



M. Flom Associates, Inc. - Global Compliance Center

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Environmental Assessment

for

Mobiles/Fixed Base Station

for

FCC ID: FCC ID: FJ6-302395

Model:302395

to

Federal Communications Commission

47 CFR 1.1310 (MPE)

Radiofrequency Radiation Exposure Limits

Date Of Report: February 16, 2004

On the Behalf of the Applicant:

Modular Mining Systems Inc

At the Request of:

P.O. Deposit Check #85258

Modular Mining Systems Inc
3289 East Hemisphere Loop
Tucson, AZ 85706-5028

Attention of:

(520) 806-9127; FAX: 889-5790 (Headquarters)
Les Zoschke, Vice President, Product Development
Email: zoschke@mmsi.com
Romer Johnson, Supervisor, Product Design
(520) 806-3603; FAX: 3344
Email: johnsonr@mmsi.com

Supervised By:

A handwritten signature in black ink that reads 'M. Flom P. Eng.' with a stylized underline.

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: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0420037

d) Client: Modular Mining Systems Inc
3289 East Hemisphere Loop
Tucson, AZ 85706-5028

e) Identification: 302395
FCC ID: FJ6-302395
Description: 802.11b Unit

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: February 16, 2004
EUT Received:

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.

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

Modular Mining Systems Inc
 3289 East Hemisphere Loop
 Tucson, AZ 85706-5028

Manufacturer:

Modular Mining Systems Inc
 3289 East Hemisphere Loop
 Tucson, AZ 85706-5028

FCC ID:

FJ6-302395

Model Number:

302395

Description:

802.11b Unit

Type of Emission:

DSSS

Frequency Range, MHz:

2412 to 2454

Power Rating, Watts:☐ Switchable☐ Variable

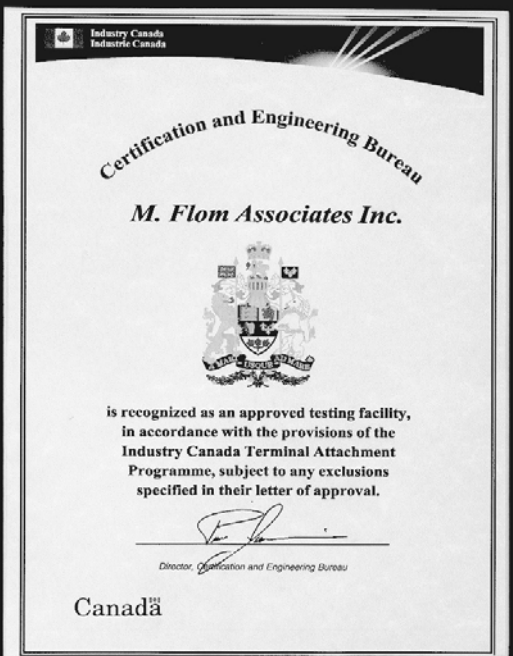
0.361 EIRP to 0.380 EIRP

☒ 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.

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Industry Canada



Certification and Engineering Bureau
M. Flom Associates Inc.

is recognized as an approved testing facility,
in accordance with the provisions of the
Industry Canada Terminal Attachment
Programme, subject to any exclusions
specified in their letter of approval.

[Signature]
Director, Certification and Engineering Bureau

Canada

Industry Canada Industrie Canada
Certification and Engineering Bureau
1241 Clyde Avenue
Ottawa, Ontario
K2C 1Y3

Tel. No. (613) 952-3650
Fax. No. (613) 952-1088

February 24, 1998

Our File: 46327-2044
Submission: 19320 O

Mr. M. Flom
M. Flom Associates, Inc.
3356 North San Marcos Place, Suite 107
Chandler, Arizona 85224-1571

Dear Mr. Flom,

The Bureau has received your test report for the Open Area Test Site located at Chandler, Arizona, dated January 30, 1998 and the supplemental information received February 24, 1998. I have reviewed the report and find it complies with RSP 100, Issue 7, section 3.3 Description of Open Area Test Site.

The site is acceptable to Industry Canada for the performance of radiated measurements. Please reference the file number "IC 2044" in the body of all test reports containing measurements made on this site. This reference number is the indication of Industry Canada's acceptance of your site. Your company has been added to our published list of qualified sites on the Bureau's web page. It is located at: <http://spectrum.ic.gc.ca/cert/> Please keep the contact information current by notifying us if it changes or is in error.

