

SUMMARY

This project was designed to test for radiated emissions and FCC Part 15 conditions at the Jackson Electric Membership Corporation ("JEMC") deployment in Jefferson, GA. We conducted a comprehensive set of tests that included the spectrum range between 2 MHz and 30 MHz. In addition to sweeps of this spectrum, we also conducted individual tests on each of the licensed HAM radio bands between 2 MHz and 30 MHz.

The test equipment utilized during the radiated emissions testing consisted of an Agilent E7402A EMC Spectrum Analyzer and a Magnetic Loop Antenna. The Spectrum Analyzer and connected PC were set in the cargo area of a SUV automobile with the car turned off for all testing. The analyzer was connected to the magnetic loop antenna via a 100' 50 Ohm RG-58 coax cable connected via a 50 Ohm BNC-N standard cable connector. The analyzer was configured to correct for both cable and antenna loss.

The radiated emissions data was collected using Peak, Quasi-Peak and Average detectors using the prescribed EMI 9kHz Resolution Bandwidth (RBW) for measurements under 30 MHz.

The Spectrum Analyzer has been properly calibrated by an independent lab and the calibration certificate appears in the Appendix of this document.

TESTING DATES

Testing Start Date: April 18-19, 2006

Testing End Date: April 18-19, 2006

LOCATION OVERVIEW

There were three separate locations tested:

1. Site #1: 850 Commerce Road, JEMC Facility, Jefferson, GA (Pad Mount)
2. Site #2: Intersection at Commerce Road and Summer Way, Jefferson, GA (OH)
3. Site #3: Northminster Subdivision Sales Office, Jefferson, GA (Customer CPE)

At each test location we conducted FCC Part 15 tests according to the FCC Part 15 Guidelines and Rules adopted on October 14, 2004 by the FCC.

TEST EQUIPMENT

Agilent E7402A EMC Spectrum Analyzer



Active 12" Magnetic Loop Antenna
1kHz – 30 MHz (Model SAS-563B)



Wood Tripod for EMI Antennas



METHODOLOGY

Location

All tests were taken on-site at the JEMC (www.jacksonemc.com) BPL deployment area.

We tested the system at one overhead location, one underground location (typ.) and one In-Premise location consisting of a typical MEPPI BPL CPE device. Specifically, the Equipment Under Test (EUT) is manufactured by Mitsubishi Electric Power Products (“MEPPI”) and consisted of:

- One MEPPI MV Node (Repeater) Point installed overhead and coupled to MV
- One MEPPI MV Node (Repeater) Point installed underground and coupled to MV
- One MEPPI Standard In-Premise CPE equipment

1) Antennas

- a. For frequencies below 30 MHz, the Active 12” magnetic loop was used. The magnetic loop antenna was at 1 meter height with its plane oriented vertically.

2) Testing Setup for Overhead EUT

- a. Measurements were performed at a horizontal separation distance of 10 meters from the overhead line
- b. Testing was performed at distances of 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 wavelength down the line from the BPL installed point on the power line
- c. Wavelength spacing was based on the mid-band frequency used by JEMC’s EUT: Mode 2 at Location 1C.

3) Spectrum Testing

- a. Full spectrum sweeps per node for OH and UG between
 - i. 2 MHz and 30 MHz
- b. HAM Band specific wavelength tests were also conducted in the following bands
 - i. 80m 3.500 – 4.000
 - ii. 40m 7.000 – 7.300
 - iii. 30m 10.100 – 10.150
 - iv. 20m 14.000 – 14.350
 - v. 17m 18.068 – 18.168
 - vi. 15m 20.000 – 21.450
 - vii. 12m 24.890 – 24.990
 - viii. 10m 28.000 – 29.700

4) Equipment Configuration

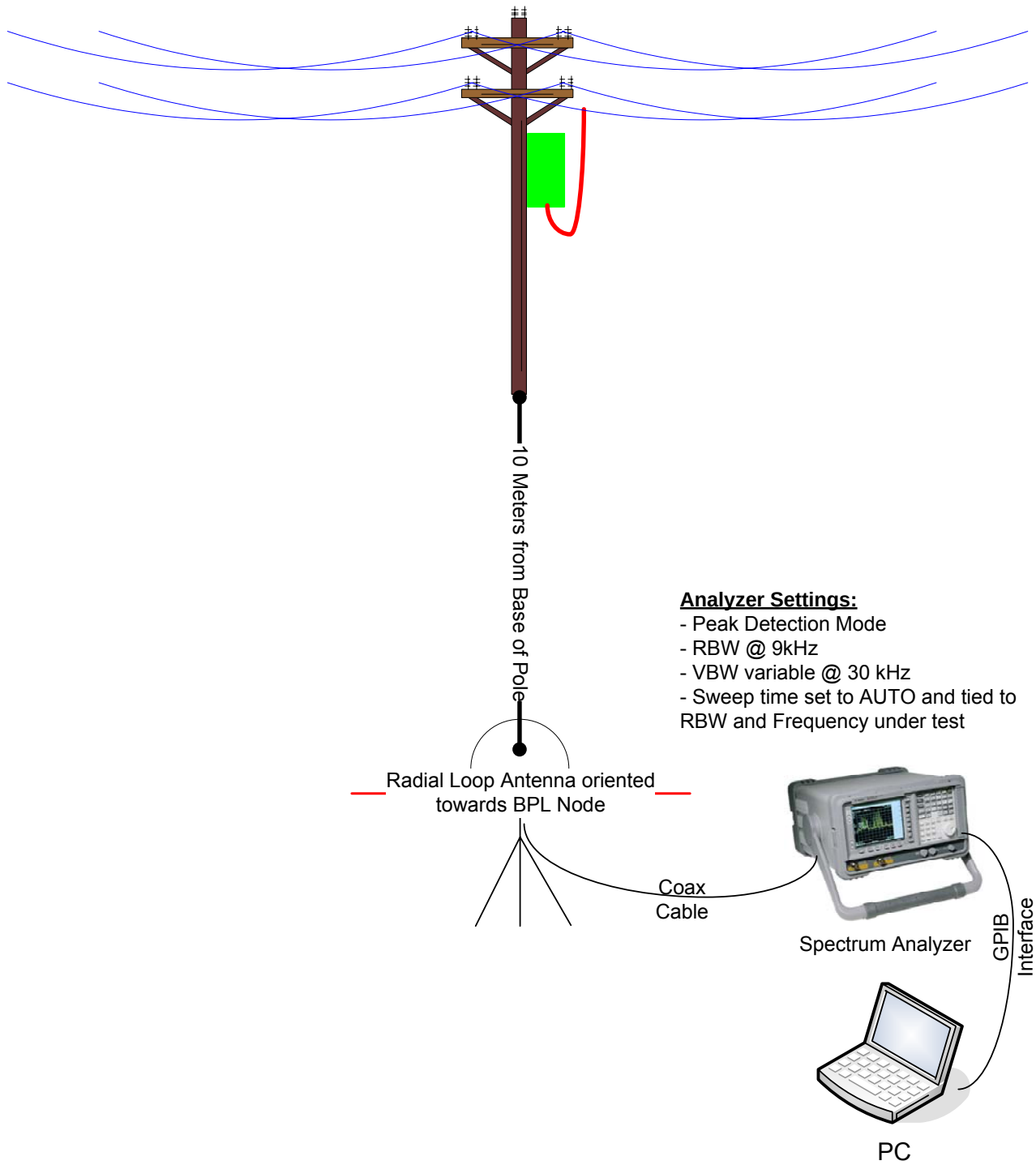
- a. Spectrum Analyzer was set to Peak and Quasi-Peak Detection Mode
- b. RBW set to 9 kHz or 120 kHz when using Quasi-Peak or PEAK detection
- c. VBW variably set automatically between 30 kHz and 300 kHz depending on frequency under test
- d. Sweep time set to *automatic* and tied to RBW and the frequency under test

5) Duty Factor

- a. Tests at Site #1: Testing was conducted while CPE was downloading a constant audio stream and Ping in order to maintain an increased Duty Factor of the EUT. In addition, there was the typical network traffic.
- b. Tests at Site #2: Testing was conducted while the Customer CPE was downloading a constant audio stream and Ping in order to maintain an increased Duty Factor of the EUT. In addition, there was the typical network traffic.
- c. Tests at Site #3: Testing was conducted while the Customer CPE was downloading a constant audio stream and Ping in order to maintain an increased Duty Factor of the EUT. In addition, there was the typical network traffic.

