



3301 E. Deseret Drive, St. George, UT 84790
www.wilsonelectronics.com • info@wilsonelectronics.com
phone 1-800-204-4104 • fax 1-435-656-2432

December 10, 2013

Subject: Antenna Kitting

Re: FCC ID: PWO460008

To Whom It May Concern:

The antenna kitting options for model 460008 signal booster were done for 19 Outside Antenna kit options and 2 Inside Antenna kit options. The order of the attached calculations is as follows:

Outside Antenna Kit Options:

1. Kits 311103, 311125, 311128, 314202
2. Kit 311703
3. Kit 301113, 301126
4. Kit 311101
5. Kit 311701
6. Kit 311119
7. Kit 311133
8. Kit 311104-17410
9. Kit 311112-17410
10. Kit 314203-17410
11. Kit 311130-5810

12. Kit 311114

13. Kit 311102
14. Kit 311104-5810
15. Kit 311112-5810
16. Kit 314203-5810
17. Kit 311104-40015
18. Kit 311112-40015
19. Kit 314203-40015

Inside Antenna Kit Options:

1. Kit 311127
2. Kit 311106

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick L. Cook', is written over a light gray horizontal line.

Patrick L. Cook

Senior Research and Development Engineer



Mobile Outside Antenna Kit Options

FCC ID: PWO460008

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

Uplink Frequency (MHz)	704-716	777-787	824-849	1710-1755	1850-1915
Uplink Output Power (dBm)	25.7	24.4	25.1	23.8	25.2

1 Magnet Mount w/12.5' RG-174	Kit Numbers: 311103 311125 311128 314202				
Antenna Gains (dBi)	-4.88	0.09	1.97	-6.99	2.51
Coax Loss (dB)	2.8	3.0	3.7	4.5	4.7
Final Gain less Loss (dB)	-7.7	-2.9	-1.7	-11.5	-2.2
Output Power plus Final Gain (dBm EIRP)	18.02	21.49	23.37	12.31	23.0

2 Magnet Mount w/12.5' RG-174	311703				
Antenna Gains (dBi)	-15.07	-4.23	0.69	-1.99	1.13
Coax Loss (dB)	2.8	3.0	3.7	4.5	4.7
Final Gain less Loss (dB)	-17.9	-7.2	-3.0	-6.5	-3.6
Output Power plus Final Gain (dBm EIRP)	7.83	17.17	22.09	17.3	21.63

3 Mini-Mag Mount w/12.5' RG-174	301113 301126				
Antenna Gains (dBi)	-0.36	-2.15	-1.92	1.16	1.85
Coax Loss (dB)	2.8	3	3.7	4.5	4.7
Final Gain less Loss (dB)	-3.2	-5.2	-5.6	-3.3	-2.9
Output Power plus Final Gain (dBm EIRP)	22.54	19.25	19.48	20.46	22.4

4 Trucker Antenna w/10.5' RG-58	311101				
Antenna Gains (dBi)	-4.51	0.4	1.72	-3.62	6.12
Coax Loss (dB)	1.2	1.3	1.4	2.2	2.3
Final Gain less Loss (dB)	-5.7	-0.9	0.3	-5.8	3.8
Output Power plus Final Gain (dBm EIRP)	20.0	23.5	25.4	18.0	29.0

5 Trucker Antenna w/10.5' RG-58	311701				
Antenna Gains (dBi)	-14.11	-0.71	2.18	-0.15	2.66
Coax Loss (dB)	1.2	1.3	1.4	2.2	2.3
Final Gain less Loss (dB)	-15.3	-2.0	0.8	-2.4	0.4
Output Power plus Final Gain (dBm EIRP)	10.39	22.39	25.88	21.45	25.6

6 Trucker Antenna w/13.5' RG-58	311119				
Antenna Gains (dBi)	-1.36	0.36	1.21	-2.3	3.57
Coax Loss (dB)	1.6	1.7	1.7	2.8	2.9
Final Gain less Loss (dB)	-3.0	-1.3	-0.5	-5.1	0.7
Output Power plus Final Gain (dBm EIRP)	22.7	23.06	24.61	18.7	25.87

7 Trucker Antenna w/13.5' RG-58	311133				
Antenna Gains (dBi)	-3.3	0.2	1.15	-4.75	4.22
Coax Loss (dB)	1.6	1.7	1.7	2.8	2.9
Final Gain less Loss (dB)	-4.9	-1.6	-0.6	-7.6	1.3
Output Power plus Final Gain (dBm EIRP)	20.9	22.9	24.6	16.3	26.5

8 NMO Antenna 10' RG-174	311104-17410				
Antenna Gains (dBi)	-4.1	-0.9	2.48	-3.51	1.8
Coax Loss (dB)	2.3	2.4	3.0	3.6	3.8
Final Gain less Loss (dB)	-6.4	-3.3	-0.5	-7.1	-2.0
Output Power plus Final Gain (dBm EIRP)	19.33	21.07	24.58	16.69	23.2

9 NMO Antenna 10' RG-174	311112-17410				
Antenna Gains (dBi)	-3.16	-0.45	2.47	-2.6	-0.65
Coax Loss (dB)	2.3	2.4	3.0	3.6	3.8
Final Gain less Loss (dB)	-5.5	-2.9	-0.5	-6.2	-4.5
Output Power plus Final Gain (dBm EIRP)	20.24	21.55	24.57	17.6	20.75

