APREL Laboratories

Assessment of Compliance

For

Maximum Permissible Exposure Evaluation with Respect to FCC Rule Part 47CFR §2.1091 and the Standards ANSI/IEEE C95.1-1992 and C95.3-1992

Gemini/PD 800 MHz
Mobile Transceiver with external vehicle-top mounting antenna

Dataradio Incorporated

December 2000

DATB-Gemini/PD Mobile Radio-3636

51 Spectrum Way Nepean ON K2R 1E6
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Engineering Report

Subject: **Maximum Permissible Exposure Evaluation with Respect to FCC Rule Part 47CFR §2.1091 and the standards ANSI/IEEE C95.1-1992 and C95.3-1992**

FCC ID: **EOTGPDB**

Equipment: **Mobile Transceiver with external vehicle-top mounting antenna**

Model: **Gemini/PD 800 MHz**

Client: **Dataradio Incorporated**
5500 Royalmount Avenue, Suite 200
Town of Mount Royal
Quebec, Canada
H4P 1H7

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

Project #: **DATB – GEMINI/PD Mobile Radio - 3636**

Approved by: _____ Date: Feb. 6, 2001
Jay Sarkar:
Technical Director, Standards & Certification

Submitted by: _____ Date: Feb. 6, 2001
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FCC ID: EOTGPDB
Client : Dataradio Inc.
Equipment : Dataradio Gemini/PD Mobile Transceiver equipped with external vehicle-top mounting monopole antenna

ENGINEERING SUMMARY

This report contains the results of the maximum permissible exposure (MPE) evaluation performed on the Dataradio Gemini/PD Mobile Transceiver equipped with an 5dB external vehicle-top mounting antenna. The output power of the unit was set at 40W-peak value running with 25% duty cycle. The antenna was connected to the transmitter via RG-58A/U coaxial cable with 1.66 dB loss. The tests were carried out in accordance with the applicable requirements of FCC rules found in 47CFR §2.1091 and the standards ANSI/IEEE C95.1-1992 and C95.3-1992.

The methodology and results for the test are described in the appropriate section of this report.

The DUI was tested on frequency 812.5125 MHz. The maximum power exposure level measured at 50 cm from the antenna was 0.489 mW/cm^2. Users and installers should be provided with the appropriate operating instructions regarding safe distances and vehicle-mount configurations, for satisfying RF exposure compliance.

FCC SUBMISSION INFORMATION

FCC ID:	**EOTGPDB**
Equipment:	Mobile Transceiver equipped with external vehicle-top mounting antenna
Model:	Gemini/PD 800 MHz
For:	Certification / Class II Permissive Change
Applicant:	**Dataradio Inc.** 5500 Royalmount Ave., Suite 200 Town of Mount Royal Quebec, Canada H4P 1H7
Manufacturer:	**Dataradio Inc.** 5500 Royalmount Ave., Suite 200 Town of Mount Royal Quebec, Canada H4P 1H7
Evaluated by:	**APREL Inc.** 51 Spectrum Way Nepean, Ontario Canada, K2R 1E6

ACRONYMS

DUI	Device Under Investigation
ERP	Effective Radiated Power
FCC	Federal Communications Commission
MPE	Maximum Permissible Exposure
N/A	Not Applicable
NTS	Not To Scale
OATS	Open Area Test Site
OEM	Original Equipment Manufacturer
QA	Quality Assurance

1.0 INTRODUCTION

1.1 General

This report describes the Maximum Permissible Exposure (MPE) tests on an Dataradio Gemini/PD 800MHz Mobile Transceiver equipped with external vehicle-top mounting antenna, the combination hereinafter called the DUI (Device Under Investigation).

1.2 Scope

MPE evaluation was performed on the DUI in accordance with the requirements of the FCC rules for RF compliance found in 47CFR §2.1091 and the standard ANSI/IEEE C95.3-1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave. This Engineering Report contains the following:

- Methodology as to how the tests were performed.
- Test results and analysis.
- Identification of the test equipment used for the testing.
- Test set-up diagram.

1.3 Schedule

The MPE tests were completed on December 16, 2000.

2.0 APPLICABLE DOCUMENTS

FCC Rule Part 47CFR §2.1091

ANSI/IEEE C95.1-1992, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz.

ANSI/IEEE C95.3-1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave.

OET Bulletin 65 (Edition 97-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.

3.0 TEST SAMPLE

The MPE test described in this procedure was performed on:

- Dataradio Gemini/PD Mobile Transceiver (model: EOTGPDB, S/N: 10033) equipped with external vehicle-top mounting monopole antenna

4.0 GENERAL REQUIREMENTS

4.1 Location of Test Facilities

The tests were performed by APREL Laboratories at APREL's test facility located in Nepean, Ontario, Canada. The laboratory operates a 3 and 10 meter Open Area Test Site (OATS) measurement facility. The test site is calibrated to ANSI C63.4-1992.

A description of the measurement facility in accordance with the radiated and AC line conducted test site criteria in 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, under the PALCAN program (ISO Guide 25). All equipment used is calibrated or verified in accordance with the intent of AQAP-6/MIL-STD-45662. APREL is also accredited by Industry Canada (formerly DOC) and recognised by the Federal Communications Commission (FCC).

4.2 Personnel

EMC/EMI testing staff member, Roman Kuleba, carried out all MPE tests.

4.3 Failure Criteria

The device under investigation was considered to have failed if any of the following occurred:

When the MPE limits exceeded those permitted by appropriate limits defined by the FCC.

4.4 Power Source Required

The following nominal DC Power was maintained during the test:

Voltage: 13.8 VDC.

4.5 Tolerance

The following tolerances on test conditions, exclusive of equipment accuracy, were maintained:

Voltage: ± 10%.

