test equipment used: 1, 3 and 4.

**Handset**

The emissions must be attenuated 20 dB below the highest power level measured; therefore, the criteria is 19.7 – 20.0 = -0.3 dBm.

| Transmitting at 2402.0 MHz | | | |
|---|---|---|---|
| Frequency Range MHz | Frequency MHz | Corrected Level dBm | Criteria dBm |
| 30 -200 | 179.6 | -74.8 | -0.3 |
| 200 - 500 | 480.1 | -45.7 | -0.3 |
| 500 - 1000 | 591.2 | -41.3 | -0.3 |
| 1000 - 2000 | 1792.2 | -46.3 | -0.3 |
| 2000 – 2399.9 | 2364.7 | -60.9 | -0.3 |
| 2483.6 - 4000 | 2881.6 | -48.9 | -0.3 |
| 4000 - 6000 | 4804.0 | -16.2 | -0.3 |
| 6000 - 8000 | 7206.0 | -35.7 | -0.3 |
| 8000 - 10000 | 9608.0 | -29.4 | -0.3 |
| 10000 - 13000 | 12,010.0 | -51.6 | -0.3 |
| 13000 - 15000 | 14,412.0 | -48.5 | -0.3 |
| 15000 - 18000 | 16,814.0 | -50.1 | -0.3 |
| 18000 - 20000 | 19,216.0 | -51.2 | -0.3 |
| 20000 - 23000 | 21,618.0 | -54.5 * | -0.3 |
| 23000 - 25000 | 24,020.0 | -54.6 * | -0.3 |
| * Noise Floor | | | |

The emissions must be attenuated 20 dB below the highest power level measured; therefore, the criteria is 20.2 – 20.0 = 0.2 dBm.

| Transmitting at 2434.0 MHz | | | |
|---|---|---|---|
| Frequency Range MHz | Frequency MHz | Corrected Level dBm | Criteria dBm |
| 30 -200 | 59.7 | -53.8 | 0.2 |
| 200 - 500 | 326.3 | -38.5 | 0.2 |
| 500 - 1000 | 623.3 | -40.4 | 0.2 |
| 1000 - 2000 | 1840.3 | -41.6 | 0.2 |
| 2000 – 2399.9 | 2194.0 | -68.9 | 0.2 |
| 2483.6 - 4000 | 2914.5 | -50.3 | 0.2 |
| 4000 - 6000 | 4868.0 | -17.7 | 0.2 |
| 6000 - 8000 | 7302.0 | -32.2 | 0.2 |
| 8000 - 10000 | 9736.0 | -29.2 | 0.2 |
| 10000 - 13000 | 12,170.0 | -44.7 | 0.2 |
| 13000 - 15000 | 14,603.0 | -49.3 | 0.2 |
| 15000 - 18000 | 17,038.0 | -45.0 | 0.2 |
| 18000 - 20000 | 19,472.0 | -42.4 | 0.2 |
| 20000 - 23000 | 21,906.0 | -49.6 | 0.2 |
| 23000 - 25000 | 24,340.0 | -54.6 * | 0.2 |
| * Noise Floor | | | |

The emissions must be attenuated 20 dB below the highest power level measured; therefore, the criteria is 20.4 – 20.0 = 0.4 dBm.

| Transmitting at 2479.0 MHz | | | |
|---|---|---|---|
| Frequency Range MHz | Frequency MHz | Corrected Level dBm | Criteria dBm |
| 30 -200 | 194.7 | -49.0 | 0.4 |
| 200 - 500 | 382.5 | -41.4 | 0.4 |
| 500 - 1000 | 668.3 | -34.5 | 0.4 |
| 1000 - 2000 | 1907.6 | -39.3 | 0.4 |
| 2000 – 2399.9 | 2005.4 | -46.3 | 0.4 |
| 2483.6 - 4000 | 2959.5 | -50.8 | 0.4 |
| 4000 - 6000 | 4958.0 | -16.6 | 0.4 |
| 6000 - 8000 | 7437.0 | -33.1 | 0.4 |
| 8000 - 10000 | 9916.0 | -32.5 | 0.4 |
| 10000 - 13000 | 12,395.0 | -42.5 | 0.4 |
| 13000 - 15000 | 14,874.0 | -48.8 | 0.4 |
| 15000 - 18000 | 17,353.0 | -47.2 | 0.4 |
| 18000 - 20000 | 19,832.0 | -47.4 | 0.4 |
| 20000 - 23000 | 22,311.0 | -50.3 * | 0.4 |
| 23000 - 25000 | 24,790.0 | -53.6 * | 0.4 |
| * Noise Floor | | | |

**Measurement Data Radiated Emissions Restricted Bands § 15.205:**

The frequency range from 30 MHz to 25 GHz was investigated to measure any radiated emissions in the restricted bands.

A diagram of the test configuration is enclosed in Appendix A and a list of reference codes for test equipment used is enclosed in Appendix B.

Test equipment used: 1, 3, 4, 7, 8, 9 and 12.

AVERAGE FACTOR

The pulse train in 100 msec consists of 2 pulses that are on for 560 μsec each. Therefore, the total pulse period in 100 msec is 1.12 msec (2 x 560 μsec).

The average factor for the PTB600 is –39.0 dB. This factor is derived using the following formula:

$$20 \log \frac{1.12 \text{ msec}}{100 \text{ msec}} = 20 \log 0.0112 = -39.0 \text{ dB}$$

The maximum allowed average factor is –20.0 dB; therefore, this figure was used to determine compliance.

See Appendix C for the pulse trains that were used to compute this average factor.

