

**TEST PROCEDURE AND REPORT
CONDUCTED AND RADIATED EMISSIONS
UNLICENSED INTENTIONAL RADIATOR**

SOUTHWEST MICROWAVE MODEL 316

16 APRIL 1999

TEST PROCEDURE AND REPORT
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UNLICENSED INTENTIONAL RADIATOR

This procedure and report was prepared to insure compliance with the requirements of part 15.245 of the Federal Communications Rules and Regulations regarding unlicensed intentional radiators. The procedures outlined herein are based on the January 11, 1999 revision of the Federal Communications Commission Rules and Regulations, Parts 2 and 15. The measurements made herein were performed on a preproduction model of the equipment specified and is considered representative of all production units of this series.

The product referenced in this document is a microwave link (Model 316) operating within the frequency band of 24.075 to 24.175 GHz. The link is intended to operate as a bistatic outdoor field disturbance system and therefore must be certified as an intentional radiator. Because of the low powers involved, harmonic measurements were performed with the carrier modulated by typical pulse signals on both a waveguide setup and an outdoor 3-meter test range. The modulation signal is comprised of a 36-microsecond pulse train operating with a 6.25 percent duty cycle. The test configuration is representative of a recommended typical installation.

All testing above 1 GHz was performed at the Southwest Microwave test site, documentation for which has been filed with the Federal Communications Commission. Emission tests below 1 GHz was performed on both the transmitter and receiver by M. Flom Associates, Chandler, Arizona.

This product utilizes a 9-inch diameter parabolic antenna, having a gain of approximately 31 dB and a beamwidth of 4.0 degrees (-3 dB) at 24.125 GHz. Both the transmitter and the receiver utilize an identical microprocessor, which is used for establishing the transmitter modulation and target detection algorithms in the receiver. The clock rate in both units is 4 MHz.

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1.0 GENERAL

The purpose of this test procedure and report is to specify the measurement technique to be used in determining compliance with Federal Communications Commission (FCC) regulations Part 15.245 applying to an unlicensed intentional radiator for purpose of certification.

2.0 SPECIFICATIONS

2.1 Commission Rules & Regulations, Title 47, Parts 15, dated January 11, 1999.

3.0 PERTINENT SPECIFICATIONS

3.1 Intentional Radiator (Transmitter)

3.1.1 Transmitter Frequency: 24.075 to 24.175 GHz (Part 15.245).

3.1.2 Fundamental Field Strength: 2500 mV/m at three meters (Part 15.245).

3.1.3 Harmonic Emissions: Not in excess of 7.5 mV/m at three meters

3.1.4 Spurious Emissions: Minimum of 50 dB below level of fundamental (Part 15.245).

3.15 Conducted Limits: 250 μ v maximum from 450 kHz to 30 MHz (Part 15.207).

3.16 Radiated Emission Limits: (Part 15.209)

Frequency MHz	Field Strength μ V/m	Measurement Distance Meters
.009-0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

3.2 Unintentional Radiator (Receiver)

3.2.1 Conducted Limits (Part 15.107)

0.45 - 1.705 MHz 1000 μ V

1.705 - 30 MHz 3000 μ V

3.2.2 Radiated Emission Limits (Part 15.109)

Frequency MHz	Field Strength μ V/m	Measurement Distance Meters
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

4.0 EQUATIONS AND CALCULATIONS

Relationships required converting measured data to specification limits.

4.1 Field Strength to Receiver Power

The electric field strength, E , in volts/meter and power density, P , in Watts/meter² at any point are related by

$$(1) \quad P = \frac{E^2}{120\pi}$$

Where 120π is known as the resistance of free space. To determine power intercepted by a receiving antenna, multiply power density by receiving area.

$$(2) \quad \text{Area} = \frac{G_R \lambda^2}{4\pi}$$

Where G_R = gain of receiving antenna λ = wavelength in meters.

Combining equations (1) and (2), field strength is converted to received power thus,

$$(3) \quad P_{\text{R WATTS}} = \frac{E^2}{120\pi} \frac{G_R \lambda^2}{4\pi}$$

Therefore, knowing the receiving antenna gain, the field strength can be obtained by measuring the received power at three meters.