5.0 TEST INSTRUMENTATION & CALIBRATION

5.1 General

APREL Laboratories, located in Nepean, Ontario is equipped with the necessary instrumentation to ensure accurate measurement of all data recorded during the tests outlined in this document. To ensure continued accuracy, each instrument is re-calibrated at intervals established by APREL and based on standards traceable to the National and International Standards. Accuracy surveillance is a function of APREL Quality Assurance.

5.2 MPE Test Equipment Required

The test equipment required to perform the MPE testing was selected from the equipment available at APREL as listed in APPENDIX A.

5.3 Calibration Requirements

All test equipment instrumentation required for MPE qualification testing was calibrated and controlled.

6.0 ELECTRICAL/MECHANICAL DESCRIPTION

The MPE Test Program was performed on an Dataradio Gemini/PD Mobile Transceiver equipped with external vehicle-top mounting antenna, the combination hereinafter called the DUI. The test sample consisted of the components supplied by the customer and described below.

6.1 Test Unit Description

The Dataradio Gemini/PD Mobile Transceiver equipped with external vehicle-top mounting antenna consisted of the following components:

Part Number	Description
-S/N: 10033	Mobile Transceiver (Dataradio Gemini/PD)
-	Antenex B8065C Vehicle roof-top mounting monopole antenna (gain 5dB - see Appendix B for the specifications)
-	12 ft Coaxial Cable (RG58A/U) with 1.66 dB cable loss (0.138 dB/ft)

The test frequency and power were set to 812.5125 MHz and 40W. The transmission duty cycle has been monitored using an internal XCVR PTT ("transceiver push to talk") control line and has been found to be 25%. A snapshot of the transmission duty cycle is provided in Appendix B. Duty cycle is limited to this maximum value by operating firmware.

6.2 MPE Test Setup

a) The DUI antenna shall be installed in the centre of a ground plane simulating the rooftop of a vehicle. The other components shall be located underneath this ground plane to simulate operation from inside of the vehicle (see Figures 6.2.1 and 6.2.2).

b) The vehicle simulator shall be positioned on the turntable in the OATS in such a way that the antenna will be located on the centre of rotation.

c) The DUI shall be connected to the 13.8 VDC power supply. DC Power Supply model (Astron VS-20M)

d) For the selection and placement of the measuring probe, the requirements of ANSI/IEEE C95.3-1992 shall be met.