Keep informed of the latest Industry Canada regulations by visiting the Bureau's site on the World Wide Web;
<http://spectrum.ic.gc.ca/~cert/>
or the Industry Canada main site at;
<http://strategis.ic.gc.ca>

Whenever major construction or repairs to the site are completed, a re-submission of the site attenuation characteristics will be required.

Yours sincerely,

Brian Kasper

Brian Kasper
Head, EMC and Standards
Certification and Engineering Bureau

Canada

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.

NIST

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

Enclosure

Page Number

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U.S. Coast Guard

U.S. Department of Transportation United States Coast Guard Commandant United States Coast Guard Washington, D.C. 20543-0001 Start Number: G-001-1-3 Phone: (202) 267-1444 16714/160-164/M. FLOM ASSOC May 2, 1989 M. Flom Associates, Inc. 3356 N. San Marcos Pl. 107 Chandler, AZ 85224 ACCEPTANCE AS AN INDEPENDENT LABORATORY FOR TESTING 406 MHz EPIRBs M. Flom Associates, Inc. is hereby accepted as an independent laboratory under 46 CFR 159 for testing 406 MHz Emergency Position Indicating Radio Beacons. These 406 MHz EPIRBs are type-accepted by the Federal Communications Commission under 47 CFR Parts 2 and 80, and are to be tested as outlined in the publication of the Radio Technical Commission for Maritime Services, entitled "RTCM Recommended Standards for 406 MHz Emergency Position Indicating Radio Beacons (EPIRBs)", dated July 31, 1987, with editorial update of December 31, 1987: Appendix A (RTCM Recommended Standards). Prior to conducting any testing you must obtain a copy of the RTCM Recommended Standards for 406 MHz Satellite EPIRBs from the Radio Technical Commission for Maritime Services, P.O. Box 19087, Washington, DC 20036. If you have any questions please contact LCDR Devo of my staff. Sincerely,  R. L. HARKLE Chief, Survival Systems Branch Merchant Vessel Inspection and Documentation Division By direction of the Commandant 16 5 3 DL 634 1. G. 00885 16 Private Use, \$300 POSTAGE AND FEES PAID United States Coast Guard DOT 514 M. Flom Associates, Inc. 3356 N. San Marcos Pl. 107 Chandler, AZ 85224	U. S. Coast Guard Accepted Independent Laboratories <table border="1"><thead><tr><th>Underwriters Laboratories</th><th>333 Pilington Road</th><th>Northbrook, IL 60062</th><th></th><th></th></tr><tr><td>(847) 272-8300</td><td>Facsimile (847) 272-4229</td><td>E-mail</td><td>Point of Contact</td><td>Mr. Jon Reynolds</td></tr></thead><tbody><tr><td colspan="5">161.011 400MHz Satellite EPIRB</td></tr><tr><td>DEIRA Fraser</td><td>Fort Cumberland Road</td><td>Portsmouth, Harb</td><td>P04 RJJ ENGLAND</td><td></td></tr><tr><td>+44 1765 334307</td><td>Facsimile 44 1765 830617</td><td>E-mail jfraser@deira.gov.uk</td><td>Point of Contact</td><td>Mr. Peter Coldwell</td></tr><tr><td colspan="5">Appendix B tests for COSPAS/SARSAT</td></tr><tr><td>Interpace</td><td>18 Avenue Edouard Belin</td><td>BP 4356 31029 Toulouse Cedex 4</td><td>FRANCE</td><td></td></tr><tr><td>+33 561 26 4114</td><td>Facsimile +33 561 26 1122</td><td>E-mail</td><td>Point of Contact</td><td>Mr. A. Sarrasin</td></tr><tr><td colspan="5">Qualified to conduct RTCM Appendix A tests for USCG and RTCM Appendix B tests for COSPAS/SARSAT</td></tr><tr><td>M. Flom Associates Inc.</td><td>3356 N. San Marcos Place</td><td>Suite 107 Chandler AZ 85224-1574</td><td></td><td></td></tr><tr><td>(602) 926 3180</td><td>Facsimile (602) 926 3398</td><td>E-mail mflom@prodnet.com</td><td>Point of Contact</td><td>Mr. Martin Flom</td></tr><tr><td>QC Metallurgical Inc.