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Environmental Assessment

for

Mobiles/Fixed Base Station

for

FCC ID: FCC ID: RY9GST900
Model:GST-900

to

Federal Communications Commission

47 CFR 1.1310 (MPE)
Radiofrequency Radiation Exposure Limits

Date Of Report: April 6, 2004

On the Behalf of the Applicant:

Space Data Corporation

At the Request of:

P.O. 20610

Space Data Corporation
460 S. Benson Lane, Suite 11-12
Chandler, AZ 85224

Attention of:

Gerard J. Quenneville, Vice President Engineering
(480) 722-2100; FAX: (480) 403-0021
jerryq@spacedata.net
Bill McCullough

Supervised By:


Morton Flom, P. Eng.

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Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a)

Test Report (Supplemental)

b) Laboratory:
(FCC: 31040/SIT)
(Canada: IC 2044)

M. Flom Associates, Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85225

c) Report Number:

d0440019

d) Client:

Space Data Corporation
460 S. Benson Lane, Suite 11-12
Chandler, AZ 85224

e) Identification:

GST-900
FCC ID: RY9GST900
Description: Base Station

f) EUT Condition:

Not required unless specified in individual tests.

g) Report Date:

April 6, 2004

EUT Received:

March 22, 2004

h, j, k):

As indicated in individual tests.

i) Sampling method:

No sampling procedure used.

l) Uncertainty:

In accordance with MFA internal quality manual.

m) Supervised by:



Morton Flom, P. Eng.

n) Results:

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

o) Reproduction:

This report must not be reproduced, except in full, without written permission from this laboratory.

Identification of the Equipment Under Test (EUT)**Name and Address of Applicant:**

Space Data Corporation
460 S. Benson Lane, Suite 11-12
Chandler, AZ 85224

Manufacturer:

Applicant

FCC ID: RY9GST900

Model Number: GST-900

Description: Ground Station

Type of Emission: 10K0F1D

Frequency Range, MHz: 901 to 902

Power Rating, Watts: 7.0
 Switchable Variable N/A

Modulation:
 AMPS
 TDMA
 CDMA
 OTHER

Antenna:
 Helical
 Monopole
 Whip
 Other

Note: For RF Safety test antenna gain taken at the upper range of expected gain (i.e. 0 dBd) and RF Power set to highest nominal power across all channels.

NIST



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

September 15, 1999

Mr. Morton Flom
M. Flom Associates Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85224

Dear Mr. Flom:

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Arrangement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at <http://ts.nist.gov/mra> under the "Asia" category.

As of August 1, 1999, you may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable EMC requirements. **Your assigned BSMI number is SL2-IN-E-041R; you must use this number when sending test reports to BSMI.** Your designation will remain in force as long as your NVLAP and/or A2LA and/or BSMI accreditation remains valid for the CNS 13438.

Please note that BSMI requires that the entity making application for the approval of regulated equipment must make such application in person at their Taipei office. **BSMI also requests the names of the authorized signatories who are authorized to sign the test reports.** You can send this information via fax to C-Taipei CAB Response Manager at 301-975-5414. I am also enclosing a copy of the cover sheet that, according to BSMI requirements, must accompany every test report.

If you have any questions, please contact Robert Gladhill at 301-975-4273 or Joe Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

Belinda L. Collins, Ph.D.
Director, Office of Standards Services

Enclosure

NIST

**Standard Test Conditions
and
Engineering Practices**

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

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Name of Test:	Environmental Assessment
Specification:	FCC: 47 CFR 1.1310
Measurement Guide:	ANSI/IEEE C95.1 1992
Test Equipment:	<p>Maximum Permissible Exposure (MPE) measurement system, consisting of:</p> <p>Narda 8717-1174R, Radiation meter Narda 8761D, E-field probe (300 kHz – 3 GHz) (Calibrated Feb-2003)</p>
Measurement Procedure:	<ol style="list-style-type: none"> 1. The following measurements were performed with a Narda probe using ANSI/IEEE C95.1 as a guide. 2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures. 3. The EUT's radiating element (antenna) was placed on a 1 m tall table for ease of testing. For equipment normally operated on a metal surface, a ground plane was used. 4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements. 5. The minimum safe distance was calculated from the formula $\text{Power Density} = \text{EIRP} / 4\pi R^2$ (Peak Watts/m²). The calculation is shown with the measurement data. 6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range of 0.2 to 2 meters in height and over a horizontal plane of 0° to 360°. 7. Average values were calculated for the whole body (0.2-2.0m), lower body (0.2-0.8m) and upper body (1.0-2.0m).
Results:	Attached.