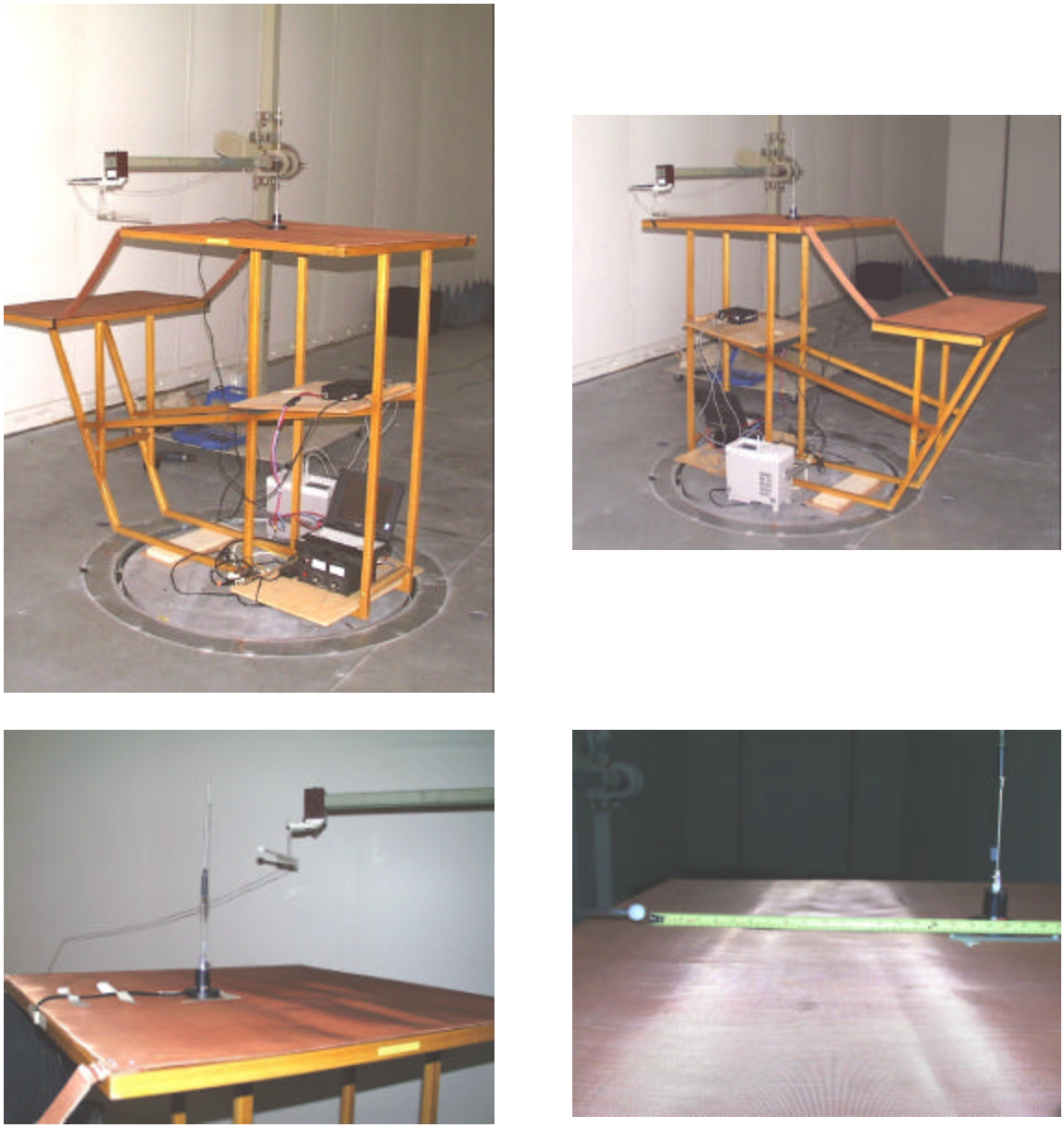


Figure 6.2.1. Photographs of the Setup

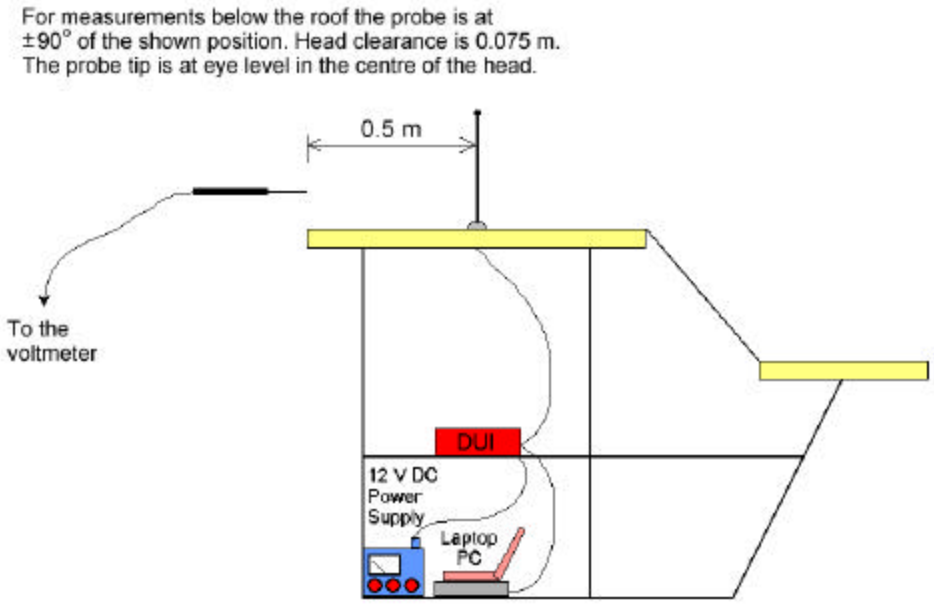


Figure 6.2.2. Elevation View of the Setup

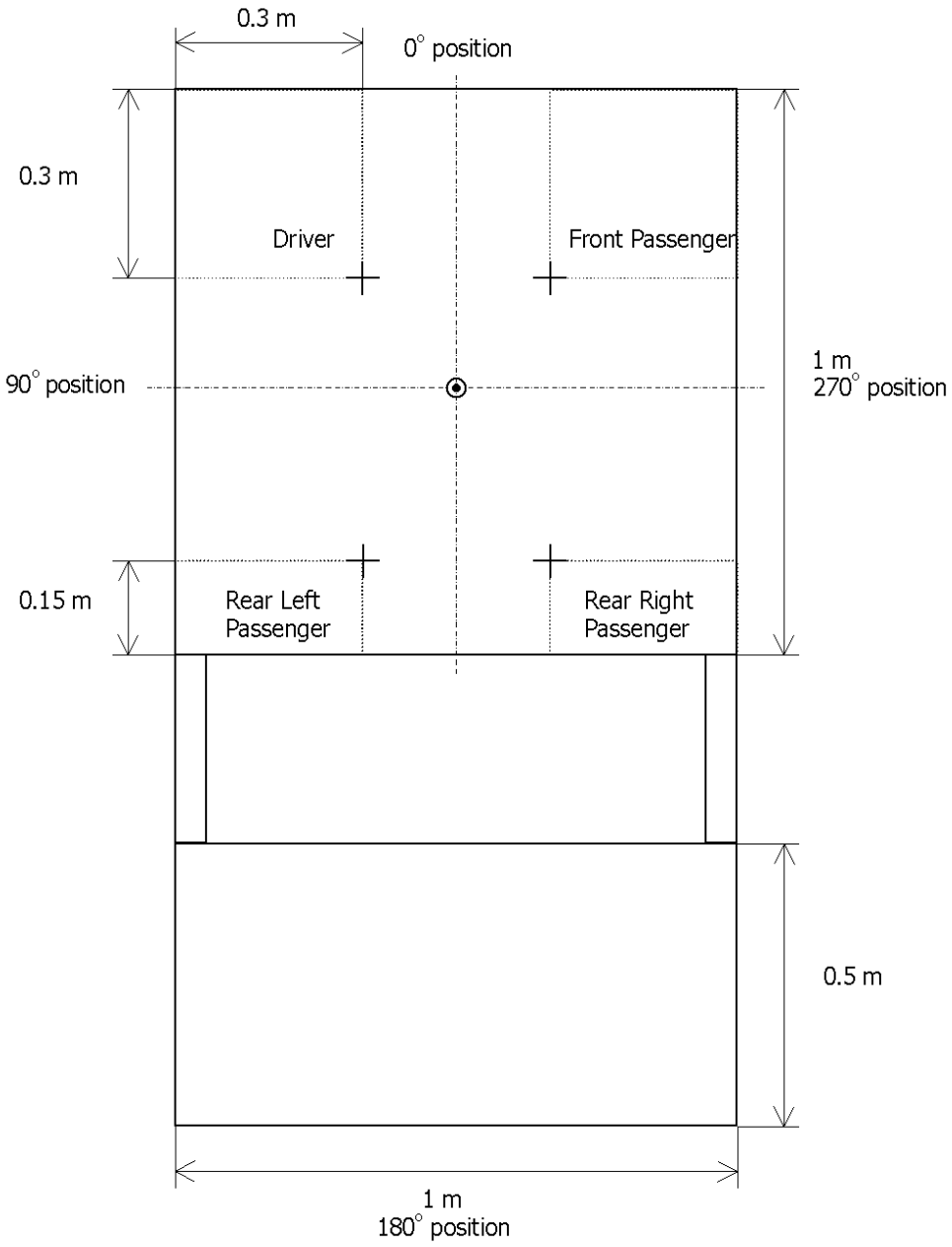


Figure 6.2.3. Plan View of Vehicle Simulator

7.0 MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST

7.1 Purpose

This test method is used to verify that the DUI meets the MPE requirements as defined in the criteria for general population/uncontrolled exposure when operating at maximum ERP and in all operating modes.

