

**TUV Product Service
Powerline Conducted Emissions**

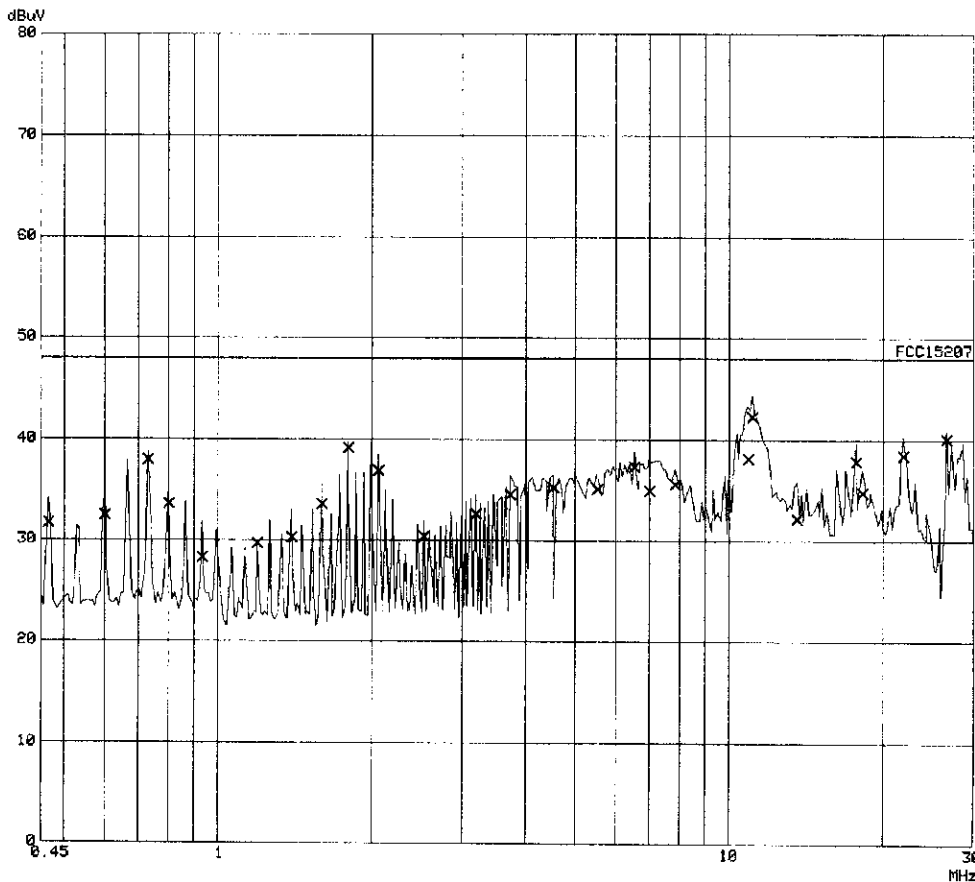
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6a QPSK-3/4
 SC106727
 Date: 24. Sep 01 10:14

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dB LISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6a QPSK-3/4
 SC106727
 Date: 24. Sep 01 10:14

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46500	31.7	48.0
0.60000	32.5	48.0
0.73000	38.0	48.0
0.80000	33.6	48.0
0.93000	28.2	48.0
1.19500	29.7	48.0
1.39500	30.3	48.0
1.59500	33.6	48.0
1.79500	39.2	48.0
2.06000	36.9	48.0
2.53000	30.4	48.0
3.19500	32.6	48.0
3.72500	34.5	48.0
4.52500	35.3	48.0
5.52000	35.1	48.0
6.52000	37.3	48.0
6.99000	35.0	48.0
7.85000	35.6	48.0
10.90500	38.2	48.0
11.11000	42.2	48.0
13.57000	32.1	48.0
17.69500	37.9	48.0
18.24500	34.8	48.0
21.91000	38.5	48.0
26.61000	40.1	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

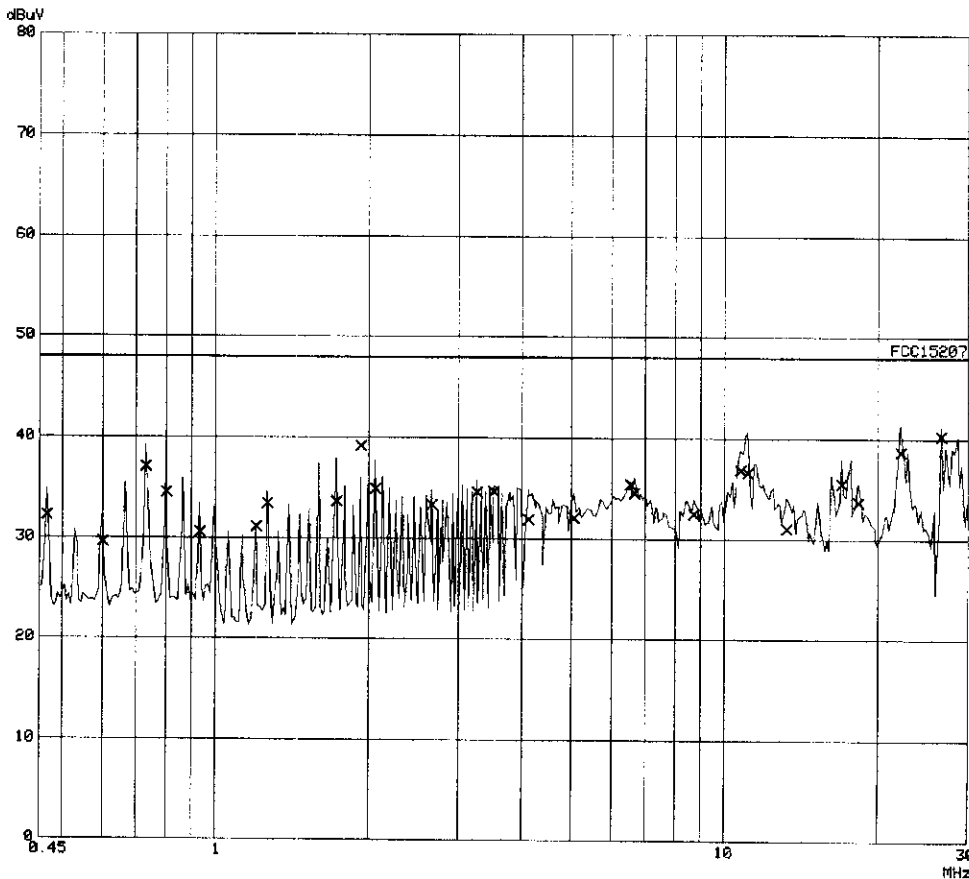
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6a QPSK-3/4
 SC106727
 Date: 24. Sep 01 10:21