**Vertical Polarity**

| Transmitting at 2402.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4804.0 | 12.2 | 42.5 | -20.0 | 34.7 | 54.0 |
| 12,010.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,216.0 | 3.9 * | 43.1 | -20.0 | 27.0 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

| Transmitting at 2434.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4868.0 | 14.0 | 44.2 | -20.0 | 38.2 | 54.0 |
| 7302.0 | 11.5 | 38.4 | -20.0 | 29.9 | 54.0 |
| 12,170.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,472.0 | 9.2 * | 48.3 | -20.0 | 37.5 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

| Transmitting at 2479.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4958.0 | 11.6 | 43.0 | -20.0 | 34.6 | 54.0 |
| 7437.0 | 14.9 | 38.5 | -20.0 | 33.4 | 54.0 |
| 12,395.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,832.0 | 9.2 * | 48.3 | -20.0 | 37.5 | 54.0 |
| 22,311.0 | 10.5 * | 50.6 | -20.0 | 41.1 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

**Horizontal Polarity**

| Transmitting at 2402.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4804.0 | 13.5 | 42.5 | -20.0 | 36.0 | 54.0 |
| 12,010.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,216.0 | 3.9 * | 43.1 | -20.0 | 27.0 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

| Transmitting at 2434.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4868.0 | 12.3 | 44.2 | -20.0 | 36.5 | 54.0 |
| 7302.0 | 13.2 | 38.4 | -20.0 | 31.6 | 54.0 |
| 12,170.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,472.0 | 9.2 * | 48.3 | -20.0 | 37.5 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

| Transmitting at 2479.0 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency MHz | Receiver Reading dBμV | Correction Factor dB | Average Factor dB | Corrected Reading dBμV/m | Limit dBμV/m |
| 4958.0 | 10.6 | 43.0 | -20.0 | 33.6 | 54.0 |
| 7437.0 | 14.1 | 38.5 | -20.0 | 32.6 | 54.0 |
| 12,395.0 | 2.4 * | 44.2 | -20.0 | 26.6 | 54.0 |
| 19,832.0 | 9.2 * | 48.3 | -20.0 | 37.5 | 54.0 |
| 22,311.0 | 10.5 * | 50.6 | -20.0 | 41.1 | 54.0 |
| * No emissions were detected with the antenna 1 meter from the EUT, the indicated readings are the noise floor measurements from the spectrum analyzer | | | | | |

**Sample Field Strength Calculation:**

The field strength is calculated by adding the Correction Factor (Antenna Factor + Cable Factor), to the measured level from the receiver. The basic equation with a sample calculation is shown below:

FS = RA + CF - AF Where
FS = Field Strength
RA = Receiver Amplitude (Receiver Reading - Amplifier Gain)
CF = Correction Factor (Antenna Factor + Cable Factor)
AF = Average Factor

**RESULT**

In the configuration tested, the EUT complied with the requirements of the specification.

## APPENDIX A. TEST EQUIPMENT USED:

| Reference No. | Type | Manufacturer | Model |
|---|---|---|---|
| 1 | Anechoic Chamber | EMC Test Systems | N/A |
| 2 | Wanship Open Area Test Site | CCL | N/A |
| 3 | Spectrum Analyzer | Hewlett Packard | 8568B or 8566B |
| 4 | Quasi-Peak Detector | Hewlett Packard | 8565A |
| 5 | Biconical Antenna | EMCO | 3108 or 3104P |
| 6 | Log-Periodic Antenna | EMCO | 3146 |
| 7 | Biconilog Antenna | EMCO | 3142 |
| 8 | Double Ridged Guide Antenna | EMCO | 3115 |
| 9 | Pre-Amplifier | Hewlett Packard | 8447D |
| 10 | Power Amplifier | Hewlett Packard | 8447E |
| 11 | Power Amplifier | Hewlett Packard | 8449A |
| 12 | Power Amplifier | Hewlett Packard | 8449B |
| 13 | LISN Anechoic Chamber | EMCO | 3825/2 |
| 14 | LISN Wanship | EMCO | 3725 |

An independent calibration laboratory following outlined calibration procedures calibrates all the equipment listed above every 12 months.

## APPENDIX B. TEST PROCEDURES:

### Line Conducted Emissions:

The line-conducted emission from the digital apparatus was measured using a spectrum analyzer with a quasi-peak adapter for peak, quasi-peak and average readings. The quasi-peak adapter uses a bandwidth of 9 kHz, with the spectrum analyzer's resolution bandwidth set at 100 kHz, for readings in the 450 kHz to 30 MHz frequency ranges.

The line conducted emissions measurements are performed in a screen room using a (50 Ω/50 μH) Line Impedance Stabilization Network (LISN).

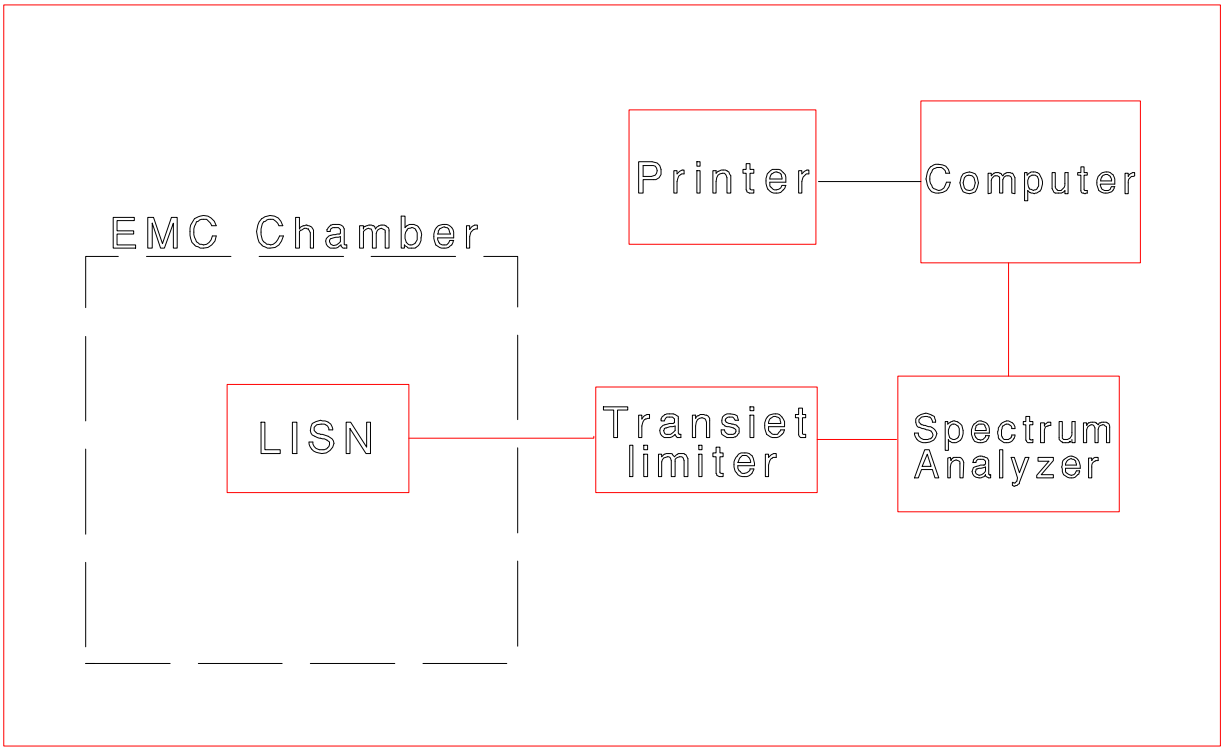
Where mains flexible power cords are longer than 1 m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

Where the EUT is a collection of digital apparatus with each digital apparatus having its own power cord, the point of connection for the LISN is determined from the following rules:

a) Each power cord, which is terminated in a mains supply plug, shall be tested separately.
b) Power cords, which are not specified by the manufacturer to be connected via a host unit, shall be tested separately.
c) Power cords which are specified by the manufacturer to be connected via a host unit or other power supplying equipment shall be connected to that host unit and the power cords of that host unit connected to the LISN and tested.