7.2 Test Equipment

Description	Manufacturer	Model No.
E-Field Probe	APREL Inc.	APR Sensor
Digital multimeter	Fluke	8505A
RF Signal Generator	Hewlett Packard	8662A
RF Signal Generator	Hewlett Packard	8340B
RF Power Meter	Rhode & Schwarz	NRVS
TEM Cell	Fisher Custom Comm. Inc.	FCC-TEM-JM1
20 dB Attenuator	Narda	4779-20
RF Amplifier	APREL Inc.	-
OATS	APREL Inc.	-
Vehicle Simulator	APREL Inc.	-
Mast with the Controller	EMCO	1051-12
Turntable with the controller	EMCO	1060-1.241
DC power supply	Astron	VS-20M

7.3 Criteria

Power Density Limits – The DUI shall not generate a power density beyond the limits in the frequency band listed in the left hand column of Table 7.3.1, and the power density given in the right hand column.

Table 7.3.1

Power Density Limits
for General Population/Uncontrolled Exposure

Frequency Range	Power Density (mW/cm^2)
300 - 1500 MHz	f/1500

Note: f = frequency in MHz

7.4 Test Procedure

The power density shall be measured 50 cm from the radiating antenna axis above the vehicle-top simulating ground plane, as well as in the approximate location of the head of possible vehicle drivers and passengers below the ground plane (see Figure 6.2.3). The measurements shall be performed at one transmitting frequency and with the highest ERP and duty cycle. The measured values shall be recorded.

a) The probe shall be positioned close to, and parallel to, the vehicle rooftop simulation with its tip 50 cm from the radiating antenna, and its axis normal to the antenna.

b) Rotate the turntable so that the probe is at the 0° position (see Figure 7.3.1).

c) Turn on the DUI and allow a sufficient time for stabilization. Turn on the transmitter and simulate normal operation conditions. Operate the transmitter at full rated output power. Record the characteristics of the transmit power (duty cycle) for the TDMA-type protocols .

d) Determine the location of the maximum power density: locate the maximum emissions by scanning vertically along the DUI's antenna. Take and record measurements of the power density at a number of points along the length of the antenna as well as just past its tip.

e) At every 45° of rotation take and record a measurement of the power density at the maximum power density height as for at least the following locations:

- half the maximum power density height
- height halfway between the maximum power density height and the tip of the radiating antenna
- just above the tip of the antenna

f) Turn off the DUI.

g) Position the probe under the vehicle rooftop simulating ground plane in the approximate location of the centre of the head of a potential driver of the simulated vehicle (see Figure 7.3.1).

h) Turn on the DUI and allow a sufficient time for stabilization. Turn on the transmitter and simulate normal operation conditions. Operate the transmitter at highest ERP and duty

cycle.

i) Take and record the measurement of the power density at this location.

j) Turn off the DUI.

k) Repeat steps g) through j) for the positions of the other potential occupants of the simulated vehicle as shown in Figure 7.3.1.

7.5 Results

The output power of the device has been set to 40W (rated output power). The measured duty cycle has been calculated at 25% resulting from 58ms Tx On over 230 ms cycle length (see appendix B). Antenna gain data provided in its specifications was 5dB. (See appendix B). The cable loss associated with the supplied 12.0 ft long *Belden RG-58A/U* coaxial cable was 1.66 dB (12.0 ft × 0.138 dB/ft)

Table 7.5.1 presents the results of the measurements made along the length of the antenna in order to find the location of the maximum power density (the antenna has a height of 48 cm). Column 1 shows the height at which the measurements were taken and column 2 shows the results (power density). Column 3 indicates limit for the MPE in the controlled environment. Margin to the limit is given in column 4.

Table 7.5.1
Power Density Measured at 0° as a Function of Height
Test Frequency: 812.5125 MHz

Height [cm]	Measured Power Density [mW/cm^2]	Limit [mW/cm^2]	Margin [mW/cm^2]
14.0	0.298	0.541	0.243
19.0	0.332	0.541	0.209
24.0	0.414	0.541	0.127
29.0	0.454	0.541	0.087
34.0	**0.489**	0.541	0.052
39.0	0.420	0.541	0.121
44.0	0.276	0.541	0.265
49.0	0.158	0.541	0.383
54.0	0.094	0.541	0.447

The data in the Table 7.5.1 is presented in the Figure 7.5.1.

