



M. Flom Associates, Inc. - Global Compliance Center

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

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T R A N S M I T T E R C E R T I F I C A T I O N

of

FCC ID: FJ6-301582

MODEL: 301805 (Repeater) and 301582 (Mobile)

to

FEDERAL COMMUNICATIONS COMMISSION

Rule Part(s) 15.247

CLASS II PERMISSIVE CHANGE

DATE OF REPORT: September 17, 2002

ON THE BEHALF OF THE APPLICANT:

Modular Mining Systems Inc

AT THE REQUEST OF:

P.O. 4500016059

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

Attention of:

Romer Johnson, Supervisor, Product Design
(520) 806-3603; FAX: 3344
Email: johnsonr@mmsi.com
and/or Eric Gustafson

SUPERVISED BY:

A handwritten signature in black ink that reads 'M. Flom P. Eng.' The signature is written in a cursive, flowing style.

Morton Flom, P. Eng.

THE APPLICANT HAS BEEN CAUTIONED AS TO THE FOLLOWING:

15.21 INFORMATION TO USER.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) SPECIAL ACCESSORIES.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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

a)

TEST REPORT

- 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: d0290031
- d) Client: Modular Mining Systems Inc
3289 East Hemisphere Loop
Tucson, AZ 85706-5028
- e) Identification: 301805 (Repeater) and 301582 (Mobile)
FCC ID: FJ6-301582
Description: Antenna for 2.4Ghz Radio
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: September 17, 2002
EUT Received: September 6, 2002
- 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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EXPOSITORY STATEMENT
PERMISSIVE CHANGE

APPLICANT: Modular Mining Systems Inc

FCC ID: FJ6-301582

The applicant has made design changes/improvements to the originally FCC approved equipment.

Data contained herein confirms that a Permissive Change to the unit has been effected and that the performance of the unit is at or better than the levels originally reported to the commission.

A copy of the original grant of equipment approval is included for convenience.

The following changes/improvements have been made:

6 Antennas added:

Manufacturer	Model	Gain, dbi	Description
MAXRAD	MUF 24005	5	Coil
MAXRAD	MSP 2401 090	10	Directional Panel
MAXRAD	MSP 2401 3120	13	Directional Panel
Mobile Mark	OD6-2400	6	OMNI
Andrew	1-24	24	Parabolic
Mobile Mark	PSTN3-2400S	2.5	½ Wave Rubber Duck

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LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

IN ACCORDANCE WITH FCC RULES AND REGULATIONS,
VOLUME II, PART 2 AND TO

15.247

Sub-part 2.1033

(c)(1): NAME AND ADDRESS OF APPLICANT:

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

MANUFACTURER:

Applicant

(c)(2): FCC ID: FJ6-301582

MODEL NO: 301805 (Repeater) and
301582 (Mobile)

(c)(3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: DSSS

(c)(5): FREQUENCY RANGE, MHz: 2400 to 2483.5

(c)(6): POWER RATING, Watts: 0.0361 EIRP
0.038 EIRP
___ Switchable ___ Variable x N/A

(c)(7): MAXIMUM POWER RATING, Watts: 50 mv/m @ 3m

15.203: ANTENNA REQUIREMENT:

x The antenna is permanently attached to the EUT
___ The antenna uses a unique coupling
___ The EUT must be professionally installed
___ The antenna requirement does not apply

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Subpart 2.1033 (continued)

(c)(8): VOLTAGES & CURRENTS IN ALL ELEMENTS IN FINAL R. F. STAGE,
INCLUDING FINAL TRANSISTOR OR SOLID STATE DEVICE:

COLLECTOR CURRENT, A = per manual
COLLECTOR VOLTAGE, Vdc = per manual
SUPPLY VOLTAGE, Vdc = 24

(c)(9): TUNE-UP PROCEDURE:

PLEASE SEE ATTACHED EXHIBITS

(c)(10): CIRCUIT DIAGRAM/CIRCUIT DESCRIPTION:

Including description of circuitry & devices provided for
determining and stabilizing frequency, for suppression of
spurious radiation, for limiting modulation and limiting
power.

PLEASE SEE ATTACHED EXHIBITS

(c)(11): LABEL INFORMATION:

PLEASE SEE ATTACHED EXHIBITS

(c)(12): PHOTOGRAPHS:

PLEASE SEE ATTACHED EXHIBITS

(c)(13): DIGITAL MODULATION DESCRIPTION:

 ATTACHED EXHIBITS
 X N/A

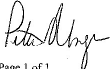
(c)(14): TEST AND MEASUREMENT DATA:

FOLLOWS

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M. Flom Associates, Inc. is accredited by the American Association for Laboratory Accreditation (A2LA) as shown in the scope below.

 THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION ACCREDITED LABORATORY A2LA has accredited M. FLOM ASSOCIATES, INC. Chandler, AZ for technical competence in the field of Electrical (EMC) Testing The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing. Testing and calibration laboratories that comply with this International Standard also operate in accordance with ISO 9001 or ISO 9002. Presented this 2nd day of March, 2001.  President For the Accreditation Council Certificate Number 1008.01 Valid to December 31, 2002 For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical (EMC) Scope of Accreditation	 American Association for Laboratory Accreditation <u>SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999</u> M. FLOM ASSOCIATES, INC. Electronic Testing Laboratory 3356 North San Marcos Place, Suite 107 Chandler, AZ 85225 Morton Flom Phone: 480 926 3100 ELECTRICAL (EMC) Valid to: December 31, 2002 Certificate Number: 1008-01 In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests: <table border="1"> <thead> <tr> <th>Tests</th> <th>Standard(s)</th> </tr> </thead> <tbody> <tr> <td>RF Emissions</td> <td>FCC Part 15 (Subparts B and C) using ANSI C63.4-2000, CISPR 11; CISPR 13; CISPR 14; CISPR 22; EN 55011; EN 55013; EN 55014; EN 55022; EN 50081-1; EN 50081-2; ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1; CNS 13438</td> </tr> <tr> <td>Harmonic Currents</td> <td>EN 61000-3-2</td> </tr> <tr> <td>Fluctuation and Flicker</td> <td>EN 61000-3-3</td> </tr> <tr> <td>RF Immunity</td> <td>EN: 50082-1, 50082-2, 55024; AS/NZS 4251.1</td> </tr> <tr> <td>Electrostatic Discharge (ESD)</td> <td>EN 61000-4-2</td> </tr> <tr> <td>Radiated Susceptibility</td> <td>EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3</td> </tr> <tr> <td>EFT</td> <td>EN 61000-4-4; IEC 1000-4-4; IEC 801-4</td> </tr> <tr> <td>Surge</td> <td>EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5</td> </tr> <tr> <td>Voltage Dips, Short Interruptions, and Line Voltage Variations</td> <td>EN 61000-4-11</td> </tr> <tr> <td>47 CFR (FCC)</td> <td>Parts: 2, 18, 21, 22, 23, 24, 25, 26, 27, 74, 80, 87, 90, 95, 97, 101 (excluding SAR Testing)</td> </tr> <tr> <td>Power Frequency Magnetic Field Immunity</td> <td>EN 61000-4-8</td> </tr> <tr> <td>Immunity to Conducted Disturbances</td> <td>EN 61000-4-6</td> </tr> </tbody> </table>  Page 1 of 1 (A2LA Cert. No. 1008.01) 08/01/02 5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3348 • Fax: 301-662 2974	Tests	Standard(s)	RF Emissions	FCC Part 15 (Subparts B and C) using ANSI C63.4-2000, CISPR 11; CISPR 13; CISPR 14; CISPR 22; EN 55011; EN 55013; EN 55014; EN 55022; EN 50081-1; EN 50081-2; ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1; CNS 13438	Harmonic Currents	EN 61000-3-2	Fluctuation and Flicker	EN 61000-3-3	RF Immunity	EN: 50082-1, 50082-2, 55024; AS/NZS 4251.1	Electrostatic Discharge (ESD)	EN 61000-4-2	Radiated Susceptibility	EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3	EFT	EN 61000-4-4; IEC 1000-4-4; IEC 801-4	Surge	EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5	Voltage Dips, Short Interruptions, and Line Voltage Variations	EN 61000-4-11	47 CFR (FCC)	Parts: 2, 18, 21, 22, 23, 24, 25, 26, 27, 74, 80, 87, 90, 95, 97, 101 (excluding SAR Testing)	Power Frequency Magnetic Field Immunity	EN 61000-4-8	Immunity to Conducted Disturbances	EN 61000-4-6
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"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, or which have been undertaken by a subcontractor that is not A2LA accredited, such data would not covered by this laboratory's A2LA accreditation.

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Sub-part
2.1033(b):TEST AND MEASUREMENT DATA

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.1031, 2.1033, 2.1035, 2.1041, 2.1043, 2.1045, and the following individual Parts:

- _____ 15.209 Radiated emission limits; general requirements
- _____ 15.211 Tunnel radio systems
- _____ 15.213 Cable locating equipment
- _____ 15.214 Cordless telephones
- _____ 15.217 Operation in the band 160-190 kHz
- _____ 15.219 Operation in the band 510-1705 kHz
- _____ 15.221 Operation in the band 525-1705 kHz (leaky coax)
- _____ 15.223 Operation in the band 1.705-10 MHz
- _____ 15.225 Operation in the band 13.553-13.567 MHz
- _____ 15.227 Operation in the band 26-27.28 MHz (remote control)
- _____ 15.229 Operation in the band 40.66-40.70 MHz
- _____ 15.231 Periodic operation in the band 40.66-40.70 MHz and above 70 MHz
- _____ 15.233 Operation within the bands 43.71-44.49, 46.60-46.98 MHz 48.75-49.51 MHz and 49.66-50.0 MHz
- _____ 15.235 Operation within the band 49.82-49.90 MHz
- _____ 15.237 Operation within the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz (auditory assistance)
- _____ 15.239 Operation in band 88-108 MHz
- _____ 15.241 Operation in the band 174-216 MHz (biomedical)
- _____ 15.243 Operation in the band 890-940 MHz (materials)
- _____ 15.245 Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (filed disturbance sensors)
- x _____ 15.247 Operation within bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (spread spectrum)
- _____ 15.249 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
- _____ 15.251 Operation within the bands 2.9-3.26 GHz, 3.267-3.332 GHz, 3.339-3.3458 GHz, and 3.358-3.6 GHz (vehicle identification systems)
- _____ 15.321 Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390-2400 MHz bands (Unlicensed PCS)
- _____ 15.323 Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band (Unlicensed PCS)

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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.