Desktop digital apparatus are placed on a non-conducting table at least 80 cm from the metallic floor. The equipment is placed a minimum of 40 cm from all walls. Floor standing equipment is placed directly on the earth grounded floor.

## Line Conducted Emissions Test




**Radiated Spurious Emissions:**

The radiated emission from the transmitter was measured using a spectrum analyzer with a quasi-peak adapter for peak and quasi-peak readings. A preamplifier with a fixed gain of 30 dB was used to increase the sensitivity of the measuring instrumentation.

A Biconilog antenna was used to measure the frequency range of 30 to 1000 MHz and a Double Ridge Guide Horn antenna was used to measure the frequency range 1 GHz to 10 GHz, at a distance of 3 meters from the EUT. The readings obtained by these antennas are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors.

The configuration of the transmitter was varied to find the maximum radiated emission. The EUT was connected to the peripherals listed in Section 2.4 via the interconnecting cables listed in Section 2.5. These interconnecting cable were

manipulated manually by a technician to obtain worst case radiated emissions. The digital apparatus was rotated 360 degrees, and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission. Where there were multiple interface ports all of the same type, cables are either placed on all of the ports or cables added to these ports until the emissions do not increase by more than 2 dB.

Transmitters are measured on a non-conducting table one-meter above the ground plane. The table is placed on a turntable which is level with the ground plane. The turntable has slip rings, which supply AC power to the digital apparatus. For equipment normally placed on floors, the equipment shall be placed directly on the turntable.

Radiated Emissions Test

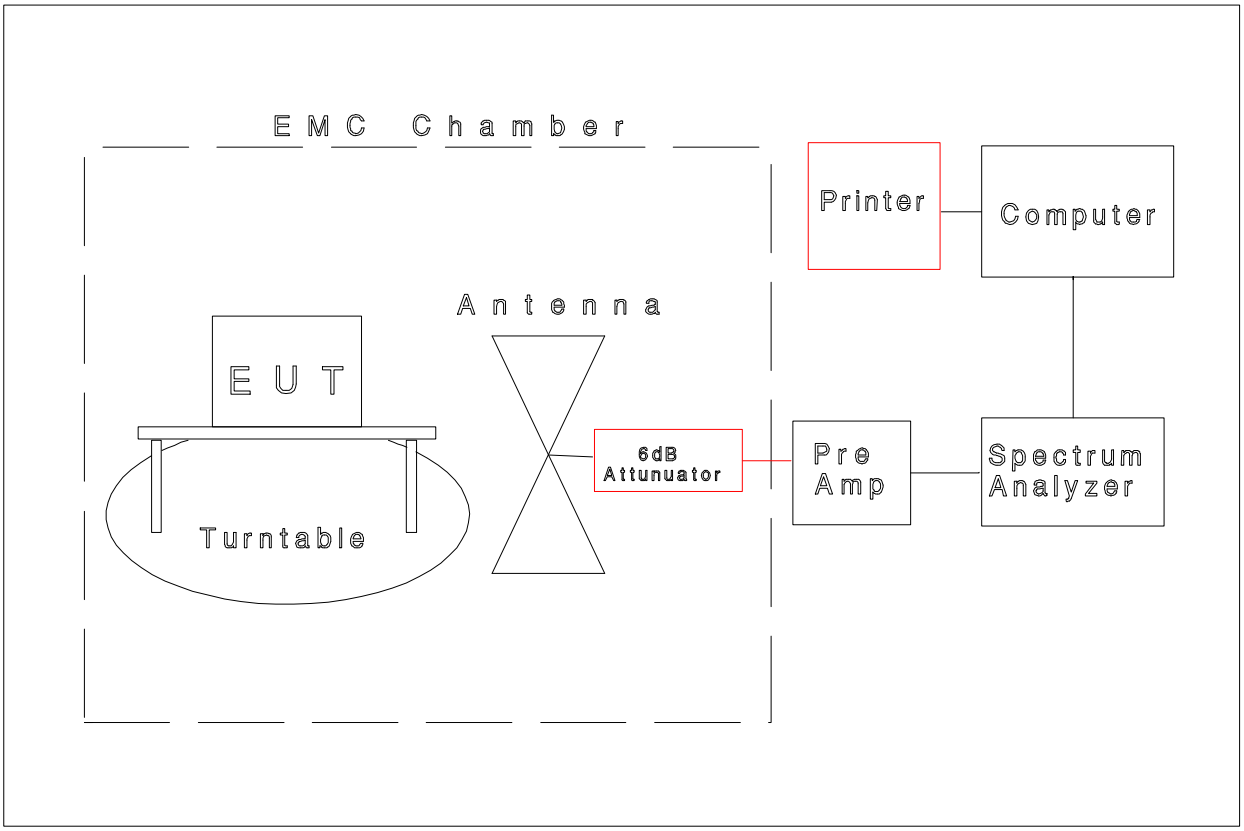



Exhibit 6

**FCC Sections 15.247 Peak Transmit Power, Emission Bandwidth and Spurious Emissions (antenna conducted)**

The EUT was directly connected to the spectrum analyzer via the antenna output port as shown in the block diagram below.

The measurements were performed on three channels, as per 47 CFR 15.31(m), one near the bottom of the spectrum, one near the middle of the spectrum and one near the top of the spectrum.

