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April 18, 2014
Subject: Antenna Kitting
Re: FCC ID: PWO460011
To Whom It May Concern:

The antenna kitting options for model 460011 signal booster were done for 13 Mobile Outside Antenna kit options, 4 Fixed Outside Antenna kit options and 16 Inside Antenna kit options. The order of the attached calculations is as follows:

Mobile Outside Antenna Kit Options:

1. Kits 311103, 311125, 311128, 314202
2. Kit 311703
3. Kit 301113, 301126
4. Kit 311701
5. Kit 311119
6. Kit 311133
7. Kit 311104-17410
8. Kit 311130-5810
9. Kit 311114
10. Kit 311102
11. Kit 314203-5810
12. Kit 311112-17410
13. Kit 314203-17410

4. 311141-0620

Inside Antenna Kit Options:

1. Kit 301152
2. Kit 311106
3. Kit 311135-40060
4. Kit 311135-5820
5. Kit 311155-0630
6. Kit 301121-40010
7. Kit 301151-0610
8. Kit 309900-50N
9. Kit 309902-75F
10. Kit 309903-75F
11. Kit 309904-75F
12. Kit 309905-50N
13. Kit 311155-1150
14. Kit 301151-1110

Fixed Outside Antenna Kit Options:

1. Kit 311203-5820
2. Kit 311201-0620
3. Kit 301126

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick L. Cook', written in a cursive style.

Patrick L. Cook
Senior Research and Development Engineer



Mobile Outside Antenna Kit Options

FCC ID: PWO460011

Final Output Power Limited to 30 dBm EIRP in all frequency bands

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	29.0	27.1

1 Magnet Mount w/12.5' RG-174	314202, 311103, 311125, 311128	
Antenna Gains (dBi)	1.97	2.51
Coax Loss (dB)	3.7	4.7
Final Gain less Loss (dB)	-1.7	-2.2
Output Power plus Final Gain (dBm EIRP)	27.27	24.9

2 Magnet Mount w/12.5' RG-174	311703	
Antenna Gains (dBi)	0.69	1.13
Coax Loss (dB)	3.7	4.7
Final Gain less Loss (dB)	-3.0	-3.6
Output Power plus Final Gain (dBm EIRP)	25.99	23.53

3 Mini-Mag Mount w/12.5' RG-174	301126	301113
Antenna Gains (dBi)	-1.4	0.4
Coax Loss (dB)	3.7	4.7
Final Gain less Loss (dB)	-5.1	-4.3
Output Power plus Final Gain (dBm EIRP)	23.9	22.8

4 Trucker Antenna w/10.5' RG-58	311701	
Antenna Gains (dBi)	2.18	2.66
Coax Loss (dB)	1.4	2.3
Final Gain less Loss (dB)	0.8	0.4
Output Power plus Final Gain (dBm EIRP)	29.78	27.5

5 Trucker Antenna w/13.5' RG-58	311119	
Antenna Gains (dBi)	1.21	3.57
Coax Loss (dB)	1.7	2.9
Final Gain less Loss (dB)	-0.5	0.7
Output Power plus Final Gain (dBm EIRP)	28.51	27.77

6 Trucker Antenna w/13.5' RG-58	311133	
Antenna Gains (dBi)	1.15	4.22
Coax Loss (dB)	1.7	2.9
Final Gain less Loss (dB)	-0.6	1.3
Output Power plus Final Gain (dBm EIRP)	28.5	28.4

7 NMO Antenna 10' RG-174	311104-17410	
Antenna Gains (dBi)	2.48	1.8
Coax Loss (dB)	3.0	3.8
Final Gain less Loss (dB)	-0.5	-2.0
Output Power plus Final Gain (dBm EIRP)	28.48	25.1

8 Marine Antenna w/10' RG-58	311130-5810	
Antenna Gains (dBi)	0.65	3.57
Coax Loss (dB)	1.3	2.1
Final Gain less Loss (dB)	-0.6	1.4
Output Power plus Final Gain (dBm EIRP)	28.4	28.5

9 Mini-Glass Mount w/14' RG-58	311114	
Antenna Gains (dBi)	-5.39	1.44
Coax Loss (dB)	1.8	3.0
Final Gain less Loss (dB)	-7.2	-1.6
Output Power plus Final Gain (dBm EIRP)	21.8	25.5



Mobile Outside Antenna Kit Options

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Final Output Power Limited to 30 dBm EIRP in all frequency bands

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	29	27.1

10 Glass Mount w/14' RG-58	311102	
Antenna Gains (dBi)	-0.86	3.39
Coax Loss (dB)	1.8	3.0
Final Gain less Loss (dB)	-2.7	0.4
Output Power plus Final Gain (dBm EIRP)	26.34	27.5

11 NMO Antenna w/10' RG-58	314203-5810	
Antenna Gains (dBi)	1.82	0.75
Coax Loss (dB)	1.3	2.1
Final Gain less Loss (dB)	0.5	-1.4
Output Power plus Final Gain (dBm EIRP)	29.5	25.8

12 NMO Antenna 10' RG-174	311112-17410	
Antenna Gains (dBi)	2.47	-0.65
Coax Loss (dB)	3.0	3.8
Final Gain less Loss (dB)	-0.5	-4.5
Output Power plus Final Gain (dBm EIRP)	28.47	22.65