4.2 Conversion Calculations: Specifically, for the fundamental

$$(4) \quad P_R = \frac{(2.5)^2 G_R \left[\frac{0.3}{(24.125)} \right]^2}{480\pi^2} \text{ watts}$$
$$= 2.04 \times 10^{-4} G_R \text{ mW}$$

The receiving antenna gain (G_R) at K-Band is 16.0 dB (40), so that the maximum average received power at three meters is:

$$P_R = 8.16 \times 10^{-3} \text{ mW} (-21 \text{ dBm})$$

For the second harmonic:

$$P_R = \frac{(7.5 \times 10^{-3} \text{ V/m})^2 G_{R2} \left[\frac{0.3}{2(24.125)} \right]^2}{480\pi^2} \text{ watts}$$

$$= 1.53 \times 10^{-9} G_{R2} \text{ mW}$$

The receiving antenna gain (G_{R2}) at the second harmonic is 20-dB (100), so that the maximum average received power at three meters is:

$$P_{R2} = 1.53 \times 10^{-7} \text{ mW} (-68.2 \text{ dBm})$$

Applying the same technique to the other harmonics,

For the third harmonic:

The receiving antenna gain (G_{R3}) at the third harmonic is 20 dB (100), so that the maximum averaged received power at three meters is:

$$P_{R3} = 6.8 \times 10^{-8} \text{ mW} (-71.7 \text{ dBm})$$

For the fourth harmonic:

The receiving antenna gain (G_{R4}) at the fourth harmonic is 23 dB (200), so that the maximum averaged received power at three meters is:

$$P_{R4} = 7.65 \times 10^{-8} \text{ mW} (-71.2 \text{ dBm})$$

Therefore, to meet the FCC field strength requirements the average received power for the fundamental cannot exceed -21.0 dBm at three meters, the second harmonic cannot exceed -68.2 dBm, the third harmonic -71.7 dBm and the fourth -71.2 dBm at three meters.

For measurements from 1 to 40 GHz the recommended bandwidth per ANSI 63.4-1992 is 1 MHz. At this bandwidth, the noise floor of the HP8563E is -64 dBm. In order to insure compliance, the harmonic measurements will be made on a waveguide setup measuring the harmonic content directly at the transmitter.

It can be shown that the field strength is related to the transmit power by the following relationship:

$$(5) \quad P_t = E^2 R^2 / 30 G_t \quad (\text{Watts})$$

Where, E = Field Strength in V/M
 R = Distance from antenna in meters
 G_t = Transmitting Antenna Gain at frequency of interest.

From the preceding equation, the following table can be configured:

Table 1

Harmonic Number	Frequency GHz	Antenna Gain dB	Field Strength V/M	Maximum Allowable Power at Transmitter dBm
1	24.125	31	2.5	1.7
2	48.25	31.4	7.5E-03	-49.1
3	72.375	33.1	7.5E-03	-50.8
4	96.5	34.4	7.5E-03	-52.1

Therefore, in the waveguide tests, the average power levels of the modulated harmonics cannot equal the power levels shown in the table.

Spurious Measurements:

Since the system is always operated in the modulated mode, the fundamental is assumed to be the maximum average power occurring in the vicinity of 24.125 GHz therefore, all spurious emissions must be 50 dB below the peak value at 3 meters.

Emissions:

Low frequency emissions were tested at an independent test laboratory because facilities at Southwest Microwave were not sufficient to insure compliance below 1 GHz. The transmitter and the receiver were tested for compliance to 15.209 because both units incorporate the same microprocessor and clock. The bands were tested at 4 MHz intervals that coincide with the clock frequency.

Conducted Emissions

Since the Model 316 is typically operated from a 12-v battery, utilizing a customer supplied charger; the conducted emissions requirement is not applicable.

5.0 TEST PROCEDURE FOR FIELD STRENGTH CONFORMANCE

5.1 The following methods and procedures are used to verify conformance to FCC regulations. The test site documentation has been submitted to the FCC.

5.2 Test Equipment

- 1 each HP Spectrum Analyzer - Model 8563E
- 1 each Narda 638 K-Band Standard Gain Horn ($G = 16$ dB)
- 1 each Dorado GH-22 Q-Band Standard Gain Horn ($G = 20$ dB)
- 1 each Dorado GH-15 V-Band Standard Gain Horn ($G = 22$ dB)
- 1 each Dorado GH-10 W-Band standard Gain Horn ($G = 23$ dB)
- 1 each HP11970Q Harmonic Mixer (33-50 GHz)
- 1 each HP11970V Harmonic Mixer (50-75 GHz)
- 1 each HP11970W Harmonic Mixer (75-110 GHz)
- 1 each K-K_A Band Waveguide Transition
- 1 each K_A-V Band Waveguide Transition
- 1 each K_A-W Band Waveguide Transition
- 2 each SMI Waveguide to Coax Adapters
- 1 each Graphics Plotter, HP7550A
- 1 each Amplifier, Kalmus 704 FC
- 1 each Antenna, Electrometrics EM 6917 (30-1000 MHz)
- 1 each 10 dB attenuator, Minicircuits CAT-10
- 2 each 3 dB attenuators, Minicircuits CAT-3
- 1 each 6 dB attenuator, Minicircuits CAT-6
- 1 each 15 VDC Power Supply, SMI PS-45
- 1 each HP 8546A/HP 85460A Spectrum Analyzer (Flom Associates)
- 1 each EMCO Antenna System and Positioner (Flom Associates)

