



## 7 FREQUENCY STABILITY

### 7.1 Test description

Parameter:	FCC §2.1055
Requirement:	FCC § 24.235
Frequency Tolerance:	Sufficient to ensure that the fundamental emission stays within the authorized frequency block

### 7.2 Test Procedure

The ppm frequency error ( PPM) of the transmitter was calculated by

$$\text{PPM} = (\text{MSF}/\text{ASF} - 1) * 10^6$$

Where MCF is the Measured Carrier Frequency in MHz

ACF is the Assigned Carrier Frequency in MHz

#### 7.2.1 Frequency Stability vs. Temperature

The EUT was connected to AC power and the RF output was connected to a spectrum analyzer. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

#### 7.2.2 Frequency Stability vs. Voltage

At room temperature ( $25 \pm 5$  °C), the EUT was connected to AC power. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

**7.3 Test Results**

Frequency Stability vs Temperature		
ACF (MHz): 1940.00		
Temperature, C	MCF (MHz)	ppm Error
50	1940.000007	-0.004
40	1940.000006	-0.004
30	1940.000010	-0.004
20	1940.000006	-0.004
10	1940.000010	-0.004
0	1940.000010	-0.004
-10	1940.000010	-0.004
-20	1940.000009	-0.004
-30	1940.000008	-0.004

Frequency Stability vs Voltage			
ACF (MHz): 1940.00			
%	Voltage, V	MCF (MHz)	ppm Error
85	102	1940.000005	-0.004
100	120	1940.000006	-0.004
115	138	1940.000006	-0.004

**7.4 Test instrumentation**

- Temperature Chamber, -50C to +100C
- Hewlett Packard 5383A Frequency Counter
- Tektronix 2784 Spectrum Analyzer

Cisco Systems Inc. Model: MWIBS-1900  
FCC ID:LDKMWIBS1900

Date of Test: January 20-February 17, 2000

## 8 AC LINE CONDUCTED EMISSIONS

### 8.1 Test description

Parameter:	ANSI C63.4
Requirement:	FCC § 15.107

### 8.2 Test Procedure

The EUT was connected to the AC line through the LISNs.

Both HOT and NEUTRAL leads were tested.

### 8.3 Test Results

Test was not performed. Test data can be found in the separate FCC Part 15 report provided by client.

