



# Assessment of Compliance

with

Respect to FCC Rules and Regulations Part 15.247, 15.205, and  
15.207: Direct Sequence Spread Spectrum System

**Access Point 300 Model S-AP-300**

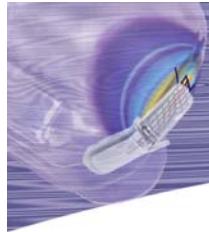
**FleetMind Solutions**



June 2005

APREL Project No.: FMSB-Access Point-5164

51 Spectrum Way Nepean ON K2R 1E6  
Tel: (613) 820-2730 Fax: (613) 820-4161  
email: [info@aprel.com](mailto:info@aprel.com)



## Engineering Report

**Subject:** Assessment of Compliance in accordance with the  
FCC Rules & Regulations Part 15.247, 15.205, 15.207  
15.209: Direct Sequence Spread Spectrum System

**FCC ID:** QVJSAP300

**Equipment:** Access Point 300

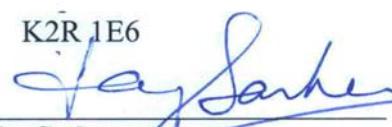
**Model:** S-AP-300

**Client:** FleetMind Solutions  
455 Fenalon, Suite 110  
Dorval, Quebec, H9S 5T8

**Project #:** FMSB-Access Point-3944

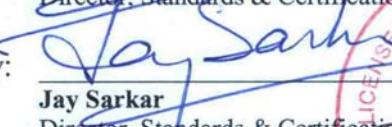
**Prepared By:** APREL Laboratories,  
Regulatory Compliance Division  
51 Spectrum Way  
Nepean, Ontario

**Author:**

K2R 1E6  
  
 Jay Sarkar  
 Director, Standards & Certification

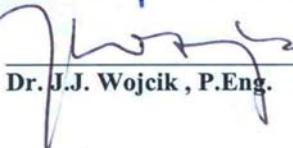
Date: June 27, 2005

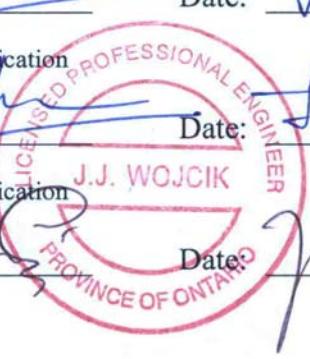
**Approved by:**

  
 Jay Sarkar  
 Director, Standards & Certification

Date: June 27, 2005

**Released by:**

  
 Dr. J.J. Wojcik, P.Eng.

  
 LICENSED PROFESSIONAL ENGINEER  
 J.J. WOJCIK  
 PROVINCE OF ONTARIO  
 Date: June 27/05

## Introduction

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## CERTIFICATE OF COMPLIANCE

<b>Applicant name and address</b>	<b>Date and Location of Testing</b>
FleetMind Solutions 455 Fenalon, Suite 110 Dorval, Quebec, H9S 5T8	Date: June 2005 Project No. : FMSB-ACCESS POINT-3944 Test Location: APREL Laboratories, Nepean, ON CANADA

**FCC ID: QVJSAP300**

**APPLICANT: FleetMind Solutions**

**Class II Permissive Change**

**Equipment Type:** Access Point 300, Wireless Modem

**Model(s):** S-AP-300

**FCC Rule Parts:** § 15.247; 15.205, 15.207, 15.209

**Classification:** Spread Spectrum Transceiver (DSS)

**Method/System:** Direct Sequence Spread Spectrum System (DSSSS)

**Max. Peak Output RF Power:** 115 mW 20.6 dBm (Conducted)

**RF Band:** 902-928 MHz conducted

This equipment has been shown to be capable of compliance with applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C-63-4.

I attest to the accuracy of the data. All measurements reported were carried out under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the compliance of these measurements and vouch for the qualifications of the persons taking them. This relates only to the sample tested.



Jayanta (Jay) Sarkar  
Technical Director, Standards & Certification

FMSB-Access Point-5164

Page 2

**Introduction****FCC ID: QVJSAP300****Client FleetMind Solutions****Product: Access Point 300, Model: S-AP-300**

## Table of Contents

Engineering Summary	5
Summary of Test Data	5
Introduction	6
Product Information	7
FCC Submission Information	8
Sections: Description of Tests	
a. Power Lines Conducted Emissions	9
b. Maximum Peak Power Output	22
c. Antenna Requirements	27
d. Radiated Spurious Emissions & Restricted Bands	31

Test Equipment List: See Appendix A

Test Results, Power Lines (Receive Mode) Conducted Emissions: Appendix B

## Introduction

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

Standard: FCC Rules and Regulations Parts 15.247, 15.205, 15.207, 15.209

## ENGINEERING SUMMARY

This report contains the measurement results of the engineering evaluation performed on a **FleetMind Access Point 300, henceforth referred to as the Device Under Investigation (DUI)**. The measurements were carried out in accordance with the FCC Rules and Regulations Parts 15.247, 15.205, 15.207, 15.209. The product was evaluated when it was set at the maximum power.

### The DUI was evaluated for Class II Permissive Change

The FleetMind Access Point 300 is a Direct Sequence Spread Spectrum System operating at 902-928 MHz band. The unit was tested at frequencies 906 MHz (L), 915 MHz (M), 924 MHz (H) and continuous mode.

Two different antennas were tested with the DUI for Restricted Bands. Test data for each antenna is presented in this report.

The DUI was evaluated and the measurement results are presented in this report.

The results presented in this report relate only to the sample tested.

## Compliance Summary

Test Description	Section	Compliance Summary Pass/Fail
Power lines Conducted Emissions Ref Paragraph FCC Part 15.207	A	Pass
Maximum Peak Output Power Ref Paragraph FCC Part 15.247 (b)	C	Pass
Antenna Requirements Ref Paragraph FCC Part 15.247(d)	E	Pass
Radiated Emissions Spurious Ref Paragraph FCC Part 15.247	F	Pass
Restricted Bands Ref Paragraph FCC Part 15.205	F	Pass

## Introduction

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## INTRODUCTION

### General

This report describes the results of the Compliance test under FCC Part 15.247, 15.205, 15.207, 15.209 conducted on a FleetMind Access Point Wireless Modem, Model S-AP-300.

### Measurement Facility

The evaluation for compliance was performed for FleetMind. by APREL Laboratories at APREL's EMI facility located in Nepean, Ontario, Canada. The laboratory operates an (3m and 10m) Open Area Test Site (OATS). The measurement facility is calibrated in accordance with ANSI C63.4-1992.

A description of the measurement facility in accordance with the radiated and AC line conducted test site criteria per ANSI C63.4-1992 is on file with the Federal Communications Commission and is in compliance with the requirements of Section 2.948 of the Commissions rules and regulations. **APREL's registration number is: 90416**

APREL is accredited by Standard Council of Canada ISO 17025..

### Standard

The evaluation and analysis were conducted in accordance with FCC Rules and Regulations Parts 15.247, 15.205, 15.207, 15.209.

*Report: This report was written by Jay Sarkar, Technical Director, Standards and Certification. Tests were performed by J. Lokaj.*

### Test Equipment

The test equipment used during the evaluation is listed in Appendix A with calibration due dates.

### Environmental Conditions

- Temperature: 25 °C ± 2
- Relative Humidity: 30 - 50 %
- Air Pressure: 101 kPa ± 3

FMSB-Access Point-5164

## Introduction

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Product Information

### Equipment Description

The Device Under Investigation (DUI) is the FleetMind Access Point, Wireless Modem, Direct Sequence Spread Spectrum System.