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NAME OF TEST: Maximum Peak Output Power (Radiated)

SPECIFICATION: 47 CFR 15.247(b)

SPEC. LIMIT: ≤ 1 Watt peak (0.25 if <50 Hopping Channels)

TEST EQUIPMENT: Attached

TEST RESULTS: Attached

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NAME OF TEST:

Maximum Peak Output Power (Radiated)

Manufacturer: MAX RAD
Model: MUF 24005

Gain: 5 dbi
Description: Coil

MHz
2434.85

EIRP, dbm
14.3

EIRP, Watts
 26.9×10^{-3}

g0290088:2002-Sep-06 Fri 08:38:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
0.000000	2434.740000	58.89	49.07	250034.54	12.7	0.019
0.000000	2434.850000	55.12	49.07	161994.4	9	0.0079
0.000000	2434.850000	60.45	49.07	299226.46	14.3	0.027
0.000000	2434.850000	60.07	49.07	286417.8	13.9	0.025
0.000000	2434.850000	58.8	49.07	247457.15	12.6	0.018
0.000000	2434.960000	59.27	49.07	261216.14	13.1	0.02
0.000000	2435.190000	59.95	49.07	282488	13.8	0.024
0.000000	2437.890000	57.99	49.09	225943.58	11.9	0.015
0.000000	2437.890000	59.93	49.09	282488	13.8	0.024

g0290087:2002-Sep-06 Fri 10:20:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
0.000000	2413.010000	55.3	48.89	161994.4	9	0.0079
0.000000	2413.010000	59.7	48.89	268843.78	13.4	0.022
0.000000	2413.010000	58.3	48.89	228823.17	12	0.016
0.000000	2413.010000	57.46	48.89	207730.37	11.1	0.013
0.000000	2413.130000	59.09	48.89	250610.93	12.8	0.019
0.000000	2414.700000	55.87	48.89	172981.64	9.5	0.0089
0.000000	2414.700000	59.39	48.89	259417.94	13.1	0.02
0.000000	2414.700000	58.16	48.89	225164.54	11.8	0.015
0.000000	2414.700000	55.87	48.89	172981.64	9.5	0.0089

g0290086:2002-Sep-06 Fri 10:36:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
0.000000	2459.480000	57.89	49.28	228296.89	11.9	0.015
0.000000	2459.590000	58.63	49.28	248599.36	12.7	0.019
0.000000	2459.700000	57.59	49.28	220546.41	11.6	0.014
0.000000	2462.960000	55.67	49.31	177418.95	9.8	0.0096
0.000000	2462.960000	56.45	49.31	194088.59	10.5	0.011
0.000000	2463.080000	56.73	49.31	200447.2	10.8	0.012
0.000000	2463.080000	55.39	49.31	171790.84	9.5	0.0089
0.000000	2463.080000	56.56	49.31	196562.2	10.6	0.011
0.000000	2463.080000	56.98	49.31	206300.37	11.1	0.013



PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Maximum Peak Output Power (Radiated)

Manufacturer: MAX RAD
Model: MSP 2401 090Gain: 10 dbi
Description: Directional PanelMHz
2462.8EIRP, dbm
19.5EIRP, Watts
 89.1×10^{-3}

g0290128:2002-Sep-10 Tue 08:23:00

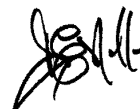
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2432.000000	2435.040000	52.54	41.21	48696.75	-1.5	0.00071
2432.000000	2437.740000	50.55	41.22	38770.37	-3.5	0.00045
2432.000000	2437.740000	70.99	41.22	407849.56	17	0.05
2432.000000	2437.740000	67.26	41.22	265460.56	13.3	0.021
2432.000000	2437.740000	54.23	41.22	59224.31	0.2	0.001
2432.000000	2437.850000	71.11	41.23	413999.67	17.1	0.051
2432.000000	2437.850000	68.74	41.23	315137.44	14.7	0.03
2432.000000	2437.850000	58.33	41.23	95060.48	4.3	0.0027
2432.000000	2438.860000	59.64	41.24	110662.38	5.7	0.0037

g0290142:2002-Sep-10 Tue 08:53:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2412.680000	66.68	41.09	244624.53	12.5	0.018
2412.000000	2412.680000	50.65	41.09	38636.7	-3.5	0.00045
2412.000000	2412.790000	57.55	41.09	85506.67	3.4	0.0022
2412.000000	2412.790000	69.22	41.09	327717.78	15.1	0.032
2412.000000	2412.790000	65.72	41.09	219028.18	11.6	0.014
2412.000000	2412.790000	69.52	41.09	339234.49	15.4	0.035
2412.000000	2413.800000	55.51	41.1	67686.18	1.4	0.0014
2412.000000	2415.830000	47.01	41.11	25468.3	-7.1	0.0002
2412.000000	2415.830000	50.48	41.11	37975.19	-3.6	0.00044

g0290130:2002-Sep-10 Tue 09:13:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2460.830000	49.2	45.31	53149.6	-0.7	0.00085
2457.000000	2462.740000	49.88	45.31	57477.78	0	0.001
2457.000000	2462.740000	66.3	45.31	380627.36	16.4	0.044
2457.000000	2462.740000	67.01	45.31	413047.5	17.1	0.051
2457.000000	2462.740000	69.19	45.31	530884.44	19.3	0.085
2457.000000	2462.740000	54.95	45.31	103038.61	5	0.0032
2457.000000	2462.850000	56.66	45.31	125458.47	6.7	0.0047
2457.000000	2462.850000	48.81	45.31	50815.94	-1.1	0.00078
2457.000000	2462.850000	69.4	45.31	543876.13	19.5	0.089



PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Maximum Peak Output Power (Radiated)

Manufacturer: MAX RAD
Model: MSP 2401 3120Gain: 13 dbi
Description: Directional Panel

MHz 2462.74		EIRP, dbm 18.7		EIRP, Watts 74.1 x 10 ⁻³		
g0290126:2002-Sep-10 Tue 10:43:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2409.980000	50.95	41.07	39902.49	-3.2	0.00048
2412.000000	2412.680000	68.96	41.09	318053.37	14.8	0.03
2412.000000	2412.680000	50.13	41.09	36391.5	-4	0.0004
2412.000000	2412.680000	68.16	41.09	290068.12	14	0.025
2412.000000	2412.790000	69.19	41.09	326587.83	15.1	0.032
2412.000000	2412.790000	68.49	41.09	301300.6	14.4	0.028
2412.000000	2412.900000	60.91	41.09	125892.54	6.8	0.0048
2412.000000	2413.010000	52.12	41.09	45761.47	-2	0.00063
2412.000000	2413.800000	60.37	41.1	118440.44	6.2	0.0042
g0290114:2002-Sep-10 Tue 10:24:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2432.000000	2434.700000	51.42	41.21	42805.54	-2.6	0.00055
2432.000000	2437.630000	61.92	41.22	143548.94	7.9	0.0062
2432.000000	2437.630000	56.09	41.22	73366.87	2.1	0.0016
2432.000000	2437.740000	71.72	41.22	443608.64	17.7	0.059
2432.000000	2437.740000	71.95	41.22	455512.19	17.9	0.062
2432.000000	2437.740000	70.68	41.22	393550.08	16.7	0.047
2432.000000	2437.850000	70.78	41.23	398565.77	16.8	0.048
2432.000000	2439.880000	63.64	41.24	175388.05	9.7	0.0093
2432.000000	2440.780000	54.93	41.24	64342.81	0.9	0.0012
g0290119:2002-Sep-10 Tue 11:15:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2462.740000	59.54	45.31	174783.33	9.6	0.0091
2457.000000	2462.740000	60.39	45.31	192752.49	10.5	0.011
2457.000000	2462.740000	68.63	45.31	497737.08	18.7	0.074
2457.000000	2462.740000	49.69	45.31	56234.13	-0.2	0.00096
2457.000000	2462.740000	67.84	45.31	454464.54	17.9	0.062
2457.000000	2462.740000	68.65	45.31	498884.49	18.7	0.074
2457.000000	2462.740000	67.79	45.31	451855.94	17.9	0.062
2457.000000	2463.080000	52.02	45.31	73536	2.1	0.0016
2457.000000	2464.880000	49.43	45.32	54638.65	-0.5	0.00089



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NAME OF TEST: Maximum Peak Output Power (Radiated)

Manufacturer: Mobile Mark
Model: OD6-2400Gain: 6 dbi
Description: OMNI

MHz		EIRP, dbm		EIRP, watts		
2462.8		21.9		154.88 x 10 ⁻³		
g0290100:2002-Sep-09 Mon 09:32:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2412.750000	67.01	48.88	623017.15	20.7	0.12
2412.000000	2412.800000	66.7	48.89	601866.26	20.4	0.11
2412.000000	2412.800000	67.03	48.89	625172.69	20.7	0.12
2412.000000	2412.800000	66.73	48.89	603948.63	20.4	0.11
2412.000000	2414.600000	66.87	48.89	613762.01	20.5	0.11
2412.000000	2414.700000	66.6	48.67	580096.17	20	0.1
2412.000000	2414.800000	66.59	48.9	594976.76	20.3	0.11
2412.000000	2414.800000	66.68	48.9	601173.74	20.4	0.11
g0290099: 2002-Sep-09 Mon 08:27:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2432.000000	2434.700000	67.14	49.07	646397.99	21	0.13
2432.000000	2434.700000	67.02	49.07	637529.08	20.9	0.12
2432.000000	2434.800000	67.09	49.07	642687.72	20.9	0.12
2432.000000	2437.750000	67.78	49.09	697429	21.6	0.14
2432.000000	2437.750000	67.61	49.09	683911.65	21.5	0.14
2432.000000	2437.750000	67.49	49.09	674528.03	21.4	0.14
2432.000000	2437.800000	67.21	49.09	653130.55	21.1	0.13
2432.000000	2438.050000	68.54	49.1	762079.01	22.4	0.17
g0290104:2002-Sep-09 Mon 10:15:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2459.740000	67.15	49.28	662979.35	21.2	0.13
2457.000000	2459.790000	66.97	49.28	649381.63	21	0.13
2457.000000	2459.990000	67.22	49.29	669113.82	21.3	0.13
2457.000000	2462.740000	67.49	49.3	691034.93	21.6	0.14
2457.000000	2462.790000	67.28	49.3	674528.03	21.4	0.14
2457.000000	2462.790000	67.05	49.3	656901.12	21.1	0.13
2457.000000	2462.790000	67	49.3	653130.55	21.1	0.13
2457.000000	2462.790000	67.8	49.3	716143.41	21.9	0.15



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NAME OF TEST: Maximum Peak Output Power (Radiated)

Manufacturer: Andrew
Model: 1-24Gain: 24 dbi
Description: Parabolic

MHz		EIRP, dbm		EIRP, Watts		
2462.7		28.7		$\frac{741.3}{10} \times 10^{-3}$		
g0290144: 2002-Sep-10 Tue 13:43:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2409.300000	45.58	41.07	21503.05	-8.6	0.00014
2412.000000	2409.750000	49.57	41.07	34040.82	-4.6	0.00035
2412.000000	2412.790000	53.27	41.09	52239.62	-0.9	0.00081
2412.000000	2413.010000	49.34	41.09	33227.68	-4.8	0.00033
2412.000000	2414.480000	46.63	41.1	24350.06	-7.5	0.00018
2412.000000	2414.590000	54.27	41.1	58681.34	0.1	0.001
2412.000000	2414.590000	77.4	41.1	841395.14	23.3	0.21
2412.000000	2414.590000	44.15	41.1	18302.06	-10	0.0001
2412.000000	2414.590000	77.61	41.1	861985.58	23.5	0.22
g0290143: 2002-Sep-10 Tue 13:24:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2432.000000	2434.700000	55.74	41.21	70388.22	1.7	0.0015
2432.000000	2434.810000	51.63	41.21	43853.07	-2.4	0.00058
2432.000000	2435.710000	49.71	41.22	35196.54	-4.3	0.00037
2432.000000	2437.630000	80.78	41.22	1258925.41	26.8	0.48
2432.000000	2437.740000	54.96	41.22	64416.93	1	0.0013
2432.000000	2437.850000	80.17	41.23	1174897.55	26.2	0.42
2432.000000	2437.850000	46.25	41.23	23659.2	-7.7	0.00017
2432.000000	2438.080000	49.59	41.23	34753.62	-4.4	0.00036
2432.000000	2439.090000	51.23	41.24	42024.25	-2.8	0.00052
g0290148: 2002-Sep-10 Tue 14:19:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2457.230000	35.04	45.29	10387.24	-14.9	0.000032
2457.000000	2459.360000	55.21	45.29	105925.37	5.3	0.0034
2457.000000	2462.630000	45.87	45.31	36224.3	-4	0.0004
2457.000000	2462.740000	49.39	45.31	54325.03	-0.5	0.00089
2457.000000	2462.740000	78.65	45.31	1577611.27	28.7	0.74
2457.000000	2462.740000	78.26	45.31	1508342.61	28.3	0.68
2457.000000	2462.740000	41.88	45.31	22882.32	-8	0.00016
2457.000000	2464.650000	52.79	45.32	80445.17	2.9	0.002
2457.000000	2464.650000	48.26	45.32	47752.93	-1.6	0.00069



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NAME OF TEST: Maximum Peak Output Power (Radiated)

Manufacturer: Mobile Mark
Model: PSTN3-2400SGain: 2.5 dbi
Description: ½ Wave Rubber Duck

