

Intertek Testing Services
Radiated Emissions 30 MHz- 1000 MHz
FCC Part 15 Class B (Pk-Vertical)

Operator: James Plotner

Model Number: MWIBS-1900

ITS Job Number: J20037661

08:23:01 AM, Friday, February 02, 2001

Company: EXIO Communications

	1	2	3	4	5	6	7	
Frequency	Pk Level				Antenna	Cable	Preamp	
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	(dB)	
34.9875 MHz	25.5	29.5	-4.0	45.9	8.3	0.5	32.2	
43.3375 MHz	22.6	29.5	-6.9	43.4	8.0	0.5	32.4	
60.3125 MHz	27.1	29.5	-2.4	52.2	3.6	0.7	32.4	
88.0 MHz	24.0	29.5	-5.5	26.9	7.6	1.1	32.6	
94.2625 MHz	23.3	33.0	-9.7	45.8	6.0	1.1	32.6	
216.0 MHz	22.8	33.0	-10.2	23.2	11.5	1.8	33.6	
325.2437 MHz	22.5	35.5	-13.0	35.0	15.6	2.2	33.2	
512.575 MHz	24.5	35.5	-11.0	32.6	19.1	3.2	33.4	
550.7687 MHz	28.5	35.5	-7.0	37.2	18.8	3.2	33.6	
600.4813 MHz	23.1	35.5	-12.4	30.0	20.0	3.4	33.3	
610.1813 MHz	26.7	35.5	-8.8	34.0	19.6	3.4	33.3	
619.8813 MHz	27.9	35.5	-7.6	34.9	20.0	3.4	33.3	
629.5812 MHz	25.0	35.5	-10.5	31.5	20.5	3.4	33.4	
639.8875 MHz	25.7	35.5	-9.8	31.7	21.0	3.4	33.4	
649.5875 MHz	23.2	35.5	-12.3	29.6	20.6	3.4	33.4	
747.8 MHz	24.8	35.5	-10.7	30.5	21.4	3.6	33.6	
846.0126 MHz	31.6	35.5	-3.9	35.4	22.7	4.2	33.6	
855.7125 MHz	29.4	35.5	-6.1	32.9	22.9	4.2	33.5	
875.7188 MHz	28.7	35.5	-6.8	31.1	23.7	4.2	33.3	
885.4188 MHz	27.5	35.5	-8.0	29.5	24.0	4.2	33.2	
895.1188 MHz	28.3	35.5	-7.2	30.5	23.7	4.2	33.1	
904.8187 MHz	29.8	35.5	-5.7	32.6	23.0	4.2	33.1	
Test Mode: Receive								
Temperature: 21.9 C								
Humidity: 25.8 %								

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 ± 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