Test performed by: Ku Chae Rohner **Date:** December, 2000

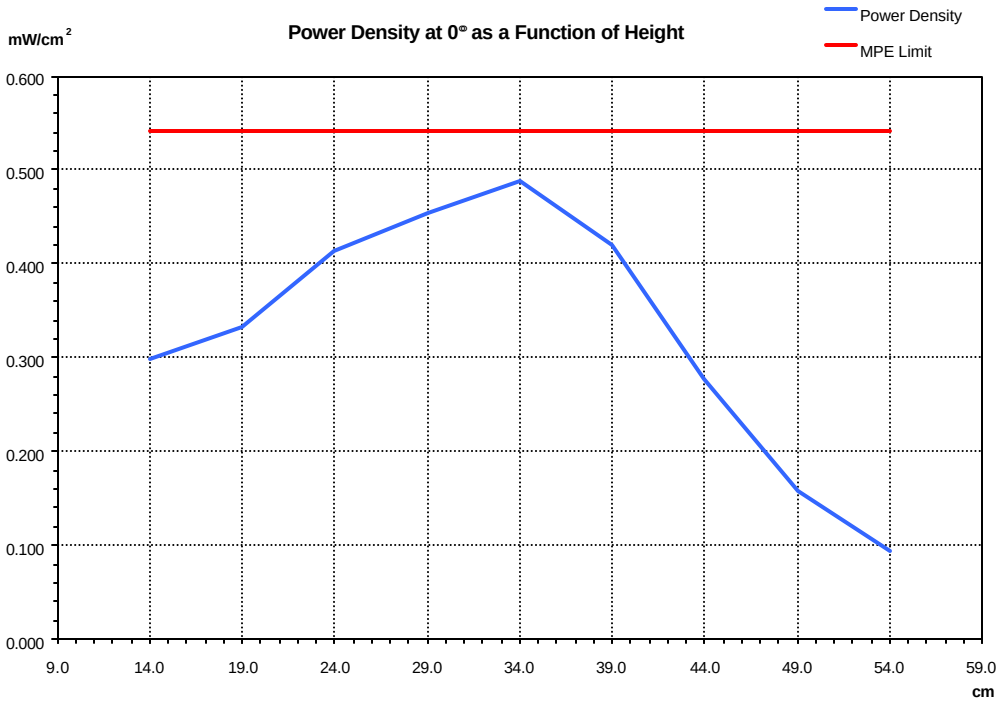


Figure 7.5.1

Table 7.5.2 presents the results of the measurements made around the antenna at every 45° of rotation. Column 1 shows the angle at which the measurements were taken and columns 2 through 10 show the measured power density at the different heights in the range from 14 cm to 49 cm from the roof-top. According to ANSI/IEEE C95.1-1992 the exposure values are those obtained by spatially averaging measured values over an area equivalent to the vertical cross-section (projected area) of the human body. Therefore, the MPE value is determined by averaging the adjusted total power density along a vertical line up to the height of a typically tall individual, taken here as 6 ft or 180 cm. Since the height for the rooftop of the simulated vehicle is 140 cm, then the averaging has to be done over those measurements made between 0 and 39 cm above the simulated vehicle rooftop, which includes first 6 scanned layers. Column 11 shows the results of this averaging.

Table 7.5.2

Power Density Measured
at every 45° as a Function of Height
Test Frequency: 812.5125

Angular Position (°)	Measured Power Density for Different Heights (mW/cm^2)									Averaged Values (mW/cm^2)	MPE Limit (mW/cm^2)
	h=14 cm	h=19 cm	h=24 cm	h=29 cm	h=34 cm	h=39 cm	h=44 cm	h=49 cm	h=54 cm		
0.0	0.298	0.332	0.414	0.454	**0.489**	0.420	0.276	0.158	0.094	0.401	0.541
45.0	0.205	0.220	0.277	0.347	0.418	0.377	0.298	0.191	0.133	0.307	0.541
90.0	0.158	0.169	0.201	0.241	0.325	0.325	0.297	0.214	0.155	0.236	0.541
135.0	0.130	0.143	0.168	0.210	0.311	0.318	0.298	0.214	0.155	0.213	0.541
180.0	0.102	0.117	0.135	0.179	0.295	0.310	0.298	0.215	0.154	0.190	0.541
225.0	0.168	0.227	0.248	0.285	0.336	0.302	0.254	0.166	0.108	0.261	0.541
270.0	0.177	0.213	0.288	0.356	0.477	0.418	0.307	0.180	0.105	0.322	0.541
315.0	0.248	0.278	0.351	0.409	0.487	0.418	0.288	0.170	0.101	0.365	0.541
360.0	0.298	0.332	0.414	0.454	**0.489**	0.420	0.276	0.158	0.094	0.401	0.541

The data in Table 7.5.2 is presented in Figure 7.5.2.