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dBLISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6a QPSK-3/4
 SC106727
 Date: 24. Sep 01 10:21

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46500	32.2	48.0
0.60000	29.6	48.0
0.73000	37.1	48.0
0.80000	34.6	48.0
0.93000	30.5	48.0
1.20000	31.2	48.0
1.26500	33.5	48.0
1.72500	33.7	48.0
1.93000	39.2	48.0
2.06000	34.9	48.0
2.66000	33.3	48.0
3.26000	34.6	48.0
3.52500	34.7	48.0
4.12000	31.9	48.0
5.05500	32.1	48.0
6.52000	35.4	48.0
6.65000	34.6	48.0
8.71500	32.5	48.0
10.77500	36.9	48.0
11.10500	36.6	48.0
13.24000	31.0	48.0
16.96000	35.5	48.0
18.30500	33.7	48.0
22.15000	38.7	48.0
26.61000	40.3 <i>DB</i>	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

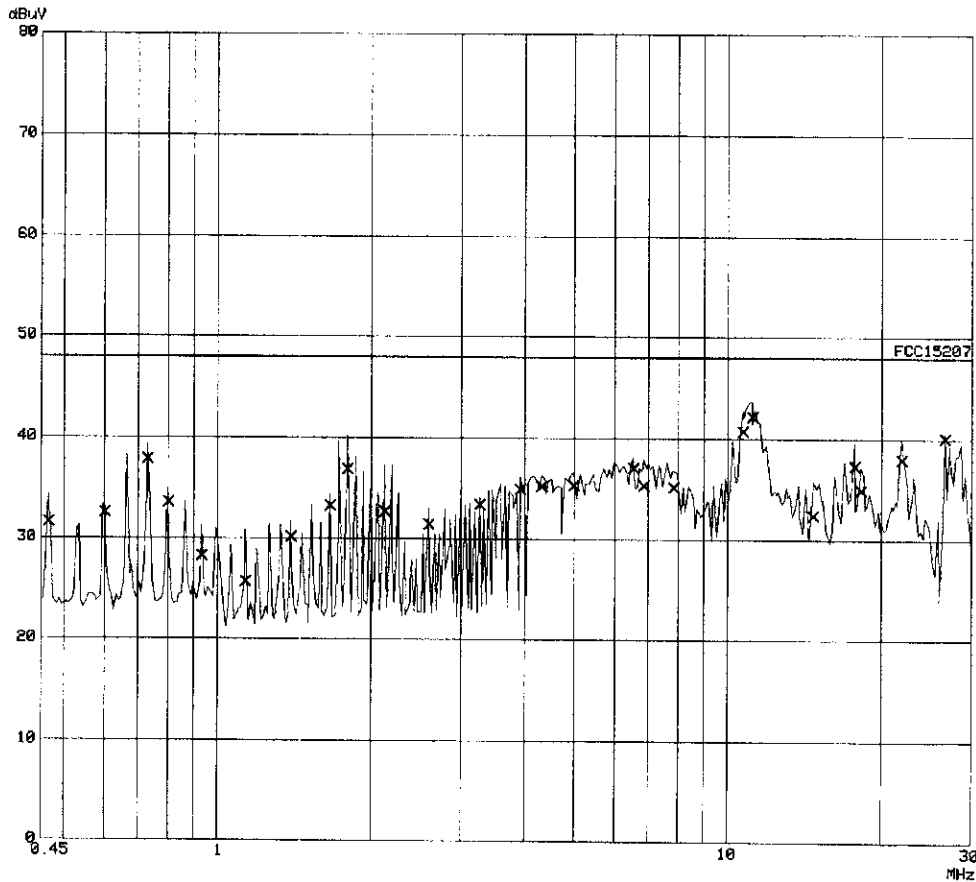
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6c 8QAM
 SC106727
 Date: 24. Sep 01 10:05

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dB LISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6c 8QAM
 SC106727
 Date: 24. Sep 01 10:05

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46500	31.6	48.0
0.60000	32.6	48.0
0.73000	37.9	48.0
0.80000	33.6	48.0
0.93000	28.2	48.0
1.13500	25.7	48.0
1.39500	30.2	48.0
1.66000	33.3	48.0
1.80000	36.9	48.0
2.12500	32.7	48.0
2.59500	31.4	48.0
3.26000	33.4	48.0
3.92500	34.9	48.0
4.32500	35.3	48.0
4.99000	35.4	48.0
6.52000	37.1	48.0
6.85000	35.3	48.0
7.85000	35.2	48.0
10.71500	40.8	48.0
11.18000	42.1 <i>DB</i>	48.0
14.70500	32.4	48.0
17.69500	37.3	48.0
18.24500	35.0	48.0
21.90500	38.0	48.0
26.61000	40.1	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