### 8.4 Test instrumentation

HP 8568B Spectrum Analyzer  
LISN

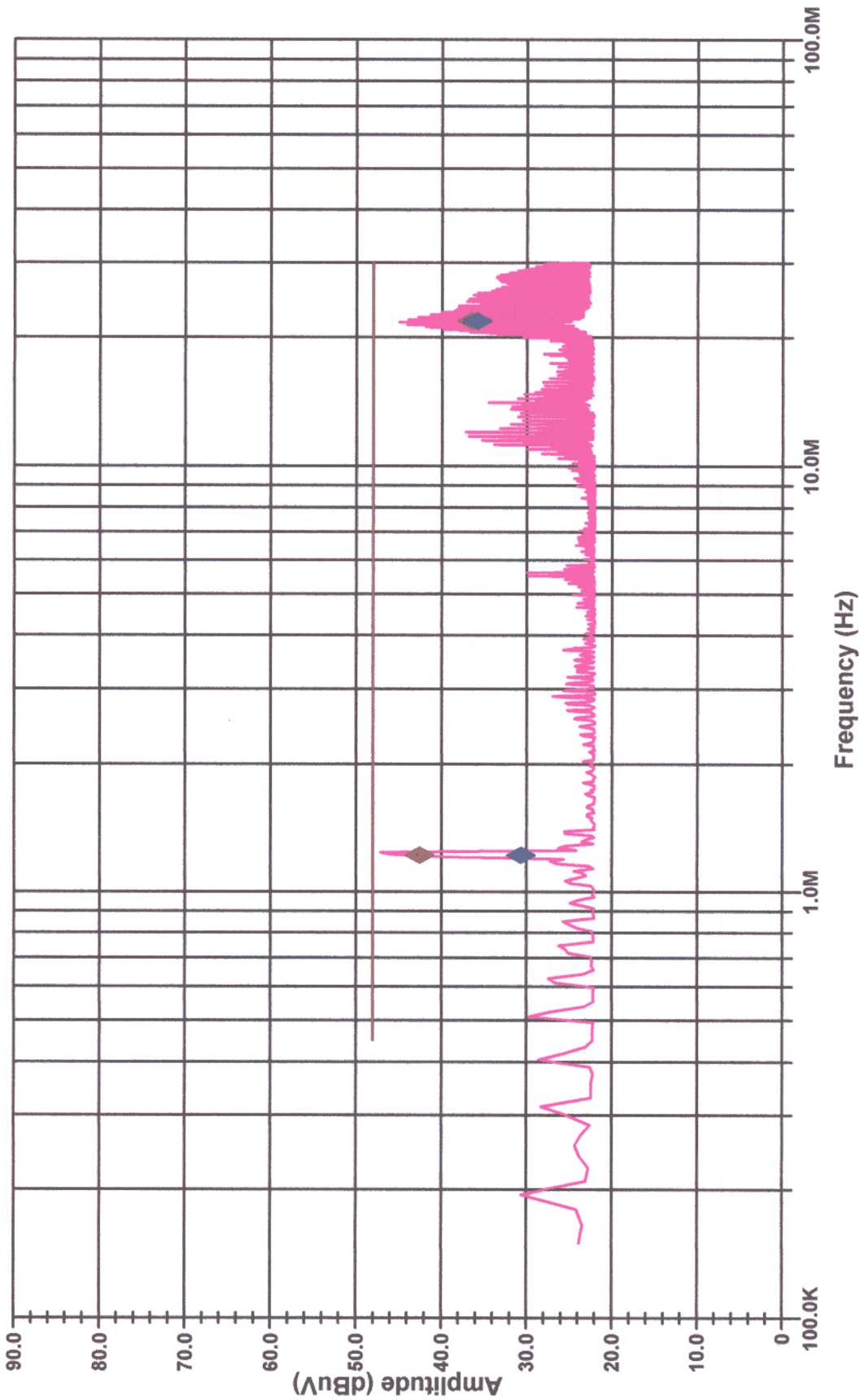
# Intertek Testing Services

Line Conducted Emissions 450 kHz - 30 MHz

FCC Part 15 Class B (Line 1)

Test Mode: 120 V 60 Hz  
Temperature: 21.9 C  
Humidity: 25.8 %

- Limit Quasi Peak
- Peak Scan
- Quasi Peak Level
- Average Level



Model Number: MWIBS-1900

Company: EXIO Communications

ITS Job Number: J20037661

Operator: James Plotner

11:19:11 AM, Friday, February 02, 2001

Intertek Testing Services  
Line Conducted Emissions 450 kHz - 30 MHz  
FCC Part 15 Class B (Line 1)