Test performed by: K Elva Ramos **Date:** Dec, 2000

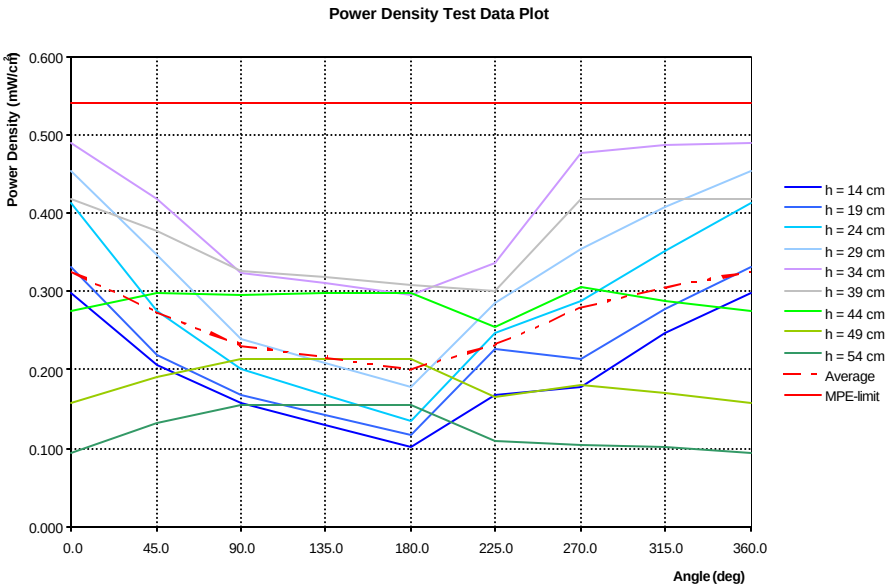


Figure 7.5.2.a

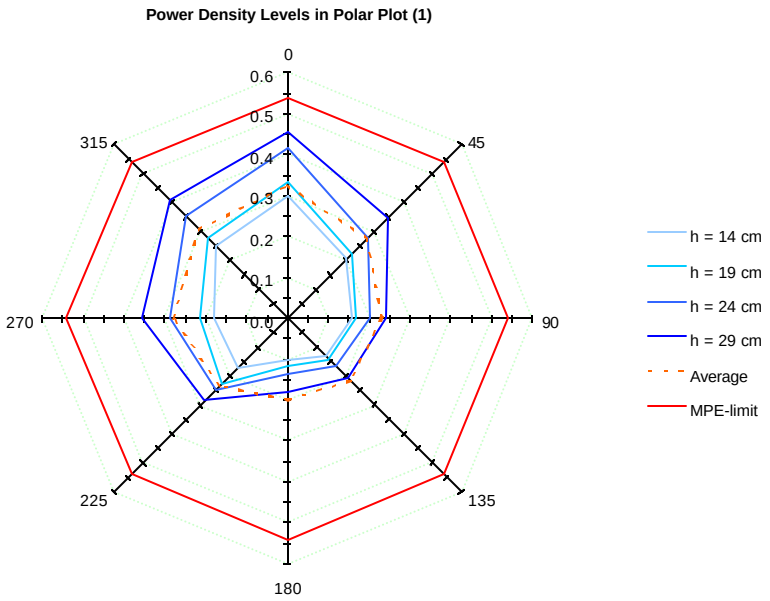


Figure 7.5.2.b

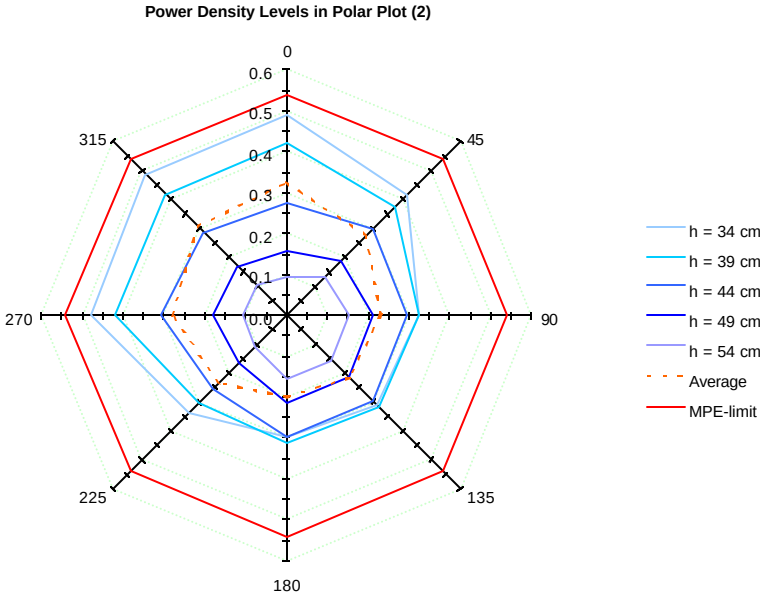


Figure 7.5.2.c

Measurements were made below the simulated vehicle rooftop, in the approximate location of the centre of the head of potential occupants. It was assumed that this typical position occurred 17.5 cm below the roof of the simulated vehicle (the clearance between the top of an occupant's head and a vehicle's roof is ~3" (7.5 cm) and distance between the top of the head and the eyes is ~4" (10 cm)). Figure 7.3.1 shows the location of measurements for the 4 potential occupants. Table 7.5.3 presents the results of the measurements. Column 1 shows the position at which the measurements were taken and column 2 shows the results.

Table 7.5.3
Power Density Measured
At Position of Potential Vehicle Occupants
Test Frequency: 812.5125 MHz

Position	Measured Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
Driver	0.032	0.541
Front Passenger	0.021	0.541
Rear Left P.	0.018	0.541
Rear Right P.	0.011	0.541

Test performed by: Ku Celer Rowan **Date:** Dec, 2000

8.0 CONCLUSION

The DUI consisting of an DataRadio Gemini/PD Mobile Transceiver transmitting at 40W with a 25% duty cycle and equipped with external vehicle-top mounting monopole antenna with less or equal then 5dB gain will not exceed the MPE requirements at given distance exceeding 50cm. The maximum power exposure level measured at 50 cm was 0.489 mW/cm^2.