MHz		EIRP, dbm		EIRP, Watts		
2437.8		16.6		45.7 x 10 ⁻³		
g0290157:2002-Sep-11 Wed 11:41:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2412.650000	58.08	48.66	217270.12	11.5	0.014
2412.000000	2412.700000	58.11	48.66	218021.84	11.5	0.014
2412.000000	2412.750000	58.3	48.66	222843.51	11.7	0.015
2412.000000	2412.800000	58.3	48.67	223100.22	11.7	0.015
2412.000000	2414.550000	59.09	48.67	244343.06	12.5	0.018
2412.000000	2414.600000	58.28	48.67	222587.1	11.7	0.015
2412.000000	2414.600000	58.23	48.67	221309.47	11.7	0.015
2412.000000	2414.800000	58.49	48.68	228296.89	11.9	0.015
g0290156: 2002-Sep-11 Wed 11:13:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2432.000000	2437.750000	61.27	48.84	320258.01	14.9	0.031
2432.000000	2437.800000	61.43	48.85	326587.83	15.1	0.032
2432.000000	2437.800000	62.93	48.85	388150.37	16.6	0.046
2432.000000	2437.800000	61.66	48.85	335351.3	15.3	0.034
2432.000000	2439.600000	61.31	48.86	322477.93	14.9	0.031
2432.000000	2439.700000	61.53	48.86	330750.11	15.2	0.033
2432.000000	2439.850000	62.16	48.86	355631.32	15.8	0.038
2432.000000	2439.850000	62.09	48.86	352776.79	15.7	0.037
g0290161:2002-Sep-11 Wed 12:18:00						
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2459.490000	59	49.01	251478	12.8	0.019
2457.000000	2462.690000	58.82	49.03	246888.01	12.6	0.018
2457.000000	2462.690000	59.11	49.03	255270.13	12.9	0.02
2457.000000	2462.740000	59.08	49.03	254389.98	12.9	0.02
2457.000000	2462.740000	58.66	49.03	242381.8	12.5	0.018
2457.000000	2462.740000	58.52	49.03	238506.38	12.3	0.017
2457.000000	2462.790000	59.29	49.03	260615.35	13.1	0.02
2457.000000	2462.990000	58.09	49.03	226986.49	11.9	0.015

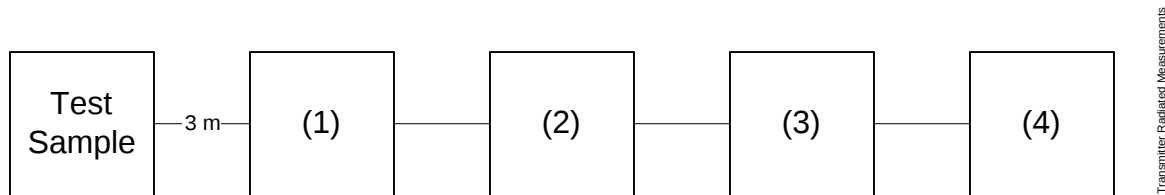


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TRANSMITTER RADIATED MEASUREMENTS

Asset Description (as applicable)	s/n
(1) <u>TRANSDUCER</u>	
i00091 Emco 3115	001469
i00089 Aprel Log Periodic	001500
i00088 EMC0 3301-B Biconical	2336
(2) <u>HIGH PASS FILTER</u>	
i00 Narda µPAD (In-Band Only)	
i00 Trilithic (Out-Of-Band Only)	
(3) <u>PREAMP</u>	
i00028 HP 8449 (+30 dB)	2749A00121
(4) <u>SPECTRUM ANALYZER</u>	
i00048 HP 8566B	2511A01467
i00057 HP 8557A	1531A00191
i00029 HP 8563E	3213A00104

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TEST SETUP: Radiated Emissions

Manufacturer: MAX RAD
Model: MUF 24005

Gain: 5 dbi
Description: Coil

g0290069: 2002-Sep-11 Wed 14:32:12
STATE: 0:General



g0290070: 2002-Sep-11 Wed 14:32:12
STATE: 0:General

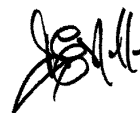


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NAME OF TEST: Out of Band Emissions

Manufacturer: MAX RAD
Model: MUF 24005Gain: 5 dbi
Description: Coilg0290083: 2002-Sep-06 Fri 13:48:00
STATE: 2:High Power Spurious Emissions

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	4824.000000	39.33	8.18	237.41	-47.7	≤602.56
2412.000000	4824.000000	30	8.38	82.99	-56.8	≤602.56
2432.000000	4864.000000	29.33	8.52	78.07	-57.4	≤602.56
2432.000000	4872.866666	40.33	8.27	269.15	-46.6	≤602.56
2457.000000	4914.000000	40	8.35	261.52	-46.9	≤602.56
2457.000000	4914.000000	30	8.71	86.2	-56.5	≤602.56
2412.000000	7236.000000	28.33	13.01	116.68	-53.9	≤602.56
2412.000000	7236.000000	38.67	13.81	420.73	-42.7	≤602.56
2432.000000	7296.000000	28.17	13.15	116.41	-53.9	≤602.56
2432.000000	7302.083333	39.67	13.79	470.98	-41.8	≤602.56
2457.000000	7371.000000	29.5	13.31	138.2	-52.4	≤602.56
2457.000000	7371.000000	38.67	13.77	418.79	-42.8	≤602.56
2412.000000	9648.000000	39.83	17.65	748.17	-37.7	≤602.56
2412.000000	9648.000000	30.33	15.57	197.24	-49.3	≤602.56
2432.000000	9728.000000	29.17	15.67	174.58	-50.4	≤602.56
2432.000000	9734.083333	41	18.13	904.69	-36.1	≤602.56
2457.000000	9828.000000	42.33	18.66	1120.73	-34.2	≤602.56
2457.000000	9828.000000	30.5	15.8	206.54	-48.9	≤602.56
2412.000000	12060.000000	24.33	17.21	119.4	-53.7	≤602.56
2412.000000	12060.000000	39.83	17.29	717.79	-38.1	≤602.56
2432.000000	12160.000000	24.33	17.22	119.54	-53.7	≤602.56
2432.000000	12166.083333	39.83	17.63	746.45	-37.8	≤602.56
2457.000000	12285.000000	25.17	17.22	131.67	-52.8	≤602.56
2457.000000	12285.000000	41.17	17.99	907.82	-36.1	≤602.56
2412.000000	14472.000000	39.5	18.42	787.05	-37.3	≤602.56
2412.000000	14472.000000	23.5	19.37	139.16	-52.4	≤602.56
2432.000000	14592.000000	24	19.33	146.72	-51.9	≤602.56
2432.000000	14598.083333	40	18.07	800.76	-37.2	≤602.56
2457.000000	14742.000000	39.17	17.69	696.63	-38.4	≤602.56
2457.000000	14742.000000	24	19.29	146.05	-51.9	≤602.56
2412.000000	16884.000000	24.67	20.74	186.42	-49.8	≤602.56
2412.000000	16884.000000	39	22.73	1220.39	-33.5	≤602.56
2412.000000	16884.000000	40.17	22.73	1396.37	-32.3	≤602.56
2432.000000	17024.000000	23.83	21.44	183.44	-50	≤602.56
2432.000000	17030.083333	39.67	23.24	1397.98	-32.3	≤602.56
2457.000000	17199.000000	22.67	22.41	179.47	-50.1	≤602.56
2457.000000	17199.000000	39.5	23.49	1410.91	-32.2	≤602.56



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Doug Noble, B.A.S. E.E.T.

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TEST SETUP: Radiated Emissions

Manufacturer: MAX RAD
Model: MSP 2401 090

Gain: 10 dbi
Description: Directional Panel

g0290058: 2002-Sep-11 Wed 11:20:28
STATE: 0:General



g0290059: 2002-Sep-11 Wed 11:20:28
STATE: 0:General



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NAME OF TEST: Out of Band Emissions

Manufacturer: MAX RAD
Model: MSP 2401 090Gain: 10 dbi
Description: Directional Panelg0290139: 2002-Sep-11 Wed 08:28:00
STATE: 2:High Power Spurious Emissions

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W $\times 10^{-6}$
2412.000000	4824.000000	40.67	8.38	283.47	-46.2	≤ 346.7
2412.000000	4829.600000	30.17	8.39	84.72	-56.7	≤ 346.7
2432.000000	4875.200000	30.5	8.57	89.85	-56.2	≤ 346.7
2432.000000	4877.833334	41.17	8.57	306.9	-45.5	≤ 346.7
2457.000000	4925.333334	30	8.74	86.5	-56.5	≤ 346.7
2457.000000	4925.733334	40	8.74	273.53	-46.5	≤ 346.7
2412.000000	7236.000000	39.83	13.01	438.53	-42.4	≤ 346.7
2412.000000	7244.400000	28.17	13.04	114.95	-54	≤ 346.7
2432.000000	7312.800000	28.67	13.19	123.88	-53.4	≤ 346.7
2432.000000	7316.750001	39.5	13.2	431.52	-42.5	≤ 346.7
2457.000000	7388.000001	29.83	13.35	144.21	-52	≤ 346.7
2457.000000	7388.600001	39.33	13.36	431.02	-42.5	≤ 346.7
2412.000000	9648.000000	41	15.57	673.75	-38.7	≤ 346.7
2412.000000	9659.200000	30	15.58	190.11	-49.6	≤ 346.7
2432.000000	9750.400000	25	15.69	108.27	-54.5	≤ 346.7
2432.000000	9755.666668	40.17	15.71	622.3	-39.3	≤ 346.7
2457.000000	9850.666668	30.33	15.81	202.77	-49.1	≤ 346.7
2457.000000	9851.466668	40.17	15.82	630.23	-39.2	≤ 346.7
2412.000000	12060.000000	40	17.21	725.27	-38	≤ 346.7
2412.000000	12074.000000	24.83	17.21	126.47	-53.2	≤ 346.7
2432.000000	12188.000000	24.33	17.21	119.4	-53.7	≤ 346.7
2432.000000	12194.583335	39.67	17.21	698.23	-38.3	≤ 346.7
2457.000000	12313.333335	24.83	17.21	126.47	-53.2	≤ 346.7
2457.000000	12314.333335	39.5	17.21	684.7	-38.5	≤ 346.7
2412.000000	14472.000000	40.17	19.37	948.42	-35.7	≤ 346.7
2412.000000	14488.800000	23.5	19.36	139	-52.4	≤ 346.7
2432.000000	14625.600000	24.33	19.32	152.23	-51.6	≤ 346.7
2432.000000	14633.500002	39.67	19.33	891.25	-36.2	≤ 346.7
2457.000000	14776.000002	24.33	19.28	151.53	-51.6	≤ 346.7
2457.000000	14777.200002	39.33	19.28	852.12	-36.6	≤ 346.7
2412.000000	16884.000000	39.83	20.74	1067.82	-34.7	≤ 346.7
2412.000000	16903.600000	23.67	20.84	168.07	-50.7	≤ 346.7
2432.000000	17063.200000	24.33	21.65	199.07	-49.2	≤ 346.7
2432.000000	17072.416669	38.5	21.71	1024.47	-35	≤ 346.7
2457.000000	17238.666669	23.17	22.63	194.98	-49.4	≤ 346.7
2457.000000	17240.066669	38	22.64	1076.47	-34.6	≤ 346.7



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Doug Noble, B.A.S. E.E.T.

