



# M. Flom Associates, Inc.

## International Compliance Testing Laboratory

3356 N. San Marcos Place, Suite 107  
Chandler, AZ 85225

toll-free: (866) 311-3268  
fax: (480) 926-3598

<http://www.mflom.com>  
[info@mflom.com](mailto:info@mflom.com)

Date: October 4, 2005

Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Zelosity Corporation  
Equipment: ZPC01  
FCC ID: R8W-ZPC01  
FCC Rules: 15.245

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

David E. Lee, Quality Assurance Manager

enclosure(s)  
cc: Applicant  
DEL/del



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## Transmitter Certification

of

FCC ID: R8W-ZPC01  
Model: ZPC01

to

**Federal Communications Commission**

Rule Part 15.245

Date of report: October 3, 2005

**On the Behalf of the Applicant:**

Zelocity Corporation

**At the Request of:**

P.O. 1045

Zelocity Corporation  
14500 N. Northsight Blvd., Suite 250  
Scottsdale, AZ 85260

**Attention of:**

Kay Comaford  
(480) 556-6007; fax: (480) 556-6008  
email: [kay@zelocity.com](mailto:kay@zelocity.com)

**Supervised by:**

David E. Lee, Compliance Test Manager

**List Of Exhibits**  
(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: Zelocity Corporation

FCC ID: R8W-ZPC01

**By Applicant:**

1. Letter Of Authorization
2. Identification Drawings
  - Label
  - Location of Label
  - Compliance Statement
  - Location of Compliance Statement
3. Documentation: 2.1033(B)
  - (3) User Manual
  - (4) Operational Description
  - (5) Block Diagram
  - (5) Schematic Diagram
  - (7) Photographs
  - Parts List
  - Active Devices

**By M.F.A. Inc.**

- A. Testimonial & Statement of Certification

**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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2.1033(c)	General Information Required	2
	Standard Test Conditions and Engineering Practices	5
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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: d05a0003

d) Client: Zelocity Corporation  
14500 N. Northsight Blvd., Suite 250  
Scottsdale, AZ 85260

e) Identification: ZPC01  
FCC ID: R8W-ZPC01  
Description: Golf Ball Radar

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

g) Report Date: October 4, 2005  
EUT Received: September 16, 2005

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:



David E. Lee, Quality Assurance Manager

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.

## List of General Information Required for Certification

In Accordance With FCC Rules and Regulations,  
Volume II, Part 2 and to

15.245

### Sub-part 2.1033

(c)(1): **Name and Address of Applicant:**

Zelocity Corporation  
14500 N. Northsight Blvd., Suite 250  
Scottsdale, AZ 85260

**Manufacturer:**

Applicant

(c)(2): **FCC ID:** R8W-ZPC01

**Model Number:** ZPC01

(c)(3): **Instruction Manual(s):**

Please See Attached Exhibits

(c)(4): **Type Of Emission:** CW / Pulsed CW

(c)(5): **FREQUENCY RANGE, MHz:** 10500 - 10550

(c)(6): **Power Rating, mV/m:** 112.46 mV/m @ 3m  
☐ Switchable ☐ Variable ☒ N/A

(c)(7): **Maximum Power Rating, W:** 2500 mv/m @ 3m

15.203: **Antenna Requirement:**

- ☒ 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

**Subpart 2.1033 (continued)**

(c)(8): Voltages & currents in all elements in final RF Stage, including final transistor or solid state device:

Collector Current	=	65mA (max)
Collector Voltage	=	5.0V
Supply Voltage, Vdc	=	9.0

(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



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)
X _____	15.245	Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (field disturbance sensors)
_____	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)

## Standard Test Conditions and Engineering Practices

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

In accordance with ANSI C63.4-2003, 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.



### A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical 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."

Certificate Number: **2152-01**

**Name of Test:** Field Strength of Spurious Radiation

**Specification:** 47 CFR 2.1053(a)

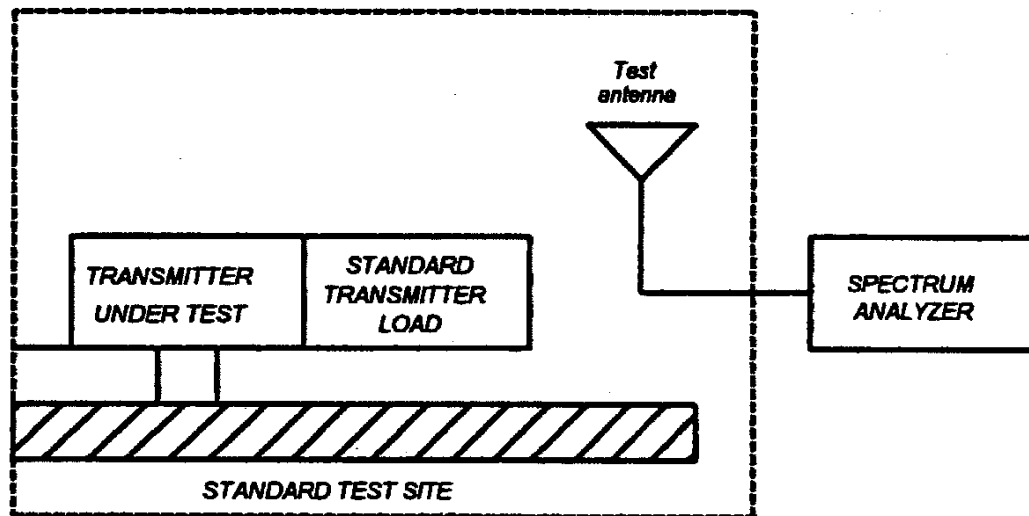
**Guide:** ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16