Frequency Range: 902 MHz - 928 MHz

Channels: 4 full channels (7 half channels)

Channel Separation: 3 MHz

Spread Spectrum Method: Direct Sequence

Max RF Peak Power Output: conducted 115 mW(20.6 dBm) (Highest ERP 21.7 dBm)

Antennas: Centurion, Dualband MicroBlade, MAF 90007  
880-960 MHz, Peak Gain (Max) 3.2 dBi

Sinclair, Ground Plane Omni antenna SG401-SF2SNM  
890-960 MHz, Gain 2.1 dBi

Ports/Connector(s): N/A

Frequencies evaluated 906 MHz (Low)  
915 MHz (Median)  
924 MHz (High)

## Introduction

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## FCC SUBMISSION INFORMATION

**FCC ID:** **QVJSAP300**

Equipment, (Type): **Access Point 300(Direct Sequence Spread Spectrum System) 902 MHz - 928 MHz RF Band**  
As marketed

Model: **S-AP-300**

For: **Class II Permissive Change**

Complies to: **FCC Rules Part 15.247, 15.205, 15.207, 15.209, 15.109, 15.107**

Applicant: **FleetMind Solutions  
455 Fenalon, Suite 110  
Dorval, Quebec, H9S 5T8**

Evaluated by: **APREL Laboratories  
51 Spectrum Way  
Nepean, Ontario  
Canada K2R 1E6**

FMSB-Access Point-5164

Page 7

## Introduction

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Test Description

And

## Measurement Results

**Access Point 300, S-AP-300**

**FLEETMIND**

FMSB-Access Point-5164

Page 8

## Introduction

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Section A

### Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

---

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Reference:** FCC Part 15.207/Industry Canada RSS 210, 6.6 (a)

**Criteria:** For an intentional radiator, which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits shown in the following table. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

**Condition:** Conducted Test

**Set-up:** Test setup from Figure a1 was used.

**Equipment:** See Appendix A

**Methodology:** See page 3

Frequency of Emissions (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the Frequency		

## Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300

Client: FleetMind Solutions

Product: Access Point 300, Model: S-AP-300

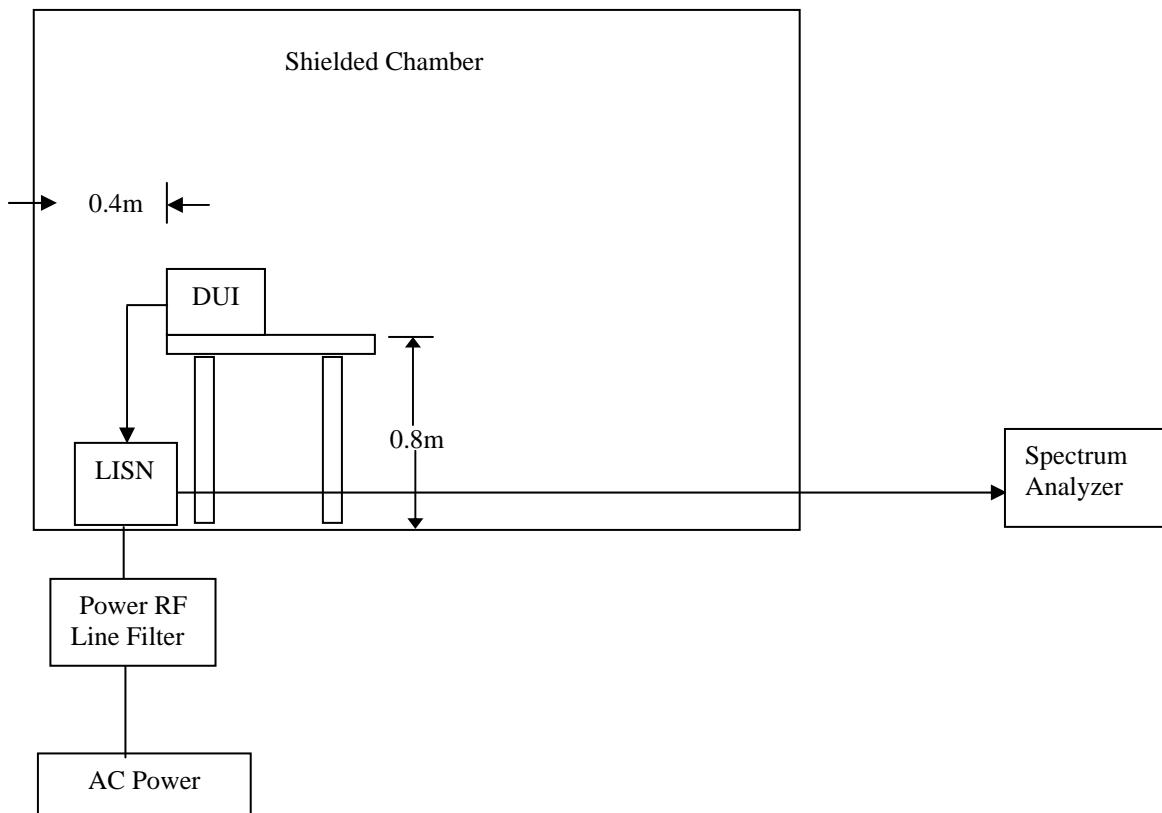


Figure a1: Conducted Emissions on Power Lines - Testing Setup

## Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

---

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

### Methodology:

Measurement of conducted emissions was carried out according to the description of ANSI C63.4-1992 paragraph 7.2, TableTop Equipment, Sec. 6.2.1.

Conducted power-line measurements were made over the frequency range from 150 kHz to 30 MHz, to determine the line-to-ground radio noise voltage that is conducted from the unit power line-input terminals that are directly (or indirectly via separate transformers power supplies) connected to a public power network.

The power-input leads of the wall mount power supply were connected to the Line Impedance Stabilization Network (LISN) using the 50 ohms/50 micro henry CISPR network. The LISN and the Unit were connected and positioned as shown in Figure 1.

Measurements were performed using the spectrum analyzer with quasi-peak and average function and 9kHz resolution bandwidth. Specific peaks were measured from the continuous plots.

The rear of the unit and peripherals were aligned and flush with the rear of the tabletop. The rear of the tabletop was 40 cm removed from the vertical conducting (shielded room) wall.

In order to find out the maximum emission, the preliminary test and a final test were performed.

The preliminary investigation was performed through the whole specified frequency range of 150kHz – 30MHz in a single scan, to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration.

The specified frequency range was then divided into several sub-divisions having narrow span in which frequencies and the levels of the interfering signals could be observed more accurately. Changing the typical cable positions or cable manipulation under the typical system configuration maximized the maximum emission in the each sub-divided frequency band. The level and the frequencies at the points, which were

## Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

---

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

regarded as relatively high emission in the sub-band, was measured and recorded. This step was repeated for all sub bands.

Based on the collected results, and the operation mode produced the maximum emission was selected and recorded in the report.

*Note:* The tests Power lines Conducted Emissions were performed using both power supplies as shown in tables 1-8. Although, the user can use either 24 V or 12 V power supply, power delivered to the RF circuitry is internally regulated and limited to 5 V only, as such RF test results presented are from a single power supply. Spot checks were made using different power supply and RF test data showed no differences.

### **Test Results:**

Test Data is tabulated in Tables 1 to 8. Only the highest measured values are presented in each table. Plots are shown in Graphs 1 to 14.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**TABLE 1**
**CONDUCTED R.F. EMISSION LEVELS**  
24 Volts, Line: LIVE, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>  <b>“C5”</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.443	42.6	134.9	57.0	708	14.4
0.150	51.1	358.9	66.0	1995	14.9
0.679	34.9	55.6	56.0	631	21.1
0.971	31.5	37.6	56.0	631	24.5
9.818	31.3	36.7	60.0	1000	28.7
2.183	24.0	15.8	56.0	631	32.0
14.423	27.5	23.7	60.0	1000	32.5
1.214	23.4	14.8	56.0	631	32.6
1.041	23.1	14.3	56.0	631	32.9

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

Table 2  
CONDUCTED R.F. EMISSION LEVELS  
24 Volts, Line: LIVE, Detection: Average  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.970	27.7	24.3	56.0	631	28.3
9.818	27.1	22.6	60.0	1000	32.9
1.212	20.3	10.4	56.0	631	35.7
8.000	24.2	16.2	60.0	1000	35.8
2.182	18.7	8.6	56.0	631	37.3
14.420	22.2	12.9	60.0	1000	37.8
0.680	17.1	7.2	56.0	631	38.9
14.472	21.1	11.4	60.0	1000	38.9
5.091	20.2	10.2	60.0	1000	39.8

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**

**Table 3**  
**CONDUCTED R.F. EMISSION LEVELS**  
24 Volts, Line: NEUTRAL, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.849	44.6	169.8	56.0	631	11.4
0.150	50.7	342.8	66.0	1995	15.3
0.409	37.8	77.6	57.7	764	19.9
0.970	32.0	39.8	56.0	631	24.0
0.728	31.6	38.0	56.0	631	24.4
0.652	30.5	33.5	56.0	631	25.5
1.213	25.6	19.1	56.0	631	30.4
2.062	25.6	19.1	56.0	631	30.4
2.182	24.9	17.6	56.0	631	31.1

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**

**Table 4**  
**CONDUCTED R.F. EMISSION LEVELS**  
24 Volts, Line: NEUTRAL, Detection: Average  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.848	40.9	110.9	56.0	631	15.1
0.970	28.5	26.6	56.0	631	27.5
0.730	23.7	15.3	56.0	631	32.3
1.212	22.5	13.3	56.0	631	33.5
2.060	20.6	10.7	56.0	631	35.4
2.182	20.0	10.0	56.0	631	36.0
1.818	18.3	8.2	56.0	631	37.7
1.091	17.9	7.9	56.0	631	38.1
2.303	17.7	7.7	56.0	631	38.3