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TEST SETUP: Radiated Emissions

Manufacturer: MAX RAD Gain: 13 dbi
Model: MSP 2401 3120 Description: Directional Panel

g0290056: 2002-Sep-11 Wed 11:19:53
STATE: 0:General



g0290057: 2002-Sep-11 Wed 11:19:53
STATE: 0:General



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NAME OF TEST: Out of Band Emissions

Manufacturer: MAX RAD
Model: MSP 2401 3120Gain: 13 dbi
Description: Directional Panel

g0290127: 2002-Sep-11 Wed 08:55:00

STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	4829.600000	30.83	8.39	91.41	-56	≤416.86
2412.000000	4829.600000	39.5	8.39	248.03	-47.3	≤416.86
2432.000000	4875.066666	39	8.57	239.06	-47.7	≤416.86
2432.000000	4875.066666	30.33	8.57	88.1	-56.3	≤416.86
2457.000000	4925.733334	41.67	8.74	331.51	-44.8	≤416.86
2457.000000	4925.733334	34.17	8.74	139.8	-52.3	≤416.86
2412.000000	7244.400000	37.17	13.04	323.97	-45	≤416.86
2412.000000	7244.400000	28.17	13.04	114.95	-54	≤416.86
2432.000000	7312.599999	29.17	13.19	131.22	-52.9	≤416.86
2432.000000	7312.599999	40.17	13.19	465.59	-41.9	≤416.86
2457.000000	7388.600001	39.5	13.36	439.54	-42.4	≤416.86
2457.000000	7388.600001	30.67	13.36	159.04	-51.2	≤416.86
2412.000000	9659.200000	39.17	15.58	546.39	-40.5	≤416.86
2412.000000	9659.200000	24.83	15.58	104.83	-54.8	≤416.86
2432.000000	9750.133332	39.33	15.69	563.64	-40.2	≤416.86
2432.000000	9750.133332	30.17	15.69	196.34	-49.4	≤416.86
2457.000000	9851.466668	40.83	15.82	679.99	-38.6	≤416.86
2457.000000	9851.466668	30.67	15.82	211.11	-48.7	≤416.86
2412.000000	12074.000000	25	17.21	128.97	-53	≤416.86
2412.000000	12074.000000	39.67	17.21	698.23	-38.3	≤416.86
2432.000000	12187.666665	38.5	17.21	610.24	-39.5	≤416.86
2432.000000	12187.666665	25.17	17.21	131.52	-52.8	≤416.86
2457.000000	12314.333335	40.33	17.21	753.36	-37.7	≤416.86
2457.000000	12314.333335	25	17.21	128.97	-53	≤416.86
2412.000000	14488.800000	38.5	19.36	781.63	-37.4	≤416.86
2412.000000	14488.800000	24.5	19.36	155.96	-51.4	≤416.86
2432.000000	14625.199998	29.67	19.32	281.51	-46.2	≤416.86
2432.000000	14625.199998	40.67	19.32	998.85	-35.2	≤416.86
2457.000000	14777.200002	25.67	19.28	176.81	-50.3	≤416.86
2457.000000	14777.200002	39.67	19.28	886.14	-36.3	≤416.86
2412.000000	16903.600000	24.33	20.84	181.34	-50.1	≤416.86
2412.000000	16903.600000	40	20.84	1101.54	-34.4	≤416.86
2432.000000	17062.733331	39	21.65	1077.71	-34.6	≤416.86
2432.000000	17062.733331	29.67	21.65	368.13	-43.9	≤416.86
2457.000000	17240.066669	23.33	22.64	198.84	-49.3	≤416.86
2457.000000	17240.066669	38.83	22.64	1184.4	-33.8	≤416.86



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TEST SETUP: Radiated Emissions

Manufacturer: Mobile Mark Gain: 6 dbi
Model: OD6-2400 Description: OMNI

g0290060: 2002-Sep-11 Wed 11:21:28
STATE: 0:General



g0290061: 2002-Sep-11 Wed 11:21:28
STATE: 0:General



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NAME OF TEST: Out of Band Emissions

Manufacturer: Mobile Mark Gain: 6 dbi
 Model: OD6-2400 Description: OMNI

g0290109: 2002-Sep-09 Mon 13:59:00

STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	4824.000000	38.67	8.38	225.16	-48.2	≤331.1
2412.000000	4824.000000	30	8.38	82.99	-56.8	≤331.1
2432.000000	4864.000000	29.5	8.52	79.62	-57.2	≤331.1
2432.000000	4878.533334	40.17	8.58	273.84	-46.5	≤331.1
2457.000000	4914.000000	29.67	8.71	82.99	-56.8	≤331.1
2457.000000	4920.083333	40.5	8.73	289.4	-46	≤331.1
2412.000000	7236.000000	28	13.01	112.33	-54.2	≤331.1
2412.000000	7236.000000	37.83	13.01	348.34	-44.4	≤331.1
2432.000000	7296.000000	28.5	13.15	120.92	-53.6	≤331.1
2432.000000	7317.800001	38.33	13.2	377.14	-43.7	≤331.1
2457.000000	7371.000000	29.83	13.31	143.55	-52.1	≤331.1
2457.000000	7377.083333	38.83	13.32	405.04	-43.1	≤331.1
2412.000000	9648.000000	40	15.57	600.48	-39.7	≤331.1
2412.000000	9648.000000	30	15.57	189.89	-49.7	≤331.1
2432.000000	9728.000000	29.67	15.67	184.93	-49.9	≤331.1
2432.000000	9757.066668	39.33	15.71	564.94	-40.2	≤331.1
2457.000000	9828.000000	31	15.8	218.78	-48.4	≤331.1
2457.000000	9834.083333	40.33	15.8	640.47	-39.1	≤331.1
2412.000000	12060.000000	24.83	17.21	126.47	-53.2	≤331.1
2412.000000	12060.000000	39.67	17.21	698.23	-38.3	≤331.1
2432.000000	12160.000000	24.33	17.22	119.54	-53.7	≤331.1
2432.000000	12196.333335	40	17.21	725.27	-38	≤331.1
2457.000000	12285.000000	24.17	17.22	117.35	-53.8	≤331.1
2457.000000	12291.083333	38.5	17.21	610.24	-39.5	≤331.1
2412.000000	14472.000000	38.67	19.37	797.99	-37.2	≤331.1
2412.000000	14472.000000	24.17	19.37	150.31	-51.7	≤331.1
2432.000000	14592.000000	23.33	19.33	135.83	-52.6	≤331.1
2432.000000	14635.600002	39.5	19.33	873.98	-36.4	≤331.1
2457.000000	14742.000000	22.17	19.29	118.3	-53.8	≤331.1
2457.000000	14748.083333	37.17	19.29	665.27	-38.8	≤331.1
2412.000000	16884.000000	23.83	20.74	169.24	-50.7	≤331.1
2412.000000	16884.000000	39	20.74	970.51	-35.5	≤331.1
2432.000000	17024.000000	23.67	21.44	180.09	-50.1	≤331.1
2432.000000	17074.866669	38.67	21.72	1045.92	-34.8	≤331.1
2457.000000	17199.000000	22.83	22.41	182.81	-50	≤331.1
2457.000000	17205.083333	37.83	22.45	1032.76	-34.9	≤331.1



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TEST SETUP: Radiated Emissions

Manufacturer: Andrew
Model: 1-24

Gain: 24 dbi
Description: Parabolic

g0290054: 2002-Sep-11 Wed 11:19:17
STATE: 0:General



g0290055: 2002-Sep-11 Wed 11:19:17
STATE: 0:General



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NAME OF TEST: Out of Band Emissions

Manufacturer: Andrew
Model: 1-24Gain: 25 dbi
Description: Parabolic

g0290153: 2002-Sep-11 Wed 09:56:00

STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	4829.533334	30	8.39	83.08	-56.8	≤389
2412.000000	4829.533334	41.83	8.39	324.34	-45	≤389
2432.000000	4875.600000	40.83	8.57	295.12	-45.8	≤389
2432.000000	4875.600000	30.67	8.57	91.62	-56	≤389
2457.000000	4925.333334	30.33	8.74	89.85	-56.2	≤389
2457.000000	4925.333334	39.17	8.74	248.6	-47.3	≤389
2412.000000	7244.300001	38.33	13.04	370.25	-43.9	≤389
2412.000000	7244.300001	28.83	13.04	124.02	-53.4	≤389
2432.000000	7313.400000	29.17	13.19	131.22	-52.9	≤389
2432.000000	7313.400000	38.17	13.19	369.83	-43.9	≤389
2457.000000	7388.000001	38.67	13.35	399.02	-43.2	≤389
2457.000000	7388.000001	29.67	13.35	141.58	-52.2	≤389
2412.000000	9659.066668	30.33	15.58	197.47	-49.3	≤389
2412.000000	9659.066668	38.5	15.58	505.82	-41.1	≤389
2432.000000	9751.200000	40.5	15.69	644.91	-39	≤389
2432.000000	9751.200000	30	15.69	192.53	-49.5	≤389
2457.000000	9850.666668	29.83	15.81	191.43	-49.6	≤389
2457.000000	9850.666668	40.17	15.81	629.51	-39.2	≤389
2412.000000	12073.833335	37.5	17.21	543.88	-40.5	≤389
2412.000000	12073.833335	24.5	17.21	121.76	-53.5	≤389
2432.000000	12189.000000	25.33	17.21	133.97	-52.7	≤389
2432.000000	12189.000000	39.83	17.21	711.21	-38.2	≤389
2457.000000	12313.333335	39.5	17.21	684.7	-38.5	≤389
2457.000000	12313.333335	25.17	17.21	131.52	-52.8	≤389
2412.000000	14488.600002	24.83	19.36	161.99	-51	≤389
2412.000000	14488.600002	37.67	19.36	710.4	-38.2	≤389
2432.000000	14626.800000	39.67	19.32	890.23	-36.2	≤389
2432.000000	14626.800000	24.33	19.32	152.23	-51.6	≤389
2457.000000	14776.000002	24.33	19.28	151.53	-51.6	≤389
2457.000000	14776.000002	38.67	19.28	789.77	-37.3	≤389
2412.000000	16903.366669	37	20.84	779.83	-37.4	≤389
2412.000000	16903.366669	24	20.84	174.58	-50.4	≤389
2432.000000	17064.600000	22.33	21.66	158.31	-51.2	≤389
2432.000000	17064.600000	38.17	21.66	980.62	-35.4	≤389
2457.000000	17238.666669	38.5	22.63	1138.94	-34.1	≤389
2457.000000	17238.666669	23	22.63	191.21	-49.6	≤389



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TEST SETUP: Radiated Emissions

Manufacturer: Mobile Mark Gain: 2.5 dBi
Model: PSTN3-2400S Description: ½ Wave Rubber Duck

g0290062: 2002-Sep-11 Wed 12:44:42
STATE: 0:General



g0290063: 2002-Sep-11 Wed 12:44:42
STATE: 0:General



PAGE NO. 27 of 48.

NAME OF TEST: Out of Band Emissions

Manufacturer: Mobile Mark
Model: PSTN3-2400SGain: 2.5 dbi
Description: ½ Wave Rubber Duck

g0290154: 2002-Sep-11 Wed 10:24:00

STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	4828.800002	38.83	8.39	229.61	-48	≤389
2412.000000	4828.800002	30.5	8.39	88	-56.3	≤389
2432.000000	4875.933334	30.33	8.57	88.1	-56.3	≤389
2432.000000	4875.933334	38.17	8.57	217.27	-48.5	≤389
2457.000000	4926.266666	39.67	8.74	263.33	-46.8	≤389
2457.000000	4926.266666	30.33	8.74	89.85	-56.2	≤389
2412.000000	7243.200003	28.5	13.04	119.4	-53.7	≤389
2412.000000	7243.200003	38.5	13.04	377.57	-43.7	≤389
2432.000000	7313.900001	38.83	13.19	399.02	-43.2	≤389
2432.000000	7313.900001	29	13.19	128.68	-53	≤389
2457.000000	7389.399999	28.83	13.36	128.68	-53	≤389
2457.000000	7389.399999	40.83	13.36	512.27	-41	≤389
2412.000000	9657.600004	40.17	15.58	613.06	-39.5	≤389
2412.000000	9657.600004	30.67	15.58	205.35	-49	≤389
2432.000000	9751.866668	30	15.69	192.53	-49.5	≤389
2432.000000	9751.866668	40.33	15.69	632.41	-39.2	≤389
2457.000000	9852.533332	39.83	15.82	606.04	-39.6	≤389
2457.000000	9852.533332	30.17	15.82	199.3	-49.2	≤389
2412.000000	12072.000005	24.83	17.21	126.47	-53.2	≤389
2412.000000	12072.000005	39.17	17.21	659.17	-38.8	≤389
2432.000000	12189.833335	40	17.21	725.27	-38	≤389
2432.000000	12189.833335	25.67	17.21	139.32	-52.3	≤389
2457.000000	12315.666665	25.5	17.21	136.62	-52.5	≤389
2457.000000	12315.666665	38.67	17.21	622.3	-39.3	≤389
2412.000000	14486.400006	38	19.37	738.75	-37.9	≤389
2412.000000	14486.400006	23.67	19.37	141.91	-52.2	≤389
2432.000000	14627.800002	23.17	19.32	133.2	-52.7	≤389
2432.000000	14627.800002	39.33	19.32	856.05	-36.6	≤389
2457.000000	14778.799998	38	19.28	731.14	-37.9	≤389
2457.000000	14778.799998	24.5	19.28	154.53	-51.4	≤389
2412.000000	16900.800007	24.17	20.83	177.83	-50.2	≤389
2412.000000	16900.800007	40.33	20.83	1142.88	-34.1	≤389
2432.000000	17065.766669	39.67	21.68	1168.15	-33.9	≤389
2432.000000	17065.766669	23.5	21.68	181.55	-50	≤389
2457.000000	17241.933331	24.67	22.65	232.27	-47.9	≤389
2457.000000	17241.933331	38.33	22.65	1119.44	-34.2	≤389



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PAGE NO. 28 of 48.
NAME OF TEST: Out of Band Emissions
SPECIFICATION: 47 CFR 15.247(c), 15.209(a)
SPEC. LIMIT: See Below
TEST EQUIPMENT: As per previous page
SEARCH ANTENNAS: 10 kHz - 32 MHz: LOOP 94598-1
 32 MHz - 1 GHz: SINGER DM105, T₁T₂T₃
 1 GHz - 18 GHz: EMCO 3115

LIMIT

In any 100 kHz bandwidth outside these frequency bands, radio frequency power that is produced by the modulation products of the spreading sequence, information sequence, and the carrier frequency shall be either

at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power

or

shall not exceed the general levels specified in 15.209(a),

whichever results in the lesser attenuation.