13 NMO Antenna 10' RG-174	314203-17410	
Antenna Gains (dBi)	1.82	0.75
Coax Loss (dB)	3.0	3.8
Final Gain less Loss (dB)	-1.2	-3.1
Output Power plus Final Gain (dBm EIRP)	27.8	24.1

Fixed Outside Antenna Kit Options

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1 Omni Directional Antenna With 20' RG-58	311203-5820	
Antenna Gains (dBi)	0.57	5.09
Coax Loss (dB)	2.6	4.3
Final Gain less Loss (dB)	-2.03	0.79
Output Power plus Final Gain (dBm EIRP)	27.0	27.9

2 Omni Directional Antenna With 20' RG-6	311201-0620	
Antenna Gains (dBi)	0.57	5.09
Coax Loss (dB)	1.7	2.7
Final Gain less Loss (dB)	-1.13	2.39
Output Power plus Final Gain (dBm EIRP)	27.9	29.5

3 Mini-Mag Antenna With 12.5' RG-174	301126	
Antenna Gains (dBi)	1.97	6.89
Coax Loss (dB)	3.7	4.7
Final Gain less Loss (dB)	-1.73	2.19
Output Power plus Final Gain (dBm EIRP)	27.3	29.3

4 Grey Brick w/20' RG-6	311141-0620	
Antenna Gains (dBi)	1.2	5.5
Coax Loss (dB)	1.7	2.7
Final Gain less Loss (dB)	-0.5	2.8
Output Power plus Final Gain (dBm EIRP)	28.5	29.9



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Uplink Frequency Band (MHz)	824-849	1850-1910
Measured Uplink Gain (dB)	49.30	48.80
Measured RSSI Shutoff (dBm/MHz)	-57.60	-48.40
MSCL Minimum (dB)	25.70	34.40
1.5' Separation Distance Path Loss (dB)	25.70	34.40
Polarity Loss (dB)	3.0	3.0
Max Antenna Gain Less Cable Loss (dB)	1.42	-0.24

1 Inside Antenna Kit 301152: Slim Low Profile with 10' RG-174

Antenna Gain Less Cable Loss (dB)	-1.7	-6.9
	-3.07	-6.67

2 Inside Antenna Kit 311106: Low Profile with 14' RG-58

Antenna Gain Less Cable Loss (dB)	-3.3	-0.7
	-4.71	-0.41

Uplink Frequency Band (MHz)	824-849	1850-1910
Measured Uplink Gain (dB)	49.30	48.80
Measured RSSI Shutoff (dBm/MHz)	-57.60	-48.40
MSCL Minimum (dB)	25.00	26.67
6' Separation Distance Path Loss (dB)	24.12	31.16
Polarity Loss	3.0	3.0
Max Antenna Gain Less Cable Loss (dB)	2.12	7.49

3 Inside Antenna Kit 311135-40060: Panel w/60' LMR 400

Antenna Gain Less Cable Loss (dB)	1.46	5.68
Margin (dB)	-0.66	-1.81

4 Inside Antenna Kit 311135-5820: Panel w/20' RG-58

Antenna Gain Less Cable Loss (dB)	1.82	5.75
Margin (dB)	-0.30	-1.74

5 Inside Antenna Kit 311155-0630: Panel w/30' RG-6

Antenna Gain Less Cable Loss (dB)	1.88	6.05
Margin (dB)	-0.24	-1.44

6 Inside Antenna Kit 301121-40010: Dome Antenna w/10' LMR 400

Antenna Gain Less Cable Loss (dB)	0.06	2.42
Margin (dB)	-2.06	-5.07

7 Inside Antenna Kit 301151-0610: Dome Antenna w/10' RG-6

Antenna Gain Less Cable Loss (dB)	-0.08	2.02
Margin (dB)	-2.20	-5.47

8 Inside Antenna Kit 309900-50N: 2 Panel Antennas and a 50 Ohm 3-Way Splitter

Antenna Gain Less Cable/Splitter Loss (dB)	1.33	7.49
Margin (dB)	-0.79	0.00

9 Inside Antenna Kit 309902-75F: 2 Panel Antennas and a 75 Ohm 3-Way Splitter

Antenna Gain Less Cable/Splitter Loss (dB)	1.33	7.49
Margin (dB)	-0.79	0.00

10 Inside Antenna Kit 309903-75F: 3 Panel Antennas and three 75 Ohm 2-Way Splitter

Antenna Gain Less Cable/Splitter Loss (dB)	1.33	7.49
Margin (dB)	-0.79	0.00

11 Inside Antenna Kit 309904-75F: 1 Panel Antenna and a 75 Ohm 2-Way Splitter

Antenna Gain Less Cable/Splitter Loss (dB)	1.33	7.49
Margin (dB)	-0.79	0.00

12 Inside Antenna Kit 309905-50N: 3 Panel Antennas and three 50 Ohm 2-Way Splitter

Antenna Gain Less Cable/Splitter Loss (dB)	1.33	7.49
Margin (dB)	-0.79	0.00

13 Inside Antenna Kit 311155-1150: Panel w/50' RG-11

Antenna Gain Less Cable Loss (dB)	2.12	6.13
Margin (dB)	0.00	-1.36

14 Inside Antenna Kit 301151-1110: Dome Antenna w/10' RG-11

Antenna Gain Less Cable Loss (dB)	0.30	2.57
Margin (dB)	-1.82	-4.92