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November 19, 2015
Subject: Antenna Kitting
Re: FCC ID: PWO460009
To Whom It May Concern:

The antenna kitting options for model 460009 signal booster were done for 46 Outside Antenna kit options. The order of the attached calculations is as follows:

Outside Antenna Kit Options:

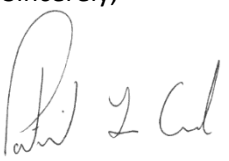
Mobile

1. Kit 301152
2. Kit 311106
3. Kit 311703
4. Kits 311103, 311125, 311128, 314202
5. Kit 311130-5810
6. Kit 311114
7. Kit 311102
8. Kit 311104-5810
9. Kit 311701
10. Kit 311119
11. Kit 311133
12. Kit 311104-17410
13. Kit 301113
14. Kit 311112-5810
15. Kit 314203-5810
16. Kit 311112-17410
17. Kit 314203-17410
18. Kit 311101
19. Kit 311156

Fixed

1. Kit 314411-40075
2. Kit 314411-5825
3. Kit 314775-0630
4. Kit 301111-0675
5. Kit 301111-5850
6. Kit 311203-40020
7. Kit 311129-400100
8. Kit 311129-5840
9. Kit 311129-0660
10. Kit 311124-0650
11. Kit 311124-400100
12. Kit 314453-5825
13. Kit 311203-5820
14. Kit 311201-0620
15. Kit 301126
16. Kit 301111-11140
17. Kit 311201-1120
18. Kit 311129-11110
19. Kit 314453-40075
20. Kit 314473-0640
21. Kit 311141-0620
22. Kit 311124-1180
23. Kit 311141-1120
24. Kit 314473-1175
25. Kit 314475-1175
26. Kit 301111-400170
27. Kit 311124-5830

Sincerely,



Patrick L. Cook
Senior Research and Development Engineer

Fixed Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

1 Wide Band Directional Antenna With 75' LMR 400 — 314411-40075

Antenna Gains (dBi)	7.8	9.1
Coax Loss (dB)	3.6	5.4
Final Gain less Loss (dB)	4.2	3.7
Output Power plus Final Gain (dBm EIRP)	27.99	26.0

2 Wide Band Directional Antenna With 25' RG-58 — 314411-5825

Antenna Gains (dBi)	7.8	9.1
Coax Loss (dB)	3.2	5.4
Final Gain less Loss (dB)	4.6	3.7
Output Power plus Final Gain (dBm EIRP)	28.4	26.0

3 Wide Band Directional Antenna With 30' RG-6 — 314775-0630

Antenna Gains (dBi)	7.8	9.1
Coax Loss (dB)	3.4	5.3
Final Gain less Loss (dB)	4.4	3.8
Output Power plus Final Gain (dBm EIRP)	28.19	26.1

4 Yagi Antenna 301111 With 75' RG-6 — 301111-0675

Antenna Gains (dBi)	10.8	-13.8
Coax Loss (dB)	6.3	9.975
Final Gain less Loss (dB)	4.5	-23.775
Output Power plus Final Gain (dBm EIRP)	28.29	-1.5

5 Yagi Antenna 301111 With 50' RG-58 — 301111-5850

Antenna Gains (dBi)	10.8	-13.8
Coax Loss (dB)	6.5	10.7
Final Gain less Loss (dB)	4.3	-24.5
Output Power plus Final Gain (dBm EIRP)	28.1	-2.2

6 Omni Directional Antenna (311203) With 20' LMR 400 — 311203-40020

Antenna Gains (dBi)	0.57	5.09
Coax Loss (dB)	0.7	1.1
Final Gain less Loss (dB)	-0.13	4.0
Output Power plus Final Gain (dBm EIRP)	23.7	26.3

Fixed Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

7 Yagi Antenna 311129 With 100' LMR 400 — 311129-400100

Antenna Gains (dBi)	9.64	-11.97
Coax Loss (dB)	4.7	7.1
Final Gain less Loss (dB)	4.9	-19.07
Output Power plus Final Gain (dBm EIRP)	28.7	3.2