The spectrum analyzer's resolution bandwidth and video bandwidth were set as follows:

**Peak Transmit Power**

RBW = 3 MHz
VBW = 3 MHz

**Emission Bandwidth**

RBW = 3 kHz
VBW = 10 kHz

**Spurious Emissions (Antenna Conducted)**

RBW = 100 kHz – 30 MHz to 1000 MHz
VBW = 300 kHz

RBW = 1 MHz – 1 GHz to 25 GHz
VBW = 3 MHz

**Test Configuration Block Diagram**

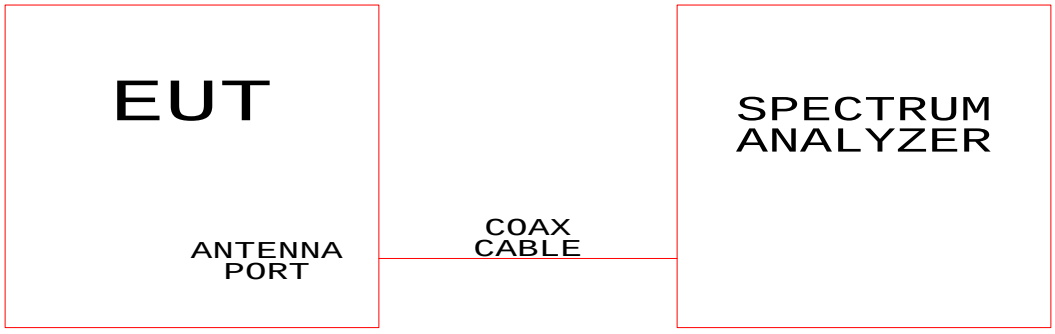
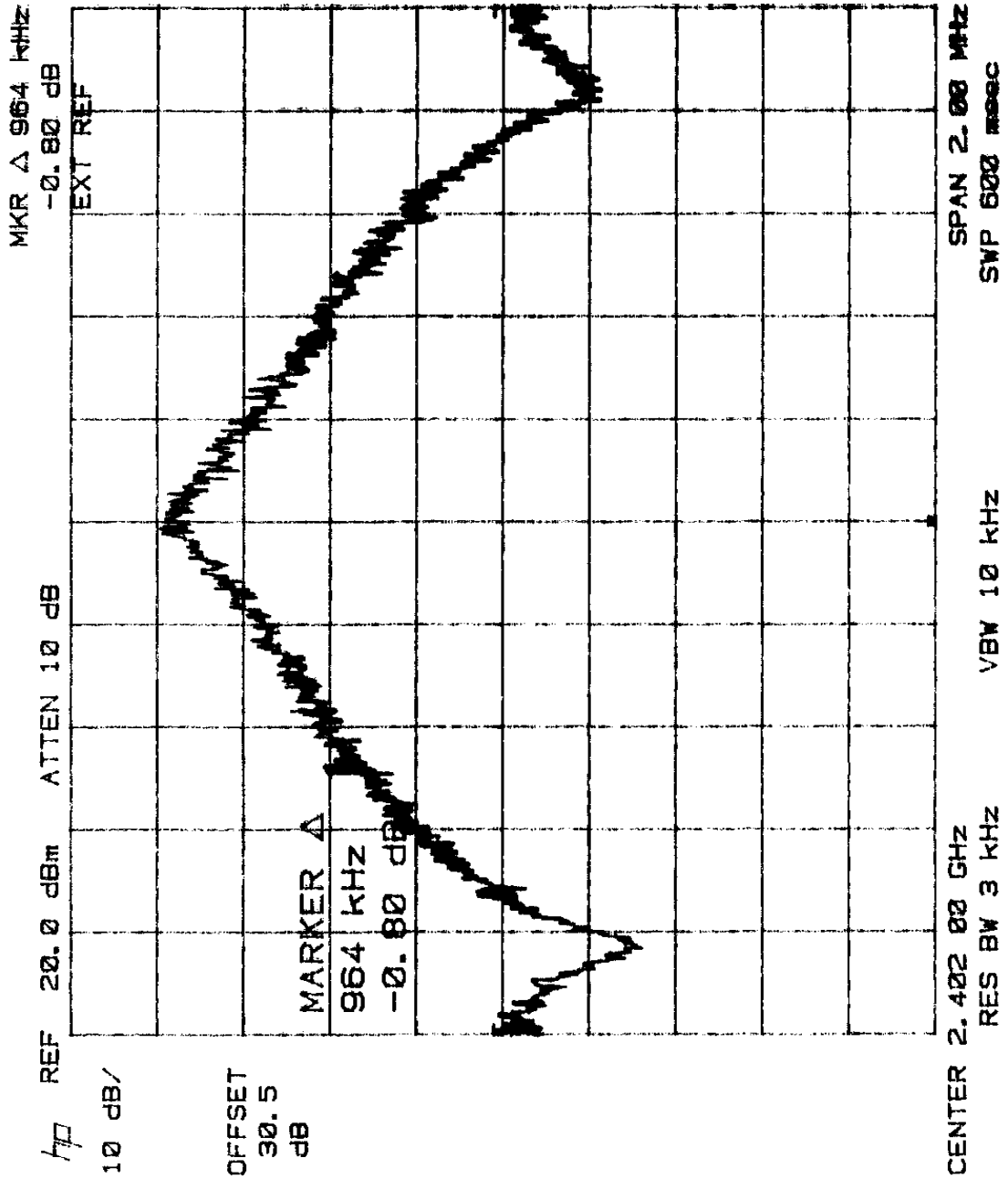