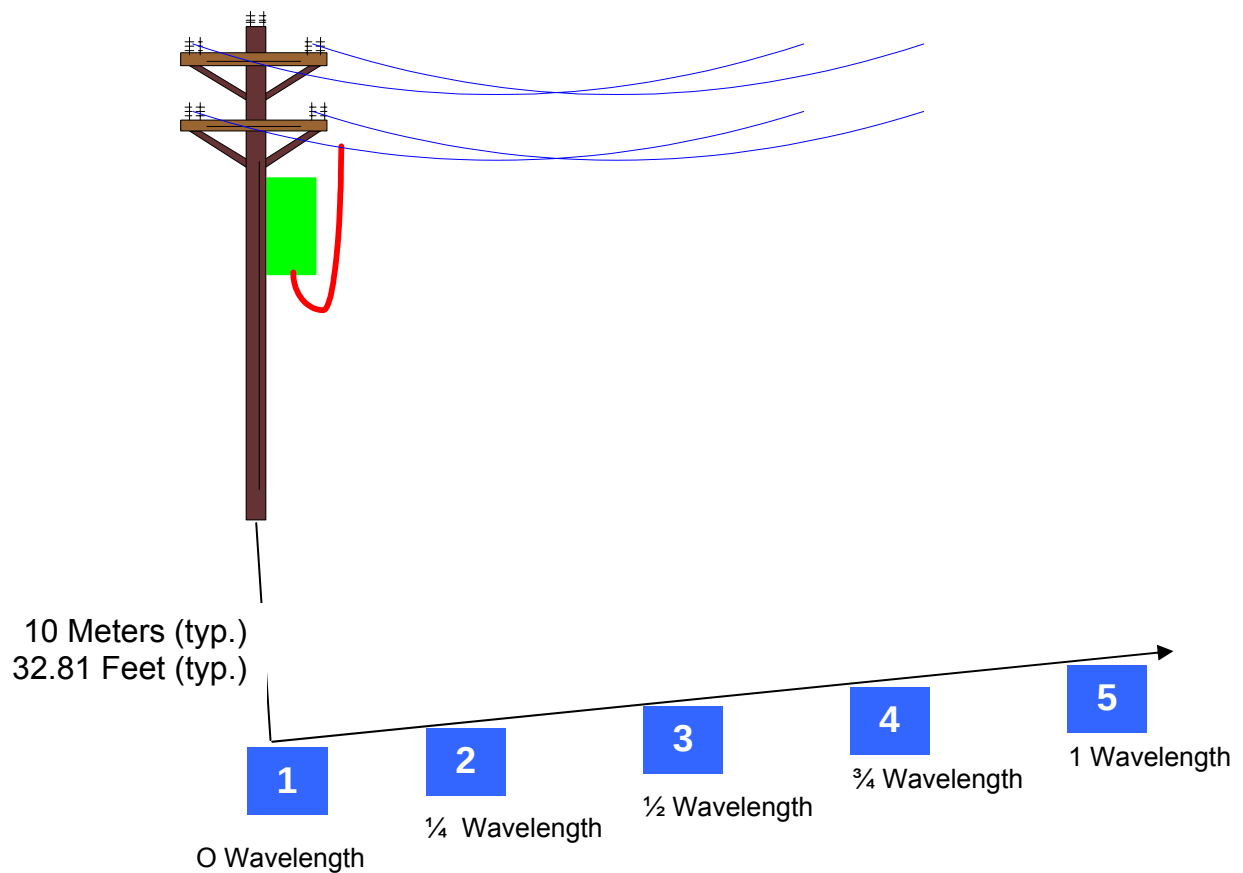
- 6) All test equipment was powered from an AC outlet housed within the BPL node enclosure.

Pole Mount Test Diagram

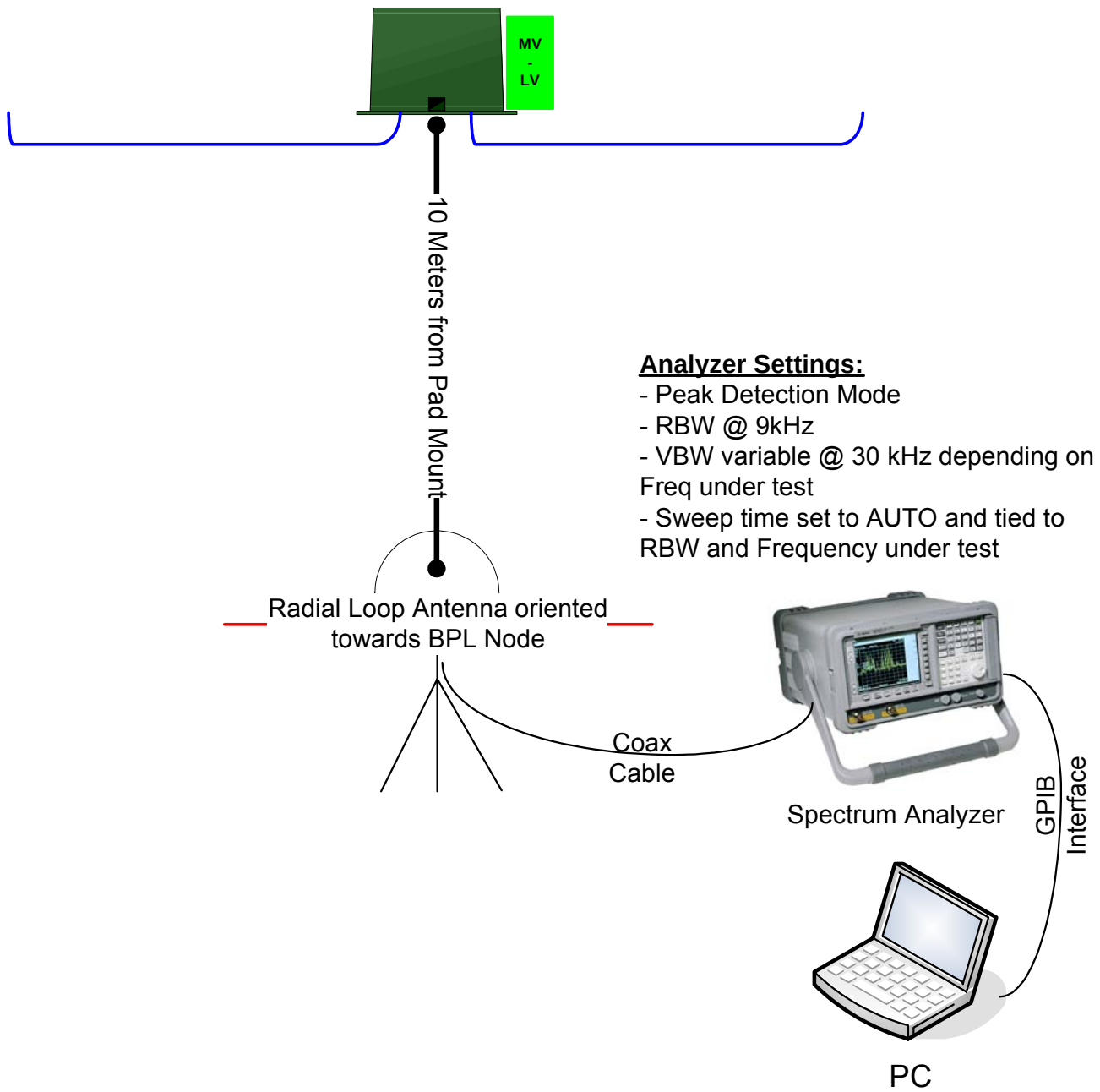


Pole Mount Physical Test (illustration)