8 Yagi Antenna 311129 With 40' RG-58 — 311129-5840

Antenna Gains (dBi)	9.64	-11.97
Coax Loss (dB)	5.2	8.6
Final Gain less Loss (dB)	4.4	-20.6
Output Power plus Final Gain (dBm EIRP)	28.2	1.7

9 Yagi Antenna 311129 With 60' RG-6 — 311129-0660

Antenna Gains (dBi)	9.64	-11.97
Coax Loss (dB)	5.0	8.0
Final Gain less Loss (dB)	4.64	-19.95
Output Power plus Final Gain (dBm EIRP)	28.4	2.4

10 Yagi Antenna 311124 With 50' RG-6 — 311124-0650

Antenna Gains (dBi)	-23.4	10.9
Coax Loss (dB)	4.2	6.7
Final Gain less Loss (dB)	-27.60	4.25
Output Power plus Final Gain (dBm EIRP)	-3.8	26.6

11 Yagi Antenna 311124 With 100' LMR 400 — 311124-400100

Antenna Gains (dBi)	-23.4	10.9
Coax Loss (dB)	4.7	7.1
Final Gain less Loss (dB)	-28.1	3.8
Output Power plus Final Gain (dBm EIRP)	-4.31	26.1

12 Panel Antenna With 25' RG-58 — 314453-5825

Antenna Gains (dBi)	4.4	10.04
Coax Loss (dB)	3.2	5.4
Final Gain less Loss (dB)	1.2	4.6
Output Power plus Final Gain (dBm EIRP)	25.0	26.9

Fixed Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

13 Omni Directional Antenna (311203) 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)	21.8	23.1

14 Omni Directional Antenna (311201) 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)	22.7	24.7

15 Mini-Mag Antenna With 12.5' RG-174 — 301126

Antenna Gains (dBi)	-1.4	0.42
Coax Loss (dB)	3.7	4.7
Final Gain less Loss (dB)	-5.1	-4.28
Output Power plus Final Gain (dBm EIRP)	18.7	18.0

16 Yagi 301111 With 140' RG-11 — 301111-11140

Antenna Gains (dBi)	10.8	-14.9
Coax Loss (dB)	6.43	10.94
Final Gain less Loss (dB)	4.37	-25.84
Output Power plus Final Gain (dBm EIRP)	28.2	-3.5

17 Omni Directional Antenna 311201 With 20' RG-11 — 311201-1120

Antenna Gains (dBi)	0.6	5.1
Coax Loss (dB)	0.9	1.6
Final Gain less Loss (dB)	-0.34	3.53
Output Power plus Final Gain (dBm EIRP)	23.5	25.8

18 Yagi 311129 With 110' RG-11 — 311129-11110

Antenna Gains (dBi)	9.6	-12
Coax Loss (dB)	5.0	8.6
Final Gain less Loss (dB)	4.63	-20.57
Output Power plus Final Gain (dBm EIRP)	28.4	1.7

Fixed Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

19 Panel Antenna With 75' LMR 400 — 314453-40075

Antenna Gains (dBi)	4.4	10.04
Coax Loss (dB)	3.6	5.4
Final Gain less Loss (dB)	0.8	4.64
Output Power plus Final Gain (dBm EIRP)	24.6	26.9

20 Panel Antenna With 40' RG-6 — 314473-0640

Antenna Gains (dBi)	4.4	10.04
Coax Loss (dB)	3.4	5.3
Final Gain less Loss (dB)	1.0	4.74
Output Power plus Final Gain (dBm EIRP)	24.8	27.0

21 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)	23.29	25.1

22 Yagi 311124 With 80' RG-11 — 311124-1180

Antenna Gains (dBi)	-23.4	10.9
Coax Loss (dB)	3.6	6.3
Final Gain less Loss (dB)	-27.00	4.65
Output Power plus Final Gain (dBm EIRP)	-3.2	27.0