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

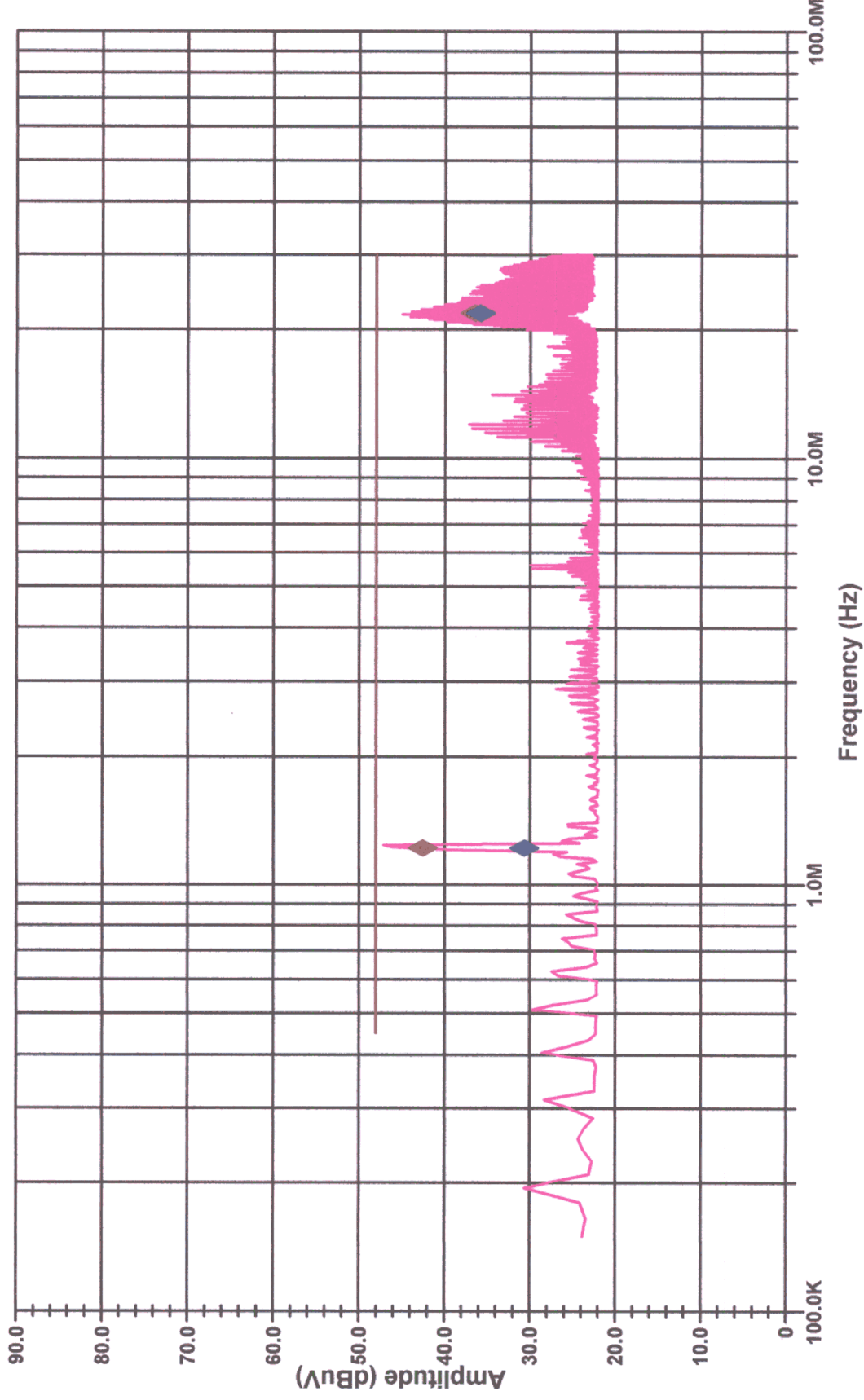
HP 8568B Spectrum Analyzer
LISN

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 %



Model Number: MWIBS-1900

Operator: James Plotner

Company: EXIO Communications

11:19:11 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 1)