5.3 Fundamental and Harmonic measurements

5.3.1 Insure test equipment is calibrated to manufacturer specifications before beginning tests.

5.3.2 Set up the waveguide test set up as shown in Fig.1.

5.3.3 Set analyzer to the following:

Resolution Bandwidth	1.0 MHz
Video Bandwidth	Auto
Averaging	Off
Amplitude Reference Level	0 dBm
Span	100 MHz
Center Frequency	24.125 GHz
Peak Search	On
Detector	Peak Positive
Sweep	1.5 Sec

5.3.4 Turn on the modulation to the transmitter and measure the fundamental power at the output of the 3-dB pad and record the peak power level and frequency in the appropriate portion of the Certification Test Report.

5.3.5 Connect the K-K_A waveguide transition at the output of the pad and the HP 11970Q (33-50 GHz) harmonic mixer. Set the analyzer to Q band and the center frequency to twice the value found in 3.5.4. Set the span to 100 MHz and the bandwidth to 1 MHz. Record the peak power of the second harmonic in the appropriate portion of the Certification test report.

5.3.6 Connect the K_A-V waveguide transition between the pad and the HP 11970V (50-75 GHz) harmonic mixer. Set the analyzer to V band and the center frequency to three times the value found in 3.5.4. Set the span to 100 MHz and the bandwidth to 1 MHz. Record the peak power of the third harmonic in the appropriate portion of the Certification.

5.3.7 Connect the K_A-W waveguide transition between the pad and the HP 11970W (75-110 GHz) harmonic mixer. Set the analyzer to W band and the center frequency to four times the value found in 3.5.4. Set the span to 100 MHz and the bandwidth to 1 MHz. Record the peak power of the fourth harmonic in the appropriate portion of the certification report.

- 5.3.8 Connect antennas to the equipment and set up the outdoor 3-meter test area as shown in Fig. 2. Before recording the data in each case, peak both the transmitter and receiving antennas for maximum signal.
- 5.3.9 Set up the spectrum analyzer to the same conditions as shown 5.3.3 and attach the K-Band receiving antenna.
- 5.3.10 Turn on the modulation to the transmitter and measure the peak fundamental power and frequency. Record in the appropriate section of the test report. Plot the fundamental spectrum and attach to the report.
- 5.3.11 Subtract 50 dB from the peak power found in 5.3.10, reduce the noise floor of the analyzer by changing the bandwidth to 100 kHz. Note the upper and lower frequencies at which the spectrum equals this value and enter in the appropriate portion of the test report. Reset the bandwidth to 1.0 MHz.
- 5.3.12 Attach the HP 11970Q mixer and the Q-Band antenna, set the spectrum analyzer to twice the frequency found in 5.3.10 and measure the second harmonic peak power. Record in the appropriate section of the test report.
- 5.3.13 Plot the second harmonic spectrum and attach to the test report.
- 5.3.14 Attach the HP 11970V mixer and the V-Band antenna, set the spectrum analyzer to three times the frequency found in 5.3.10 and measure the third harmonic peak power. Record in the appropriate section of the test report.
- 5.3.15 Plot the third harmonic spectrum and attach to the test report.
- 5.3.16 Attach the HP 11970W mixer and the W-Band antenna, set the spectrum analyzer to four times the frequency found in 5.3.10 and measure the fourth harmonic peak power. Record in the appropriate section of the test report.
- 5.3.17 Plot the fourth harmonic spectrum and attach to the test report.

5.4 Spurious

Reconnect the K-Band antenna and turn on the modulation to the transmitter. Slowly sweep the analyzer between 18 and 24.075 GHz and insure that no signal exceeds a level 50 dB below the peak. Repeat the same process between 24.175 and 26.5 GHz.

5.5 Radiated Emissions

Radiated emissions were performed at an independent test laboratory on a Model 315 microwave system. This system is identically the same as the Model 316 except for antenna size and the transmitter output power. Each of the systems incorporates the same printed circuit boards. The Model 315 was chosen for these tests because the smaller diameter antenna would not mask radiation from the circuitry. A copy of the test data is attached.