1. There are five test points located at distances of 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 wavelength down the line from the BPL overhead point on the power line. Wavelength spacing is based on the mid-band frequency of the specific mode implemented by the MEPPI equipment.
2. Measurements were performed at a horizontal separation distance of 10 meters.
3. The magnetic loop antenna was used at 1 meter height with its plane oriented vertically

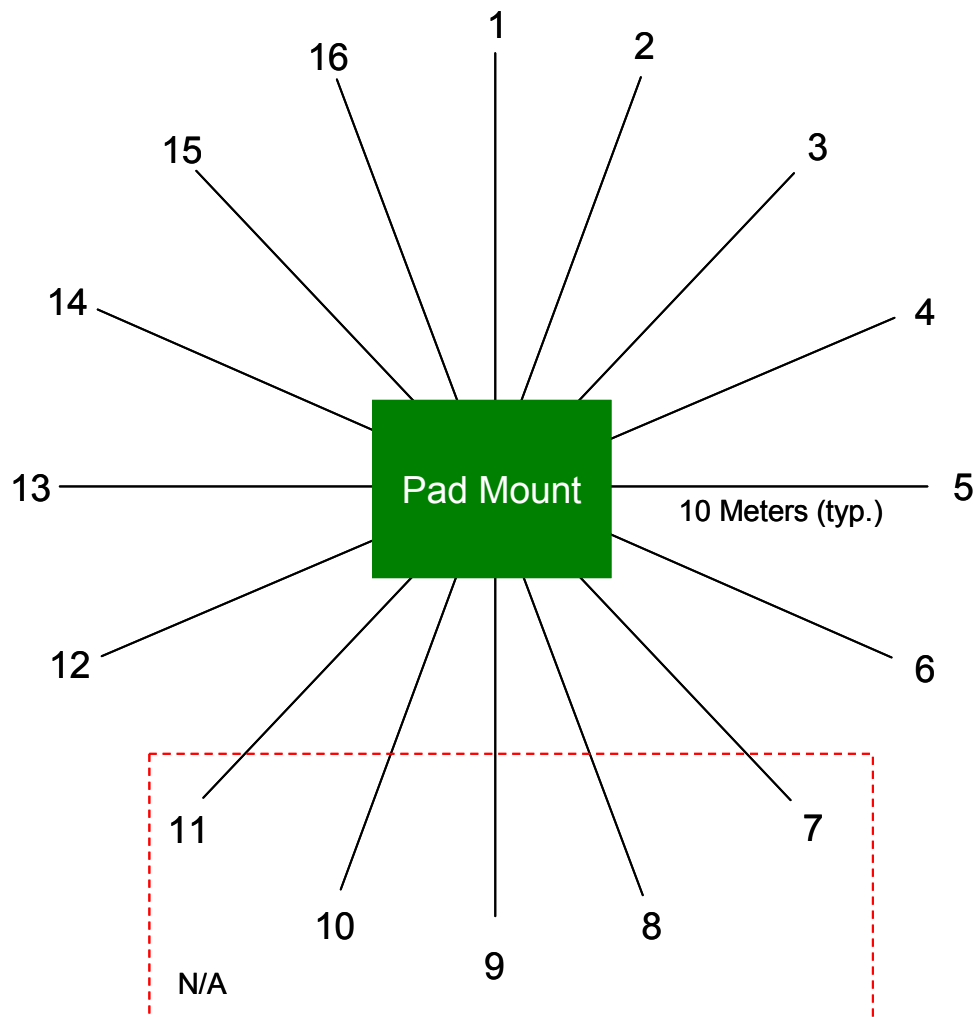


Underground Pad Mount Test Diagram



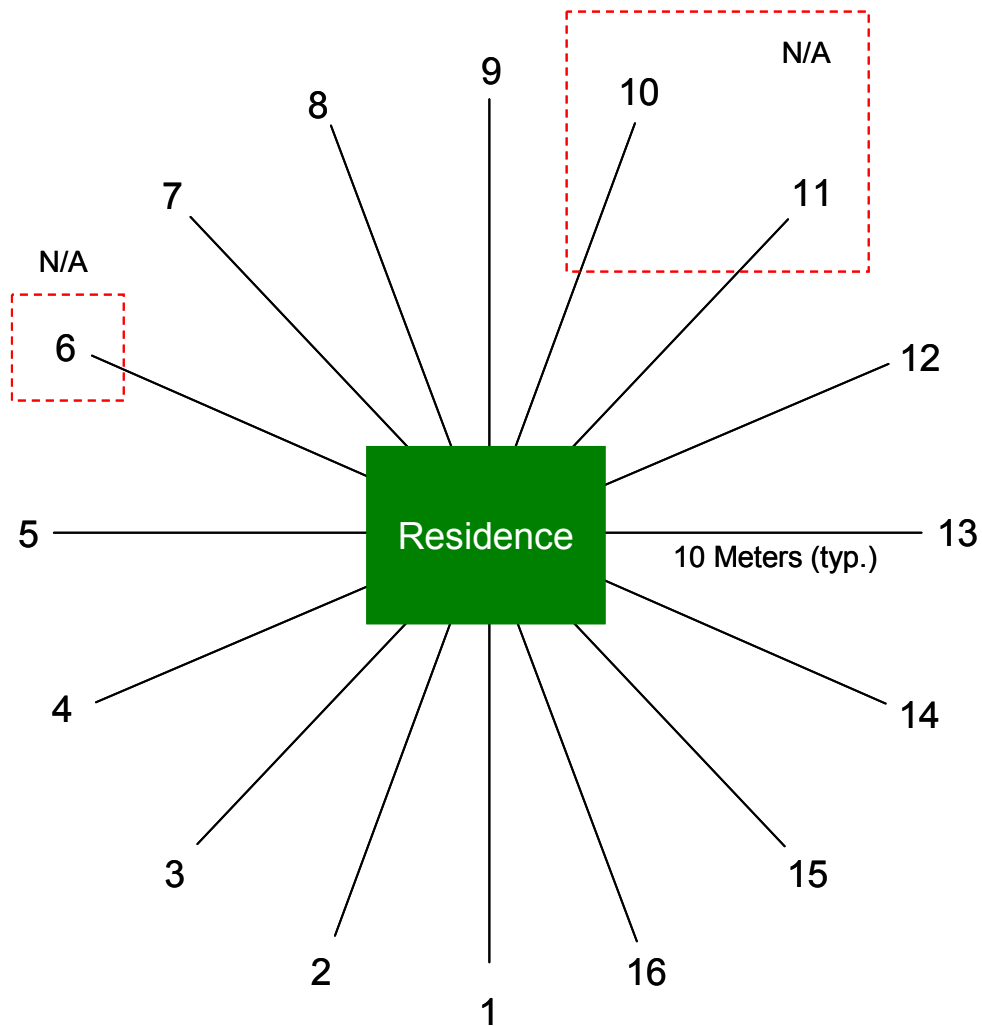
Underground Pad Mount Testing

1. There were eleven accessible test points located radially around the Pad Mount Transformer.
2. Measurements were performed at a separation distance of 10 meters from the node located at the transformer.
3. For frequencies below 30 MHz, the magnetic loop antenna was used at 1 meter height with its plane oriented vertically.



In Premise Testing

1. There were thirteen accessible test points located radially around the Residential Home.
2. Measurements were performed at a separation distance of 10 meters from the building perimeter.
3. For frequencies below 30 MHz, the magnetic loop antenna was used at 1 meter height with its plane oriented vertically



Mitsubishi Electric Components Description

LV – ICU Coupler: Mitsubishi Electric's Inductive Coupling Unit is capable of achieving signal coupling with the distribution line without any electrical contact. It is characterized by high reliability and ease of installation on existing distribution lines.