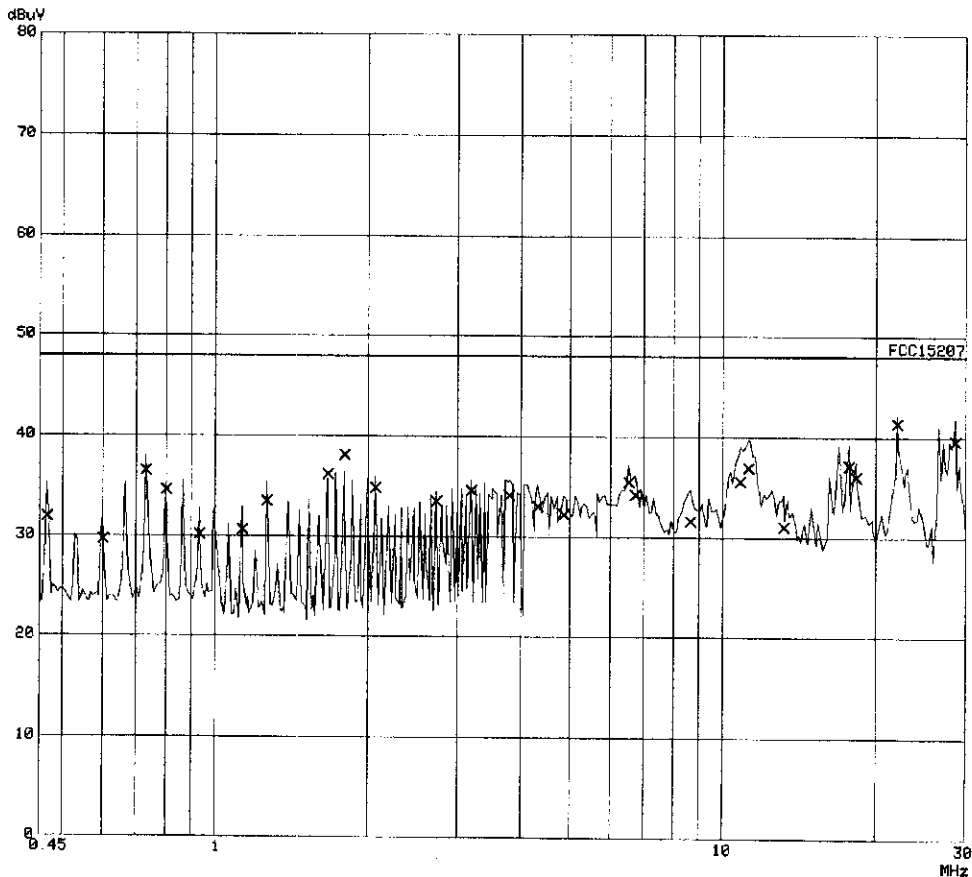
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6c 8QAM
 SC106727
 Date: 24. Sep 01 09:56

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dB LISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6c 8QAM
 SC106727
 Date: 24. Sep 01 09:56

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46500	31.9	48.0
0.60000	29.7	48.0
0.73000	36.5	48.0
0.80000	34.6	48.0
0.93000	30.2	48.0
1.13000	30.7	48.0
1.26500	33.5	48.0
1.66500	36.2	48.0
1.79500	38.2	48.0
2.06500	34.9	48.0
2.73000	33.5	48.0
3.19500	34.6	48.0
3.79500	34.1	48.0
4.32500	33.0	48.0
4.86000	32.2	48.0
6.52000	35.5	48.0
6.72000	34.2	48.0
8.65500	31.6	48.0
10.84500	35.6	48.0
11.24500	36.9	48.0
13.18000	31.0	48.0
17.69500	37.1	48.0
18.30500	36.1	48.0
22.03000	41.4	48.0
28.68500	39.6	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

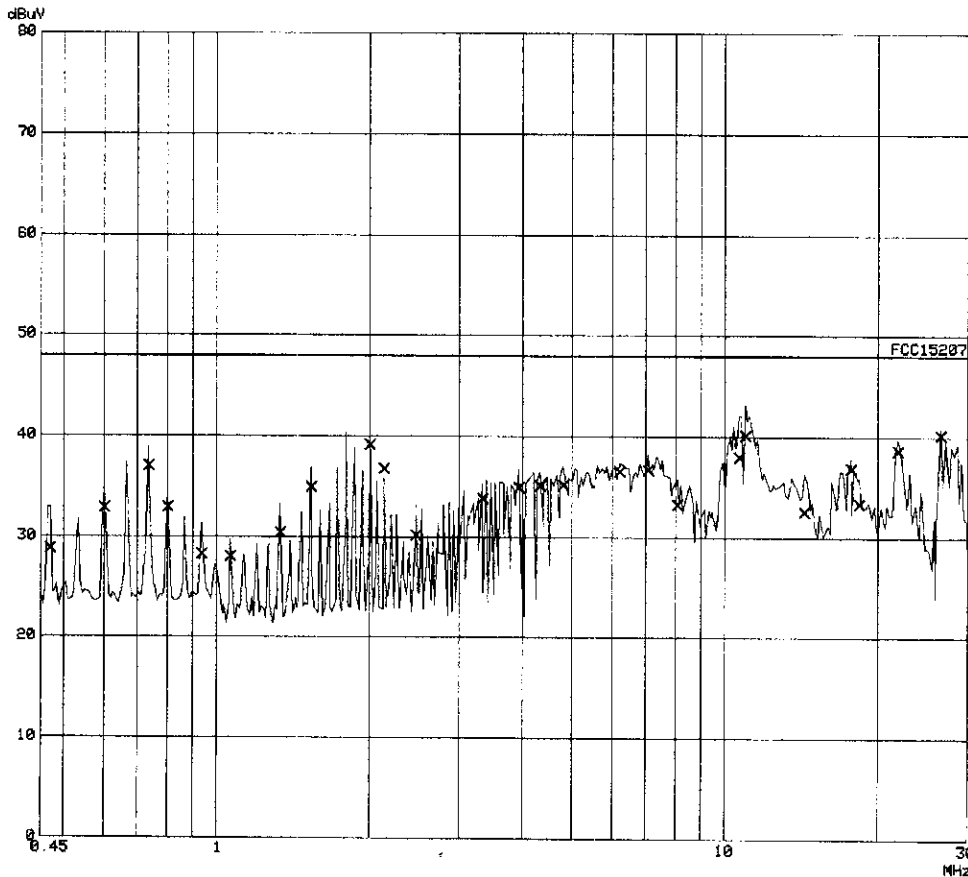
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6f 16QAM
 SC106727
 Date: 24. Sep 01 09:15