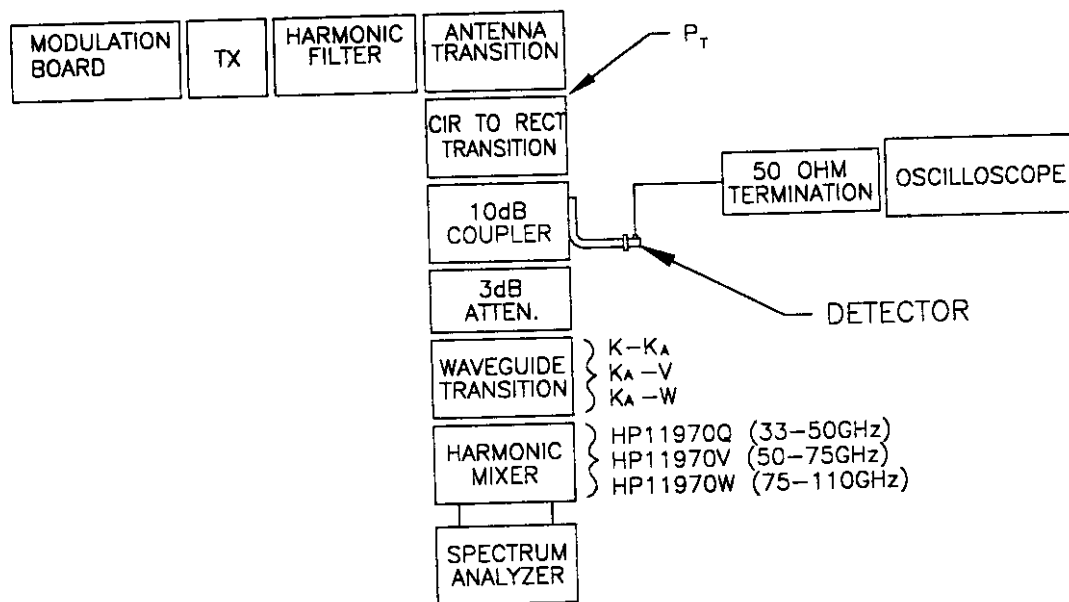


FIGURE 1
WAVEGUIDE SET UP

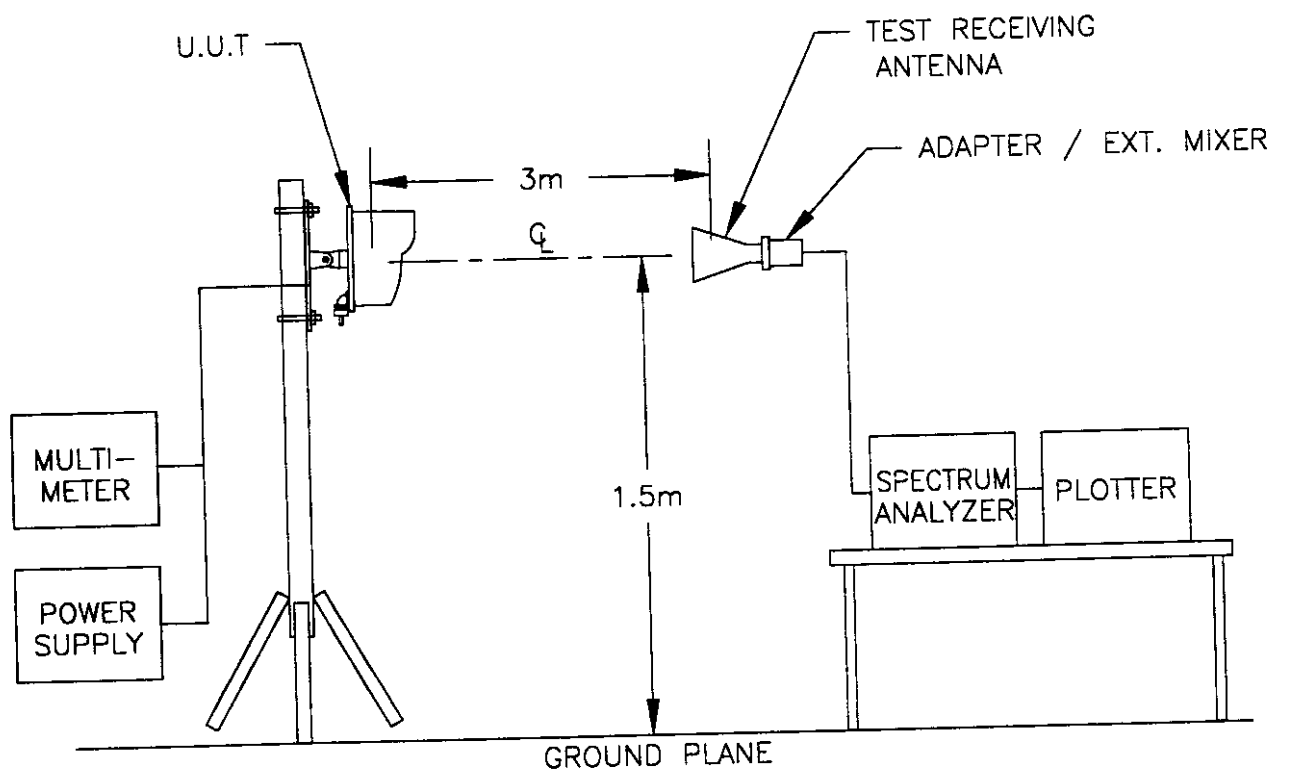


FIGURE 2
OUTDOOR 3 METER TEST SET UP

CERTIFICATION TEST REPORT FOR MODEL 316

SERIAL NUMBER E 702

TESTED BY: Rick Williams

DATE: 4-14-99

FUNDAMENTAL AND HARMONIC MEASUREMENTS (WAVEGUIDE)

	FREQUENCY GHz	POWER dBm	SPEC dBm
FUNDAMENTAL	<u>24.125</u>	<u>-2.5</u>	1.7
SECOND HARMONIC	<u>48.250</u>	<u>-69.27</u>	-49.1
THIRD HARMONIC	<u>72.350</u>	<u>-59.27</u>	-50.8
FOURTH HARMONIC	<u>96.500</u>	<u>-72.47</u>	-52.1

FUNDAMENTAL AND HARMONIC MEASUREMENTS (3 METER TEST RANGE)

BANDWIDTH

F HIGH 24.1473 GHz

F LOW 24.0863 GHz

PLOT FH-FL 61 MHz 100 MHz

		FREQUENCY GHz	POWER dBm	SPEC dBm
FUNDAMENTAL	PLOT	<u>24.1197</u>	<u>-24.83</u>	-21
SECOND HARMONIC	PLOT	<u>48.2393</u>	<u>-70.27</u>	-68.2
THIRD HARMONIC	PLOT	<u>72.3592</u>	<u>-72.10</u>	-71.7
FOURTH HARMONIC	PLOT	<u>96.4788</u>	<u>NONE VIEWED</u>	-71.2

SPURIOUS

18-24.075 GHz NO SPURS -50 dBc
24.175-26.5 GHz NO SPURS -50 dBc

RADIATED EMISSIONS

SEE ATTACHMENT

TO THE BEST OF MY KNOWLEDGE, THIS DEVICE MEETS THE REQUIREMENTS OF PARTS 15.245, 15.209 AND 15.109 OF THE CODE OF FEDERAL REGULATIONS

APPROVED BY:
TITLE:

Edward J. Foley
V.P. ENGINEERING

DATE: 4/19/99

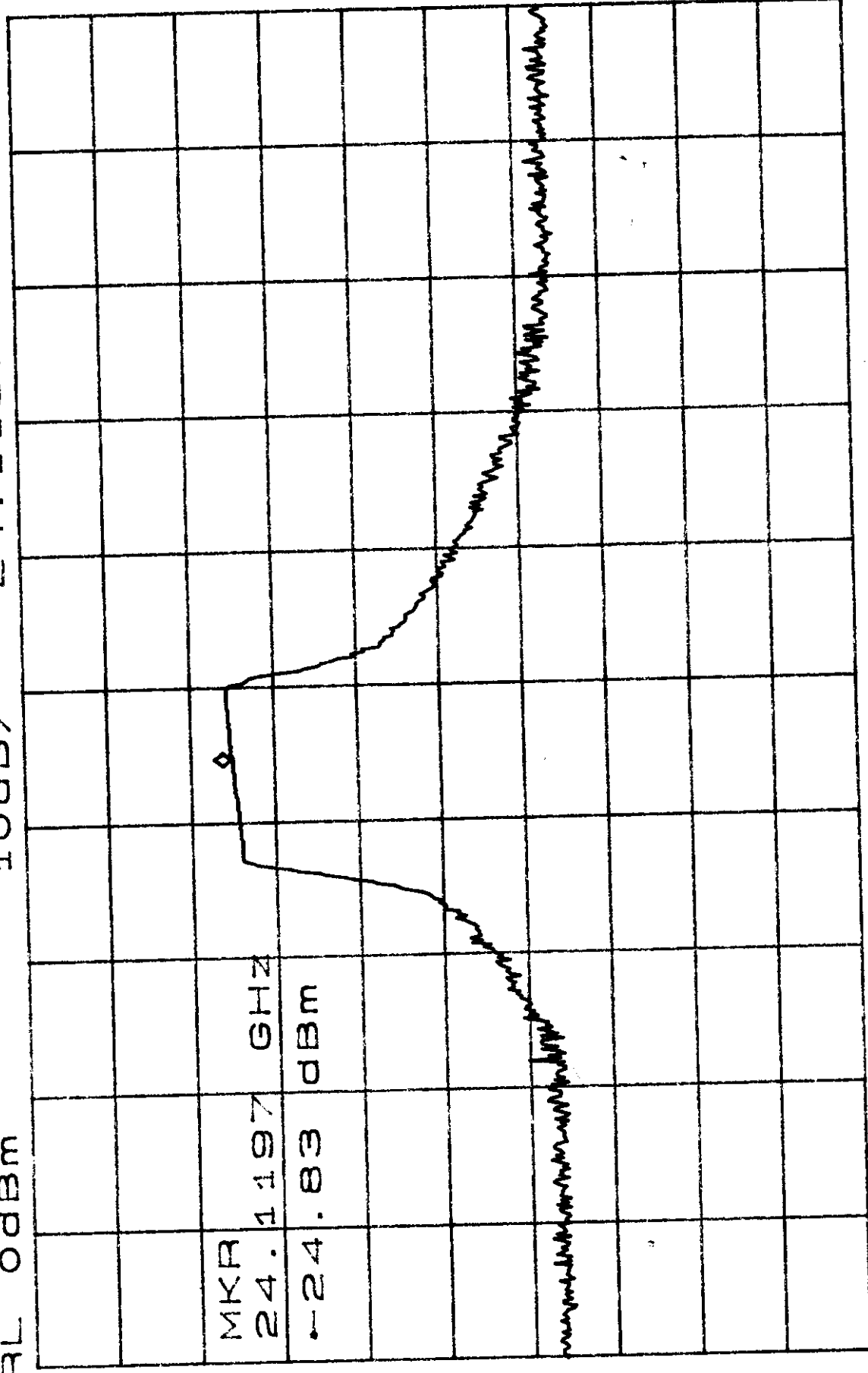
NY 100-248393

24.197GHz

ATTEN 100B

MEMORANDUM

408



SPAZZANO. ON THE

005051
UNCLASSIFIED

CENTER 24.1250GHZ

VBW 1.0MHZ

RBW 1. OMHN

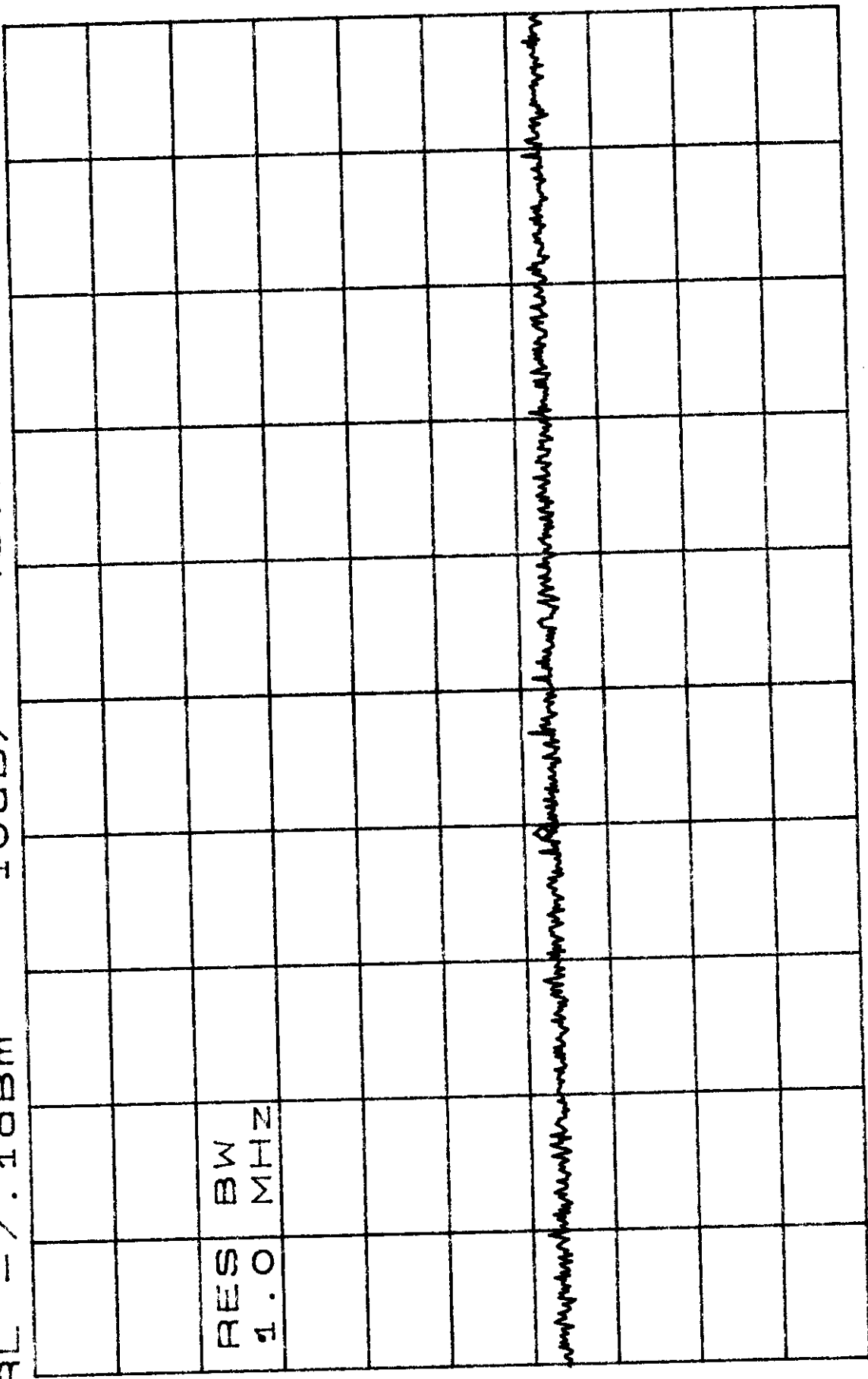
CL 22.9dB MKR -70.27dBm

RL -7.1dBm 48.2393GHz

10dB/

RES BW

1.0 MHz



D

SPAN 100.0MHz

*SWP 1.50sec

CENTER 48.2500GHz

VBW 1.0MHz

*RBW 1.0MHz

CL 34.4dB MKR -72.10dBm

RL 4.4dBm 72.3592GHz

10dB/

RES BW

100 KHZ

BANDWIDTH CHANGED
TO REDUCE NOISE
FLOOR - NO HARMONIC
OBSERVED ON OR Pk580

RES BW
100 KHZ

Handwritten notes and a spectrum plot are visible in the grid area.