All other emissions outside these bands shall not exceed the general radiated emission limits specified in 15.209(a).

MEASUREMENTS PROCEDURE:

At first, bench tests were performed to locate the emissions at the antenna terminals.

In the field, tests were conducted over the range shown. The test sample was set up on a wooden turntable above ground, and at a distance of three meters from the antenna connected to the spectrum analyzer.

In order to obtain the maximum response at each frequency, the turntable was rotated, and the search antenna was raised and lowered. The EUT was also adjusted for maximum response.

The field strength was calculated from:

$$E \text{ } \mu\text{V/m @ 3 m} = \text{LOG}_{10}^{-1}(\text{dBm} + 107 + \text{A.F.} + \text{C.L.})$$

The following results are worst case conditions. Tests were conducted in Horizontal and Vertical polarization modes.

MEASUREMENT RESULTS: ATTACHED

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NAME OF TEST: Out of Band Emissions
 Manufacturer: MAX RAD Gain: 5 dbi
 Model: MUF 24005 Description: Coil
 Lower Bandedge g0290080: 2002-Sep-06 Fri 13:06:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	2367.610000	8.61	48.49	716.14	-38.1	≤ 288.4
2412.000000	2368.740000	-2.04	48.5	210.38	-48.8	≤ 288.4
2412.000000	2370.090000	8.45	48.51	704.69	-38.3	≤ 288.4
2412.000000	2371.440000	-2.1	48.53	209.65	-48.8	≤ 288.4
2412.000000	2371.780000	9.44	48.53	791.59	-37.3	≤ 288.4
2412.000000	2373.910000	-2	48.55	212.57	-48.7	≤ 288.4
2412.000000	2374.030000	9.08	48.55	761.2	-37.6	≤ 288.4
2412.000000	2376.280000	-2.06	48.56	211.35	-48.7	≤ 288.4
2412.000000	2376.390000	8.56	48.56	717.79	-38.1	≤ 288.4
2412.000000	2378.530000	8.94	48.59	752.49	-37.7	≤ 288.4
2412.000000	2378.750000	-1.98	48.59	214.04	-48.6	≤ 288.4
2412.000000	2380.660000	8.52	48.61	718.62	-38.1	≤ 288.4
2412.000000	2380.780000	-2.03	48.61	213.3	-48.6	≤ 288.4
2412.000000	2382.910000	-2.03	48.63	213.8	-48.6	≤ 288.4
2412.000000	2383.250000	8.98	48.63	759.45	-37.6	≤ 288.4
2412.000000	2385.160000	7.86	48.64	668.34	-38.7	≤ 288.4
2412.000000	2385.160000	-1.92	48.64	216.77	-48.5	≤ 288.4
2412.000000	2387.530000	-1.96	48.66	216.27	-48.5	≤ 288.4
2412.000000	2387.750000	8.22	48.66	698.23	-38.3	≤ 288.4
2412.000000	2390.000000	9.9	48.69	850.16	-36.6	≤ 288.4
2412.000000	2390.000000	-1.85	48.69	219.79	-48.4	≤ 288.4

Upper Bandedge g0290077:2002-Sep-06 Fri 11:03:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
0.000000	2483.500000	-1.34	49.48	255.27	-47.1	≤ 288.4
0.000000	2483.500000	9.38	49.48	877	-36.4	≤ 288.4
0.000000	2485.750000	-1.46	49.5	252.35	-47.2	≤ 288.4
0.000000	2485.860000	9.46	49.5	887.16	-36.3	≤ 288.4
0.000000	2488.230000	-1.53	49.52	250.9	-47.2	≤ 288.4
0.000000	2488.230000	10.29	49.52	978.36	-35.4	≤ 288.4
0.000000	2490.250000	-1.91	49.53	240.44	-47.6	≤ 288.4
0.000000	2490.480000	8.54	49.54	801.68	-37.1	≤ 288.4
0.000000	2492.840000	-1.98	49.55	239.06	-47.7	≤ 288.4
0.000000	2492.840000	9.44	49.55	890.23	-36.2	≤ 288.4
0.000000	2494.980000	-1.96	49.58	240.44	-47.6	≤ 288.4
0.000000	2495.090000	9.25	49.58	873.98	-36.4	≤ 288.4
0.000000	2497.340000	-1.96	49.6	240.99	-47.6	≤ 288.4
0.000000	2497.450000	8.45	49.6	798.91	-37.2	≤ 288.4
0.000000	2499.250000	10.05	49.61	961.61	-35.6	≤ 288.4
0.000000	2499.250000	-1.94	49.61	241.82	-47.6	≤ 288.4
0.000000	2501.950000	8.91	49.63	845.28	-36.7	≤ 288.4
0.000000	2503.190000	-1.91	49.65	243.78	-47.5	≤ 288.4
0.000000	2504.650000	8.47	49.66	806.31	-37.1	≤ 288.4

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NAME OF TEST: Out of Band Emissions
 Manufacturer: MAX RAD Gain: 10 dbi
 Model: MSP 2401 090 Description: Directional Panel
 Lower Bandedge g0290137: 2002-Sep-10 Tue 10:04:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
0.000000	2367.500000	19.19	44.68	1561.35	-31.4	≤1258.9
0.000000	2367.610000	7.84	44.68	422.67	-42.7	≤1258.9
0.000000	2369.750000	7.87	44.69	424.62	-42.7	≤1258.9
0.000000	2369.860000	19.63	44.69	1644.37	-30.9	≤1258.9
0.000000	2371.550000	19.1	44.71	1550.6	-31.4	≤1258.9
0.000000	2371.890000	7.9	44.72	427.56	-42.6	≤1258.9
0.000000	2374.030000	19.46	44.73	1619.94	-31	≤1258.9
0.000000	2374.140000	7.98	44.73	432.02	-42.5	≤1258.9
0.000000	2376.390000	20.25	44.76	1780.33	-30.2	≤1258.9
0.000000	2376.730000	7.93	44.76	431.02	-42.5	≤1258.9
0.000000	2378.750000	7.92	44.78	431.52	-42.5	≤1258.9
0.000000	2379.200000	20.35	44.78	1805.09	-30.1	≤1258.9
0.000000	2380.890000	19.21	44.8	1586.72	-31.2	≤1258.9
0.000000	2381.000000	7.94	44.8	433.51	-42.5	≤1258.9
0.000000	2383.140000	7.91	44.82	433.01	-42.5	≤1258.9
0.000000	2383.140000	20.38	44.82	1819.7	-30	≤1258.9
0.000000	2385.280000	7.97	44.84	437.02	-42.4	≤1258.9
0.000000	2385.950000	20.86	44.85	1929.75	-29.5	≤1258.9
0.000000	2387.640000	7.96	44.86	437.52	-42.4	≤1258.9
0.000000	2387.860000	19.96	44.86	1741.81	-30.4	≤1258.9
0.000000	2390.000000	20.42	44.89	1842.89	-29.9	≤1258.9
0.000000	2390.000000	8.09	44.89	445.66	-42.2	≤1258.9

Upper Bandedge g0290133: 2002-Sep-10 Tue 09:53:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2457.000000	2483.500000	9.23	45.42	540.13	-40.6	≤1258.9
2457.000000	2483.500000	19.66	45.42	1794.73	-30.1	≤1258.9
2457.000000	2485.640000	19.89	45.43	1845.02	-29.9	≤1258.9
2457.000000	2485.980000	8.59	45.43	502.34	-41.2	≤1258.9
2457.000000	2488.000000	20.21	45.44	1916.46	-29.6	≤1258.9
2457.000000	2488.110000	8.54	45.44	500.03	-41.2	≤1258.9
2457.000000	2489.460000	20.66	45.45	2020.69	-29.1	≤1258.9
2457.000000	2490.590000	8.45	45.46	496.02	-41.3	≤1258.9
2457.000000	2492.730000	8.07	45.46	474.79	-41.7	≤1258.9
2457.000000	2492.730000	20.63	45.46	2016.04	-29.1	≤1258.9
2457.000000	2495.090000	8.05	45.48	474.79	-41.7	≤1258.9
2457.000000	2495.310000	20.33	45.48	1952.09	-29.4	≤1258.9
2457.000000	2496.550000	20.4	45.49	1970.15	-29.3	≤1258.9
2457.000000	2497.340000	8.03	45.49	474.24	-41.7	≤1258.9
2457.000000	2498.690000	19.57	45.5	1792.67	-30.2	≤1258.9
2457.000000	2499.250000	8.07	45.5	476.98	-41.7	≤1258.9
2457.000000	2501.500000	19.86	45.52	1857.8	-29.8	≤1258.9
2457.000000	2501.610000	8.05	45.52	476.98	-41.7	≤1258.9
2457.000000	2502.740000	21.4	45.52	2218.2	-28.3	≤1258.9
2457.000000	2503.410000	8.07	45.53	478.63	-41.6	≤1258.9
2457.000000	2504.990000	20.68	45.54	2046.44	-29	≤1258.9
2457.000000	2505.780000	7.98	45.54	474.24	-41.7	≤1258.9

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NAME OF TEST: Out of Band Emissions
 Manufacturer: MAX RAD Gain: 13 dbi
 Model: MSP 2401 3120 Description: Directional Panel
 Lower Bandedge g0290118: 2002-Sep-10 Tue 11:08:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	2367.500000	19.91	40.85	1091.44	-34.5	≤1288.2
2412.000000	2367.500000	7.84	40.85	271.96	-46.5	≤1288.2
2412.000000	2369.980000	18.3	40.85	906.78	-36.1	≤1288.2
2412.000000	2370.090000	7.45	40.85	260.02	-46.9	≤1288.2
2412.000000	2371.890000	18.54	40.87	934.33	-35.8	≤1288.2
2412.000000	2372.110000	7.44	40.87	260.32	-46.9	≤1288.2
2412.000000	2374.030000	7.43	40.88	260.32	-46.9	≤1288.2
2412.000000	2374.030000	18.99	40.88	985.14	-35.4	≤1288.2
2412.000000	2376.610000	7.9	40.89	275.11	-46.4	≤1288.2
2412.000000	2376.840000	19.24	40.9	1016.25	-35.1	≤1288.2
2412.000000	2378.750000	7.94	40.9	276.69	-46.4	≤1288.2
2412.000000	2378.860000	19.62	40.9	1061.7	-34.7	≤1288.2
2412.000000	2380.550000	18.89	40.92	978.36	-35.4	≤1288.2
2412.000000	2380.890000	7.9	40.92	276.06	-46.4	≤1288.2
2412.000000	2383.030000	19.31	40.93	1028.02	-35	≤1288.2
2412.000000	2383.360000	7.93	40.93	277.33	-46.4	≤1288.2
2412.000000	2385.500000	7.95	40.94	278.29	-46.3	≤1288.2
2412.000000	2385.840000	19.7	40.94	1076.47	-34.6	≤1288.2
2412.000000	2387.750000	7.96	40.95	278.93	-46.3	≤1288.2
2412.000000	2387.980000	18.78	40.95	969.39	-35.5	≤1288.2
2412.000000	2390.000000	19.52	40.97	1058.03	-34.7	≤1288.2
2412.000000	2390.000000	8.09	40.97	283.79	-46.2	≤1288.2