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dB LISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc *OK*
 Operator: Dave Bernardin
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 1Channel 6f 16QAM
 SC106727
 Date: 24. Sep 01 09:15

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.47000	28.8	48.0
0.60000	32.8	48.0
0.73500	37.0	48.0
0.80000	33.0	48.0
0.93500	28.2	48.0
1.06500	28.0	48.0
1.33500	30.4	48.0
1.53500	34.9	48.0
2.00000	39.2	48.0
2.13500	36.8	48.0
2.47000	30.2	48.0
3.33500	33.8	48.0
3.93500	35.0	48.0
4.33500	35.1	48.0
4.80500	35.2	48.0
6.20500	36.6	48.0
7.07000	36.7	48.0
8.07000	33.3	48.0
10.67000	37.9	48.0
11.00500	40.1	48.0
14.34500	32.5	48.0
17.69500	36.8	48.0
18.36500	33.3	48.0
21.91000	38.6	48.0
26.61000	40.2 <i>OK</i>	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

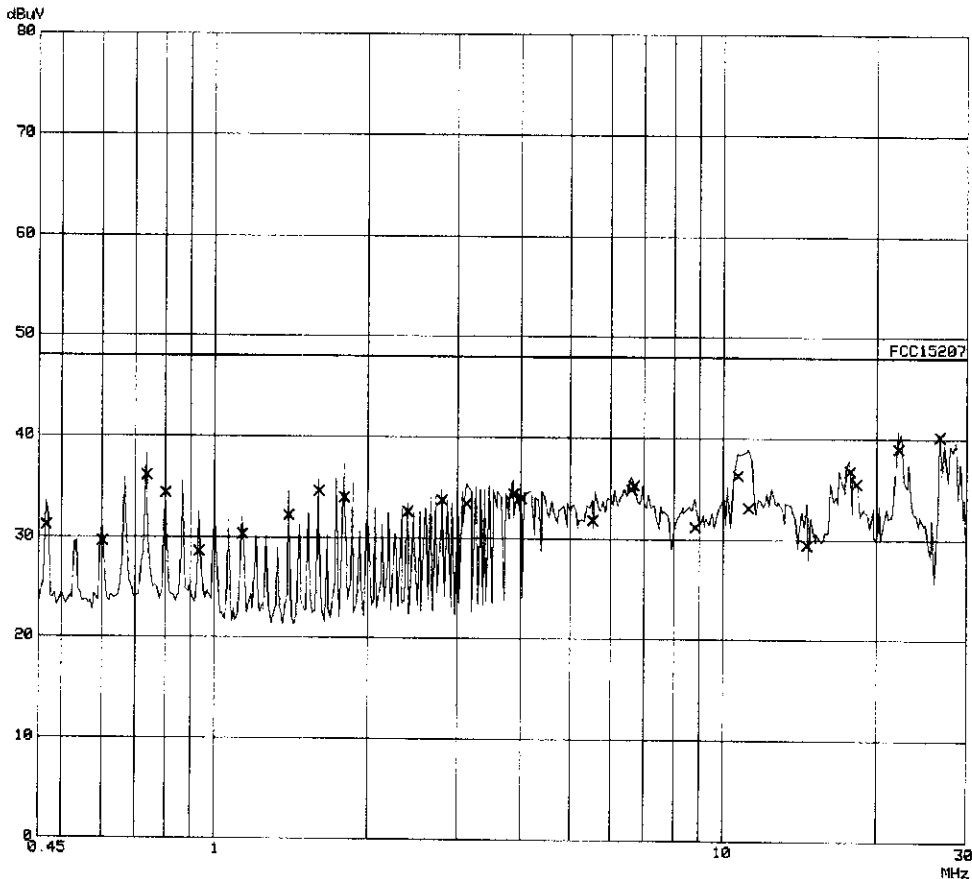
EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6f 16QAM
 SC106727
 Date: 24. Sep 01 09:27

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dB LISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