Operator: James Plotner

Model Number: MWIBS-1900

11:19:13 AM, Friday, February 02, 2001

ITS Job Number: J20037661

Company: EXIO Communications

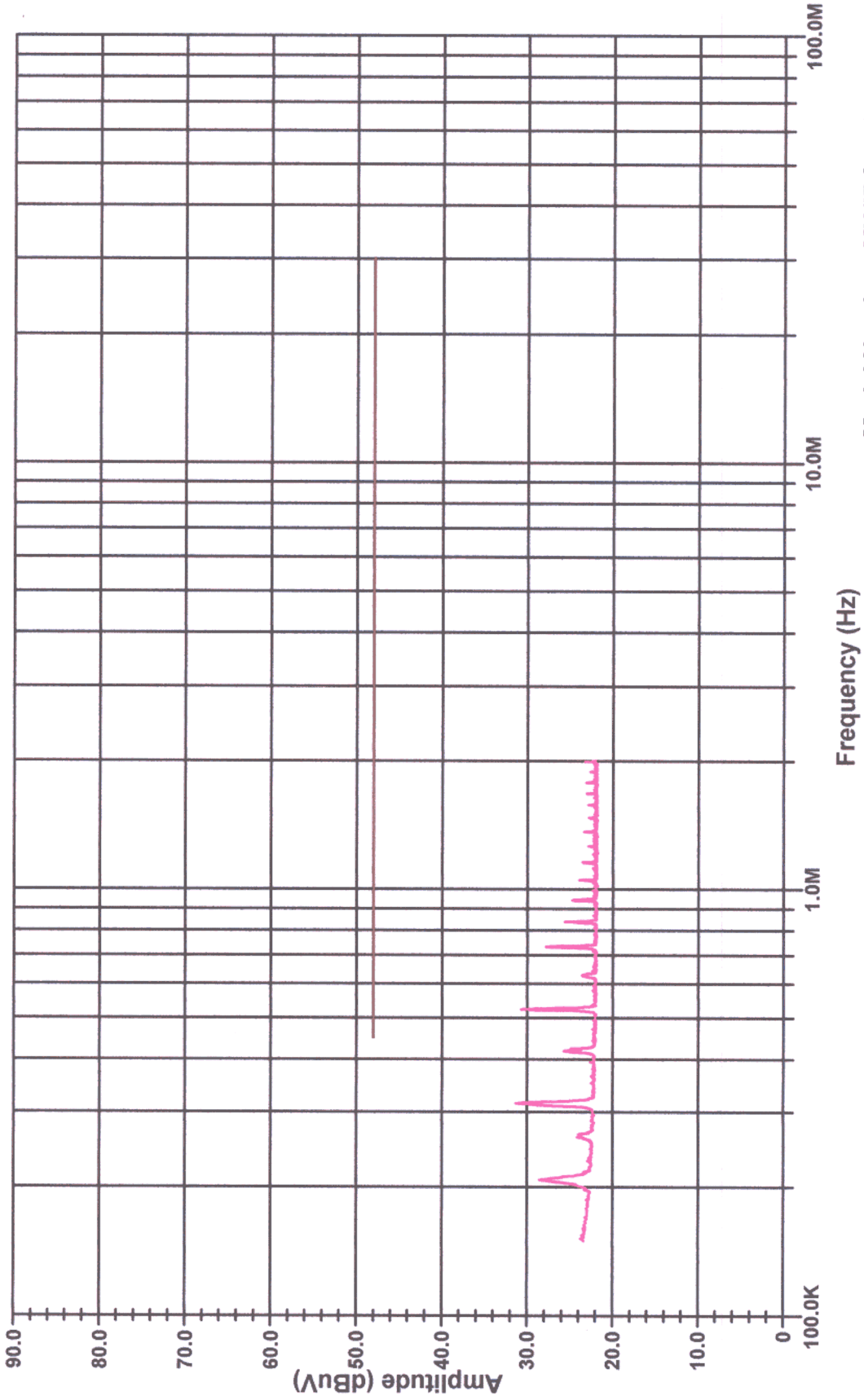
	1	2	4	5
Frequency MHz	Pk Level (dBuV)	QP Level (dBuV)	Limit (dBuV)	Pk Margin QP Margin (dBuV)
1.22 MHz		42.5	48.0	
1.239525 MHz	47.1		48.0	-0.9
20.7465 MHz	37.9		48.0	-10.1
20.85098 MHz	39.8		48.0	-8.2
21.05992 MHz	41.3		48.0	-6.7
21.1644 MHz	41.8		48.0	-6.2
21.35842 MHz	44.1		48.0	-3.9
21.4629 MHz	43.5		48.0	-4.5
21.67185 MHz	45.0		48.0	-3.0
21.77632 MHz	42.6		48.0	-5.4
21.847 MHz		36.4	48.0	-5.0
21.98528 MHz	43.9		48.0	-4.1
22.08975 MHz	40.0		48.0	-8.0
22.28378 MHz	42.7		48.0	-5.3
22.49272 MHz	37.8		48.0	-10.2
22.5972 MHz	41.2		48.0	-6.8
22.80615 MHz	38.0		48.0	-10.0
22.91062 MHz	40.0		48.0	-8.0
23.10465 MHz	38.4		48.0	-9.6
23.2091 MHz	38.2		48.0	-9.8
23.41808 MHz	38.1		48.0	-9.9
23.71658 MHz	38.0		48.0	-10.0
Test Mode: 120 V 60 Hz				
Temperature: 21.9 C				
Humidity: 25.8 %				