23 Grey Panel With 20' RG-11 — 311141-1120

Antenna Gains (dBi)	1.2	5.5
Coax Loss (dB)	1.0	1.6
Final Gain less Loss (dB)	0.25	3.94
Output Power plus Final Gain (dBm EIRP)	24.0	26.2

24 Panel Antenna With 75' RG-11 — 314473-1175

Antenna Gains (dBi)	4.4	10
Coax Loss (dB)	3.4	5.8
Final Gain less Loss (dB)	0.98	4.18
Output Power plus Final Gain (dBm EIRP)	24.8	26.5

Fixed Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

25 Wide Band Directional Antenna With 75' RG-11 — 314475-1175

Antenna Gains (dBi)	7.8	9.1
Coax Loss (dB)	3.42	5.9
Final Gain less Loss (dB)	4.38	3.24
Output Power plus Final Gain (dBm EIRP)	28.2	25.5

Yagi Antenna 301111 With 170' LMR 400 — 301111-400170

26

Antenna Gains (dBi)	10.8	-13.8
Coax Loss (dB)	6.3	9.8
Final Gain less Loss (dB)	4.5	-23.6
Output Power plus Final Gain (dBm EIRP)	28.3	-1.3

2 Yagi Antenna 311124 With 30' RG-58 — 311124-5830

Antenna Gains (dBi)	-23.4	10.9
Coax Loss (dB)	3.9	6.4
Final Gain less Loss (dB)	-27.3	4.5
Output Power plus Final Gain (dBm EIRP)	-3.5	26.8

Mobile Outside Antenna Kit Options

FCC ID: PWO460009

1 Slim Low Profile w/10' RG-174 — 301152

Antenna Gains (dBi)	2.22	-3.11
Coax Loss (dB)	3.0	3.8
Final Gain less Loss (dB)	-0.8	-6.9
Output Power plus Final Gain (dBm EIRP)	23.01	15.4

2 Low Profile w/14' RG-58 — 3111106

Antenna Gains (dBi)	0.5	0.9
Coax Loss (dB)	1.9	3.2
Final Gain less Loss (dB)	-1.4	-2.34
Output Power plus Final Gain (dBm EIRP)	22.43	19.96

Mobile Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	23.79	22.3

3 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)	20.78	18.73

4 Magnet Mount w/12.5' RG-174)3 — 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)	22.06	20.1

5 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)	23.1	23.7

6 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)	16.6	20.7

7 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)	21.13	22.7

8 NMO Antenna w/10' RG-58 — 311104-5810

Antenna Gains (dBi)	2.48	1.8
Coax Loss (dB)	1.3	2.1
Final Gain less Loss (dB)	1.2	-0.3
Output Power plus Final Gain (dBm EIRP)	24.97	22

Mobile Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	25	25

9 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)	24.57	22.7

10 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)	23.3	22.97

11 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)	23.2	23.6

12 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)	23.27	20.3

13 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)	18.69	18.0

Mobile Outside Antenna Kit Options

FCC ID: PWO460009

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

Uplink Frequency (MHz)	824-849	1850-1915
Uplink Output Power (dBm)	25	25

14 NMO Antenna w/10' RG-58 — 311112-5810

Antenna Gains (dBi)	2.47	-0.65
Coax Loss (dB)	1.3	2.1
Final Gain less Loss (dB)	1.2	-2.8
Output Power plus Final Gain (dBm EIRP)	24.96	19.55

15 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)	24.3	21.0

16 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)	23.26	17.85

17 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)	22.6	19.3

18 Trucker Antenna w/10.5' RG-58 — 311101

Antenna Gains (dBi)	1.72	6.12
Coax Loss (dB)	1.4	2.3
Final Gain less Loss (dB)	0.3	3.8
Output Power plus Final Gain (dBm EIRP)	24.1	26.1

19 Magnet Mount w/5' RG-174 — 311156

Antenna Gains (dBi)	2.1	4.7
Coax Loss (dB)	3.8	6.9
Final Gain less Loss (dB)	-1.7	-2.2
Output Power plus Final Gain (dBm EIRP)	22.1	20.1