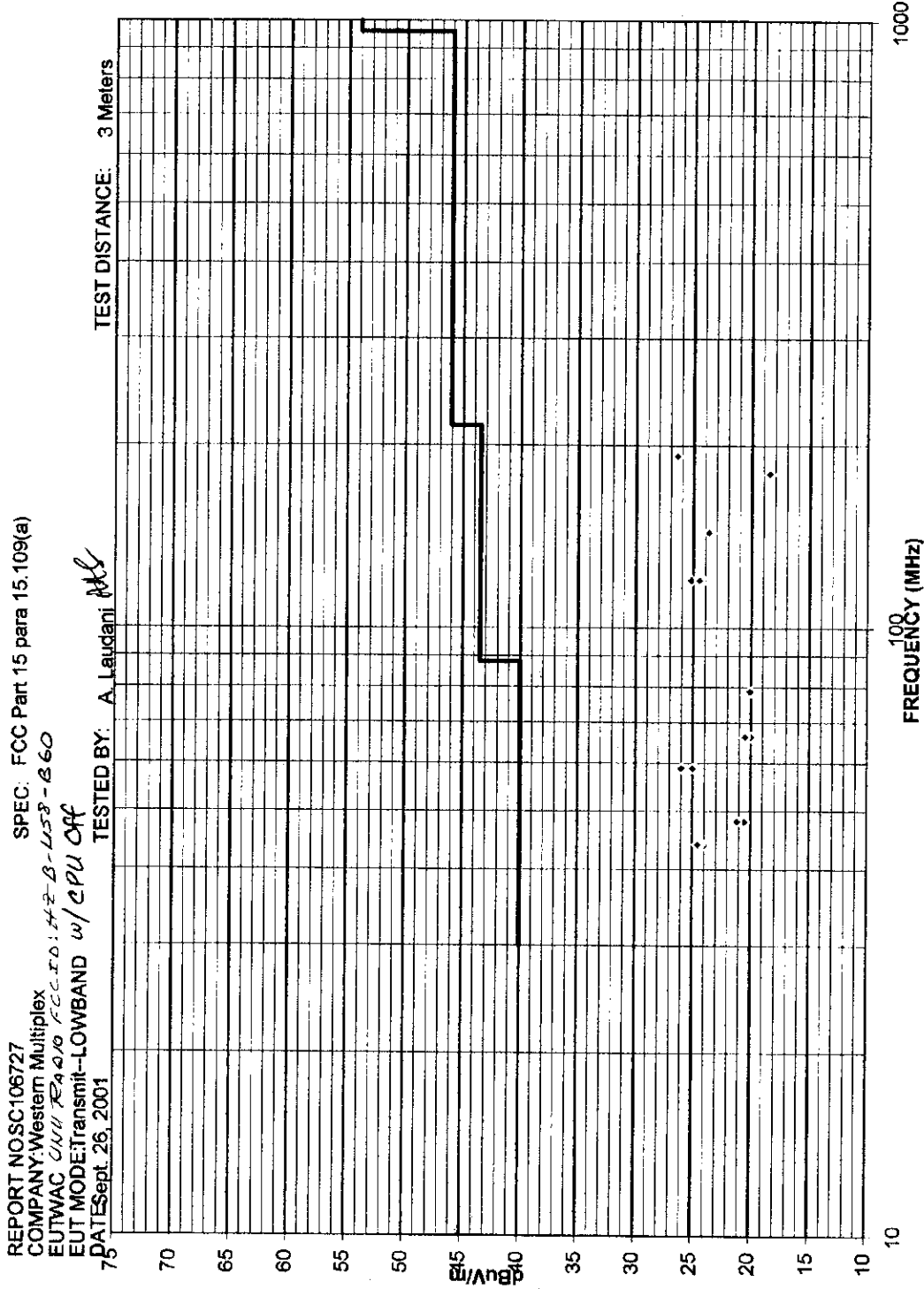
**TUV Product Service
Powerline Conducted Emissions**

EUT: Tsunami Multipoint Base Station
 Manuf: Western multiplex
 Op Cond: 110 Vac to -48Vdc
 Operator: Dave Bernardin *DB*
 Test Spec: FCC Part 15 B
 Comment: 110V ac 60 Hz Line 2Channel 6f 16QAM
 SC106727
 Date: 24. Sep 01 09:27

Final Measurement Results:

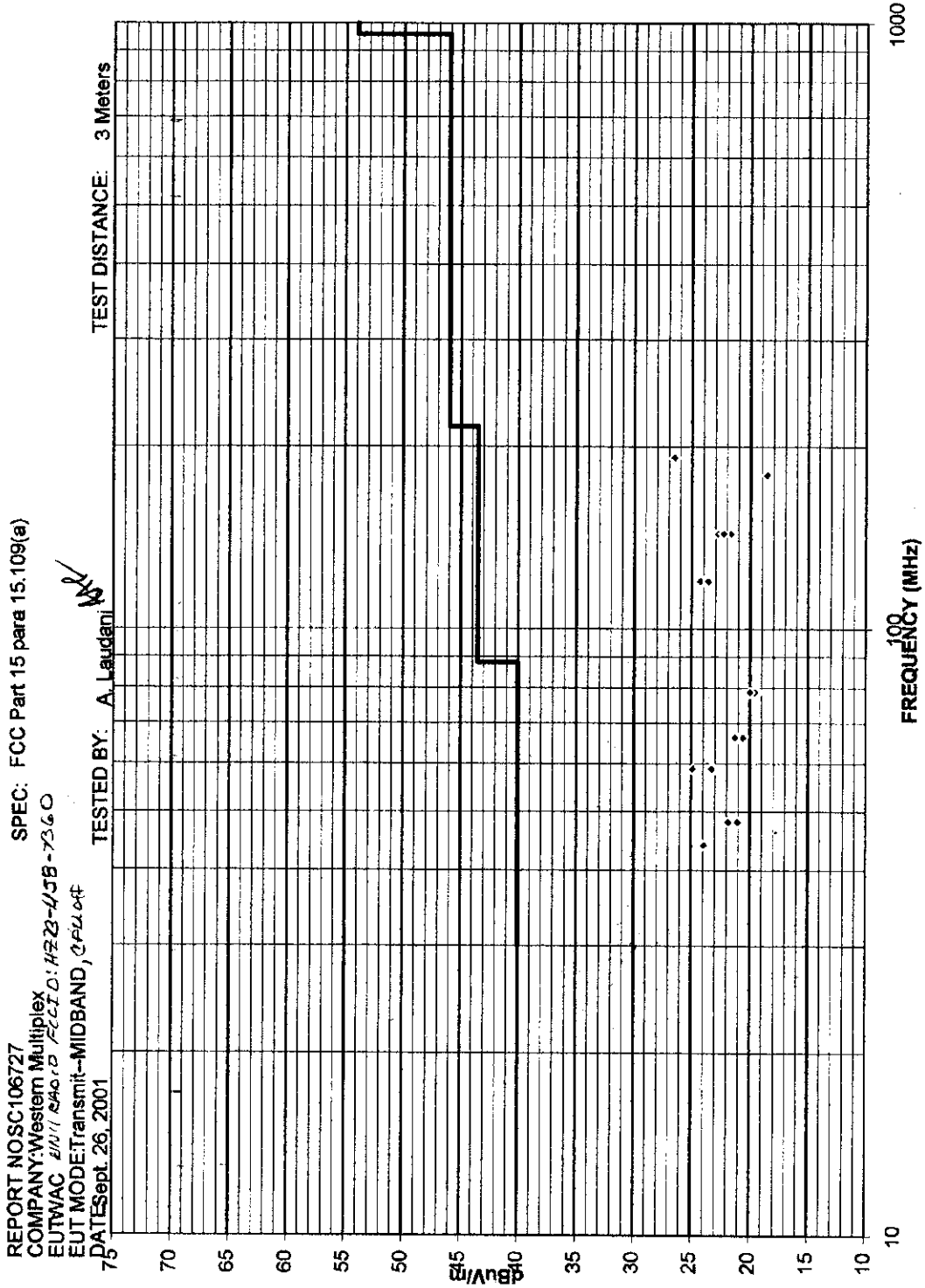
Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46500	31.2	48.0
0.60000	29.6	48.0
0.73500	36.1	48.0
0.80000	34.4	48.0
0.93000	28.6	48.0
1.13500	30.3	48.0
1.40000	32.3	48.0
1.60000	34.6	48.0
1.79500	34.0	48.0
2.40000	32.6	48.0
2.80000	33.8	48.0
3.13000	33.5	48.0
3.86500	34.4	48.0
4.00000	34.0	48.0
5.53000	31.8	48.0
6.60000	34.9	48.0
6.66500	35.2	48.0
8.79500	31.2	48.0
10.66500	36.3	48.0
11.19000	33.1	48.0
14.59500	29.4	48.0
17.69500	36.8	48.0
18.24500	35.5	48.0
22.06000	39.0	48.0
26.61000	40.2 <i>DB</i>	48.0

* limit exceeded



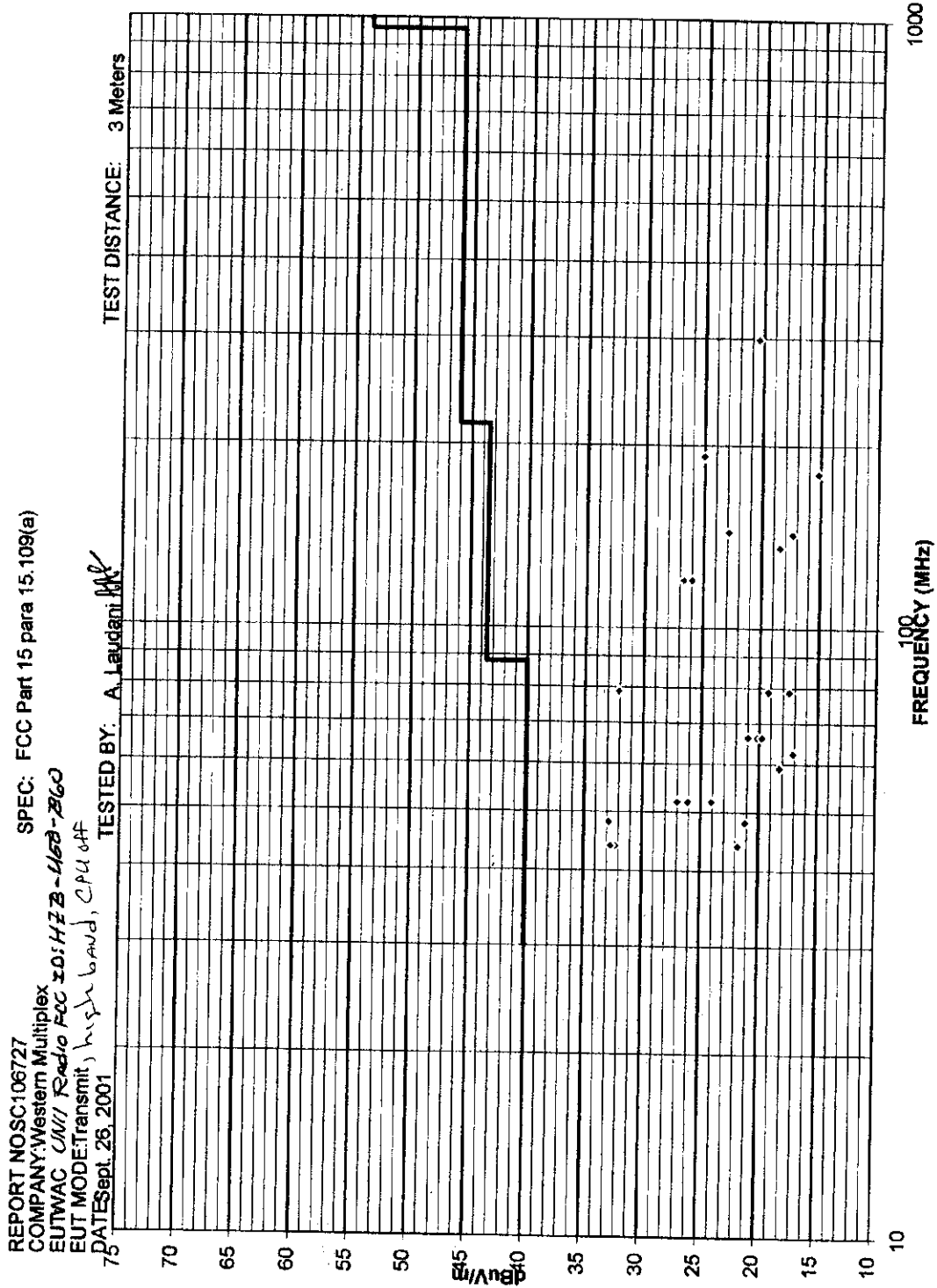
REPORT No: SC106727
 SPEC: FCC Part 15 para 15.109(a)
 CUSTOMER: Western Multiplex
 TEST DIST: 3 Meters
 E.U.T.: WAC UNII Radio FCC ID: HZB-153-AGD
 TEST SITE: 2
 EUT MODE: Transmit-LOWBAND w/ CPU off
 BICONICAL: 739
 DATE: Sept. 26, 2000 TESTED BY: A. Lauriani
 LOG PERIODIC: 739
 NOTES: Quasi-Peak with 120 KHz measurement bandwidth. RCVR: 427