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**

**Table 5**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: LIVE, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.598	36.2	64.6	56.0	631	19.8
0.150	40.0	100.0	66.0	1995	26.0
13.343	29.6	30.2	60.0	1000	30.4
2.063	23.5	15.0	56.0	631	32.5
9.575	25.3	18.4	60.0	1000	34.7
13.447	23.8	15.5	60.0	1000	36.2
25.333	23.7	15.3	60.0	1000	36.3
4.000	19.1	9.0	56.0	631	36.9
27.271	22.8	13.8	60.0	1000	37.2

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

Table 6  
CONDUCTED R.F. EMISSION LEVELS  
12 Volts, Line: LIVE, Detection: Average  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.607	20.9	11.1	56.0	631	35.1
13.447	23.8	15.5	60.0	1000	36.2
13.397	23.6	15.1	60.0	1000	36.4
13.342	23.4	14.8	60.0	1000	36.6
13.288	23.2	14.5	60.0	1000	36.8
13.657	22.8	13.8	60.0	1000	37.2
2.060	18.1	8.0	56.0	631	37.9
13.814	21.5	11.9	60.0	1000	38.5
9.576	20.1	10.1	60.0	1000	39.9

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**

**Table 7**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: NEUTRAL, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>  “C5”
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.849	37.3	73.3	56.0	631	18.7
0.786	33.9	49.5	56.0	631	22.1
0.728	33.7	48.4	56.0	631	22.3
0.490	32.0	39.9	56.2	643	24.1
0.970	28.9	27.9	56.0	631	27.1
0.150	38.7	86.1	66.0	1995	27.3
1.213	23.5	15.0	56.0	631	32.5

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Transmitter AC Wireline) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**

**Table 8**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: NEUTRAL, Detection: Average  
Resolution Bandwidth: 9 kHz

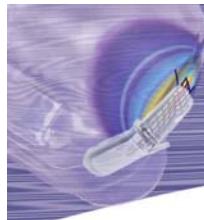
Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.848	33.0	44.7	56.0	631	23.0
0.784	26.5	21.1	56.0	631	29.5
0.970	24.8	17.4	56.0	631	31.2
0.728	24.4	16.6	56.0	631	31.6
1.213	19.4	9.3	56.0	631	36.6
9.819	22.5	13.3	60.0	1000	37.5
13.553	22.2	12.9	60.0	1000	37.8
13.816	20.5	10.6	60.0	1000	39.5
1.453	15.7	6.1	56.0	631	40.3

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

Tested by \_\_\_\_\_

date June 1/05



## Maximum Peak Power Output

---

*FCC ID: QVJSAP300Client*

*Client : FleetMind Solutions*

*Product: Access Point 300, Model: S-AP-300*

## Section B

### Test: Maximum Peak Power Output

---

FMSB-Access Point-5164

Page 22

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2005 APREL Laboratories

[www.aprel.com](http://www.aprel.com)  
info@aprel.com

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories

## Maximum Peak Power Output

**FCC ID: QVJSAP300Client**

**Client : FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Ref.:** FCC Part 15.247(b)(1)

**Criteria:** The maximum peak output power shall not exceed 1 watt (30 dBm). If directional transmitting antennas with a gain of more than 6 dB are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB.

**Condition:** Conducted Test

**Procedure:** The maximum peak output RF power was measured by conducted method. The DUI was configured to operate at maximum power and the antenna port was connected to the spectrum analyzer via cable. Tests were done for Low (906.0MHz), Medium (915.0MHz) and High (924.0MHz) channels. Results are shown in table c1.

The spectrum analyzer settings were adjusted as follows:

Resolution BW:	3 MHz
Video BW:	3 MHz
Span:	5.0 MHz
Reference Level:	30.0 dBm
Sweep Time:	20 ms
Attenuator:	50 dB
Detector Function	Peak

**Equipment:** See Appendix A.

**Test Set-ups:** See Figure No. c1.



**Figure c1:** Test set up for the Conducted Power Measurement

## Maximum Peak Power Output

**FCC ID: QVJSAP300Client**  
**Client : FleetMind Solutions**  
**Product: Access Point 300, Model: S-AP-300**

### Test Results:

**Table c1**  
**Maximum Peak Output RF Power: Conducted**

FREQ (MHz)	Channel	Measured Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Output Power (mW)	Limit (dBm)	Margin (dB)	Pass/Fail
906.0	Low	20.1	0.5	20.6	115	30.0	9.4	Pass
915.0	Medium	19.7	0.5	20.2	105	30.0	9.8	Pass
924.0	High	18.9	0.5	19.4	87.1	30.0	10.6	Pass

**Conclusion:** Pass. Since the gains of the antennas specified by manufacturer do not exceed 6.0 dBi there was no need to reduce the output power.

### ERP values:

	Centurion MicroBlade Antenna	Sinclair Ground Plane Omni Antenna
906MHz	21.7dBm	20.6dBm
915MHz	21.3dBm	20.2dBm
924MHz	20.5dBm	19.4dBm

Highest ERP 21.7 dBm

FMSB-Access Point-5164

## Maximum Peak Power Output

**FCC ID: QVJSAP300Client**

**Clien : FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Pictures of Test Set-up

FMSB-Access Point-5164

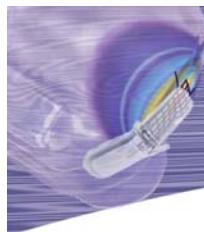
Page 25

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2005 APREL Laboratories

[www.aprel.com](http://www.aprel.com)  
info@aprel.com

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories



## Maximum Peak Power Output

**FCC ID: QVJSAP300Client**

**Clien : FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**



### FleetMind – Access Point Maximum Peak Output RF Power Measurement (Conducted)

FMSB-Access Point-5164

## Antenna Requirements

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Section C

### Antenna Requirements

---

FMSB-Access Point-5164

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2004 APREL Laboratories

Page 27  
[www.aprel.com](http://www.aprel.com)  
[info@aprel.com](mailto:info@aprel.com)

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories

## Antenna Requirements

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Ref.:** FCC Part 15.203

**Criteria:** An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the applicant can be used with the device. The use of a permanently attached antenna or of an antenna that used a unique coupling to the intentional radiator shall be sufficient to comply with this requirement.

**Result:** The FleetMind Access Point 300 complies with the requirement of 15.203. Both antennas use unique coupling methods, the connector is located inside the box and the antenna cable is routed out of the box through a hole. Cable connector can not be accessed from outside. At the other end, the cable is permanently connected to the antenna. The box cover is attached with the base by 14 unique screws making it difficult to open.

**Note:** Two antennas were tested for this Class II Permissive Change application; but only one of which will be used in any given installation.

**Antennas:** Centurion, Dualband MicroBlade, MAF 90007  
880-960 MHz, Peak Gain (Max) 3.2 dBi

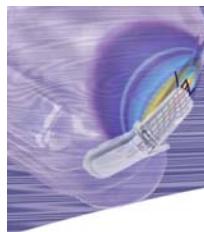
Sinclair, Ground Plane Omni antenna SG401-SF2SNM  
890-960 MHz, Gain 2.1 dBi

**Conclusion:** The unit meets the Antenna requirements of 15.203

**Condition:** See Criteria

**Set-up:** N/A

**Equipment:** N/A

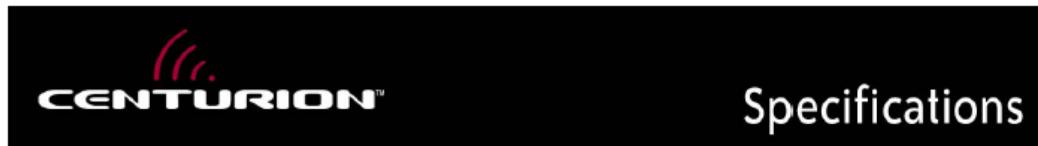


## Antenna Requirements

FCC ID: QVJSAP300

Client FleetMind Solutions

Product: Access Point 300, Model: S-AP-300



### Dualband MicroBlade™

#### Telematics Antenna - GSM & DCS

## Specifications

Part Number (P/N):

MAF90002

MAF90004

### Specifications:

- Slim flexible design for easy integration into automotive vehicles
- Sleek durable housing for longer lifespan
- Great for data over voice applications

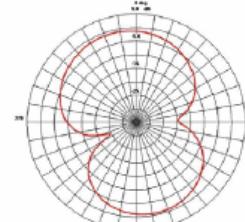
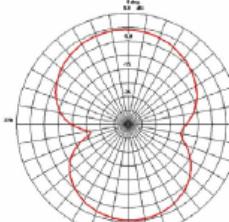
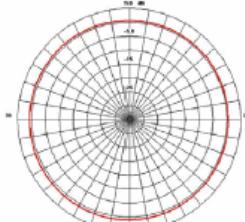
	GSM	DCS
Element Type	PCB	PCB
Frequency Ranges	880 - 960 MHz	1710 - 1880 MHz
Peak Gain (Max)	3.2 dBi	2.4 dBi
Polarization	Linear	
Impedance	50 ohms	
Input Power (Max)	10 watts	
VSWR (Min performance)	< 2.0:1	
Input Connection	Semi-rigid Cable	
Dimensions (L x W)	143 x 27 mm	
Cover	Polyolefin	