APPENDIX A

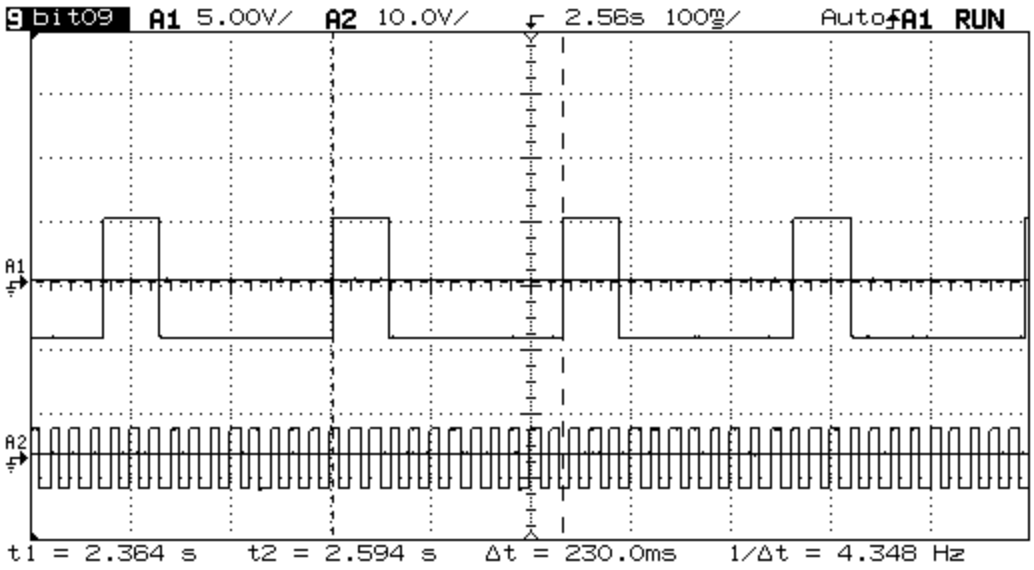
List of Test Equipment

Description	Range	Manufacturer	Model #	APREL Asset #	Cal. Due Date
Field Sensor Probe	20 MHz – 3 GHz	APREL Inc	APR Sensor	301433	Aug 3, 2001
Digital Multimeter	–	Fluke	8505A	100665	July 17, 2001
RF-Signal Generator	10 kHz – 1.28 GHz	HP	8662A	100456	Nov 1, 2000
RF-Signal Generator	10 MHz – 26.5 GHz	HP	8340B	100955	Nov 1, 2000
RF Power Meter	–	Rhode & Schwarz	NRVS	100851	July 21, 2001
TEM Cell	–	Fisher Custom Comm., Inc.	FCC-TEM-JM1	301438	N/A
20 dB Attenuator	DC – 18 GHz	Narda	4779-20	301370	May 18, 2001
RF Amplifier	500 MHz – 1 GHz	–	–	100995	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
Vehicle Simulator	–	APREL Inc.	–	301470	N/A
Turntable with the Controller	0^o – 360^o	EMCO	1060 – 1.241	100506	N/A

APPENDIX B
Technical Specifications

1) TDMA-type protocol maximum duty cycle

Snapshot of the transmitter PTT line.
A1- Transmitter PTT line, active high.
A2 - duty cycle check counter line



Gemini/PD MPE measurements, Aprel Laboratories, Dec 16,2000 CP
s/n 10033, DBA Protocol, non-acknowledged packets
58 msec TxOn, 230 msec cycle, 25.2% duty cycle

2) Off-the-shelf antenna specifications

Model Antenex B8065C, 5dB gain

ANTENEX® COILS - Lowband, VHF, UHF, 800MHz & 900MHz

Our mobile antennas are designed and built for rugged applications. They are used extensively on municipal vehicles, in off road racing, on industrial vehicles, taxi cabs and other high endurance applications such as police cruisers, emergency vehicles, and forestry service vehicles. The detailed attention given to the manufacture and design of our coils and coil housings ensure that they will stand up to the most rugged of applications. We manufacture over 100 variations. Our no ground plane antennas give you the flexibility you need in any mounting application; while our dual band and wide band models allow you to get full value out of today's advanced radios. If you cannot find the right ANTENEX® product for your mobile application, please contact us for assistance.

C27, B1443, B1443S, B1442N, B4505C, B8063

Model	Frequency	Gain	Whip Style
LOWBAND DC GROUND BASE LOADED 1/4 WAVE MODELS			
C27	26-28 MHz	Unity	49" Tapered
C30	30-35 MHz	Unity	49" Tapered
C34	34-37 MHz	Unity	49" Tapered
C37	37-40 MHz	Unity	49" Tapered
C40	40-47 MHz	Unity	49" Tapered
C47	47-50 MHz	Unity	49" Tapered
C50	50-54 MHz	Unity	49" Tapered
VHF 1/4 WAVE MODELS			
B52	52-174 MHz	Unity	55" Tapered
B66	66-174 MHz	Unity	49" Tapered
VHF 1/4 WAVE BROADBAND MODELS			
B132	132-928 MHz	Unity	21" Straight
B132S	132-525 MHz	Unity	21" Straight
VHF 5/8 WAVE BROADBAND MODELS			
B1323	132-174 MHz	3 dB	55" Tapered
B1443	144-174 MHz	3 dB	49" Tapered
B2003	200-250 MHz	3 dB	33" Straight
B2503	250-280 MHz	3 dB	24½" Straight
B3153	315-325 MHz	3 dB	25¼" Straight
VHF NO GROUND PLANE BASE LOADED 1/2 WAVE MODELS			
B1322N	132-174 MHz	2.4 dB	55" Tapered
B1442N	144-174 MHz	2.4 dB	49" Tapered
B2002N	200-225 MHz	2.4 dB	29½" Straight
UHF 5/8 WAVE MODELS			
B4063	406-430 MHz	3 dB	13" Straight
B4303	430-450 MHz	3 dB	11 13/16" Straight
B4503	450-470 MHz	3 dB	11" Straight
B4703	470-490 MHz	3 dB	10 11/16" Straight
B4903	490-512 MHz	3 dB	10½" Straight

For more information see http://www.antenex.com.

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Ordering Guide - Clear, Easy & Sensible!

BB4505CNS - Medium Black Base, 450-470 MHz, 5 dB, Closed Phasing Coil, No Ground Plane Design, with Shock Spring.

B	Antenna Style	B = Medium Base C = Tall Base
B	Finish	Blank = Chrome B = Black
450	Frequency	Frequency component of part number in bold below:
5	Gain	Blank = Unity 2 = 2.4 dB 3 = 3 dB 5 = 5 dB
C	Phasing Coil	Blank = Open Phasing Coil (collinear radiator only) C = Closed Phasing Coil (collinear radiator only)
N	Ground Plane	Blank = Ground Plane required N = No Ground Plane required
S	Spring Option	S = Spring Option

Frequency

27-29	**30-35**	**34-37**	**37-40**	**40-47**	**47-50**
50-54	**52-174**	**66-174**	**118-132**	**132-152**	**132-174**
132-198	**144-174**	**200-225**	**200-250**	**250-280**	**315-325**
406-430	**430-450**	**450-470**	**470-490**	**490-512**	
806-866	**896-970**				

All coils are tuned on a HP™ analyzer before packaging to assure proper performance.