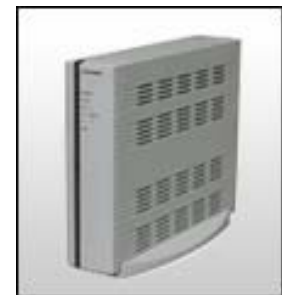


LV – CCU Coupler: Mitsubishi Electric's Capacitive Coupling Unit provides an excellent solution when making direct electrical connections between the PLC equipment and the power grid.

MV Node: The Medium Voltage Node is installed at HV/MV and MV/LV transformer stations. Its role is to provide the bridging between the Backbone Network (Fiber optic, Wireless) and the PLC network. Throughout the PLC network, one MV Node unit is placed in each transformer station. The MV Node can accommodate different MV/LV cards. Flexible in its applications, the MV Node may be configured to receive and relay communication between other MV Nodes, as well as communicate with a number of Low Voltage units down the LV power grid.



CPE: The Customer Premises Equipment (CPE) is the end user modem. It is designed for quick and easy installation for home users. For broadband services (TCP/IP), the CPE connects to a PC/printer/server/router via its Ethernet or USB interfaces. For voice services (H323 or SIP), it features a standard RJ11 connector, for a regular analogue telephone. Self-contained and compact, the CPE features an internal low-noise power supply and built-in coupling unit. The self-configuration mode ensures maximum "user friendliness" of the CPE.



SITE #1 – JEMC FACILITY, 850 COMMERCE ROAD, JEFFERSON, GA 30549

UNDERGROUND PAD MOUNT TRANSFORMER – LOCATION 2C

This set of tests was conducted between 4:00 – 6:00 pm on April 18, 2006. The location chosen was at a Pad Mount transformer connected to the JEMC BPL Pilot network with a MEPPI MV card set using mode 1 (3 MHz – 13 MHz)

The Equipment Under Test (EUT) was powered by direct connection to the secondary power and injected the signals into the MV using Artech's MV Inductive Coupler.

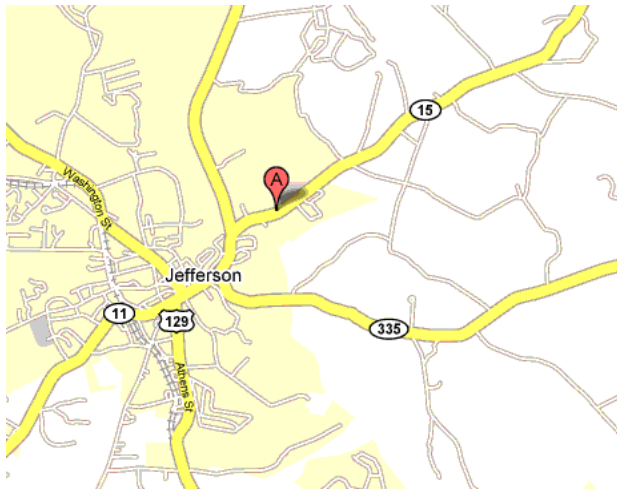
The FCC states the limits for the radiated emissions made at frequencies between 1.705 and 30 MHz at a 30 Meter distance. We used 40 dB per decade as the extrapolation factor to adjust the limit from a 30 meter distance to a 10 meter distance as allowed in Part 15.31(f)(2). The limit for radiated emissions below 30 MHz, extrapolated to a 10 Meter distance is 48.62 dB μ V/m.

- Measurements under 30 MHz in non-HAM bands were configured with a margin of -6dB
- Measurements under 30 MHz in the HAM bands were configured with a margin of -20dB
- "No Data" indicates that measurements were all below the -20dB margin relative to the FCC Limit.

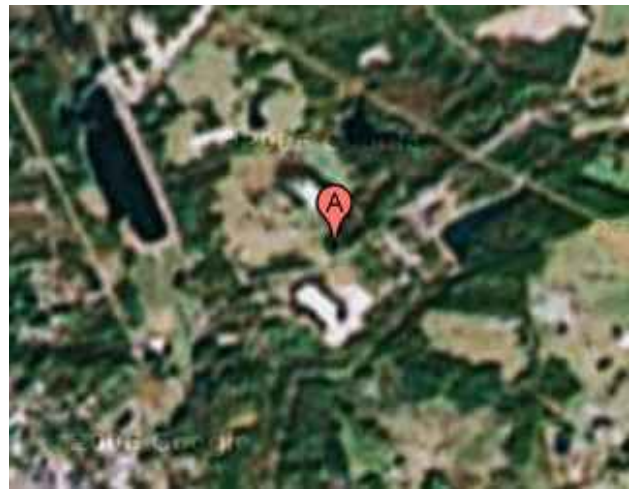
The Test Results Data table appears later in this section. Test data listed in the table are as follows:

- 1) Frequency Bands under Test
- 2) Frequency of detected Peak Signal above Margin
- 3) Peak Measurement Data (dB μ V/m)
- 4) Quasi Peak Measurement Data (dB μ V/m)
- 5) Average Measurement Data (dB μ V/m)
- 6) FCC Limit at 10 Meters (48.5 dB μ V/m)
- 7) Delta Limit to Peak
- 8) Delta Limit to Quasi Peak

In addition to typical customer traffic on the BPL network, there was an audio stream instantiated during our tests in order to increase the Duty Factor of the components being tested. Based on FCC Part 15 Testing Guidelines – "If the data communications burst rate is at least 20 burst per second, quasi-peak measurements shall be employed, as specified in Section 15.35(a)". The data listed in the column heading titled "Delta Limit to QP" notes the value of the Quasi Peak measurement relative to the FCC Limit.