# Intertek Testing Services

Test Mode: Removed GPS Cable  
Temperature: 21.9 C  
Humidity: 25.8 %

Line Conducted Emissions 450 kHz - 30 MHz  
FCC Part 15 Class B (Line 1)

— Limit Quasi Peak  
— Peak Scan



Model Number: MWIBS-1900

Operator: James Plotner

Company: EXIO Communications

11:51:46 AM, Friday, February 02, 2001

ITS Job Number: J20037661

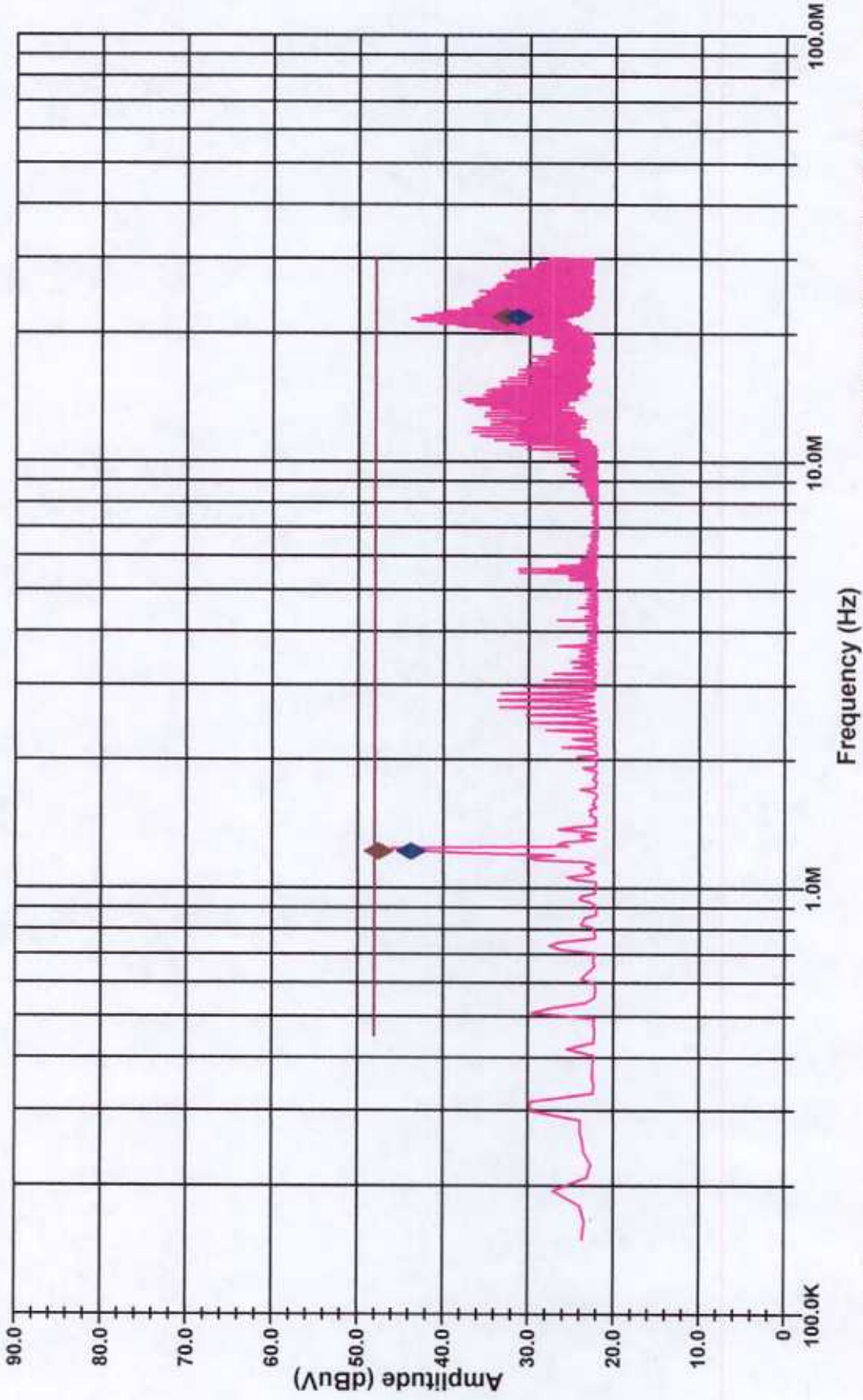
# Intertek Testing Services

Line Conducted Emissions 450 kHz - 30 MHz

FCC Part 15 Class B (Line 2)

Test Mode: 120 V 60 Hz  
Temperature: 21.9 C  
Humidity: 25.8 %

— Limit  
— Peak Scan  
◆ Quasi Peak Level  
◆ Average Level



Model Number: MWIBS-1900

Company: EXIO Communications

ITS Job Number: J20037661

Operator: James Plotner

11:35:51 AM, Friday, February 02, 2001



Intertek Testing Services  
Line Conducted Emissions 450 kHz - 30 MHz  
FCC Part 15 Class B (Line 2)