Upper Bandedge g0290122: 2002-Sep-10 Tue 11:45:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2457.000000	2483.500000	20.04	45.42	1874.99	-29.8	≤1288.2
2457.000000	2483.500000	8.76	45.42	511.68	-41	≤1288.2
2457.000000	2485.640000	20.75	45.43	2037.04	-29	≤1288.2
2457.000000	2485.750000	8.52	45.43	498.31	-41.3	≤1288.2
2457.000000	2487.890000	20.03	45.44	1877.15	-29.8	≤1288.2
2457.000000	2488.000000	8.54	45.44	500.03	-41.2	≤1288.2
2457.000000	2490.030000	20.89	45.46	2077.3	-28.9	≤1288.2
2457.000000	2490.360000	8.47	45.46	497.16	-41.3	≤1288.2
2457.000000	2492.500000	8.1	45.46	476.43	-41.7	≤1288.2
2457.000000	2492.840000	20.68	45.48	2032.36	-29.1	≤1288.2
2457.000000	2494.530000	19.22	45.48	1717.91	-30.5	≤1288.2
2457.000000	2494.980000	7.63	45.48	452.38	-42.1	≤1288.2
2457.000000	2497.000000	7.61	45.49	451.86	-42.1	≤1288.2
2457.000000	2497.110000	20.66	45.49	2030.02	-29.1	≤1288.2
2457.000000	2498.800000	7.63	45.5	453.42	-42.1	≤1288.2
2457.000000	2499.140000	18.94	45.5	1667.25	-30.8	≤1288.2
2457.000000	2501.500000	20.68	45.52	2041.74	-29	≤1288.2
2457.000000	2501.610000	8.33	45.52	492.61	-41.4	≤1288.2
2457.000000	2503.640000	19.63	45.53	1811.34	-30.1	≤1288.2
2457.000000	2503.980000	8.1	45.53	480.29	-41.6	≤1288.2
2457.000000	2506.000000	19.63	45.54	1813.43	-30.1	≤1288.2
2457.000000	2506.000000	8.07	45.54	479.18	-41.6	≤1288.2

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NAME OF TEST: Out of Band Emissions
 Manufacturer: Mobile Mark Gain: 6 dbi
 Model: OD6-2400 Description: OMNI
 Lower Bandedge g0290105:2002-Sep-09 Mon 12:48:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2369.530000	-1.21	48.51	231.74	-47.9	0.000000016
2412.000000	2370.090000	11.38	48.51	987.42	-35.3	0.00000003
2412.000000	2372.000000	-1.02	48.53	237.41	-47.7	0.000000017
2412.000000	2372.000000	10.21	48.53	864.97	-36.5	0.000000022
2412.000000	2373.910000	-0.56	48.55	250.9	-47.2	0.000000019
2412.000000	2374.480000	12.01	48.55	1066.6	-34.7	0.000000034
2412.000000	2376.500000	-1.07	48.56	236.86	-47.7	0.000000017
2412.000000	2376.500000	10.9	48.56	939.72	-35.8	0.000000026
2412.000000	2378.190000	12.01	48.58	1070.29	-34.6	0.000000035
2412.000000	2378.640000	-0.75	48.59	246.6	-47.4	0.000000018
2412.000000	2381.000000	-0.84	48.61	244.62	-47.5	0.000000018
2412.000000	2381.000000	10.42	48.61	894.33	-36.2	0.000000024
2412.000000	2383.140000	12.9	48.63	1192.61	-33.7	0.000000043
2412.000000	2383.360000	-0.59	48.63	252.35	-47.2	0.000000019
2412.000000	2385.500000	-0.58	48.65	253.22	-47.2	0.000000019
2412.000000	2385.500000	11.16	48.65	978.36	-35.4	0.000000029
2412.000000	2387.640000	-0.63	48.66	252.06	-47.2	0.000000019
2412.000000	2387.750000	11.47	48.66	1015.08	-35.1	0.000000031
2412.000000	2390.000000	0.3	48.69	281.51	-46.2	0.000000024
2412.000000	2390.000000	12.65	48.69	1166.81	-33.9	0.000000041

Upper Bandedge g0290108:2002-Sep-09 Mon 13:27:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2483.500000	19.52	49.18	2722.7	-26.5	0.00000022
2457.000000	2483.500000	5.97	49.18	572.14	-40.1	0.000000098
2457.000000	2485.640000	4.84	49.2	503.5	-41.2	0.000000076
2457.000000	2485.640000	17.55	49.2	2175.2	-28.5	0.00000014
2457.000000	2488.000000	17.48	49.21	2160.23	-28.5	0.00000014
2457.000000	2488.000000	5.35	49.21	534.56	-40.7	0.000000085
2457.000000	2490.140000	5.28	49.23	531.5	-40.7	0.000000085
2457.000000	2490.140000	19.25	49.23	2654.61	-26.7	0.00000021
2457.000000	2492.500000	15.43	49.24	1711.99	-30.6	0.000000087
2457.000000	2492.500000	3.99	49.24	458.67	-42	0.000000063
2457.000000	2494.530000	3.92	49.26	456.04	-42	0.000000063
2457.000000	2495.430000	16.82	49.27	2016.04	-29.1	0.00000012
2457.000000	2497.000000	16.18	49.28	1874.99	-29.8	0.0000001
2457.000000	2497.000000	3.85	49.28	453.42	-42.1	0.000000062
2457.000000	2498.910000	16.27	49.3	1898.89	-29.7	0.00000011
2457.000000	2499.140000	3.73	49.3	448.23	-42.2	0.000000006
2457.000000	2501.500000	15.2	49.32	1682.67	-30.7	0.000000085
2457.000000	2501.500000	3.94	49.32	460.26	-42	0.000000063
2457.000000	2503.530000	3.69	49.33	447.71	-42.2	0.000000006
2457.000000	2503.530000	16.08	49.33	1864.23	-29.8	0.0000001

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NAME OF TEST: Out of Band Emissions
 Manufacturer: Andrew Gain: 24 dbi
 Model: 1-24 Description: Parabolic
 Lower Bandedege g0290151: 2002-Sep-10 Tue 14:52:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2457.000000	2483.500000	30.34	45.42	6137.62	-19.5	≤11220.1
2457.000000	2483.500000	18.37	45.42	1547.03	-31.4	≤11220.1
2457.000000	2485.410000	29.91	45.43	5847.9	-19.9	≤11220.1
2457.000000	2485.750000	18.31	45.43	1538.15	-31.5	≤11220.1
2457.000000	2488.000000	18.36	45.44	1548.82	-31.4	≤11220.1
2457.000000	2488.110000	30.05	45.44	5949.77	-19.7	≤11220.1
2457.000000	2490.030000	29.06	45.46	5321.08	-20.7	≤11220.1
2457.000000	2490.250000	18.31	45.46	1543.48	-31.5	≤11220.1
2457.000000	2492.610000	29.68	45.46	5714.79	-20.1	≤11220.1
2457.000000	2492.610000	18.05	45.46	1497.96	-31.7	≤11220.1
2457.000000	2494.530000	18.05	45.48	1501.41	-31.7	≤11220.1
2457.000000	2494.750000	28.85	45.48	5205.95	-20.9	≤11220.1
2457.000000	2496.890000	30.03	45.49	5970.35	-19.7	≤11220.1
2457.000000	2497.000000	17.54	45.49	1417.42	-32.2	≤11220.1
2457.000000	2499.140000	17.58	45.5	1425.61	-32.1	≤11220.1
2457.000000	2499.360000	29.96	45.5	5929.25	-19.8	≤11220.1
2457.000000	2501.390000	29.5	45.52	5636.38	-20.2	≤11220.1
2457.000000	2501.390000	17.58	45.52	1428.89	-32.1	≤11220.1
2457.000000	2503.410000	18.31	45.53	1555.97	-31.4	≤11220.1
2457.000000	2503.640000	29.72	45.53	5787.62	-20	≤11220.1
2457.000000	2505.890000	31.51	45.54	7120.33	-18.2	≤11220.1
2457.000000	2505.890000	18.03	45.54	1508.34	-31.7	≤11220.1

Upper Bandedege g0290147: 2002-Sep-10 Tue 14:03:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W x 10 ⁻⁶
2412.000000	2367.500000	17.79	40.85	855.07	-36.6	≤11220.1
2412.000000	2367.950000	28.75	40.85	3019.95	-25.6	≤11220.1
2412.000000	2369.640000	17.73	40.85	849.18	-36.6	≤11220.1
2412.000000	2369.860000	27.88	40.85	2732.12	-26.5	≤11220.1
2412.000000	2371.780000	28.78	40.87	3037.39	-25.6	≤11220.1
2412.000000	2372.000000	17.81	40.87	859.01	-36.5	≤11220.1
2412.000000	2374.360000	28.13	40.88	2821.63	-26.2	≤11220.1
2412.000000	2374.480000	17.84	40.88	862.98	-36.5	≤11220.1
2412.000000	2376.500000	17.79	40.89	859.01	-36.5	≤11220.1
2412.000000	2378.750000	17.82	40.9	862.98	-36.5	≤11220.1
2412.000000	2378.860000	28.25	40.9	2867.48	-26.1	≤11220.1
2412.000000	2381.000000	17.85	40.92	867.96	-36.5	≤11220.1
2412.000000	2381.000000	28.09	40.92	2821.63	-26.2	≤11220.1
2412.000000	2383.140000	28.75	40.93	3047.89	-25.5	≤11220.1
2412.000000	2383.480000	17.84	40.93	867.96	-36.5	≤11220.1
2412.000000	2385.390000	29.02	40.94	3147.75	-25.3	≤11220.1
2412.000000	2385.610000	17.85	40.94	869.96	-36.4	≤11220.1
2412.000000	2387.640000	28.9	40.95	3108.14	-25.4	≤11220.1
2412.000000	2387.640000	17.84	40.95	869.96	-36.4	≤11220.1
2412.000000	2390.000000	17.9	40.97	878.01	-36.4	≤11220.1
2412.000000	2390.000000	28.75	40.97	3061.96	-25.5	≤11220.1

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NAME OF TEST: Out of Band Emissions

Manufacturer: Mobile Mark
Model: PSTN3-2400SGain: 2.5 dbi
Description: ½ Wave Rubber Duck

Lower Bandedge g0290158:2002-Sep-11 Wed 12:09:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2412.000000	2369.750000	6.09	48.34	526.62	-40.8	0.000000083
2412.000000	2370.310000	19.17	48.34	2374.11	-27.7	0.00000017
2412.000000	2372.000000	6.1	48.36	528.45	-40.8	0.000000083
2412.000000	2372.000000	17.08	48.36	1870.68	-29.8	0.0000001
2412.000000	2373.800000	18.57	48.37	2223.31	-28.3	0.00000015
2412.000000	2374.250000	6.16	48.37	532.72	-40.7	0.000000085
2412.000000	2376.500000	6.12	48.39	531.5	-40.7	0.000000085
2412.000000	2376.500000	18.08	48.39	2106.2	-28.8	0.00000013
2412.000000	2378.640000	6.11	48.41	532.11	-40.7	0.000000085
2412.000000	2379.090000	18.48	48.41	2210.55	-28.3	0.00000015
2412.000000	2381.000000	6.12	48.43	533.95	-40.7	0.000000085
2412.000000	2381.000000	17.22	48.43	1916.46	-29.6	0.00000011
2412.000000	2382.580000	18.76	48.44	2290.87	-28	0.00000016
2412.000000	2383.360000	6.11	48.44	533.95	-40.7	0.000000085
2412.000000	2385.500000	6.14	48.46	537.03	-40.6	0.000000087
2412.000000	2385.500000	17.1	48.46	1896.71	-29.7	0.00000011
2412.000000	2387.410000	19.01	48.47	2365.92	-27.7	0.00000017
2412.000000	2387.860000	6.11	48.47	535.8	-40.6	0.000000087
2412.000000	2390.000000	6.1	48.5	537.03	-40.6	0.000000087
2412.000000	2390.000000	17.39	48.5	1970.15	-29.3	0.00000012