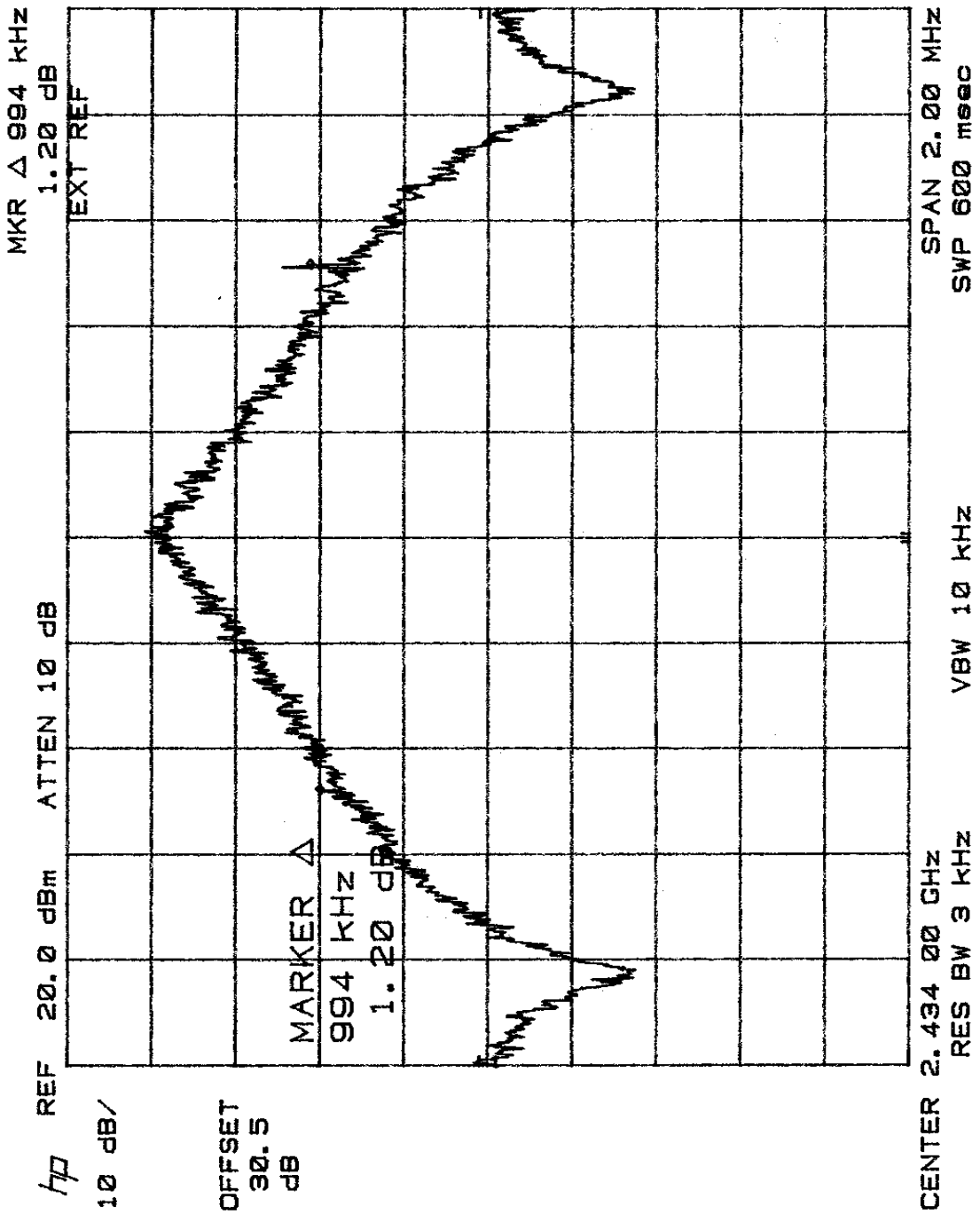

Exhibit 6

**APPENDIX C. SPECTRUM ANALYZER PLOTS:**



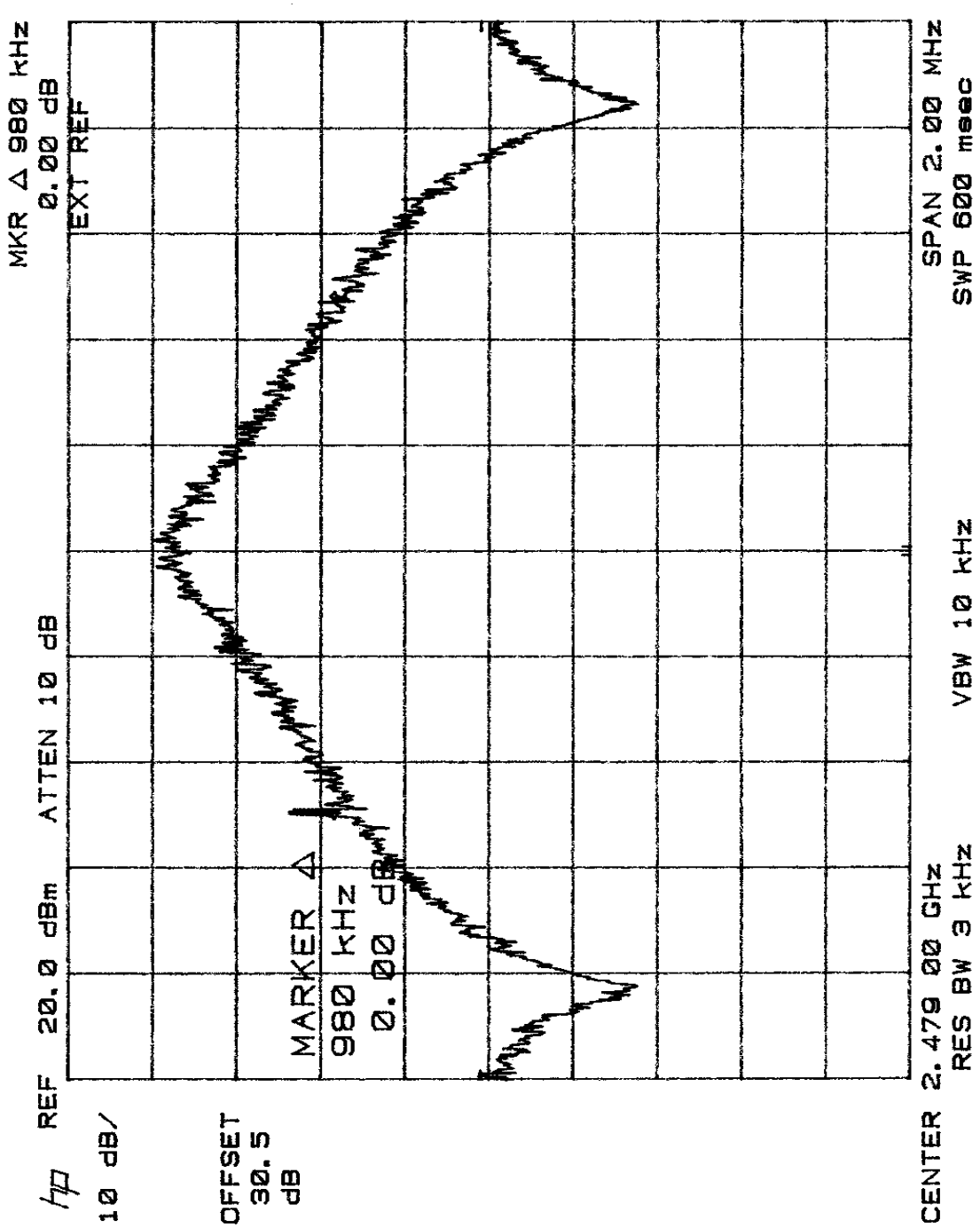

Emission Bandwidth Plot (Low Channel)