Operator: James Plotner

Model Number: MWIBS-1900

11:35:52 AM, Friday, February 02, 2001

ITS Job Number: J20037661

Company: EXIO Communications

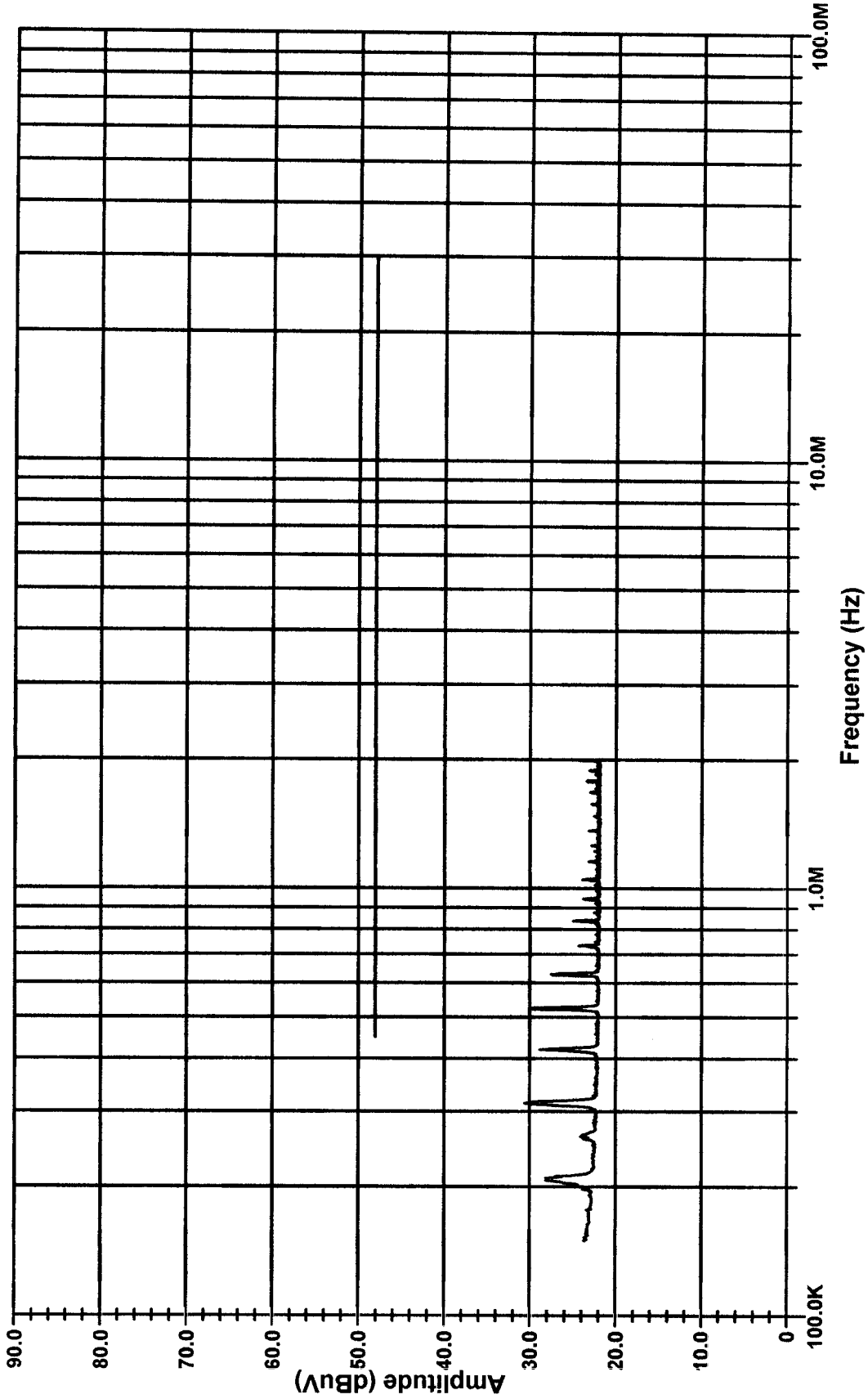
	1	2	3	4	5
Frequency	Pk Level	QP Level	Limit	Pk Margin	QP Margin
MHz	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
1.21913 MHz		47.5	48.0		
1.239525 MHz	46.1		48.0	-1.9	
	36.8		48.0	-11.2	
13	37.4		48.0	-10.6	
13			48.0	-10.2	
14.07502 MHz	37.3		48.0	-10.7	
20.71665 MHz	37.7		48.0	-10.3	
20.82112 MHz	38.4		48.0	-9.6	
21.03008 MHz	40.7		48.0	-7.3	
21.11962 MHz	40.4		48.0	-7.6	
21.32858 MHz	43.2		48.0	-4.8	
21.43305 MHz	41.8		48.0	-6.2	
	37.0		48.0	-11.0	
21.642 MHz	43.8		48.0	-4.2	
21.74648 MHz	40.8		48.0	-7.2	
21.83538 MHz	37.6	32.8	48.0	-10.4	
21.85095 MHz	37.1		48.0	-10.9	
21.95542 MHz	42.6		48.0	-5.4	
22.0599 MHz	37.7		48.0	-10.3	
22.25392 MHz	41.1		48.0	-6.9	
22.56735 MHz	39.8		48.0	-8.2	
22.86585 MHz	38.0		48.0	-10.0	
Test Mode: 120 V 60 Hz					
Temperature: 21.9 C					
Humidity: 25.8 %					

# Intertek Testing Services

Test Mode: Removed GPS Cable  
Temperature: 21.9 C  
Humidity: 25.8 %

Line Conducted Emissions 450 kHz - 30 MHz  
FCC Part 15 Class B (Line 2)

— Limit  
— Peak Scan



Model Number: MWIBS-1900

Company: EXIO Communications

Operator: James Plotner

11:49:35 AM, Friday, February 02, 2001