Operator: James Plotner

Model Number: MWIBS-1900

ITS Job Number: J20037661

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

Company: EXIO Communications

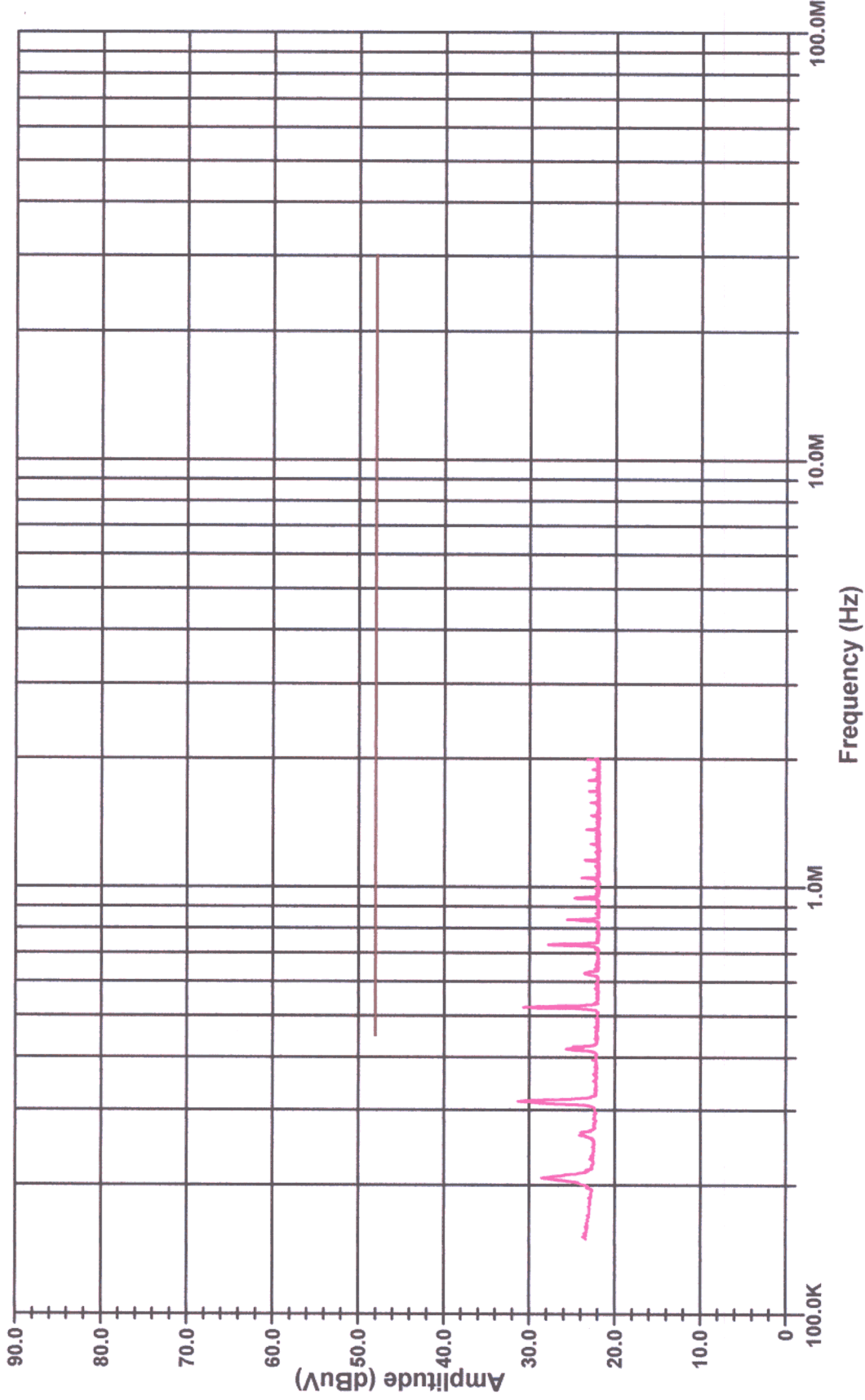
	1	2	4	5	
Frequency	Pk Level	QP Level	Limit	Pk Margin	QP Margin
MHz	(dBuV)	(dBuV)	(dBuV)	(dBuV)	
1.22 MHz		42.5	48.0		
1.239525 MHz	47.1		48.0	-0.9	
20.7465 MHz	37.9		48.0	-10.1	
20.85098 MHz	39.8		48.0	-8.2	
21.05992 MHz	41.3		48.0	-6.7	
21.1644 MHz	41.8		48.0	-6.2	
21.35842 MHz	44.1		48.0	-3.9	
21.4629 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)



Model Number: MWIBS-1900

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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