Exhibit 6



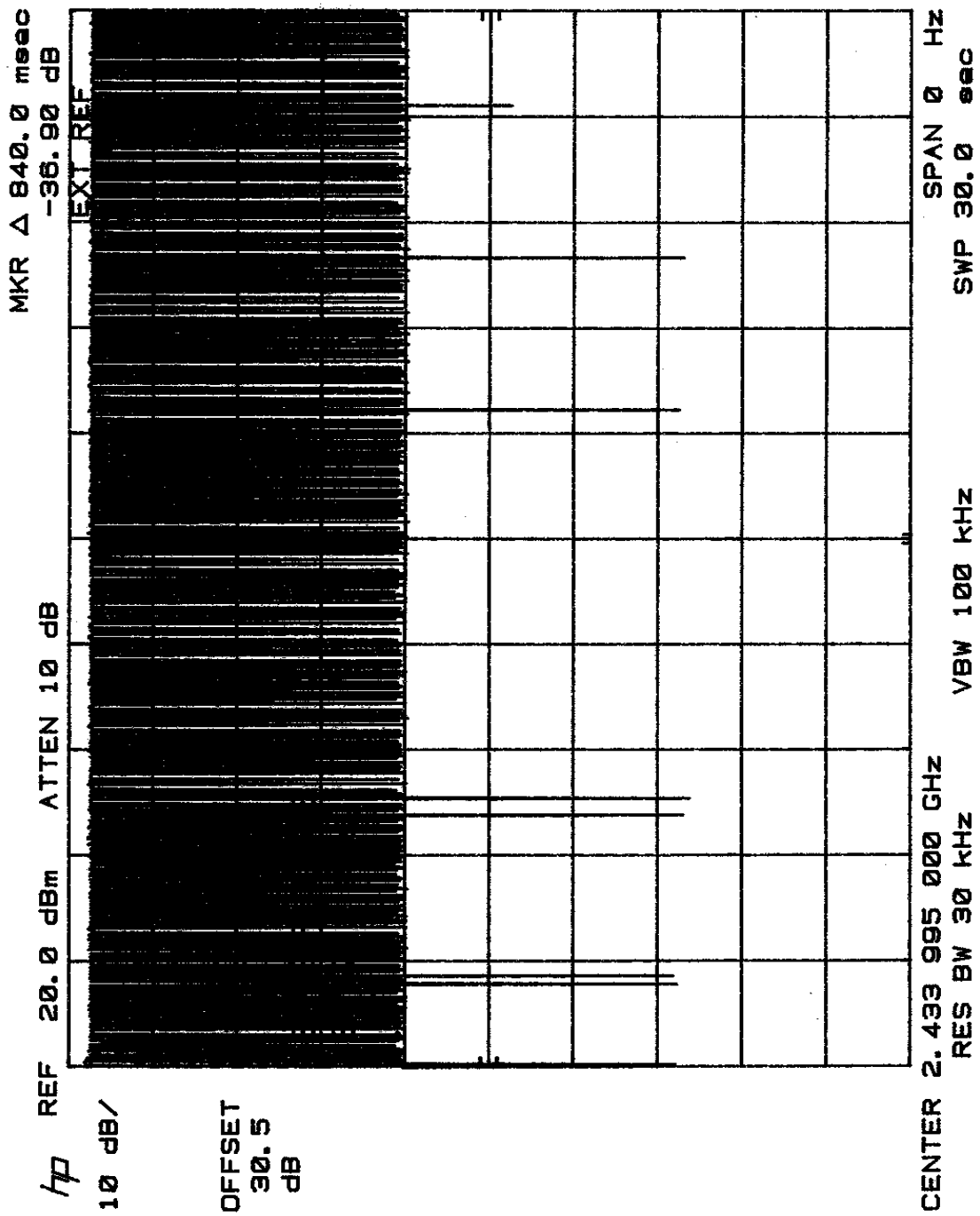

Emission Bandwidth Plot (Middle Channel)