Test Setup:

Maximum Permissible Exposure (MPE)

Whip



Yagi



Name of Test:

R.F. Radiation Exposure

FCC Rules:

1.1307, 1.1310, 1.1311, 2.1091

Description, EUT:

See page 2 of Test Report

Test Frequency, MHz

= 901.475

Antenna Gain

= 3 dBi Omni

Antenna Model

	1/4 Wave <u>X</u>	5/8 Wave _____	Other dBd _____	Other _____
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Limits: Uncontrolled
Exposure
47 CFR 1.1310
Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
30-300 MHz:	Limit [mW/cm ²] = 0.2
300-1500 MHz	Limit [mW/cm ²] = f/1500
1500-100,000 MHz:	Limit [mW/cm ²] = 1.0

Pre-test
Calculations
$$\begin{aligned}
 \text{Power}_{[\text{W EIRP}]} &= P_{[\text{conducted}]} \times G_{[\text{antenna}]} &= 7\text{W} \\
 \text{Limit}_{[\text{mW/cm}^2]} &= 0.600 \\
 \text{Limit}_{[\text{W/m}^2]} &= 10 \times \text{Limit}_{[\text{mW/cm}^2]} &= 6.00 \\
 R_{[\text{m}]} &= [P_{[\text{W EIRP}]} / (4\pi \times \text{Limit}_{[\text{W/m}^2]})]^{1/2} &= 0.293
 \end{aligned}$$

Results:
at tested distance

50cm

	Probe Height, m	Power Density, mW/cm ²
	2.0	0.10
	1.8	0.15
	1.6	0.19
	1.4	0.21
	1.2	0.25
	1.0	0.24
	0.8	0.20
	0.6	0.17
	0.4	0.12
	0.2	0.10

Power Density

Calculations:
The measured power density readings were summed and the

For whole body:

results divided by the number of readings to calculate the average.

For lower body:

Average of 0.2 to 2.0 m, mW/cm² = 0.173

For upper body:

Average of 0.2 to 0.8 m, mW/cm² = 0.148Average of 1.0 to 2.0 m, mW/cm² = 0.190

Supervised By:



Morton Flom, P. Eng.

Page Number

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Name of Test:

R.F. Radiation Exposure

FCC Rules:

1.1307, 1.1310, 1.1311, 2.1091

Description, EUT:

See page 2 of Test Report

Test Frequency, MHz

= 901.475

Antenna Gain

= 10 dBi Yagi

Antenna Model

	1/4 Wave	5/8 Wave	Other	dBd	7.85	Other
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Limits: Uncontrolled
Exposure
47 CFR 1.1310
Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
30-300 MHz:	Limit [mW/cm ²] = 0.2
300-1500 MHz	Limit [mW/cm ²] = f/1500
1500-100,000 MHz:	Limit [mW/cm ²] = 1.0

Pre-test
Calculations

Power _[W EIRP] = P _[conducted] × G _[antenna]	=	7W
Limit _[mW/cm²]	=	0.600
Limit _[W/m²] = 10 × Limit _[mW/cm²]	=	6.00
R _[m] = [P _[W EIRP] / (4π × Limit _[W/m²])] ^{1/2}	=	0.293

Results:
at tested distance

50cm

	Probe Height, m	Power Density, mW/cm ²
	2.0	0.02
	1.8	0.08
	1.6	0.13
	1.4	0.19
	1.2	0.23
	1.0	0.24
	0.8	0.19
	0.6	0.15
	0.4	0.09
	0.2	0.06

Power Density

Calculations:
The measured power density readings were summed and the results divided by the number of readings to calculate the average.

For whole body:

Average of 0.2 to 2.0 m, mW/cm² = 0.138

For lower body:

Average of 0.2 to 0.8 m, mW/cm² = 0.123

For upper body:

Average of 1.0 to 2.0 m, mW/cm² = 0.143

Supervised By:



Morton Flom, P. Eng.

(The following will be placed in the Instruction Manual)

Mandatory Safety Instructions to Installers & Users

Use only manufacturer or dealer supplied antenna.

Antenna Minimum Safe Distance: 50cm.

Antenna Gains: Three dBi on High Power with whip (+0.85dB referenced to a dipole) and ten dBi on Low Power with Yagi (+7.85dB referenced to a dipole). Rule Part 24D limit is 7W ERP

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

Antenna Mounting: The antenna supplied by the manufacturer or radio dealer must not be mounted at a location such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna i.e. **50cm**

To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.

Base Station Installation: The antenna should be fixed-mounted on an outdoor permanent structure. RF Exposure compliance must be addressed at the time of installation.

Antenna Substitution: Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer. You may be exposing person or persons to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

Warning: Maintain a separation distance from the antenna to a person(s) of at least **50cm**.

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. Transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

**Testimonial
and
Statement of Certification**

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



Morton Flom, P. Eng.