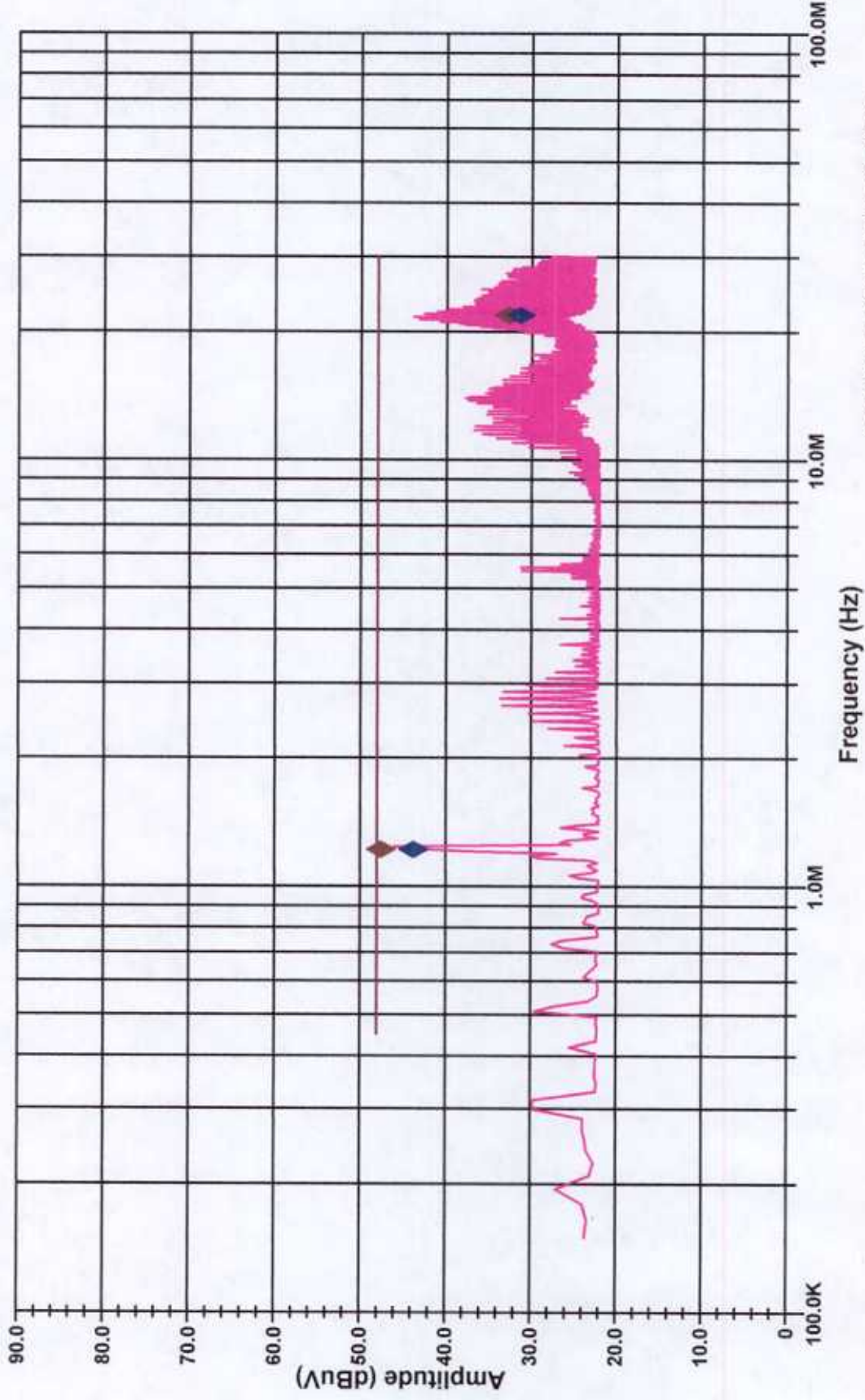
FCC Part 15 Class B (Line 2)

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

Operator: James Plotner

Company: EXIO Communications

11:35:51 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)