Model	Frequency	Gain	Whip Style
UHF CLOSED COIL COLLINEAR MODELS			
B4065C	406-430 MHz	5 dB	37 3/8" Collinear
B4305C	430-450 MHz	5 dB	34 1/8" Collinear
B4505C	450-470 MHz	5 dB	32½" Collinear
B4705C	470-490 MHz	5 dB	31¼" Collinear
B4905C	490-512 MHz	5 dB	29 1/8" Collinear
UHF NO GROUND PLANE BASE LOADED 1/2 WAVE MODELS			
B4062N	406-430 MHz	2.4 dB	12 3/8" Straight
B4302N	430-450 MHz	2.4 dB	10 5/8" Straight
B4502N	450-470 MHz	2.4 dB	10 5/16" Straight
B4702N	470-490 MHz	2.4 dB	9½" Straight
B4902N	490-512 MHz	2.4 dB	10¼" Straight
UHF NO GROUND PLANE CLOSED COIL COLLINEAR MODELS			
B4065CN	406-430 MHz	5 dB	34 1/8" Collinear
B4305CN	430-450 MHz	5 dB	32 7/8" Collinear
B4505CN	450-470 MHz	5 dB	30½" Collinear
B4705CN	470-490 MHz	5 dB	28 7/16" Collinear
B4905CN	490-512 MHz	5 dB	27 1/8" Collinear
800/900 MHz BASE LOADED 5/8 WAVE MODELS			
B8063	806-866 MHz	3 dB	4 7/8" Straight
B8963	896-970 MHz	3 dB	4 1/8" Straight
800/900 MHz BASE LOADED CLOSED COLLINEAR MODELS			
B8065C	806-866 MHz	5 dB	16" Collinear
B8965C	896-970 MHz	5 dB	13¾" Collinear
800/900 MHz NO GROUND PLANE BASE LOADED ½ WAVE MODELS			
B8062N	806-866 MHz	2.4 dB	4 7/8" Straight
B8962N	896-970 MHz	2.4 dB	4 1/8" Straight
800/900 MHz NO GROUND PLANE CLOSED COLLINEAR MODELS			
B8065CN	806-866 MHz	5 dB	16" Collinear
B8965CN	896-970 MHz	5 dB	13¾" Collinear

Whip length may vary slightly depending on manufacturing process.

Model	Description
SPRING OPTION ACCESSORY	
S	Shock Spring for B and C Coils
SB	Black Chrome Shock Spring for B & C Coils

Add "S" to the end of the part number to receive spring on coil. See the Ordering Guide above for details.
Note: 800/900 MHz models are not available with a spring.

BLACK CHROME FINISH OPTION

B	Black Lowband, VHF, UHF or 800/900 MHz

Add a "B" to the part number. See the Ordering Guide above for details.
Note: Models with whips >49" not available in black.

MOBILE TO BASE CONVERTERS

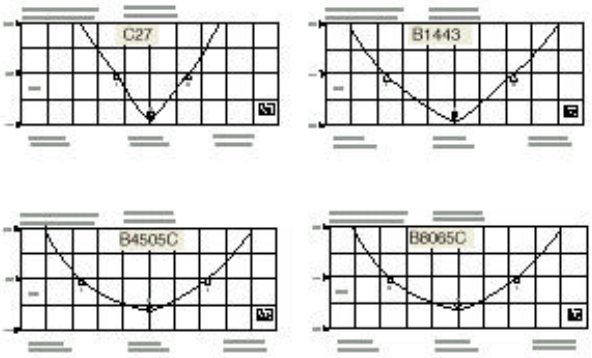
MBC	Mobile-to-Base Converter for VHF, UHF w/ SO239
MBCN	Mobile-to-Base Converter for VHF, UHF w/ N Term.
MBC800	Mobile-to-Base Converter for 800/900 MHz w/ N

ANTENEX

Technical Data - Product Features & Information

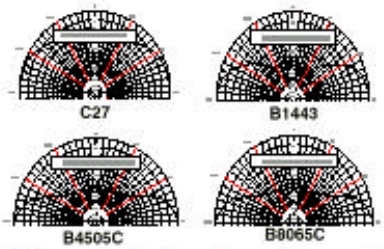
- **Gain:** See model.
- **Frequency Range:** See model.
- **VSWR:** <1.5:1 unless otherwise noted, <2:1 for Lowband
- **Maximum Power:** All models - 200 watts.
- **Bandwidth:** See representative VSWR plot.
- **Impedance (Nom.):** 50 ohms
- **Tuning:** Models are shipped at the lowest frequency in the range. Custom factory tuning is available.
- **Mounting Base:** Molded high heat ABS with copper, nickel, brite or black chrome solid brass inserts
- **Radiator:** 17-7ph tapered stainless steel whip or 17-7ph straight stainless steel collinear with a centerless ground finish or black chrome plate.
- **Coil Form:** 3 dimensional precision machined delrin®.
- **Phasing Coils:** Silver plated tempered brass
- **Contacts:** Gold plated push pin
- **Mounts to:** 3/4", 3/8", Magnetic and Mini-Trunk mounts
- **Quality Control:** 100% tested on a HP® network analyzer.

VSWR



MBC800
Mobile Base Converter
For a quick base antenna - anytime, anywhere. Shown with optional B8063

Vertical Field Patterns



"I have finally found a quality mobile antenna line that setting the VSWR on is consistently hassle free." Dan, Hawkins Communications Inc.

CB27 , BB1443S, BB1442N, BB4505C, BB8063

B1443, B4505C, C27

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