EUT MARGIN FREQUENCY (MHz)	Temperature: -14.0		28		Relative Humidity: 44		34		VW 1.8		EUT ANTENNA HEIGHT (meters)	NOTE
	VERTICAL measured (dBuV)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)					
43.90	5.7	4.6	18.3	24.0	40	-16.0	0	1	8QAM -6A			
48.00	3.8	1.6	17.5	21.3	40	-18.7	0	1	8QAM -6A			
58.83	12.1	2.5	13.9	26.0	40	-14.0	60	1	8QAM -6A			
66.21	9.8	2.4	10.5	20.3	40	-19.7	60	1	8QAM -6A			
78.71	11	4.3	9.1	20.1	40	-19.9	60	1	8QAM -6A			
120.00	9.4	3.2	14.8	24.2	43.5	-19.3	60	1	8QAM -6A			
144.00	11.8	1.2	11.9	23.7	43.5	-19.8	0	1	8QAM -6A			
180.00	6.3	0	12.2	18.5	43.5	-25.0	0	1	8QAM -6A			
192.00	13.4	7.2	13.0	26.4	43.5	-17.1	300	1	8QAM -6A			
43.99	6.1	3.5	18.3	24.4	40	-15.6	0	1	16QAM -6A			
48.00	3.1	2.5	17.5	20.6	40	-19.4	0	1	16QAM -6A			
58.83	10.9	2.3	13.9	24.8	40	-15.2	60	1	16QAM -6A			
66.21	9.5	2.8	10.5	20.0	40	-20.0	60	1	16QAM -6A			
78.71	10.9	4	9.1	20.0	40	-20.0	60	1	16QAM -6A			
120.00	10.4	3.2	14.8	25.2	43.5	-18.3	60	1	16QAM -6A			
144.00	11.6	0.9	11.9	23.5	43.5	-20.0	60	1	16QAM -6A			
43.99	6.3	3.5	18.3	24.6	40	-15.4	0	1	QPSK3/4 -6A			
48.00	3.7	1.7	17.5	21.2	40	-18.8	0	1	QPSK3/4 -6A			
58.83	11.1	3.4	13.9	25.0	40	-15.0	60	1	QPSK3/4 -6A			
66.21	10	2.3	10.5	20.5	40	-19.5	60	1	QPSK3/4 -6A			
78.71	11	3.4	9.1	20.1	40	-19.9	60	1	QPSK3/4 -6A			
120.00	9.7	3.6	14.8	24.5	43.5	-19.0	60	1	QPSK3/4 -6A			
144.00	11.8	1	11.9	23.7	43.5	-19.8	60	1	QPSK3/4 -6A			



REPORT No. SC106727
 CUSTOMER: Western Multiplex
 EUT: WAC *WVH Radio FCC ID: H23-1158-B60*
 EUT MODE: Transmit-MIDBAND, CPU *off*
 DATE: Sept. 26, 200 TESTED BY: A. Laudani
 NOTES: Quasi-Peak with 120 KHz measurement bandwidth. *AW*
 SPEC: FCC Part 15 para 15.108(a)
 TEST DIST: 3 Meters
 TEST SITE: 2
 BICONICAL: 739
 LOG PERIODIC: 739
 RCVR: 427