Operator: James Plotner

Model Number: MWIBS-1900

ITS Job Number: J20037661

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

Company: EXIO Communications

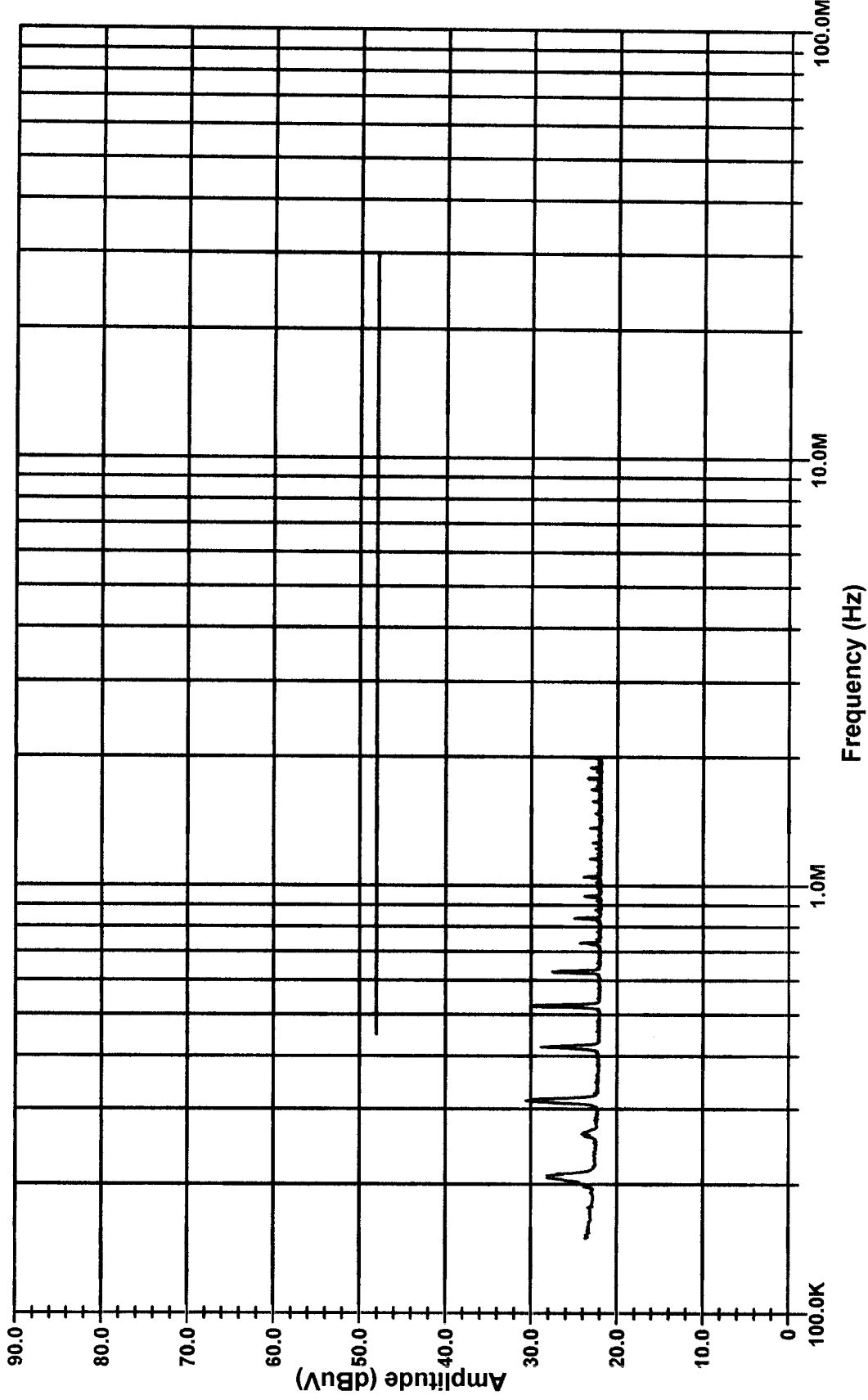
	1	2	3	4	5	
Frequency	Pk Level	QP Level	Limit	Pk Margin	QP Margin	
MHz	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	
1.21913 MHz		47.5	48.0			
1.239525 MHz	46.1		48.0	-1.9		
	36.8		48.0	-11.2		
1.3	37.4		48.0	-10.6		
1.3			48.0	-10.2		
14.07502 MHz	37.3		48.0	-10.7		
20.71665 MHz	37.7		48.0	-10.3		
20.82112 MHz	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)



Operator: James Plotner

Model Number: MWIBS-1900

Company: EXIO Communications

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