Upper Bandedge g0290162:2002-Sep-11 Wed 12:36:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2457.000000	2483.500000	6.24	49.18	590.2	-39.8	0.00000001
2457.000000	2483.500000	17.59	49.18	2180.22	-28.5	0.00000014
2457.000000	2485.520000	6.18	49.2	587.49	-39.8	0.00000001
2457.000000	2485.860000	19.23	49.2	2639.37	-26.8	0.00000021
2457.000000	2488.000000	6.18	49.21	588.17	-39.8	0.00000001
2457.000000	2488.000000	18.84	49.21	2526.39	-27.2	0.00000019
2457.000000	2490.140000	19.34	49.23	2682.25	-26.7	0.00000021
2457.000000	2490.140000	6.18	49.23	589.52	-39.8	0.00000001
2457.000000	2492.500000	6.11	49.24	585.46	-39.9	0.00000001
2457.000000	2492.500000	18.32	49.24	2387.81	-27.7	0.00000017
2457.000000	2494.520000	6.14	49.26	588.84	-39.8	0.00000001
2457.000000	2494.750000	18.04	49.26	2317.39	-27.9	0.00000016
2457.000000	2496.890000	6.16	49.27	590.88	-39.8	0.00000001
2457.000000	2497.000000	17.32	49.28	2137.96	-28.6	0.00000014
2457.000000	2499.250000	6.18	49.3	594.29	-39.7	0.000000011
2457.000000	2499.470000	19.05	49.3	2615.17	-26.9	0.00000002
2457.000000	2501.500000	6.16	49.32	594.29	-39.7	0.000000011
2457.000000	2501.500000	18.18	49.32	2371.37	-27.7	0.00000017
2457.000000	2503.190000	19.48	49.33	2757.4	-26.4	0.00000023
2457.000000	2503.410000	6.18	49.33	596.35	-39.7	0.000000011

PAGE NO. 35 of 48.
NAME OF TEST: Restricted Bands of Operation
SPECIFICATION: 47 CFR 15.205
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

The EUT was set up on a three meter open field site according to the procedure on ANSI C63.4.

Sensitivity of system was measured:

Below 2 GHz:

CISPR Bandwidths	= 8 dB μ V
1 MHz RBW, 1 MHz VBW	= 12 dB μ V
1 MHz RBW, 10 Hz VBW	= 3 dB μ V

Above 2 GHz:

1 MHz RBW, 1 MHz VBW	= 33 dB μ V
1 MHz RBW, 10 Hz VBW	= 22 dB μ V

Sensitivity of system with preamps:

Below 2 GHz:

Preamps are not used in this range.

Above 2 GHz:

Peak	= 3 dB μ V
Average	= -8 dB μ V

Cable Loss:

915 MHz	= -0.8 dB μ V
2450 MHz	= -3 dB μ V

Note:

dB loss vs. frequency included in programmed software.

Reference Level Offset:

set @ 1 dB, accounts for cable and connector loss.

TEST RESULTS: No harmonic or spurious emissions were detected in the restricted bands in excess of the limits of 15.205. System measurement sensitivity was -130 dBm.



PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

PAGE NO. 36 of 48.
NAME OF TEST: Emissions At Band Edges
SPECIFICATION: 47 CFR
TEST EQUIPMENT: As for "Out of Band Emissions"

MEASUREMENT RESULTS

ATTACHED

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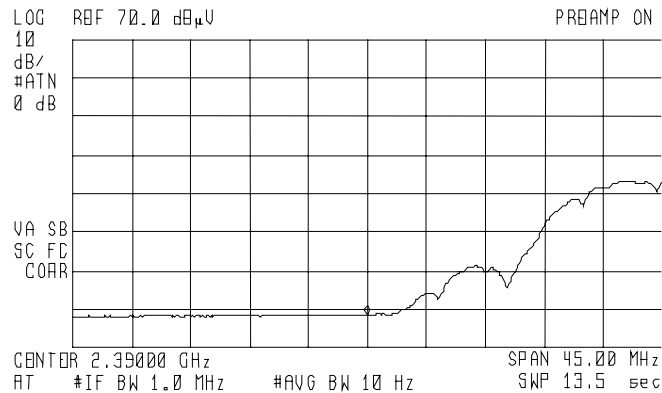
NAME OF TEST: Emission Masks (Conducted)
 g0290082: 2002-Sep-06 Fri 13:19:00
 STATE: 2:High Power

Manufacturer: MAX RAD
 Model: MUF 24005

Gain: 5 dbi
 Description: Coil



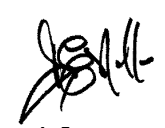
ACTV DBT: PBAK
 MEAS DBT: PBAK QP AVG
 MKR 2.39000 GHz
 -1.85 dBμV



POWER:
 MODULATION:

HIGH
 DSSS
 LOWER BANDEDGE

PERFORMED BY:


 Doug Noble, B.A.S. E.E.T.

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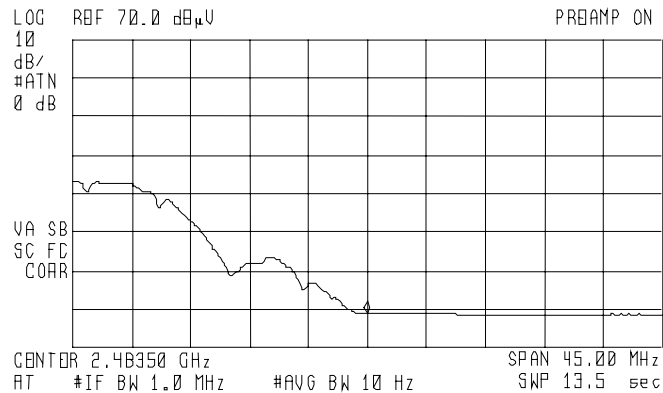
NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0290079: 2002-Sep-06 Fri 11:47:00
 STATE: 2:High Power

Manufacturer: MAX RAD
 Model: MUF 24005

Gain: 5 dbi
 Description: Coil



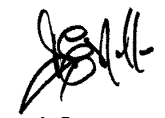
ACTV DBT: PBAK
 MEAS DBT: PBAK QP AVG
 MKR 2.40350 GHz
 -1.36 dBμV



POWER:
 MODULATION:

HIGH
 DSSS
 UPPER BANDEDGE CHANNEL 11

PERFORMED BY:


 Doug Noble, B.A.S. E.E.T.

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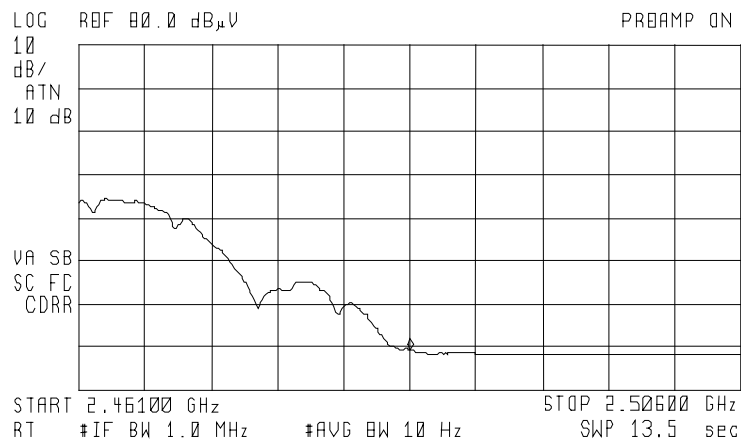
NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0290132: 2002-Sep-10 Tue 09:52:00
 STATE: 2:High Power

Manufacturer: MAX RAD
 Model: MSP 2401 090

Gain: 10 dbi
 Description: Directional Panel



ACTV DET: PBAK
 MEAS DET: PBAK QP AVG
 MKR 2.48350 GHz
 9.23 dBμV



POWER:
 MODULATION:

HIGH
 DSSS
 UPPER BANDEDGE CH 11

PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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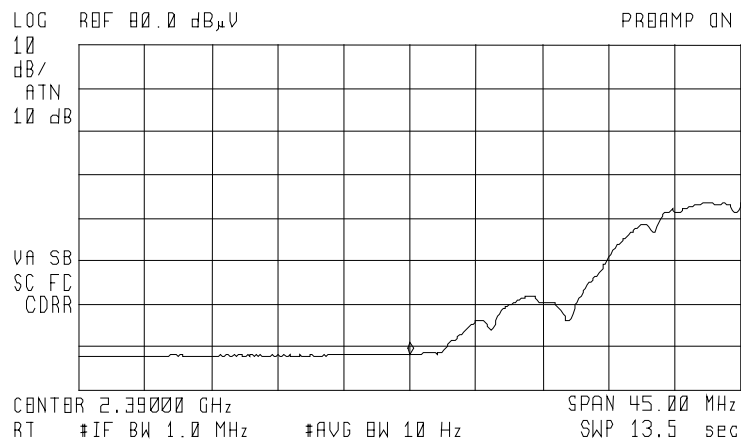
NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0290136: 2002-Sep-10 Tue 10:03:00
 STATE: 2:High Power

Manufacturer: MAX RAD
 Model: MSP 2401 090

Gain: 10 dbi
 Description: Directional Panel



ACTV DET: PBAK
 MEAS DET: PBAK QP AVG
 MKR 2.39000 GHz
 8.09 dBμV



POWER:
 MODULATION:

HIGH
 DSSS
 LOWER BANDEDGE CH 1

PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)

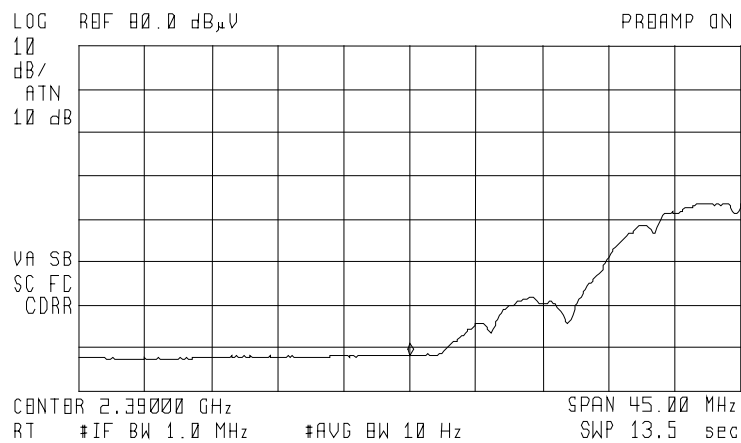
Manufacturer: MAX RAD
Model: MSP 2401 3120

Gain: 13 dbi
Description: Directional Panel

g0290117: 2002-Sep-10 Tue 11:08:00
STATE: 2:High Power



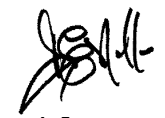
ACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.39000 GHz
8.09 dBμV



POWER:
MODULATION:

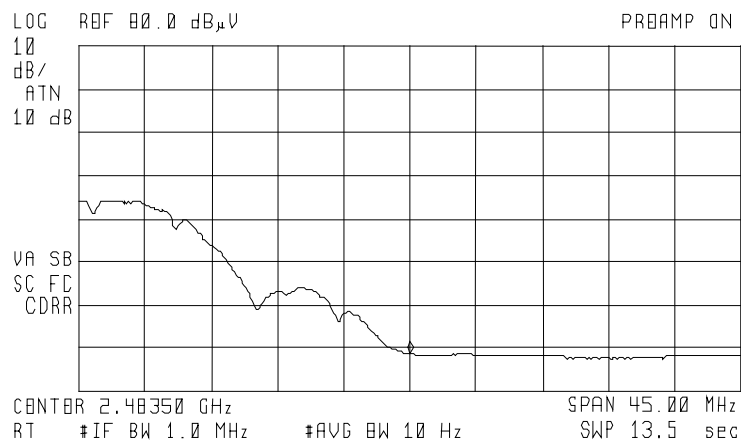
HIGH
DSSS
LOWER BANDEDGE CH 1

PERFORMED BY:

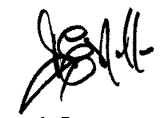

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NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: MAX RAD
Model: MSP 2401 3120Gain: 13 dbi
Description: Directional Panelg0290121: 2002-Sep-10 Tue 11:44:00
STATE: 2:High PowerACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.48350 GHz
8.76 dBμVPOWER:
MODULATION:HIGH
DSSS
UPPER BANDEDGE CH 11

PERFORMED BY:


Doug Noble, B.A.S. E.E.T.