### Measurement Procedure

1.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

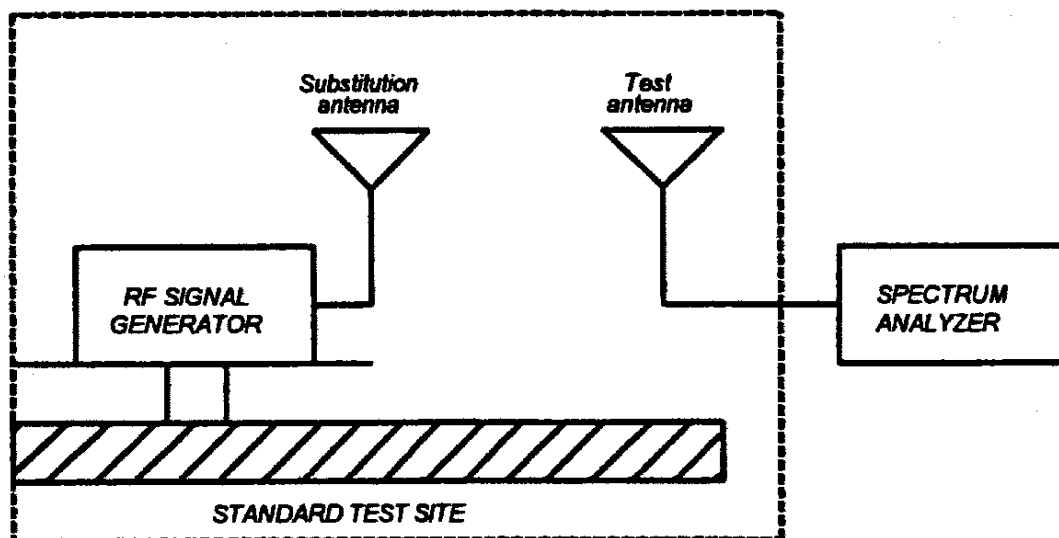
#### 1.2.12.2 Method of Measurement

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
  - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
  - 2) Video Bandwidth = 3 times Resolution Bandwidth, or 30 kHz (22.917)
  - 3) Sweep Speed  $\leq 2000$  Hz/second
  - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.



**Name of Test:** Field Strength of Spurious Radiation (Cont.)

- D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to  $\pm$  the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

**Name of Test:** Field Strength of Spurious Radiation (Cont.)

- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

$$\text{Radiated spurious emissions dB} = 10 \log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$$

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

**Test Equipment:**

Asset	Description	s/n	Cycle	Last Cal
(as applicable)			Per ANSI C63.4-1992/2000 Draft, 10.1.4	
<b>Transducer</b>				
X	i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo. Sep-03
	i00065	EMCO 3301-B Active Monopole	2635	24 mo. Sep-03
X	i00089	Apriel 2001 200MHz-1GHz	001500	24 mo. Sep-03
X	i00103	EMCO 3115 Horn 1GHz-18GHz	9208-3925	24 mo. Jan-04
X	i00085	EMCO 3116 Horn 18GHz - 40GHz	2076	24 mo. Jan-04
<b>Amplifier / Couplers</b>				
X	i00028	HP 8449A	2749A00121	12 mo. May-05
X	i00193	HP11970A Harmonic Mixer	3003A07720	24 mo Jan-04
<b>Spectrum Analyzer</b>				
X	i00029	HP 8563E	3213A00104	12 mo. May-05
X	i00033	HP 85462A	3625A00357	12 mo. Jan-03
	i00048	HP 8566B	2511AD1467	12 mo. Jan-03

Measurement Results: Field Strength of Spurious Radiation

Frequency of Carrier, MHz = 105525 (nominal)  
 Spectrum Searched = 30MHz - 1GHz  
 Fc upto 40GHz  
 All Other Emissions =  $\geq 20$ dB Below Limit  
 Measurement Results = Attached  
 Meets general radiated emission limits (Rule 15.209)  
 outside of the frequency band.

Per 47 CFR 15.245:

(a) EUT is, or makes use of, a field disturbance sensor.

(b) EUT complies with the following limits:

Fc Frequency, MHz	Fc FIELD, mv/m	Spurious Field, mv/m
902-928	500	1.6
2435-2465	500	1.6
5783-5815	500	1.6
10500-10550	2500	25.0
24075-24175	2500	25.0

(b)(1) Harmonic emissions in the restricted bands below 17.7 GHz do not exceed the field strength limits of 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz do not exceed the following field strength limits:

(b)(1)(i) For field disturbance sensors used only within a building or to open doors, 25.0 mv/m

(b)(1)(ii) For all other field disturbance sensors, 7.5 mv/m

(b)(1)(iii) Emissions in the restricted bands fully comply with the limits given in 15.209

(b)(2) Emissions were measured at a disturbance of 3 meters.