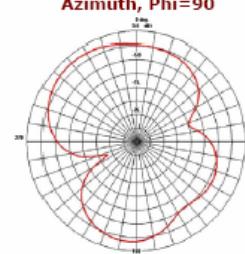
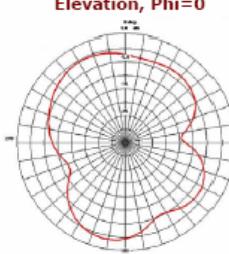
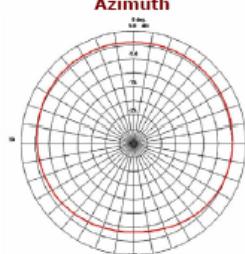
### Cables & Connectors:

Part Number	Cable	Connector
MAF90002	3 m Black RG-174 Coax	SMA - Male
MAF90004	9" Black RG-174 Coax	Straight MCX Plug

GSM  
880 MHz



DCS  
1785 MHz



Specifications subject to change without notice.

MicroBlade GSM.DCS 2 - 5/31/04



3425 N. 44<sup>th</sup> Street, LINCOLN, NE 68504 USA  
 SALES PHONE: 800.228.4563  
 PHONE: 402.467.4491 • FAX: 402.467.4528  
[www.centurion.com](http://www.centurion.com) • [sales@centurion.com](mailto:sales@centurion.com)  
 Copyright © 2004 Centurion Wireless Technologies, Inc. All Rights Reserved



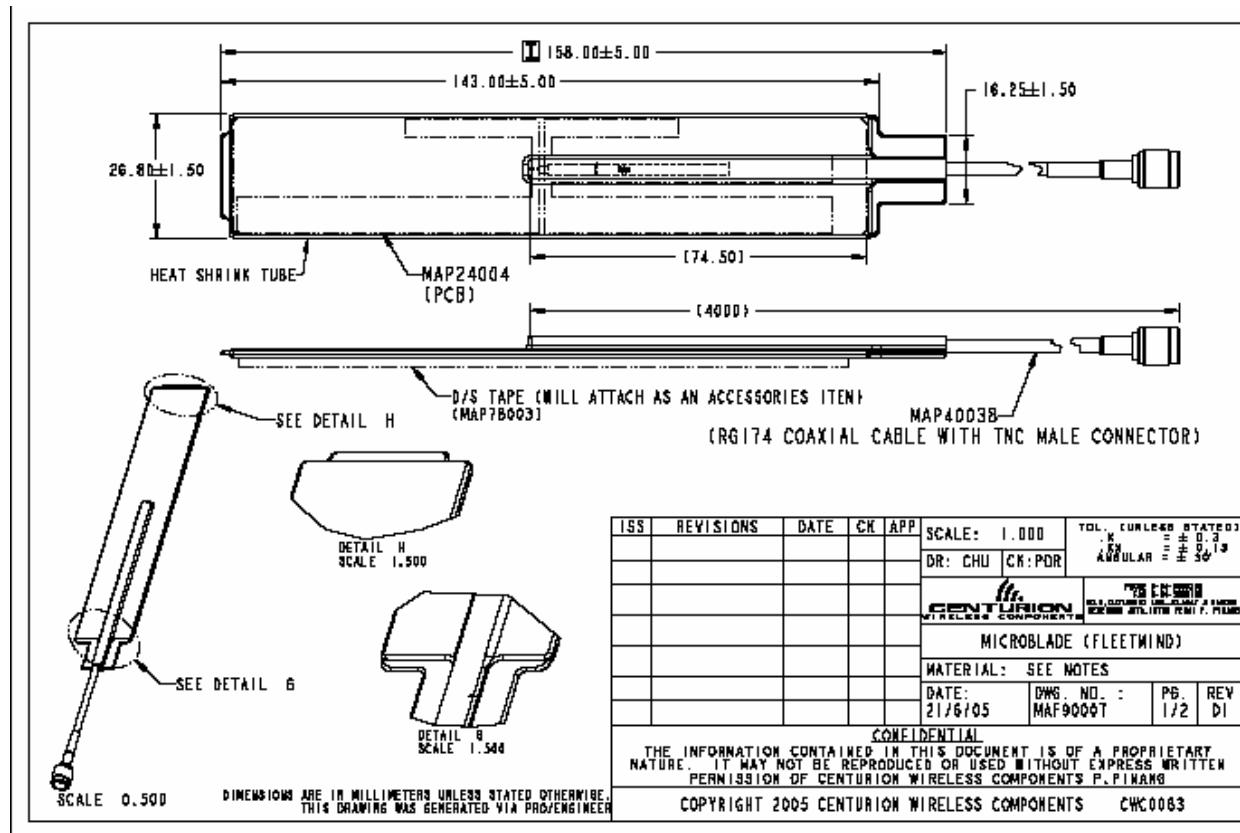
FMSB-Access Point-5164

## Antenna Requirements

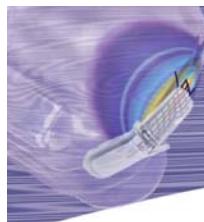
FCC ID: QVJSAP300

Client FleetMind Solutions

Product: Access Point 300, Model: S-AP-300



FMSB-Access Point-5164



## Antenna Requirements

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**



We have you covered.

Antennas - 700-1000 MHz Base Station

SG401 Series

**SG401-SF2SNM**

(SRL401NM\*2)

Ground plane omni antenna, 0 dBd gain, 890-960 MHz

- Rugged construction, light weight and easy to install
- Can be stocked for reuse due to it's broad band
- 2 clamps provided



### Electrical Specifications

Frequency range	MHz	890 to 960
Gain	dBd (dBi)	unity (2.1)
Polarization		omnidirectional
Input VSWR (max)		1.5:1
Polarization		vertical
Horizontal beamwidth	degrees	360
Vertical beamwidth	degrees	80
Average power input (max)	W	100
Lightning protection		DC ground
Connector		N Male

### Mechanical Specifications

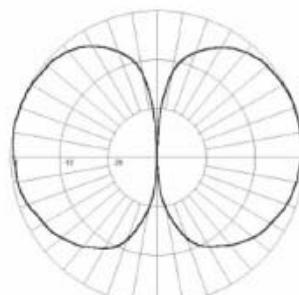
Height	in (mm)	21 (533)
Weight	lbs (kg)	1 (0.5)
Mounting hardware	Clamps supplied	

### Environmental Specifications

Survival wind velocity (no ice)	mph (km/h)	175 (282)
Survival wind velocity (1/2" radial ice)	mph (km/h)	140 (225)
Rated wind velocity (no ice)	mph (km/h)	150 (242)
Rated wind velocity (1/2" radial ice)	mph (km/h)	110 (177)
Lateral thrust (100mph)	lbs (N)	12.3 (54.7)
Temperature range	°F (°C)	-40 to +140 (-40 to +60)

### Ordering Information

Specify frequency of operation.



Elevation

## Radiated Spurious Emissions & Restricted Bands

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Section D

### Test: Radiated Spurious Emissions & Restricted Bands

---

FMSB-Access Point-5164

Page 31

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2004 APREL Laboratories

[www.aprel.com](http://www.aprel.com)  
info@aprel.com

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Ref.:** FCC Part 15.247 (c), 15.205

**Criteria:** 1) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required.

2) **Restricted Bands:** In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Condition:** Conducted & Radiated Tests

**Set-up:** See Figure 1 and figure 2

**Equipment:** See Appendix A

**Methodology:** 1) **RF Antenna Conducted Test:** The DUI was configured to operate at maximum power and with the frequency which has the highest emission level. The DUI antenna port was connected to the spectrum analyser via RF cable.

Set the spectrum analyser as following: RBW = 100KHz, VBW = 300KHz, scan up through 10<sup>th</sup> harmonic. Record observable harmonics and spurs.

2) **Tests for Restricted Bands:** The preliminary radiated emission measurement was performed according to the description of ANSI C63.4 – 1992 Sec.8.3.1.1 in a semi anechoic shielded room in order to determine the characteristic frequencies of the radiation and record all frequencies that fall into the restricted bands.