</td><td>2879 Skating Road</td><td>Hollywood FL 33020-4499</td><td></td><td></td></tr><tr><td>(954) 923 0499</td><td>Facsimile (954) 923 0988</td><td>E-mail qcp@comcast.net</td><td>Point of Contact</td><td>Mr. Dean Sackler</td></tr><tr><td colspan="5">Qualified to conduct RTCM Appendix A tests only</td></tr><tr><td colspan="5">161.012 Personal Flotation Device Lights</td></tr><tr><td>American Bureau of Shipping</td><td>ABS American ABS Plaza</td><td>16055 Northchase Dr. Houston TX 77060-6088</td><td></td><td></td></tr><tr><td>(281) 877-4343</td><td>Facsimile (281) 877-4795</td><td>E-mail abshd@absgroup.com</td><td>Point of Contact</td><td>Mr. Charles J. Durkin</td></tr><tr><td>Canadian Standards Assoc.</td><td>175 Riverside Blvd.</td><td>Ethiobioske Ontario M9W 1R3 CANADA</td><td></td><td></td></tr><tr><td>(416) 747 4880</td><td>Facsimile (416) 747-4149</td><td>E-mail</td><td>Point of Contact</td><td>Mr. Brian Hamer</td></tr></tbody></table> Wednesday, November 25, 1998 Page 35 of 44	Underwriters Laboratories	333 Pilington Road	Northbrook, IL 60062			(847) 272-8300	Facsimile (847) 272-4229	E-mail	Point of Contact	Mr. Jon Reynolds	161.011 400MHz Satellite EPIRB					DEIRA Fraser	Fort Cumberland Road	Portsmouth, Harb	P04 RJJ ENGLAND		+44 1765 334307	Facsimile 44 1765 830617	E-mail jfraser@deira.gov.uk	Point of Contact	Mr. Peter Coldwell	Appendix B tests for COSPAS/SARSAT					Interpace	18 Avenue Edouard Belin	BP 4356 31029 Toulouse Cedex 4	FRANCE		+33 561 26 4114	Facsimile +33 561 26 1122	E-mail	Point of Contact	Mr. A. Sarrasin	Qualified to conduct RTCM Appendix A tests for USCG and RTCM Appendix B tests for COSPAS/SARSAT					M. Flom Associates Inc.	3356 N. San Marcos Place	Suite 107 Chandler AZ 85224-1574			(602) 926 3180	Facsimile (602) 926 3398	E-mail mflom@prodnet.com	Point of Contact	Mr. Martin Flom	QC Metallurgical Inc.	2879 Skating Road	Hollywood FL 33020-4499			(954) 923 0499	Facsimile (954) 923 0988	E-mail qcp@comcast.net	Point of Contact	Mr. Dean Sackler	Qualified to conduct RTCM Appendix A tests only					161.012 Personal Flotation Device Lights					American Bureau of Shipping	ABS American ABS Plaza	16055 Northchase Dr. Houston TX 77060-6088			(281) 877-4343	Facsimile (281) 877-4795	E-mail abshd@absgroup.com	Point of Contact	Mr. Charles J. Durkin	Canadian Standards Assoc.	175 Riverside Blvd.	Ethiobioske Ontario M9W 1R3 CANADA			(416) 747 4880	Facsimile (416) 747-4149	E-mail	Point of Contact	Mr. Brian Hamer
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**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.

Page Number 6 of 7.

Name of Test: Environmental Assessment

Specification: FCC: 47 CFR 1.1310

Measurement Guide: ANSI/IEEE C95.1 1992

Test Equipment: Maximum Permissible Exposure (MPE) measurement system, consisting of:
Narda 8717-1174R, Radiation meter
Narda 8761D, E-field probe (300 kHz – 3 GHz)
(Calibrated Nov-98)

Measurement Procedure:

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.

Page Number 7 of 7.

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

MPE Calculation

Frequency = 2412 MHz

R.F. Power = 7.244 W EIRP (Maximum with 25 dB antenna)

Minimum Safe Distance
(Occupational Controlled) = $[7.244/(12.56 \times 50)]^{1/2}$

= 0.1074 meters

= 10.74 cm

(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: 20 cm.

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. 20 cm.

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 20 cm.

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:

A handwritten signature in black ink, appearing to read "M. Flom P. Eng.", with a horizontal line drawn underneath the signature.

Morton Flom, P. Eng.