850 Commerce Road, JEMC Location
Jefferson, GA 30549 (Map)



850 Commerce Road, JEMC Location
Jefferson, GA 30549



JEMC Location - Pad Mount Transformer



JEMC Location - Pad Mount Transformer

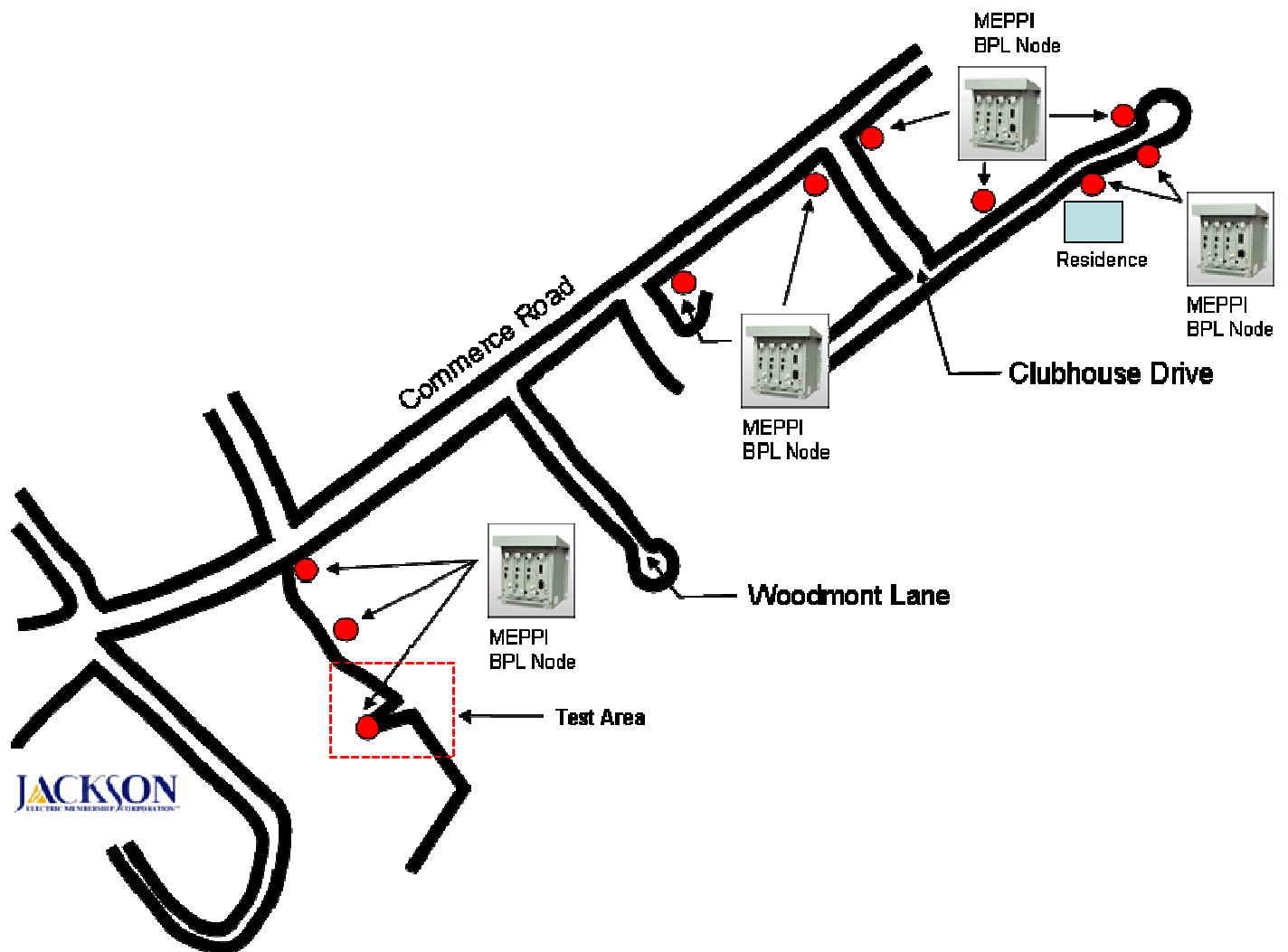


JEMC Location - Pad Mount Transformer



JEMC Location - Pad Mount Transformer

One Line Drawing



	MHz		Margin	Freq	Peak	QP	Avg	Limit	Delta Limit to Peak	Delta Limit to QP
					dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dB
P1	2	30	-6dB	9.55	45.9	45.04	39.9	48.6	-2.7	-3.56
				11.76	65.79	64.43	55.99	48.6	17.19	15.83
				11.78	51.15	50.11	51.44	48.6	2.55	1.51
				13.74	50.4	46.6	40.22	48.6	1.8	-2
	3.5	4	-20dB	No Data (Audio Stream on Ping on)						
	7	7.3	-20dB	No Data (Audio Stream on Ping on)						
	10.1	10.15	-20dB	No Data (Audio Stream on Ping on)						
	14	14.35	-20dB	No Data (Audio Stream on Ping on)						
	18.068	18.168	-20dB	No Data (Audio Stream on Ping on)						
	21	21.45	-20dB	No Data (Audio Stream on Ping on)						
	24.89	24.99	-20dB	No Data (Audio Stream on Ping on)						
	28	29.7	-20dB	No Data (Audio Stream on Ping on)						
P2	2	30	-6dB	9.549	47.12	46.54	44.98	48.6	-1.48	-2.06
				9.55	47.4	47.79	42.31	48.6	-1.2	-0.81
				11.76	74.21	72.79	68.11	48.6	25.61	24.19
				12.1	46.65	47.2	43.64	48.6	-1.95	-1.4
P3	2	30	-6dB	9.549	50.97	48.39	49.13	48.6	2.37	-0.21
				11.76	63.1	62.73	56.74	48.6	14.5	14.13
				11.82	46.15	49.54	48.57	48.6	-2.45	0.94
				13.74	52.92	48.56	42.38	48.6	4.32	-0.04
P4	2	30	-6dB	9.549	48.08	46.31	47.65	48.6	-0.52	-2.29
				11.76	64.19	54.65	54.5	48.6	15.59	6.05
				13.74	55.45	51.63	45.8	48.6	6.85	3.03
				15.11	46.35	48.17	40.44	48.6	-2.25	-0.43
P5	2	30	-6dB	9.546	49.43	49.36	37.88	48.6	0.83	0.76
				9.551	51.29	49.85	50.37	48.6	2.69	1.25
				9.799	49.41	44.28	40.13	48.6	0.81	-4.32
				11.77	61.08	58.92	52.7	48.6	12.48	10.32
				12.12	47.12	44.28	43.31	48.6	-1.48	-4.32
				13.74	58.26	53.96	47.37	48.6	9.66	5.36
				15.11	41.96	43.54	42.92	48.6	-6.64	-5.06
P6	2	30	-6dB	9.799	56.22	52.68	49.21	48.6	7.62	4.08
				9.8	56.7	52.25	46.09	48.6	8.1	3.65
				11.76	67.56	63.89	57.97	48.6	18.96	15.29
				12.05	60.19	53.86	53.77	48.6	11.59	5.26
				12.73	42.18	42.2	46.04	48.6	-6.42	-6.4
				13.74	58.2	55.14	49.24	48.6	9.6	6.54
P12	2	30	-6dB	9.802	53.59	48.37	39.72	48.6	4.99	-0.23
				11.76	56.73	54.04	50.39	48.6	8.13	5.44
				13.74	53.11	48.54	42.51	48.6	4.51	-0.06
P13	2	30	-6dB	11.76	52.66	51.23	50.85	48.6	4.06	2.63
P14	2	30	-6dB	11.76	54.16	47.52	45.28	48.6	5.56	-1.08

				13.74	55.09	51.06	45.18	48.6	6.49	2.46
P15	2	30	-6dB	9.55	52.74	47.17	46.07	48.6	4.14	-1.43
				11.78	50.21	52.33	49.62	48.6	1.61	3.73
				13.74	59.24	53.88	48.56	48.6	10.64	5.28
P16	2	30	-6dB	9.549	46.44	50.56	46	48.6	-2.16	1.96
				11.76	59.1	58.09	57.45	48.6	10.5	9.49

The table above documents each of the measurements conducted and lists each of the Signals where the Peak measurement exceeded the Margin (relative to the Limit). For “sweep” tests conducted between 2 MHz – 30 MHz a -6dB Margin was used, while a -20dB Margin was used for all HAM band tests.

The set of tests at Site #1 consisted of the MEPPI MV device operating between 3 MHz – 13 MHz. We observed Signals in the 11 MHz range whose measured Peak exceeded the -6dB margin and FCC limit. There were no measured Signals in the HAM bands that exceeded the -20dB Margin offset from the FCC Limit (for specific values please review the data table above). Almost all of the Margin and Limit transgressions occurred at 9.549, 11.76, and 13.74 MHz. Although these points do not occur in a licensed HAM band, they do exceed the FCC limit in a limited number of cases. JEMC should verify its Powermask in this mode to confirm current power levels.

SITE #2 LOCATION – COMMERCE ROAD AT THE ASSISTED LIVING FACILITY (OVERHEAD)

This set of tests was conducted between 7:00 – 8:30 am on April 19, 2006. The location chosen was the OH Repeater Point between the Injection Point and the UG Riser Pole to the Bentley Assisted Living facility.

The Equipment Under Test (EUT) - the *OH Repeater Point* - is powered by direct connection to the secondary power and injected the signals into the MV Primary using Artech OH Capacitive Couplers.