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

Based on this information, measurements were performed in the open area test site at these characteristic frequencies. APREL Open Area Test Site is calibrated to ANSI C63.4-1992 and is filed with FCC. The test site is characteristically flat, free of reflecting structures. All reflecting objects, including test personnel, lie outside the perimeter of the ellipse (defined in ANSI C63.4-1992) or below the ground plane level. The horizontal and vertical site attenuation measurements are within  $\pm 4$  dB of the theoretical site attenuation of an ideal site. The DUI was placed on a turntable positioned 3 meters away from the receiving antenna, which in turn was connected to the spectrum analyzer. The DUI was operated in a manner that produced the highest emissions.

For each characteristic frequency, the received signal was maximized by appropriate positioning of the turntable and the height of the receiving antenna. The height of the antenna was adjusted between 1 m and 4 m in height above the ground plane. The turntable was rotated 360° from a remote control to maximize the emissions. The process was repeated for both horizontal and vertical polarization. All cables were arranged for maximum emission.

Radiated RF emission levels measured were identified as having been emitted by the DUI. Measurements were performed using the spectrum analyzer employing a CISPR quasi-peak detector function and 120 kHz bandwidth on frequencies from 30 MHz to 960 MHz, and for frequencies above 960 MHz employing an average detector function and 1 MHz resolution bandwidth. All measurements were performed at discrete frequencies.

### **Block Diagram:**

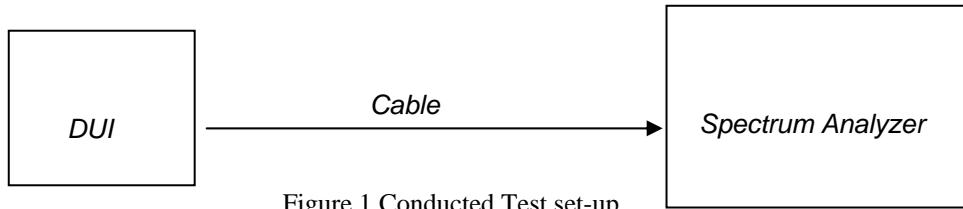
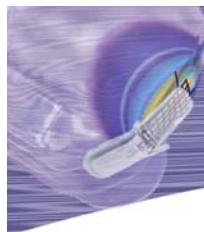


Figure 1 Conducted Test set-up



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Table 1:** Restricted Bands per §15.205

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	Above 38.6
13.36 - 13.41			

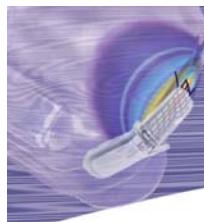
**Table 2:** Radiated Emission Limits per §15.209

Frequency (MHz)	Field Strength ( $\mu$ V/m)	Field Strength ( $\text{dB}\mu\text{V/m}$ )	(meters)
0.009 – 0.490	$2400/F_{(\text{kHz})}$	$20 \cdot \log_{10}(2400/F_{(\text{kHz})})$	300
0.490 – 1.705	$24000/F_{(\text{kHz})}$	$20 \cdot \log_{10}(24000/F_{(\text{kHz})})$	30
1.705 – 30.00	30	29.5	30
30.0 – 88.0	100	40.0	3
88.0 – 216.0	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3

**Note:** The emissions from an intentional radiator, which fall in the restricted bands as shown in table 1, shall not exceed the field strength levels specified in table 2.

FMSB-Access Point-5164

Page 34



## Radiated Spurious Emissions & Restricted Bands

FCC ID: QVJSAP300

Client FleetMind Solutions

Product: Access Point 300, Model: S-AP-300

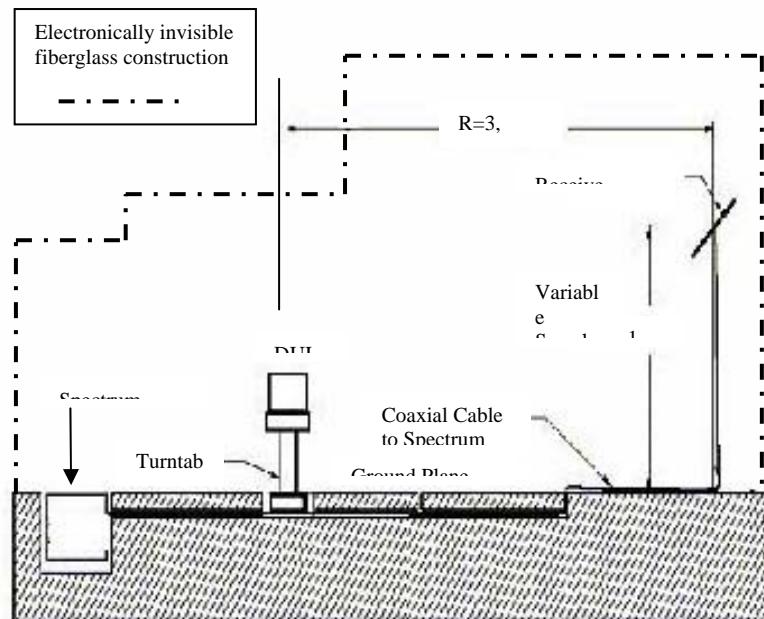


Figure 2.a: Test set up for the radiated emission measurement in OATS (not to scale)



Figure 2.b: APREL Laboratories all season Open Area Test Site (OATS)

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Test Results:** Test data is tabulated in Tables 3 and 4

**Table 3 RF Antenna Port Emissions: Conducted**

**Frequency: 915MHz (highest emissions)**

Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Emissions (dBm)	Limit (dBm)	Margin (dB)
<b>Harmonics</b>					
915.0	14.4	2.0	16.4		Reference
1830.0	-29.5	2.7	-26.8	-3.6	23.2
2745.0	-37.3	3.4	-33.9	-3.6	30.3
3660.0	-57.2	4.1	-53.1	-3.6	49.5
4575.0	-63.8	4.7	-59.1	-3.6	55.5
5490.0	-64.2	5.4	-58.8	-3.6	55.2
<b>Spurious</b>					
64.0	-55.6	0.7	-54.9	-3.6	51.3
72.0	-50.8	0.7	-50.1	-3.6	46.5
80.0	-55.1	0.7	-54.4	-3.6	50.8
104.0	-50.5	0.8	-49.7	-3.6	46.1
120.0	-47.1	0.9	-46.2	-3.6	42.6
136.0	-46.0	0.9	-45.1	-3.6	41.5
160.0	-48.9	1.0	-47.9	-3.6	44.3
168.0	-49.3	1.0	-48.3	-3.6	44.7
240.0	-41.0	1.1	-39.9	-3.6	36.3
248.0	-42.2	1.1	-41.1	-3.6	37.5
256.0	-45.0	1.1	-43.9	-3.6	40.3
272.0	-43.7	1.2	-42.5	-3.6	38.9
296.0	-43.2	1.2	-42.0	-3.6	38.4

Note: The limit for harmonics and spurious signals is 20 dB below the fundamental signal which is 16.4 dBm. Therefore the limit is  $16.4 - 20.0 = -3.6$  dBm.

FMSB-Access Point-5164

Page 36

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Table 4.a Restricted Bands Emissions**

**FleetMind – Access Point**

**Radiated Emissions from Transmitter**

**Frequency: 915MHz , Distance: 3.0 m**

**Polarization: Vertical**

Frequency (MHz)	Reading (dB $\mu$ V)	Correction (dB/m)	Field-strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
248.00	13.0	16.3	29.3	46.0	16.7
256.00	16.2	16.5	32.7	46.0	13.3
272.00	15.6	16.8	32.4	46.0	13.6
280.00	18.5	17.0	35.5	46.0	10.5

**Table 4.b Restricted Bands Emissions**

**FleetMind – Access Point**

**Radiated Emissions from Transmitter**

**Frequency: 915MHz , Distance: 3.0 m**

**Polarization: Horizontal**

Frequency (MHz)	Reading (dB $\mu$ V)	Correction (dB/m)	Field-strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
248.00	15.3	16.3	31.6	46.0	14.4
256.00	15.4	16.5	31.9	46.0	14.1
272.00	17.6	16.8	34.4	46.0	11.6
280.00	20.5	17.0	37.5	46.0	8.5

**Notes:**

1. The spectrum was scanned from 9 kHz to 10<sup>th</sup> harmonic and the worst-case emissions are reported.
2. All conducted harmonics and spurious signals were at least 20 dB below the highest emission level within the authorized band as measured with a 100 kHz Resolution Bandwidth.

FMSB-Access Point-5164

Page 37

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

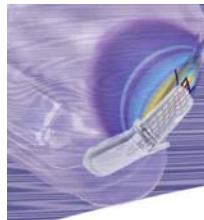
**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

3. All radiated spurious signals in the restricted bands specified in §15.205 were below the limits listed in Table 2.
4. There were no radiated fundamental signals and harmonics observed within the restricted bands specified in §15.205.
5. The band-edge requirements are not applicable.

*Note:* The tests for restricted bands were performed using both antennas; the delta between the two results obtained from the two antennas were negligible, as such only the results from one antenna is presented.