10 NMO Antenna 10' RG-174	314203-17410				
Antenna Gains (dBi)	-1.57	0.48	1.82	-5.74	0.75
Coax Loss (dB)	2.3	2.4	3.0	3.6	3.8
Final Gain less Loss (dB)	-3.9	-1.9	-1.2	-9.3	-3.1
Output Power plus Final Gain (dBm EIRP)	21.8	22.5	23.9	14.5	22.2



Mobile Outside Antenna Kit Options

FCC ID: PWO460008

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

Uplink Frequency (MHz)	704-716	777-787	824-849	1710-1755	1850-1915
Uplink Output Power (dBm)	25.7	24.4	25.1	23.8	25.2

11 Marine Antenna w/10' RG-58 311130-5810

Antenna Gains (dBi)	-1.0	-1.6	0.65	-1.68	3.57
Coax Loss (dB)	1.2	1.2	1.3	2.1	2.1
Final Gain less Loss (dB)	-2.2	-2.9	-0.6	-3.7	1.4
Output Power plus Final Gain (dBm EIRP)	23.55	21.5	24.5	20.1	26.6

12 Mini-Glass Mount w/14' RG-58 311114

Antenna Gains (dBi)	-7.53	-6.11	-5.39	2.57	1.44
Coax Loss (dB)	1.6	1.7	1.8	2.9	3.0
Final Gain less Loss (dB)	-9.1	-7.8	-7.2	-0.3	-1.6
Output Power plus Final Gain (dBm EIRP)	16.6	16.6	17.9	23.5	23.6

13 Glass Mount w/14' RG-58 311102

Antenna Gains (dBi)	-3.68	-2.54	-0.86	2.19	3.39
Coax Loss (dB)	1.6	1.7	1.8	2.9	3.0
Final Gain less Loss (dB)	-5.3	-4.2	-2.7	-0.7	0.4
Output Power plus Final Gain (dBm EIRP)	20.42	20.16	22.44	23.09	25.6

14 NMO Antenna w/10' RG-58 311104-5810

Antenna Gains (dBi)	-4.1	-0.9	2.48	-3.51	1.8
Coax Loss (dB)	1.2	1.2	1.3	2.1	2.1
Final Gain less Loss (dB)	-5.3	-2.1	1.2	-5.6	-0.3
Output Power plus Final Gain (dBm EIRP)	20.43	22.27	26.28	18.19	24.9

15 NMO Antenna w/10' RG-58 311112-5810

Antenna Gains (dBi)	-3.16	-0.45	2.47	-2.6	-0.65
Coax Loss (dB)	1.2	1.2	1.3	2.1	2.1
Final Gain less Loss (dB)	-4.4	-1.7	1.2	-4.7	-2.8
Output Power plus Final Gain (dBm EIRP)	21.34	22.75	26.27	19.1	22.45

16 NMO Antenna w/10' RG-58 314203-5810

Antenna Gains (dBi)	-1.57	0.48	1.82	-5.74	0.75
Coax Loss (dB)	1.2	1.2	1.3	2.1	2.1
Final Gain less Loss (dB)	-2.8	-0.7	0.5	-7.8	-1.4
Output Power plus Final Gain (dBm EIRP)	22.9	23.7	25.6	16.0	23.9

17 NMO Antenna w/15'LMR 400 311104-40015

Antenna Gains (dBi)	-4.1	-0.9	2.48	-3.51	1.8
Coax Loss (dB)	0.8	0.8	0.9	1.1	1.3
Final Gain less Loss (dB)	-4.9	-1.7	1.6	-4.6	0.5
Output Power plus Final Gain (dBm EIRP)	20.83	22.67	26.7	19.19	25.7

18 NMO Antenna w/15'LMR 400 311112-40015

Antenna Gains (dBi)	-3.16	-0.45	2.47	-2.6	-0.65
Coax Loss (dB)	0.8	0.8	0.9	1.1	1.3
Final Gain less Loss (dB)	-4.0	-1.3	1.6	-3.7	-2.0
Output Power plus Final Gain (dBm EIRP)	21.74	23.15	26.67	20.1	23.25

19 NMO Antenna w/15'LMR 400 314203-40015

Antenna Gains (dBi)	-1.57	0.48	1.82	-5.74	0.75
Coax Loss (dB)	0.8	0.8	0.9	1.1	1.3
Final Gain less Loss (dB)	-2.4	-0.3	0.9	-6.8	-0.6
Output Power plus Final Gain (dBm EIRP)	23.3	24.1	26.0	17.0	24.7



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Uplink Frequency Band (MHz)	704-716	777-787	824-849	1710-1755	1850-1915
Measured Uplink Gain (dB)	49.4	48.90	48.60	45.80	49.10
Measured RSSI Shutoff (dBm/MHz)	-60.00	-60.00	-57.30	-47.50	-53.00
MSCL Minimum (dB)	23.40	22.90	25.30	32.30	30.10
1.5' Separation Distance Path Loss (dB)	22.69	23.53	24.12	30.44	31.16
Polarity Loss (dB)	3.0	3.0	3.0	3.0	3.0
Max Antenna Gain Less Cable Loss (dB)	2.29	3.63	1.82	1.14	4.06

1 Inside Antenna Kit 311127: Slim Low Profile with 10' RG-174

Antenna Gain Less Cable Loss (dB)	-5.1	-3.6	-1.7	-6.2	-6.9
Margin (dB)	-7.38	-7.18	-3.47	-7.33	-10.97

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

Antenna Gain Less Cable Loss (dB)	-7.2	-5.9	-3.3	-1.8	-0.7
Margin (dB)	-9.52	-9.51	-5.11	-2.97	-4.71