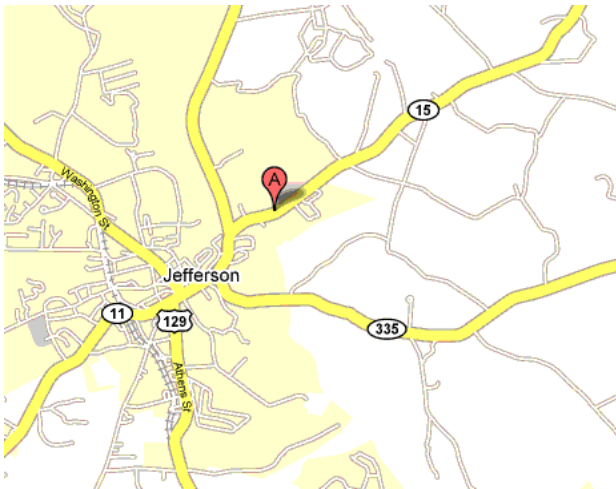
The FCC states the limits for the radiated emissions made at frequencies between 1.705 and 30 MHz at a 30 Meter distance. We used 40 dB per decade as the extrapolation factor to adjust the limit from a 30 meter distance to a 10 meter distance as allowed in Part 15.31(f)(2). The limit for radiated emissions below 30 MHz, extrapolated to a 10 Meter distance is 48.6 dB μ V/m.

- Measurements under 30 MHz in non-HAM bands were configured with a margin of -6dB
- Measurements under 30 MHz in the HAM bands were configured with a margin of -20dB
- “No Data” indicates that measurements were all below the -20dB margin relative to the FCC Limit.

The Test Results Data table appears later in this section. Test data listed in the table are as follows:

- 1) Frequency Bands under Test
- 2) Frequency of detected Peak Signal above Margin
- 3) Peak Measurement Data (dB μ V/m)
- 4) Quasi Peak Measurement Data (dB μ V/m)
- 5) Average Measurement Data (dB μ V/m)
- 6) FCC Limit at 10 Meters (48.5 dB μ V/m)
- 7) Delta Limit to Peak
- 8) Delta Limit to Quasi Peak

During these tests it is of import to note that there was a constant download of traffic in order to increase the utilization of the network and the “Burst Factor” of the individual BPL components. Based on FCC Part 15 Testing Guidelines – “If the data communications burst rate is at least 20 burst per second, quasi-peak measurements shall be employed, as specified in Section 15.35(a). The data listed in column heading titled “Delta Limit to QP” notes the value of the Quasi Peak measurement relative to the FCC Limit.



Overhead Node 1C at Commerce Road
Jefferson, GA 30549 (Map)



Overhead Node 1C at Commerce Road
Jefferson, GA 30549



Overhead Node 1C test site
In front of Assisted Living Facility

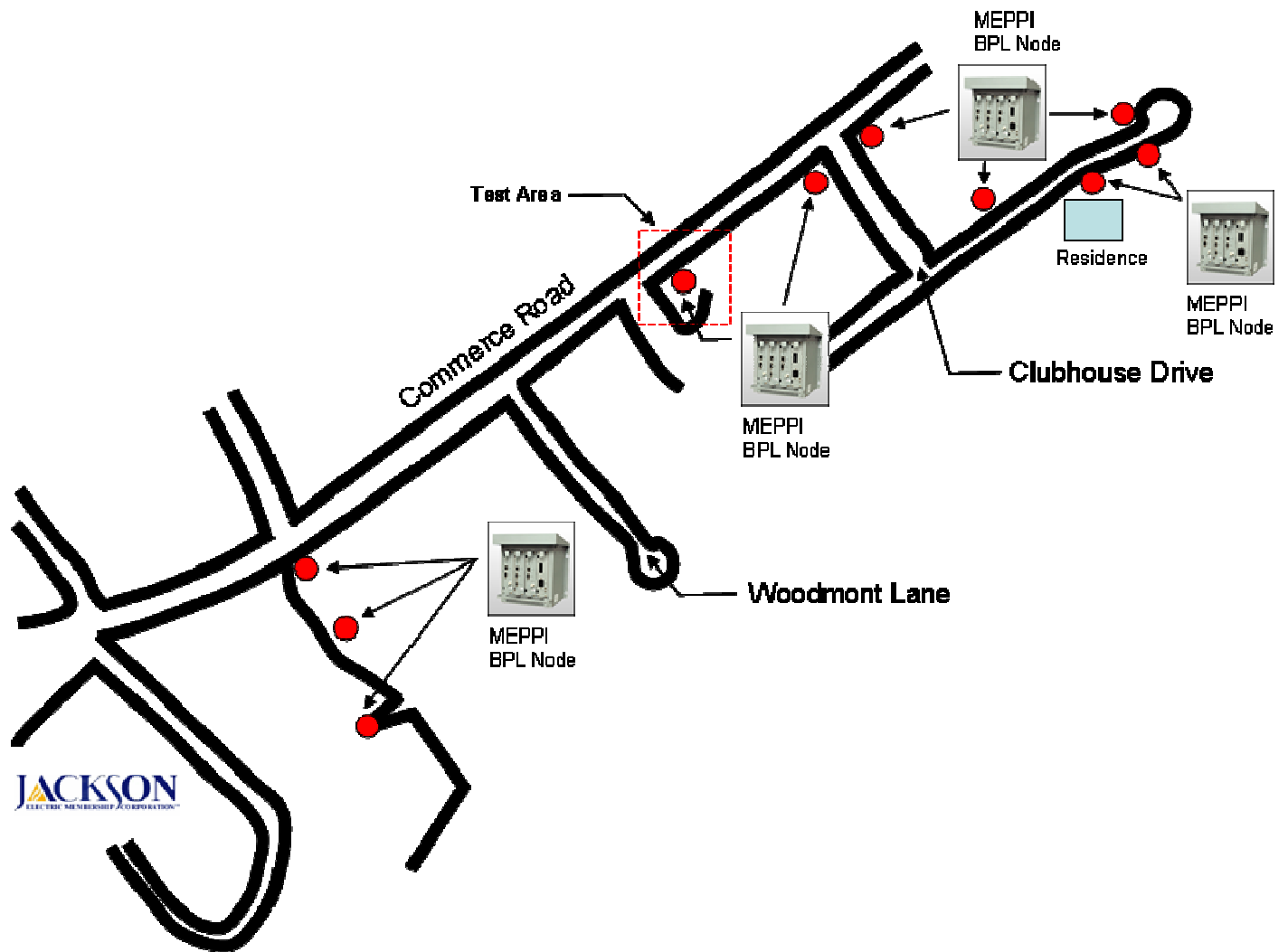


Overhead Node 1C test site
In front of Assisted Living Facility



Overhead Node 1C test site - In front of Assisted Living Facility

One Line Drawing



	MHz		Margin	Freq	Peak	QP	Avg	Limit	Delta Limit to Peak	Delta Limit to QP
					dBμV/m	dBμV/m	dBμV/m	dBμV/m	dB	dB
0 λ	2	30	-6dB	6.855	44.32	44.32	44.23	48.6	-4.28	-4.28
				9.725	47.74	46.77	41.85	48.6	-0.86	-1.83
				11.67	61.21	58.71	48.09	48.6	12.61	10.11
				11.78	53.2	55.96	55.07	48.6	4.6	7.36
				12	52.89	51.27	56.27	48.6	4.29	2.67
	3.5	4	-20dB	No Data (Audio Stream on Ping on)						
	7	7.3	-20dB	No Data (Audio Stream on Ping on)						
	10.1	10.15	-20dB	No Data (Audio Stream on Ping on)						
	14	14.35	-20dB	No Data (Audio Stream on Ping on)						
	18.068	18.168	-20dB	No Data (Audio Stream on Ping on)						
	21	21.45	-20dB	No Data (Audio Stream on Ping on)						
	24.89	24.99	-20dB	No Data (Audio Stream on Ping on)						
	28	29.7	-20dB	No Data (Audio Stream on Ping on)						
¼ λ	2	30	-6dB	5.952	50.77	48.95	41.18	48.6	2.17	0.35
				6.855	40.33	45.72	47.9	48.6	-8.27	-2.88
				9.55	46.18	48.73	50.75	48.6	-2.42	0.13
				11.76	68.01	68.01	56.43	48.6	19.41	19.41
½ λ	2	30	-6dB	5.984	45.62	46.39	36.49	48.6	-2.98	-2.21
				9.55	53.46	51.31	51.41	48.6	4.86	2.71
				12	71.63	71.13	62.25	48.6	23.03	22.53
¾ λ	2	30	-6dB	9.55	49.85	49.85	41.23	48.6	1.25	1.25
				9.725	39.91	44.7	49.03	48.6	-8.69	-3.9
				11.68	69.22	63.47	57.87	48.6	20.62	14.87
1 λ	2	30	-6dB	5.07	44.03	43.54	39.74	48.6	-4.57	-5.06
				5.985	48.12	48.52	54.27	48.6	-0.48	-0.08
				9.57	67.62	66.66	64.29	48.6	19.02	18.06
				11.76	72.76	71.74	69.58	48.6	24.16	23.14