**Conclusion:** The unit complies with the requirements.



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Pictures of Test Set-up

FMSB-Access Point-5164

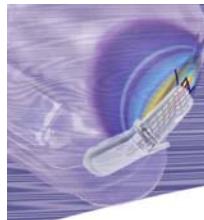
Page 39

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2004 APREL Laboratories

[www.aprel.com](http://www.aprel.com)  
info@aprel.com

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

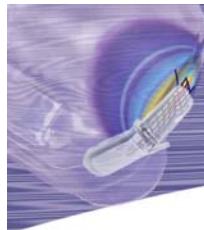
**Product: Access Point 300, Model: S-AP-300**



**FleetMind – Access Point (DUI)**

FMSB-Access Point-5164

Page 40



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

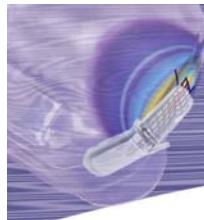


### FleetMind – Access Point

**Spurious Emissions from Transmitter - Conducted**  
**Frequency Range: 9KHz – 10GHz**

FMSB-Access Point-5164

Page 41



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

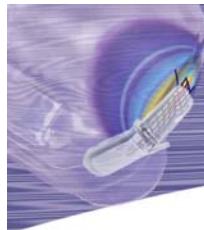


### FleetMind – Access Point with Sinclair Ground plane omni antenna

#### Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 42

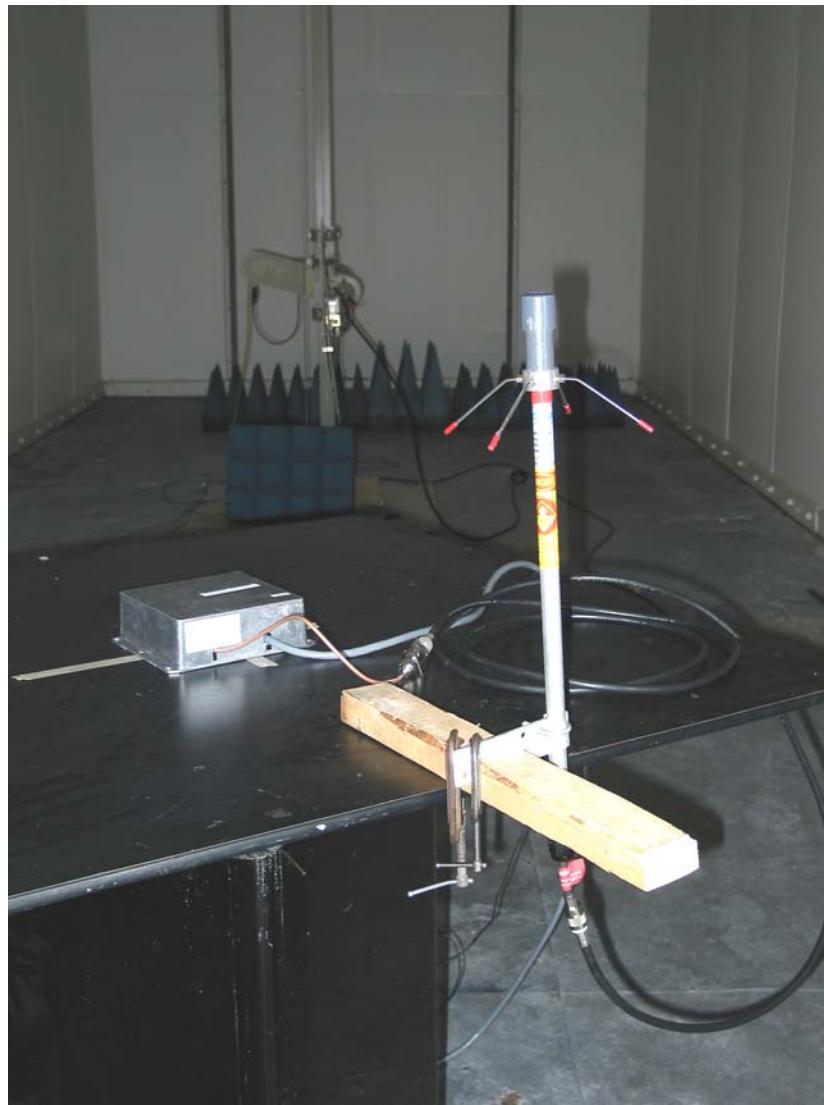


## Radiated Spurious Emissions & Restricted Bands

FCC ID: QVJSAP300

Client FleetMind Solutions

Product: Access Point 300, Model: S-AP-300

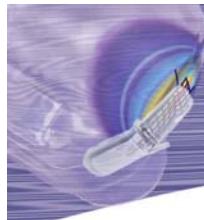


FleetMind – Access Point with Sinclair Ground plane omni antenna

Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 43

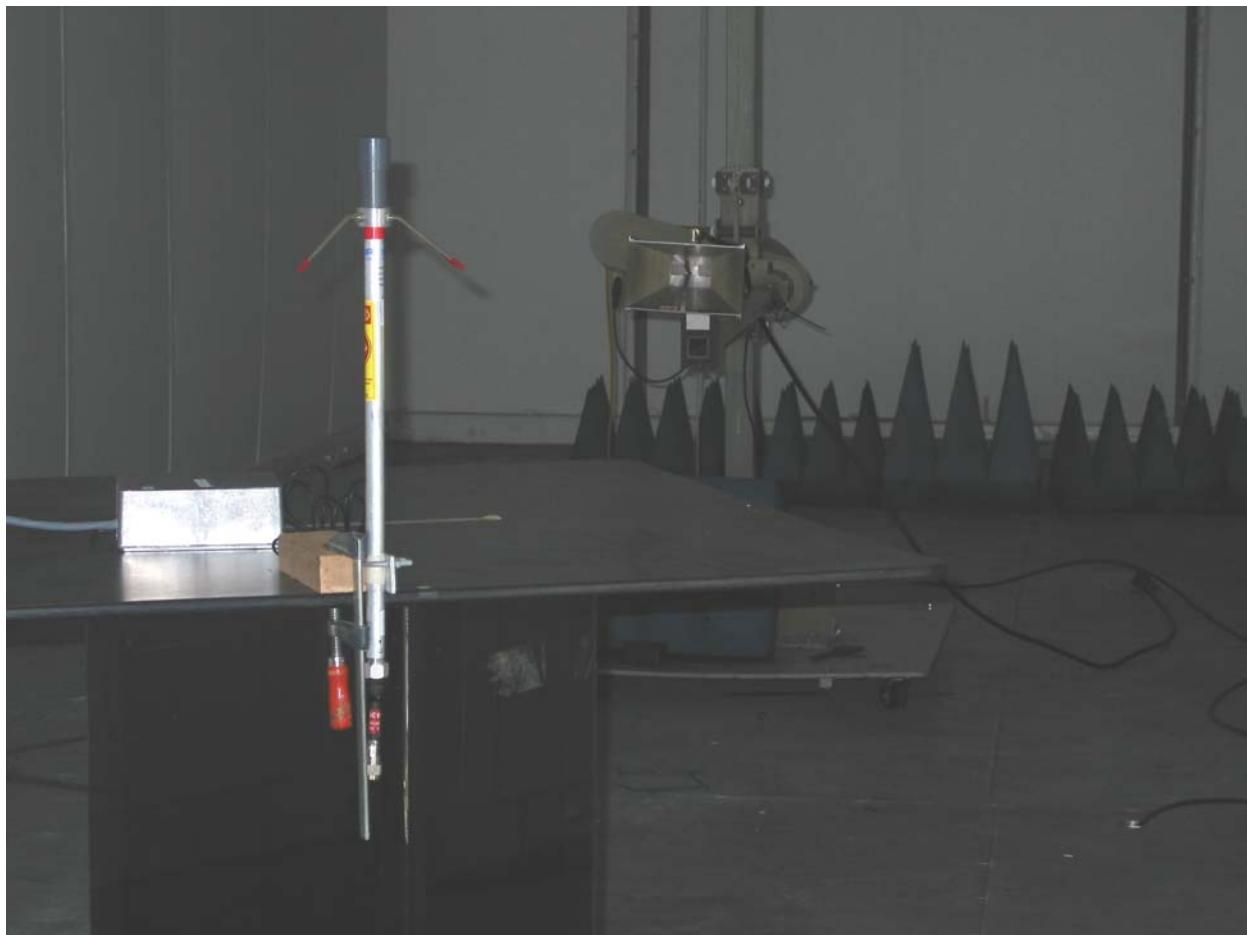


## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

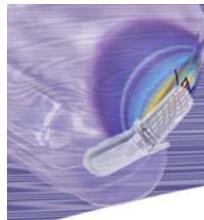


**FleetMind – Access Point with Sinclair Ground plane omni antenna**

**Testing for Radiated Emissions from Transmitter**

FMSB-Access Point-5164

Page 44