Exhibit 6



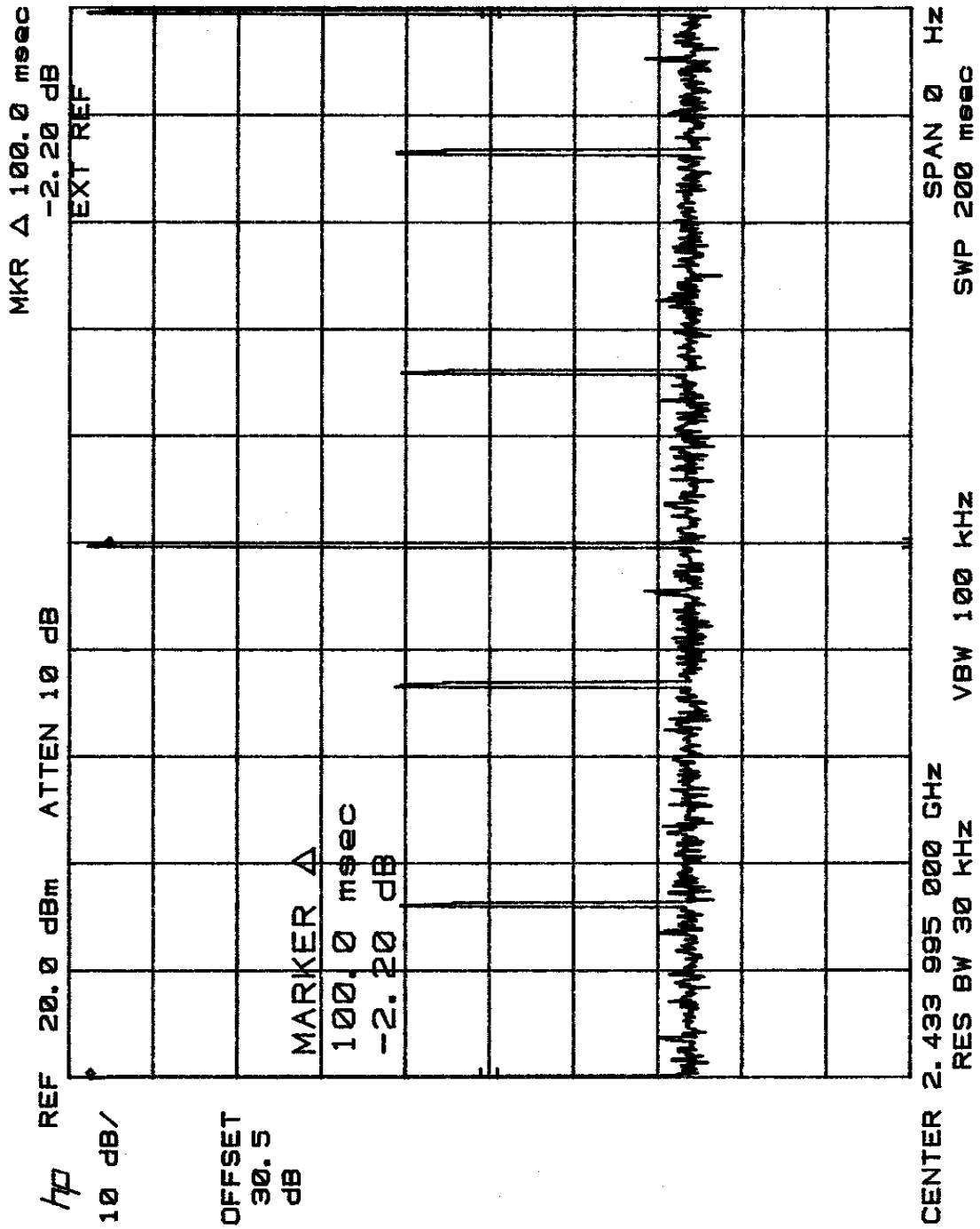

Emission Bandwidth Plot (High Channel)

Exhibit 6

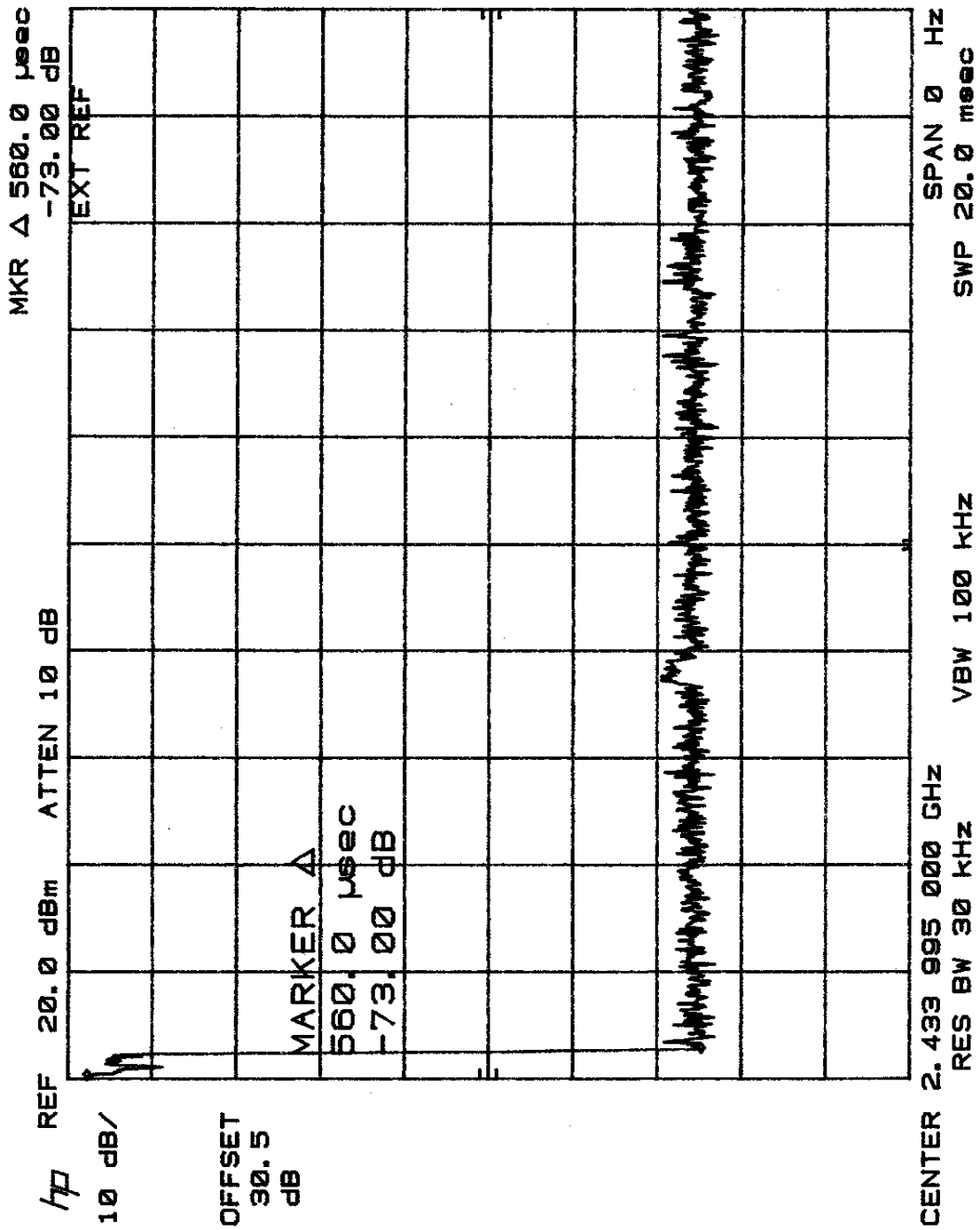



Pulse Train Plot (30 sec)