The table above documents each of the measurements conducted and lists each of the Signals where the Peak measurement exceeded the Margin (relative to the Limit). For “sweep” tests conducted between 2 MHz – 30 MHz a -6dB Margin was used, while a -20dB Margin was used for all HAM band tests.

The set of tests at Site #2 consisted of the MEPPI OH MV Node operating between 13.5 MHz – 23.5 MHz. We observed Signals whose measured Peak exceeded the set margin and FCC limit generally at 9.55 and 11.67 MHz. The MEPPI frequency modes used at this location are 1) OH: Mode 2 and upstream UG: Mode 1 (on the dip for the JEMC UG). There were no margin or limit transgressions in the mode 2 spectrum, however, the transgressions noted above appear to occur from the Mode 1 Head End. There were no measured Signals in the HAM bands that exceeded the -20dB Margin (for specific values please review the data table above).

SITE #3 – 92 CLUBHOUSE DRIVE, NORTHMINSTER ESTATES, JEFFERSON, GA

This set of tests was conducted between 8:45 – 11:00 am on April 19, 2006. The location chosen was the Sales Office (a residential model home) in the Northminster Estates subdivision. This location was used to test the CPE device connected to the BPL LV segment, as well as, control the Duty Factor of the EUT.

The Equipment Under Test (EUT) was a MEPPi in-premise CPE device used inside the Premise.

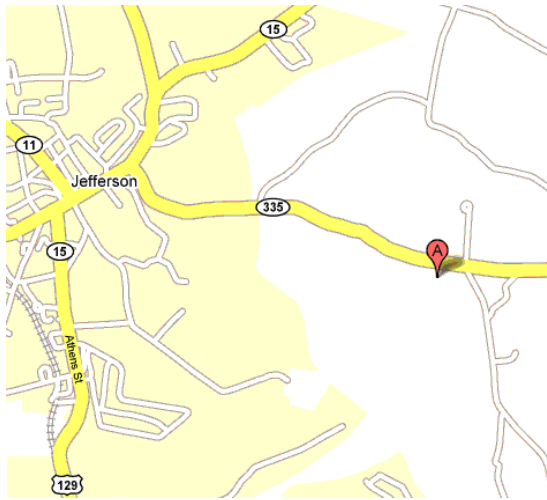
The FCC states the limits for the radiated emissions made at frequencies between 1.705 and 30 MHz at a 30 Meter distance. We used 40 dB per decade as the extrapolation factor to adjust the limit from a 30 meter distance to a 10 meter distance as allowed in Part 15.31(f)(2). The limit for radiated emissions below 30 MHz, extrapolated to a 10 Meter distance is 48.6 dB μ V/m.

- Measurements under 30 MHz in non-HAM bands were configured with a margin of -6dB
- Measurements under 30 MHz in the HAM bands were configured with a margin of -20dB
- “No Data” indicates that measurements were all below the -20dB margin relative to the FCC Limit.

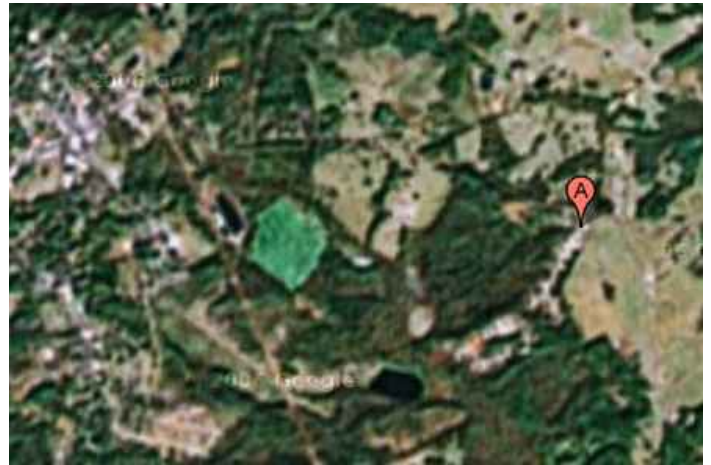
The Test Results Data table appears later in this section. Test data listed in the table are as follows:

- 1) Frequency Bands under Test
- 2) Frequency of detected Peak Signal above Margin
- 3) Peak Measurement Data (dB μ V/m)
- 4) Quasi Peak Measurement Data (dB μ V/m)
- 5) Average Measurement Data (dB μ V/m)
- 6) FCC Limit at 10 Meters (48.5 dB μ V/m)
- 7) Delta Limit to Peak
- 8) Delta Limit to Quasi Peak

During these tests it is of import to note that there was a constant download of traffic in order to increase the utilization of the network and the “Burst Factor” of the individual BPL components. Based on FCC Part 15 Testing Guidelines – “If the data communications burst rate is at least 20 burst per second, quasi-peak measurements shall be employed, as specified in Section 15.35(a). The data listed in column heading titled “Delta Limit to QP” notes the value of the Quasi Peak measurement relative to the FCC Limit.