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

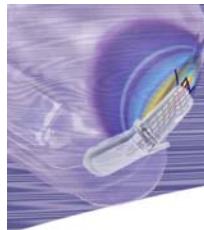


**FleetMind – Access Point with Sinclair Ground plane omni antenna**

**Testing for Radiated Emissions from Transmitter**

FMSB-Access Point-5164

Page 45



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

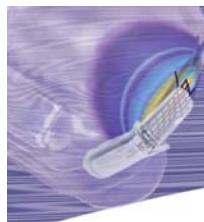


### FleetMind – Access Point with Centurion MicroBlade Antenna MAF90002

#### Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 46



## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

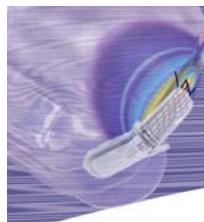


### FleetMind – Access Point with Centurion MicroBlade Antenna MAF90002

#### Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 47

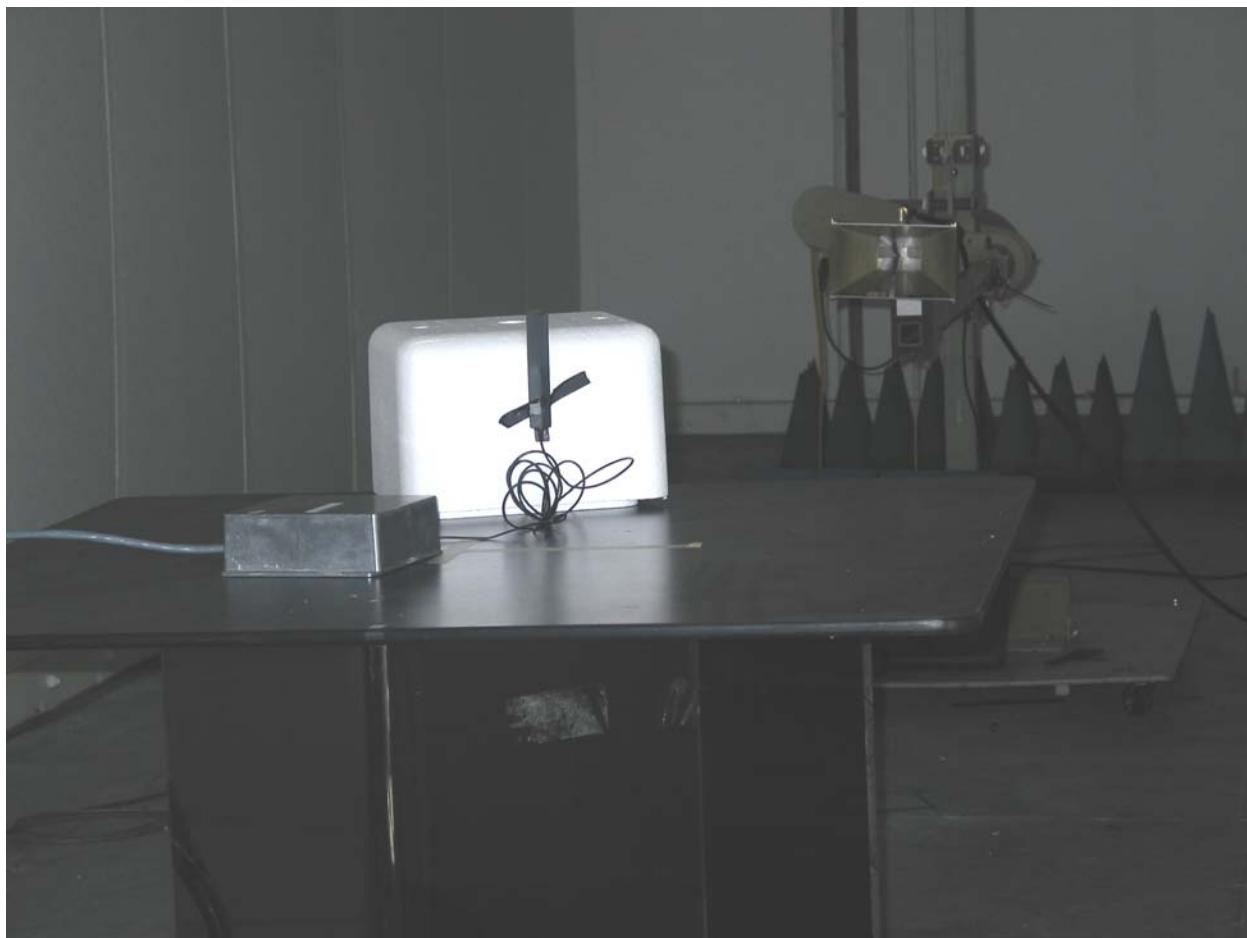


## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

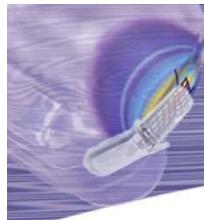


### FleetMind – Access Point with Centurion MicroBlade Antenna MAF90002

#### Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 48

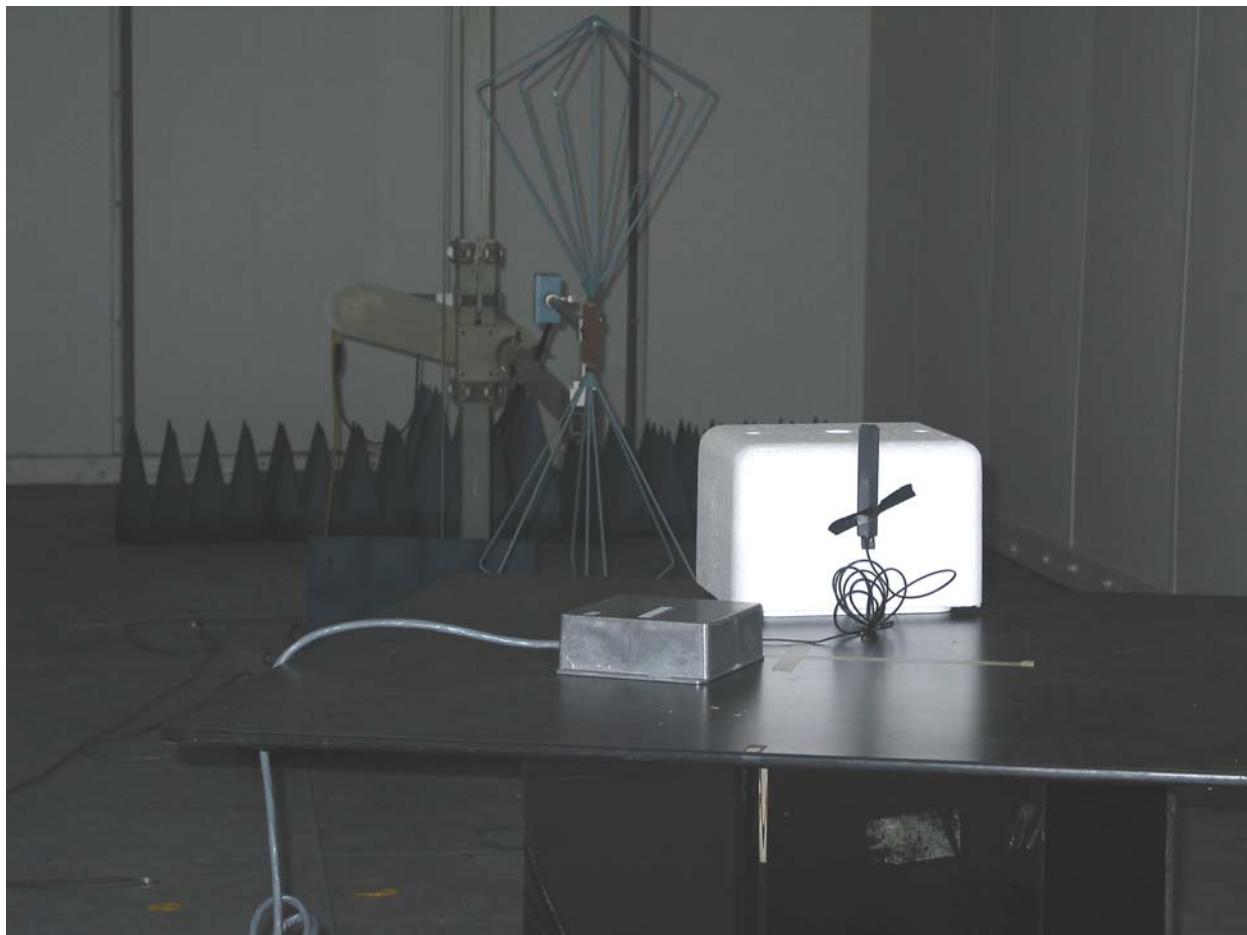


## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**



### FleetMind – Access Point with Centurion MicroBlade Antenna MAF90002

#### Testing for Radiated Emissions from Transmitter

FMSB-Access Point-5164

Page 49

## Radiated Spurious Emissions & Restricted Bands

---

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## Appendix A

## List of Equipment

FMSB-Access Point-5164

Page 50

51 Spectrum Way  
Ottawa ON Canada K2R 1E6  
© 2004 APREL Laboratories

[www.aprel.com](http://www.aprel.com)  
info@aprel.com

Phone (613) 820-2730  
Fax (613) 820-4161

This report shall not be reproduced, except in full, without the express written approval of APREL Laboratories