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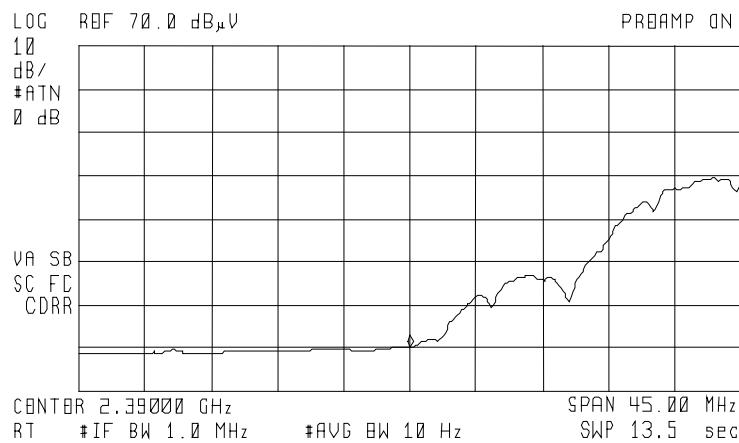
NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: Mobile Mark Gain: 6 dbi
Model: OD6-2400 Description: OMNI

g0290106: 2002-Sep-09 Mon 12:53:00
STATE: 2:High Power



ACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.39000 GHz
.30 dBμV



POWER: HIGH
MODULATION: DSSS
LOWER BANDEDGE

PERFORMED BY:

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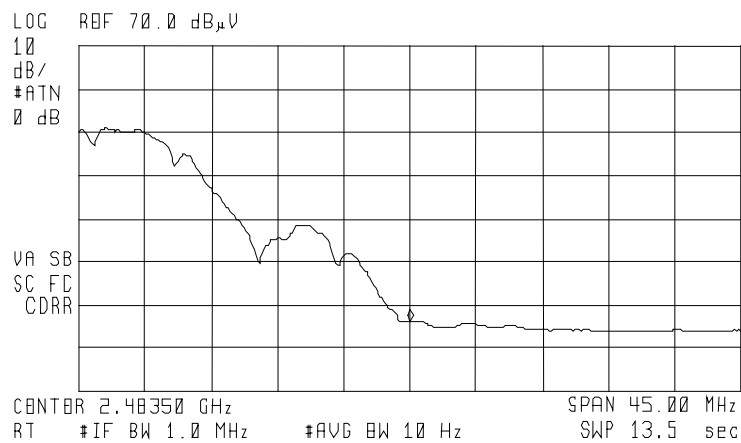
NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: Mobile Mark Gain: 6 dbi
Model: OD6-2400 Description: OMNI

g0290112: 2002-Sep-09 Mon 15:35:00
STATE: 2:High Power



ACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.48350 GHz
5.97 dBμV



POWER: HIGH
MODULATION: DSSS
UPPER BANDEDGE

PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)

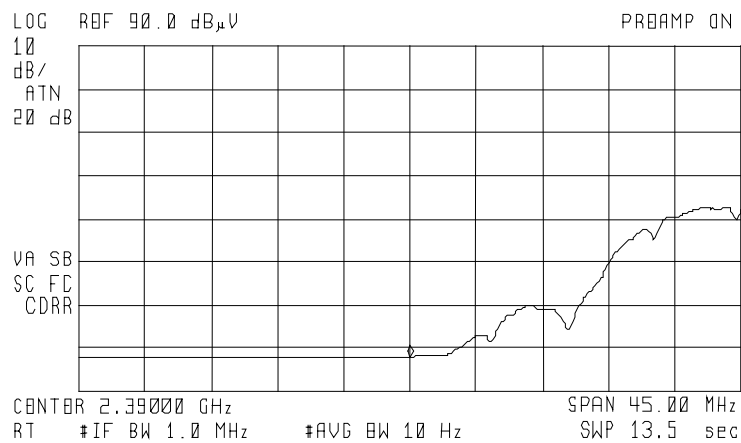
Manufacturer: Andrew
Model: 1-24

Gain: 24 dbi
Description: Parabolic

g0290146: 2002-Sep-10 Tue 14:03:00
STATE: 2:High Power



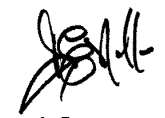
ACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.39000 GHz
17.90 dBμV



POWER:
MODULATION:

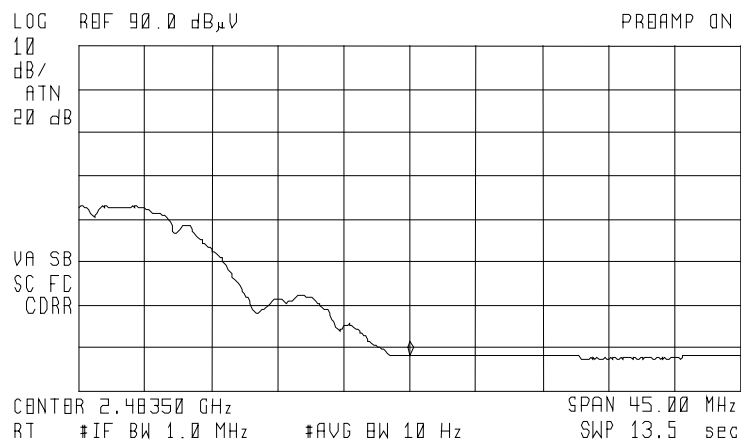
HIGH
DSSS
LOWER BANDEDGE CH 1

PERFORMED BY:

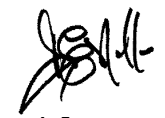

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NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: Andrew
Model: 1-24Gain: 24 dbi
Description: Parabolicg0290150: 2002-Sep-10 Tue 14:52:00
STATE: 2:High PowerACTV DET: PBAK
MEAS DET: PBAK QP AVG
MKR 2.48350 GHz
18.37 dBμVPOWER:
MODULATION:HIGH
DSSS
UPPER BANDEDGE CH 11

PERFORMED BY:


Doug Noble, B.A.S. E.E.T.

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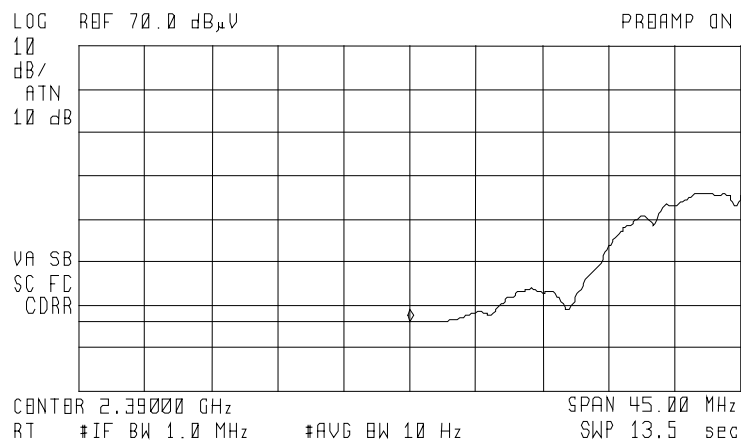
NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: Mobile Mark Gain: 2.5 dbi
 Model: PSTN3-2400S Description: ½ Wave Rubber Duck

g0290159: 2002-Sep-11 Wed 12:15:00
 STATE: 2:High Power



ACTV DET: PBAK
 MEAS DET: PBAK QP AVG
 MKR 2.39000 GHz
 6.10 dBμV



POWER: HIGH
 MODULATION: DSSS
 LOWER BANDEDGE

PERFORMED BY:

Doug Noble, B.A.S. E.E.T.

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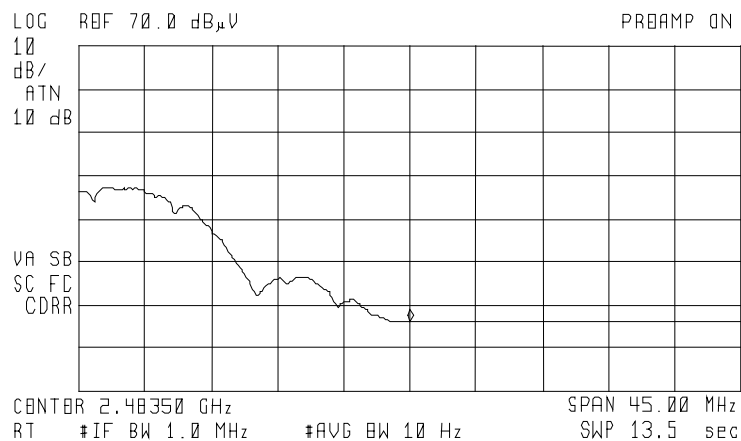
NAME OF TEST: Emission Masks (Occupied Bandwidth)

Manufacturer: Mobile Mark Gain: 2.5 dbi
 Model: PSTN3-2400S Description: ½ Wave Rubber Duck

g0290163: 2002-Sep-11 Wed 12:39:00
 STATE: 2:High Power



ACTV DET: PBAK
 MEAS DET: PBAK QP AVG
 MKR 2.48350 GHz
 6.24 dBμV



POWER: HIGH
 MODULATION: DSSS
 UPPER BANDEDGE

PERFORMED BY: END OF Doug Noble, B.A.S. E.E.T. TEST REPORT

RADIATED MEASUREMENTS
FOR PART 15 TRANSMITTERS W/ INTEGRAL ANTENNAS

Radiated Measurements

<u>RANGE OF MEASUREMENT</u>	<u>SPECIFICATION</u>	<u>RESOLUTION B/W</u>	<u>VIDEO B/A</u>
30 to 1000 MHz	CISPR	≥100 kHz	≥100 kHz
>1000 MHz	FCC, 15.37(b)	1 MHz	≥1 MHz
(if averaging)	FCC, 15.37(b)	1 MHz	10 Hz

Measuring Equipment

a. ANTENNAS:

EMCO 3109	20 - 300 MHz
APREL AALP2001	200 - 1000 MHz
APREL AAB20200	20 - 200 MHz
APREL AAH118	1 - 18 GHz

b. INSTRUMENTS:

HP8566B	Spectrum Analyzer
HP85685A	Preselector, w/ preamp below 2 GHz
HP85650A	Quasi Peak Adapter
HP8449	Preamp, above 2 GHz
HP8563E	Spectrum Analyzer, above 2 GHz

All test instrumentation is calibrated every January and every July. In addition, all test instrumentation is calibrated daily, or as required by the manufacturer. A Calibration Agreement is maintained with Hewlett Packard.

Occupied Bandwidth

Occupied Bandwidth is measured as a radiated signal without attenuators and/or filter. RBW, VBW and scan settings as shown were set to produce a meaningful result in accordance with ANSI C63.4, Section 13.1.7.

Part 15.21, Information to User

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly avoided by the party responsible for compliance could void the user's authority to operate the equipment.

§ 15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (b) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69625	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	322-339.4	3600-4400	(2)
13.36-13.41			

Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. Above 38.6

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.