(b)(3) Emissions radiated outside of the specified frequency bands, other than harmonics, were attenuated by at least the lesser attenuation of 50 dB below the fundamental of 15.209.

(b)(4) The emissions were measured on instrumentation employing an average detector. The provisions in 15.35 for limiting peak emissions were met.

**Name of Test:** Transmitter Fundamental Emissions (Radiated)  
g0590105: 2005-Sep-22 Thu 15:53:00  
State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV @ m	C.F., dB	mV/m @ m
10525.000000	10521.697442	50.97 3	50.05	112.460 3

**Name of Test:** Transmitter Spurious Emissions (Radiated)  
g0590107: 2005-Sep-23 Fri 08:30:00  
State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV @ m	C.F., dB	mV/m @ m
10525.000000	21044.424614	26.97 3	45.31	3.63 3
10525.000000	31567.434278	33.15 3	50.85	16.85 3



Performed By:

Fred Chastain, Test Technician

**Name of Test:** Non-Harmonic Spurious Emissions (Radiated)  
g0590106: 2005-Sep-22 Thu 15:57:00  
State: 0:General

All other emissions in the required measurement range were more that 20 dB below the required limits.

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV @ m		C.F., dB	μV/m @ m	
10525.000000	32.580000	15.02	3	12.07	22.62	3
10525.000000	35.000000	15.08	3	11.37	21.01	3
10525.000000	39.376300	20.66	3	12.21	44.00	3
10525.000000	47.780000	12.50	3	12.09	16.96	3
10525.000000	49.930000	18.50	3	11.84	32.89	3
10525.000000	68.980000	14.08	3	8.00	12.71	3
10525.000000	116.430000	12.21	3	10.98	14.44	3
10525.000000	117.780000	15.37	3	11.07	20.99	3
10525.000000	141.850000	11.69	3	12.02	15.33	3
10525.000000	172.080000	15.67	3	12.10	24.46	3
10525.000000	188.450000	17.10	3	13.05	32.17	3
10525.000000	218.230000	11.01	3	14.97	19.91	3
10525.000000	229.350000	19.63	3	15.58	57.61	3
10525.000000	235.680000	9.76	3	15.90	19.19	3
10525.000000	239.600000	8.48	3	16.10	16.94	3
10525.000000	258.050000	16.59	3	18.28	55.40	3
10525.000000	266.200000	19.21	3	19.84	89.64	3
10525.000000	282.630000	12.16	3	22.84	56.23	3
10525.000000	298.430000	11.08	3	25.64	68.55	3
10525.000000	313.680000	21.59	3	15.59	72.28	3
10525.000000	314.930000	19.33	3	15.62	55.91	3
10525.000000	344.050000	7.93	3	16.29	16.26	3
10525.000000	348.130000	13.75	3	16.38	32.10	3
10525.000000	364.050000	15.20	3	16.74	39.54	3
10525.000000	397.600000	7.70	3	17.44	18.07	3
10525.000000	428.400000	6.79	3	17.98	17.32	3
10525.000000	440.530000	10.41	3	18.17	26.85	3
10525.000000	447.250000	17.62	3	18.29	62.45	3
10525.000000	484.050000	10.98	3	18.78	30.76	3
10525.000000	503.950000	15.23	3	19.22	52.78	3
10525.000000	505.380000	7.93	3	19.30	22.99	3
10525.000000	526.130000	8.94	3	20.50	29.65	3
10525.000000	555.380000	12.62	3	22.16	54.83	3
10525.000000	611.350000	11.88	3	24.99	69.74	3
10525.000000	708.080000	9.34	3	26.31	60.60	3
10525.000000	735.150000	9.49	3	25.96	59.22	3
10525.000000	738.250000	9.97	3	25.93	62.37	3
10525.000000	775.330000	11.03	3	25.43	66.53	3
10525.000000	806.500000	8.80	3	25.17	49.95	3
10525.000000	832.680000	9.73	3	25.45	57.41	3



**Name of Test:** Non-Harmonic Spurious Emissions (Radiated) - Con't

g0590106: 2005-Sep-22 Thu 15:57:00

State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV @ m	C.F., dB	$\mu\text{V/m}$ @ m
10520.000000	849.180000	13.87 3	25.62	94.30 3
10520.000000	898.150000	12.17 3	26.11	82.04 3
10520.000000	913.780000	12.11 3	26.64	86.60 3
10520.000000	944.850000	11.44 3	27.78	91.41 3
10520.000000	984.380000	11.95 3	29.12	113.11 3
10520.000000	987.130000	8.00 3	29.21	72.53 3



Performed By:

Fred Chastain, Test Technician

## Radiated Measurements For Part 15 Transmitters with Integral Antennas

### Radiated Measurements

Range Of Measurement	Specification	Resolution B/W	Video B/A
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

### 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	
13.36-13.41			

**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:

David E. Lee, Quality Assurance Manager