92 Clubhouse Drive, Sales Office
Jefferson, GA 30549



92 Clubhouse Drive, Sales Office
Jefferson, GA 30549



92 Clubhouse Drive, Sales Office



92 Clubhouse Drive, Sales Office

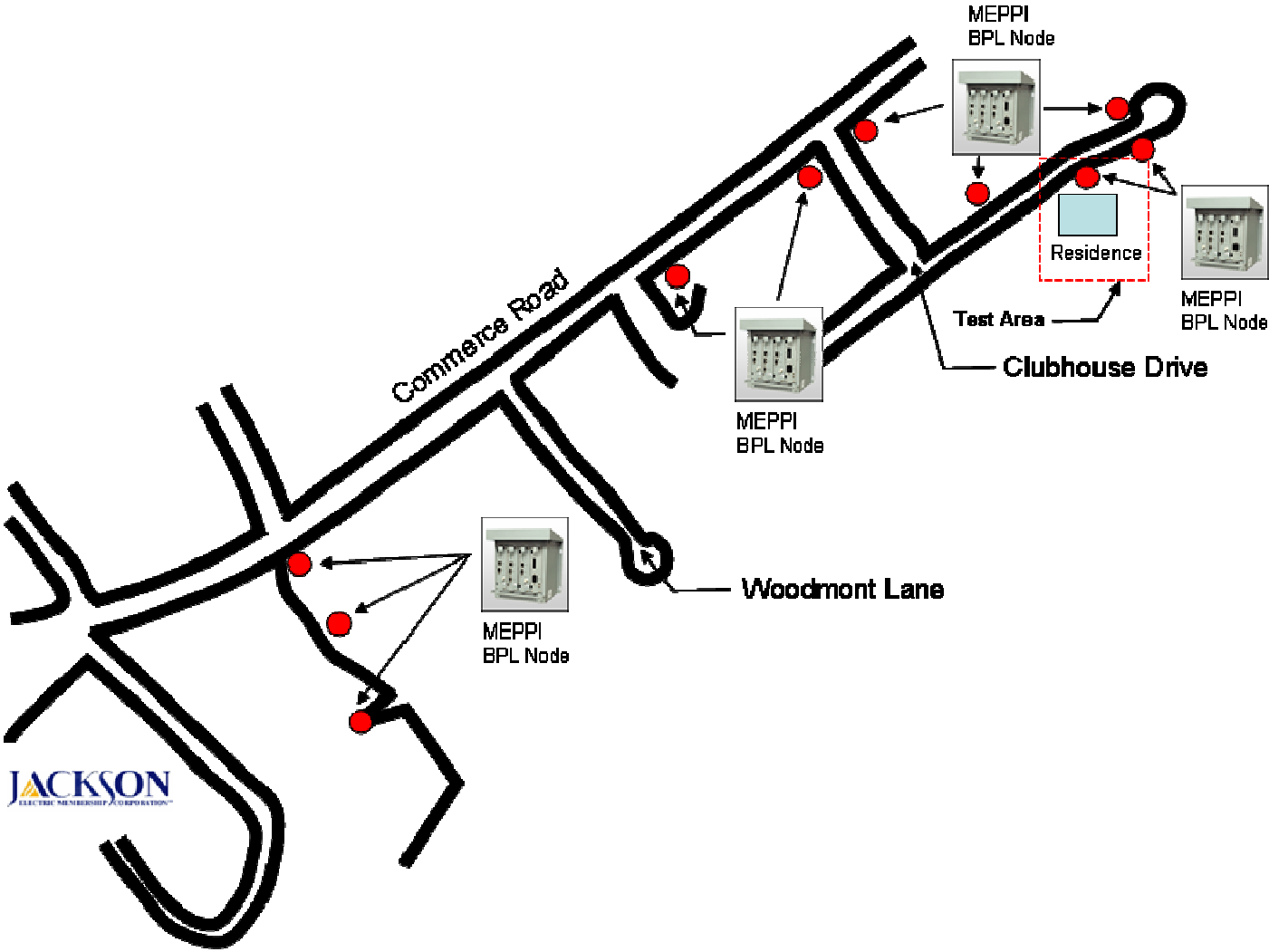


92 Clubhouse Drive, Sales Office



92 Clubhouse Drive, Sales Office

One Line Drawing



	MHz		Margin	Freq	Peak	QP	Avg	Limit	Delta Limit to Peak	Delta Limit to QP
					dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dB
P1	2	30	-6dB	5.949	55.19	51.82	47.51	48.6	6.59	3.22
				9.57	47.73	45.27	45.52	48.6	-0.87	-3.33
				11.76	68.06	65.73	63.69	48.6	19.46	17.13
	3.5	4	-20dB	No Data (Audio Stream on Ping on)						
	7	7.3	-20dB	No Data (Audio Stream on Ping on)						
	10.1	10.15	-20dB	No Data (Audio Stream on Ping on)						
	14	14.35	-20dB	No Data (Audio Stream on Ping on)						
	18.068	18.168	-20dB	No Data (Audio Stream on Ping on)						
	21	21.45	-20dB	No Data (Audio Stream on Ping on)						
	24.89	24.99	-20dB	No Data (Audio Stream on Ping on)						
	28	29.7	-20dB	No Data (Audio Stream on Ping on)						
P2	2	30	-6dB	8.504	42.04	43.87	42.5	48.6	-6.56	-4.73
				9.57	64.74	65.71	66.52	48.6	16.14	17.11
				9.569	64.09	58.76	68.78	48.6	15.49	10.16
				11.78	46.04	46.04	42.52	48.6	-2.56	-2.56
				11.85	60.81	60.8	53.49	48.6	12.21	12.2
P3	2	30	-6dB	9.57	60.04	59.48	56.89	48.6	11.44	10.88
				9.775	58.4	58.75	53.97	48.6	9.8	10.15
				12	69.18	65.62	53.94	48.6	20.58	17.02
P4	2	30	-6dB	5.851	48.46	44.01	43.49	48.6	-0.14	-4.59
				9.775	64.55	62.01	56.84	48.6	15.95	13.41
				10.45	45.05	43.62	45.21	48.6	-3.55	-4.98
				11.76	64.73	59.15	62.89	48.6	16.13	10.55
				13.65	47.66	50.03	44.24	48.6	-0.94	1.43
P5	2	30	-6dB	9.57	50.74	47.63	48.32	48.6	2.14	-0.97
				9.776	58.86	54.87	50.76	48.6	10.26	6.27
				12	71.14	68.37	58.36	48.6	22.54	19.77
				13.65	67.13	65.56	62.09	48.6	18.53	16.96
P7	2	30	-6dB	9.549	49.52	49.52	49.51	48.6	0.92	0.92
				11.76	56.41	60.69	57.25	48.6	7.81	12.09
				12	57.47	56.91	42.87	48.6	8.87	8.31
P8	2	30	-6dB	11.76	61.33	57.37	53.9	48.6	12.73	8.77
				11.8	60.7	58.95	52.62	48.6	12.1	10.35
				15.22	48.73	47.09	37.26	48.6	0.13	-1.51
P9	2	30	-6dB	9.55	37.72	41.3	43.58	48.6	-10.88	-7.3
				9.774	51.27	42.1	42.97	48.6	2.67	-6.5
				11.76	60.45	61.06	65.13	48.6	11.85	12.46
				11.8	59.58	52.47	61.86	48.6	10.98	3.87
P12	2	30	-6dB	9.774	49.51	46.66	46.7	48.6	0.91	-1.94
				9.775	49.01	45.24	44.23	48.6	0.41	-3.36
				12	63.73	63.21	60.39	48.6	15.13	14.61
P13	2	30	-6dB	9.568	58	58.8	54.16	48.6	9.4	10.2

				9.57	57.68	57.67	55.26	48.6	9.08	9.07
				10.45	46.59	33.93	47.54	48.6	-2.01	-14.67
				11.76	70.69	70.69	62.62	48.6	22.09	22.09
				12	58.06	57.85	64.85	48.6	9.46	9.25
P14	2	30	-6dB	9.57	61.73	59.37	53.73	48.6	13.13	10.77
				11.76	78.56	77.82	68.56	48.6	29.96	29.22
				13.65	52.81	51.78	50.95	48.6	4.21	3.18
P15	2	30	-6dB	12	64.03	65.66	63.08	48.6	15.43	17.06
				13.66	56.68	53.84	50.56	48.6	8.08	5.24
				15.26	45.83	45.84	42.51	48.6	-2.77	-2.76
P16	2	30	-6dB	9.57	50.89	49.68	46.38	48.6	2.29	1.08
				9.775	49.51	49.51	49.49	48.6	0.91	0.91
				11.29	48.66	45.88	32.36	48.6	0.06	-2.72
				11.34	49.62	45.84	31.12	48.6	1.02	-2.76
				11.76	63.98	60.51	61.08	48.6	15.38	11.91
				12	48.3	52.73	54.95	48.6	-0.3	4.13

The table above documents each of the measurements conducted and lists each of the Signals where the Peak measurement exceeded the Margin (relative to the Limit). For “sweep” tests conducted between 2 MHz – 30 MHz a -6dB Margin was used, while a -20dB Margin was used for all HAM band tests.

The set of tests at Site #3 consisted of the MEPPI LV In-Premise CPE device operating in Mode 7 between 3 MHz – 8 MHz. We observed Signals whose measured Peak exceeded the set margin and FCC limit in the mode 8 (8 MHz – 13 MHz) band almost exclusively. This may be caused by the use of Mode 8 on the MV serving the node being tested. However, we conducted identical tests with Mode 8 nodes turned off at locations “T”, “U”, and “V” and observed that the signals only marginally changed (see images below). JEMC should verify its powermask settings in mode 8 to validate that its power levels are within FCC limits. There were no measured Signal transgressions in the HAM bands that exceeded the -20dB Margin.