EUT MARGIN		Temperature: 28		Relative Humidity: 44		vr 1.5					
FREQUENCY (MHz)	VERTICAL measured (dBuV)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)	NOTE		
43.90	6	3.4	16.3	24.3	40	-15.7	0	1	8QAM -6C		
48.00	3.5	2	17.5	21.0	40	-19.0	0	1	8QAM -6C		
58.83	11	0	13.9	24.9	40	-15.1	60	1	8QAM -6C		
66.21	10.4	2.4	10.5	20.9	40	-19.1	60	1	8QAM -6C		
78.71	10.3	3.5	9.1	19.4	40	-20.6	60	1	8QAM -6C		
120.00	9.1	3.1	14.8	23.9	43.5	-19.6	60	1	8QAM -6C		
144.00	9.8	1	11.9	21.7	43.5	-21.8	0	1	8QAM -6C		
180.00	6.4	0	12.2	18.6	43.5	-24.9	0	1	8QAM -6C		
192.00	9	13.5	13.0	26.5	43.5	-17.0	0	1	8QAM -6C		
43.99	5.8	3.2	18.3	24.1	40	-15.9	0	1	16QAM -6C		
48.00	4.4	3	17.5	21.9	40	-18.1	0	1	16QAM -6C		
58.83	9.2	2.2	13.9	23.1	40	-16.9	60	1	16QAM -6C		
66.21	10.1	2.6	10.5	20.8	40	-19.4	60	1	16QAM -6C		
78.71	10.5	3.9	9.1	19.6	40	-20.4	60	1	16QAM -6C		
120.00	9.5	3.2	14.8	24.3	43.5	-19.2	60	1	16QAM -6C		
144.00	10.9	1.2	11.9	22.8	43.5	-20.7	60	1	16QAM -6C		
43.99	5.7	3.7	18.3	24.0	40	-16.0	0	1	QPSK3/4 -6C		
48.00	3.6	3	17.5	21.1	40	-18.9	0	1	QPSK3/4 -6C		
58.83	9.4	3	13.9	23.3	40	-16.7	60	1	QPSK3/4 -6C		
66.21	10.8	2.5	10.5	21.3	40	-18.7	60	1	QPSK3/4 -6C		
78.71	10.9	4.4	9.1	20.0	40	-20.0	60	1	QPSK3/4 -6C		
120.00	8.8	3.1	14.8	23.6	43.5	-19.9	60	1	QPSK3/4 -6C		
144.00	10.4	1.4	11.9	22.3	43.5	-21.2	60	1	QPSK3/4 -6C		



REPORT No: SC106727
 CUSTOMER: Western Multiplex
 SPEC: FCC Part 15 para 15.109(a)
 TEST DIST: 3 Meters
 EUT: WAC UNIII Radio FCC ID: HZB-U58-B60 TEST SITE: 2
 EUT MODE: Transmitting high band, CPDLoFF BICONICAL: 739
 DATE: Sept. 26, 200 TESTED BY: A. Laudani LOG PERIODIC: 739
 NOTES: Quasi-Peak with 120 KHz measurement bandwidth. RCVR: 427

EUT MARGIN	Temperature: -7.1		28		Relative Humidity: 44		ver 1.8		EUT ANTENNA HEIGHT (meters)	NOTE
	FREQUENCY (MHz)	VERTICAL measured (dBuV)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)		
	43.90	14	5	18.3	32.3	40	-7.7	0	1	16QAM-6F
	48.00	15.4	4.9	17.5	32.9	40	-7.1	0	1	16QAM-6F
	52.00	10.5	0.3	16.5	27.0	40	-13.0	0	1	16QAM-6F
	59.10	4.5	-0.1	13.8	18.3	40	-21.7	90	1	16QAM-6F
	62.40	5	2	12.1	17.1	40	-22.9	90	1	16QAM-6F
	66.21	8	10.5	10.5	21.0	40	-19.0	60	1	16QAM-6F
	78.71	22.3	23	9.1	32.1	40	-7.9	60	1	16QAM-6F
	120.00	11	3.3	14.8	26.8	43.5	-17.7	60	1	16QAM-6F
	136.00	5.6	-0.1	12.9	18.5	43.5	-25.0	180	1	16QAM-6F
	143.00	5.4	-1	12.0	17.4	43.5	-26.1	110	1	16QAM-6F
	144.00	11	-1	11.9	22.9	43.5	-20.6	280	1	16QAM-6F
	180.00	3	2	12.2	18.2	43.5	-28.3	190	1	16QAM-6F
	192.00	12	10.8	13.0	28.0	43.5	-18.5	270	1	16QAM-6F
	289.00	3.1	-0.2	17.4	20.5	46	-25.5	130	1	16QAM-6F
	43.90	14.4	5	18.3	32.7	40	-7.3	0	1	8QAM-6F
	48.00	3.7	3	17.5	21.2	40	-18.8	0	1	8QAM-6F
	78.71	8.4	5	9.1	17.5	40	-22.5	60	1	8QAM-6F
	52.00	7.6	0	16.5	24.1	40	-15.9	60	1	8QAM-6F
	120.00	11.9	3	14.8	28.7	43.5	-16.8	60	1	8QAM-6F
	66.21	9.7	2	10.5	20.2	40	-19.8	60	1	8QAM-6F
	43.90	3.5	-2	18.3	21.8	40	-18.2	0	1	QPSK3/4-6F
	48.00	3.7	1.4	17.5	21.2	40	-18.8	0	1	QPSK3/4-6F
	52.00	9.6	1.1	16.5	26.1	40	-13.9	60	1	QPSK3/4-6F
	66.21	9.3	2	10.5	19.8	40	-20.2	60	1	QPSK3/4-6F
	78.71	10.2	3.6	9.1	19.3	40	-20.7	60	1	QPSK3/4-6F
	120.00	11.2	3	14.8	28.0	43.5	-17.5	60	1	QPSK3/4-6F