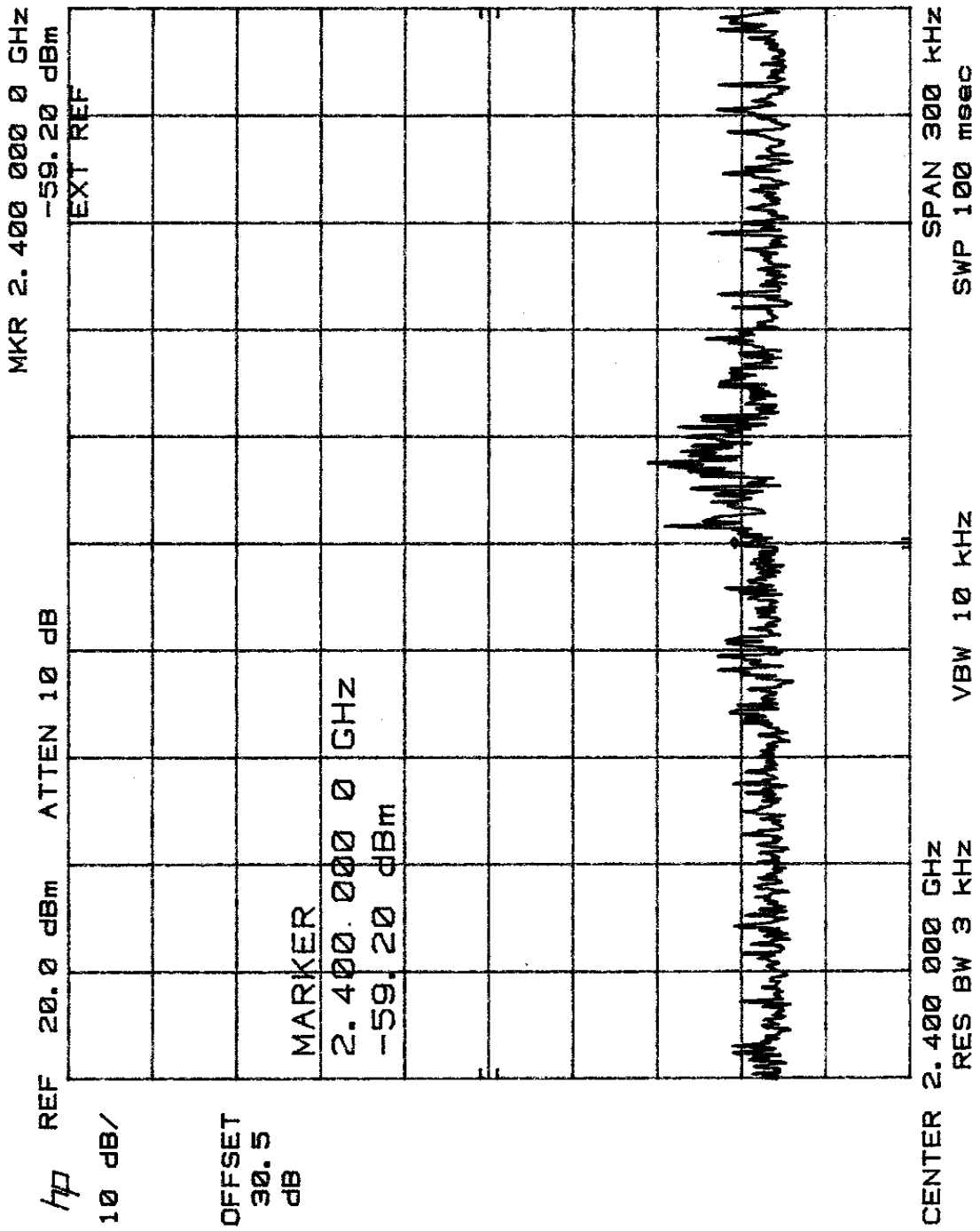
Exhibit 6



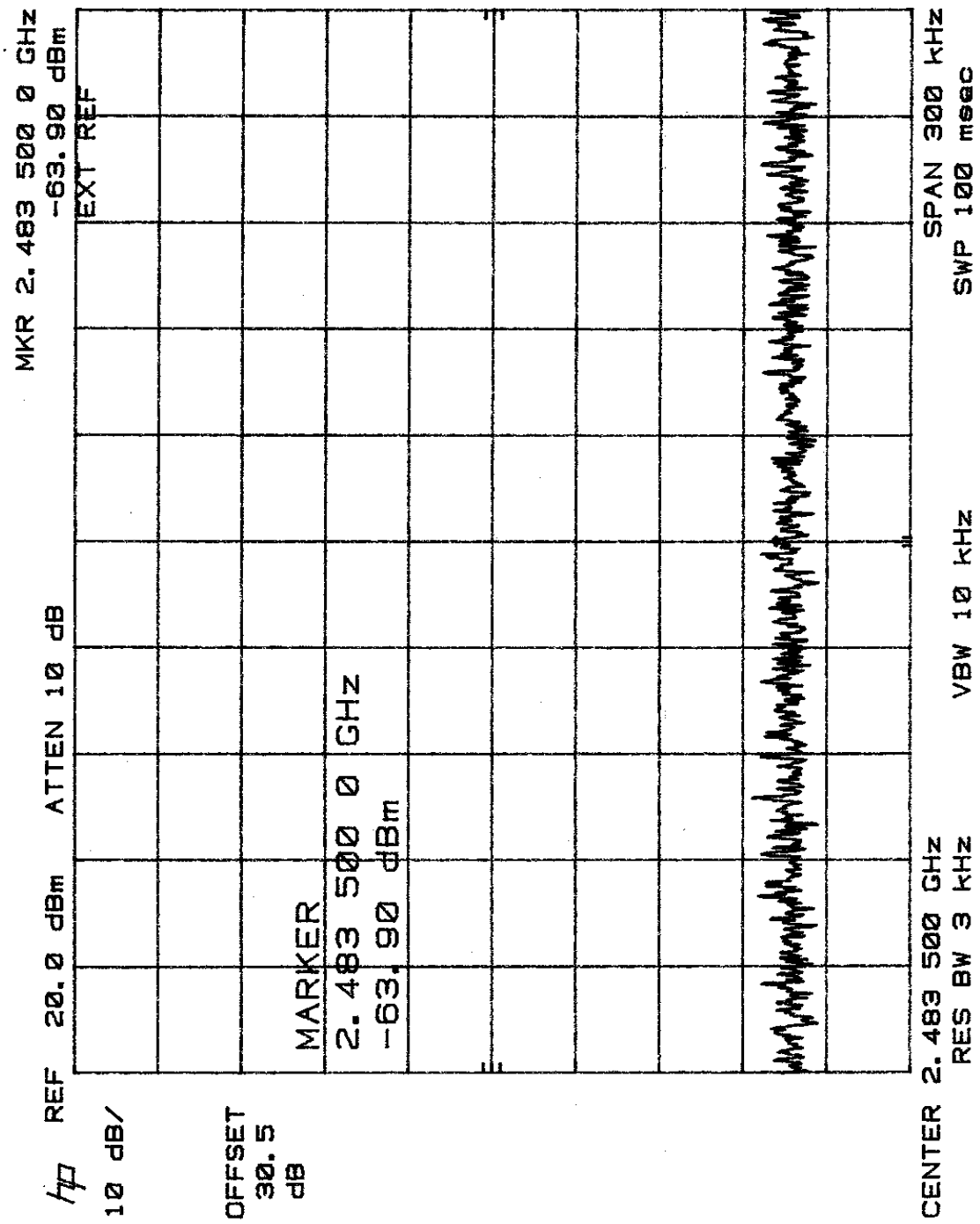

Pulse Train Plot (200 msec)
Exhibit 6




Pulse Train Plot (20 msec)
Exhibit 6




Spurious Emissions Plot (Lower Band)
Exhibit 6




Spurious Emissions Plot (Upper Band)
Exhibit 6