## Radiated Spurious Emissions & Restricted Bands

**FCC ID: QVJSAP300**

**Client FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

### List of Equipment

Description	Range	Manufacturer	Model #	APREL Asset #	Cal. Due Date
Spectrum Analyzer	9 kHz - 3 GHz	Anritsu	MS2661C	301330	Sept. 11, 2005
Spectrum Analyzer	9 kHz - 30 GHz	Anritsu	MS2667C	301386	Sept.5, 2005
Biconical Antenna	20 MHz - 200 MHz	Eaton	94455-1	100890	July 18, 2005
Log - Periodic Antenna	200 MHz -1.0 GHz	Eaton	ALP-1	100063	July 31, 2005
Horn Antenna	1 – 18 GHz	APREL Inc.	AA – 118	100553	June 17, 2005
Anechoic Shielded Room	10 kHz - 10 GHz	APREL Inc.	–	301329	N/A
OATS	30 MHz – 1 GHz	APREL Inc.	3 m & 10 m	N/A	N/A
Mast with the Controller	1 m – 4 m	EMCO	1051 – 12	100507	N/A
Turntable with the Controller	0° - 360°	EMCO	1060 – 1.241	100506	N/A

Calibration verified by \_\_\_\_\_

date June 1 /05

FMSB-Access Point-5164

Page 51

**Test: Power Lines (Receive Mode) Conducted Emissions**

---

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

## **Appendix B**

### **Test Results**

### **Power Lines (Receive Mode) Conducted Emissions**

## Test: Power Lines (Receive Mode) Conducted Emissions

---

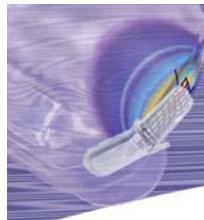
**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

**Reference:** FCC Part 15.107

There is virtually no difference between the results found between the transmit and receive mode.



## Test: Power Lines (Receive Mode) Conducted Emissions

FCC ID: QVJSAP300

Client: FleetMind Solutions

Product: Access Point 300, Model: S-AP-300

FCC Part 15.107

TABLE 1

CONDUCTED R.F. EMISSION LEVELS  
24 Volts, Line: LIVE, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.443	42.6	134.9	57.0	708	14.4
0.150	51.1	358.9	66.0	1995	14.9
0.679	34.9	55.6	56.0	631	21.1
0.971	31.5	37.6	56.0	631	24.5
9.818	31.3	36.7	60.0	1000	28.7
2.183	24.0	15.8	56.0	631	32.0
14.423	27.5	23.7	60.0	1000	32.5
1.214	23.4	14.8	56.0	631	32.6
1.041	23.1	14.3	56.0	631	32.9

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**

**FCC ID: QVJSAP300**

**Client: FleetMind Solutions**

**Product: Access Point 300, Model: S-AP-300**

FCC Part 15.107

Table 2

**CONDUCTED R.F. EMISSION LEVELS**

24 Volts, Line: LIVE, Detection: Average

Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.970	27.7	24.3	56.0	631	28.3
9.818	27.1	22.6	60.0	1000	32.9
1.212	20.3	10.4	56.0	631	35.7
8.000	24.2	16.2	60.0	1000	35.8
2.182	18.7	8.6	56.0	631	37.3
14.420	22.2	12.9	60.0	1000	37.8
0.680	17.1	7.2	56.0	631	38.9
14.472	21.1	11.4	60.0	1000	38.9
5.091	20.2	10.2	60.0	1000	39.8

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**

**Table 3**  
**CONDUCTED R.F. EMISSION LEVELS**  
24 Volts, Line: NEUTRAL, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.849	44.6	169.8	56.0	631	11.4
0.150	50.7	342.8	66.0	1995	15.3
0.409	37.8	77.6	57.7	764	19.9
0.970	32.0	39.8	56.0	631	24.0
0.728	31.6	38.0	56.0	631	24.4
0.652	30.5	33.5	56.0	631	25.5
1.213	25.6	19.1	56.0	631	30.4
2.062	25.6	19.1	56.0	631	30.4
2.182	24.9	17.6	56.0	631	31.1

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**
**Table 4**
**CONDUCTED R.F. EMISSION LEVELS**  
24 Volts, Line: NEUTRAL, Detection: Average  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.848	40.9	110.9	56.0	631	15.1
0.970	28.5	26.6	56.0	631	27.5
0.730	23.7	15.3	56.0	631	32.3
1.212	22.5	13.3	56.0	631	33.5
2.060	20.6	10.7	56.0	631	35.4
2.182	20.0	10.0	56.0	631	36.0
1.818	18.3	8.2	56.0	631	37.7
1.091	17.9	7.9	56.0	631	38.1
2.303	17.7	7.7	56.0	631	38.3

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**

**Table 5**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: LIVE, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.598	36.2	64.6	56.0	631	19.8
0.150	40.0	100.0	66.0	1995	26.0
13.343	29.6	30.2	60.0	1000	30.4
2.063	23.5	15.0	56.0	631	32.5
9.575	25.3	18.4	60.0	1000	34.7
13.447	23.8	15.5	60.0	1000	36.2
25.333	23.7	15.3	60.0	1000	36.3
4.000	19.1	9.0	56.0	631	36.9
27.271	22.8	13.8	60.0	1000	37.2

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**
**Table 6**
**CONDUCTED R.F. EMISSION LEVELS**
**12 Volts, Line: LIVE, Detection: Average  
Resolution Bandwidth: 9 kHz**

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b>  “C5”
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.607	20.9	11.1	56.0	631	35.1
13.447	23.8	15.5	60.0	1000	36.2
13.397	23.6	15.1	60.0	1000	36.4
13.342	23.4	14.8	60.0	1000	36.6
13.288	23.2	14.5	60.0	1000	36.8
13.657	22.8	13.8	60.0	1000	37.2
2.060	18.1	8.0	56.0	631	37.9
13.814	21.5	11.9	60.0	1000	38.5
9.576	20.1	10.1	60.0	1000	39.9

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**

**Table 7**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: NEUTRAL, Detection: Quasi-Peak  
Resolution Bandwidth: 9 kHz

<b>Frequency (MHz)</b>	<b>Measured Level</b>		<b>Limit</b>		<b>Margin (dB)</b> <b>“C5”</b>
	<b>dB<math>\mu</math>V “C1”</b>	<b><math>\mu</math>V</b>	<b>dB<math>\mu</math>V “C3”</b>	<b><math>\mu</math>V</b>	
0.849	37.3	73.3	56.0	631	18.7
0.786	33.9	49.5	56.0	631	22.1
0.728	33.7	48.4	56.0	631	22.3
0.490	32.0	39.9	56.2	643	24.1
0.970	28.9	27.9	56.0	631	27.1
0.150	38.7	86.1	66.0	1995	27.3
1.213	23.5	15.0	56.0	631	32.5

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

**Test: Power Lines (Receive Mode) Conducted Emissions**
**FCC ID: QVJSAP300**
**Client: FleetMind Solutions**
**Product: Access Point 300, Model: S-AP-300**
**FCC Part 15.107**

**Table 8**  
**CONDUCTED R.F. EMISSION LEVELS**  
12 Volts, Line: NEUTRAL, Detection: Average  
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) “C5”
	dB $\mu$ V “C1”	$\mu$ V	dB $\mu$ V “C3”	$\mu$ V	
0.848	33.0	44.7	56.0	631	23.0
0.784	26.5	21.1	56.0	631	29.5
0.970	24.8	17.4	56.0	631	31.2
0.728	24.4	16.6	56.0	631	31.6
1.213	19.4	9.3	56.0	631	36.6
9.819	22.5	13.3	60.0	1000	37.5
13.553	22.2	12.9	60.0	1000	37.8
13.816	20.5	10.6	60.0	1000	39.5
1.453	15.7	6.1	56.0	631	40.3

Margin C5 = C3-C1 in dB

All the above measurements were performed in the shielded room.

Tested by \_\_\_\_\_



date June 1/05