SPAN 100.0MHz

CENTER 72.3750GHz

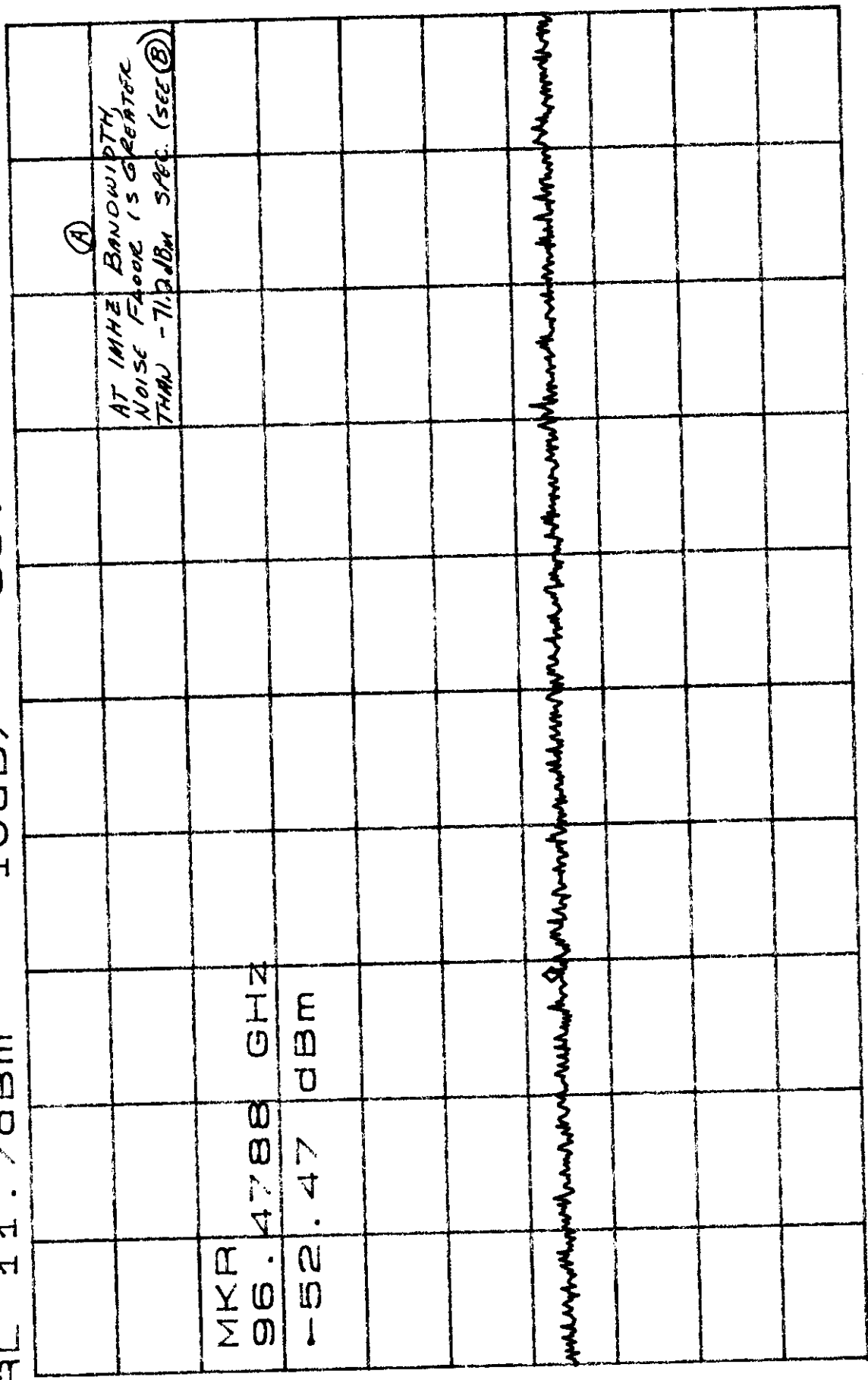
*SWP 1.50sec

VBW 100KHz

*RBW 100KHz

CL 41.7dB MKR -52.47dBm

RL 11.7dBm 10dB/ 96.4788GHz



D

CENTER 96.5000GHz SPAN 100.0MHz

*RBW 1.0MHz *SWP 4.38sec

VBW 1.0MHz

Low Frequency Emission Test Report

Low frequency emission tests were performed by an outside testing laboratory for frequency ranges below 1 GHz. Testing was performed on a preproduction Model 315. Testing was performed on a FCC approved outdoor 3 meter test range.

The certified testing facility was:

M. Flom Associates, Inc.
3356 N. San Marcos Pl., #107
Chandler, AZ 85224-1571
Tel. 602 926 3100
Fax. 602 926 3598

The emission tests were performed per 15.209 for both the transmitter and the receiver since each contains a microprocessor for system modulation and detection. The band was searched from the clock frequency (4 MHz) to 1GHz in 4 MHz steps. Both the horizontal and vertical planes were searched from 1 meter to 4 meters.

A copy of the following is attached:

- 1.) Test Data – Emissions
- 2.) Pictures of the 3 Meter Test Site

The result of the testing is shown on the attached report and no signals were found which exceeded the specification.

Approved By: Edward J. Foley Date: 4/13/99
Title: V.P. ENGINEERING

EMISSIONS (RXE)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 11:09, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	4.000000	5.2	3	13.4	18.6	30		8 P-
0.000	8.000000	4.7	3	11.5	16.3	30		7 P-
0.000	12.000000	7.5	3	10.7	18.2	30		8 P-
0.000	16.000000	3.6	3	9.3	12.9	30		4 P-
0.000	20.000000	.5	3	7.4	7.9	30		2 P-
0.000	24.000000	.1	3	6.5	6.6	30		2 P-
0.000	28.000000	2.2	3	8.1	10.3	30		3 P-
0.000	32.000000	3.6	3	13.6	17.2	3		7 P-
0.000	36.000000	2.7	3	14.3	17.0	3		7 P-
0.000	40.000000	6.1	3	14.0	20.1	3		10 P-
0.000	44.000000	2.6	3	13.2	15.8	3		6 P-
0.000	48.000000	4.0	3	13.3	17.4	3		7 P-
0.000	52.000000	7.4	3	13.3	20.6	3		11 P-
0.000	56.125000	8.8	3	12.9	21.7	3		12 P-
0.000	60.000000	8.1	3	12.5	20.6	3		11 P-
0.000	68.000000	12.8	3	10.1	22.9	3		14 P-
0.000	76.000000	13.9	3	9.3	23.2	3		14 P-
0.000	80.000000	15.7	3	9.2	24.9	3		18 P-
0.000	84.000000	7.8	3	9.7	17.4	3		7 P-
0.000	112.000000	4.9	3	13.0	18.0	3		8 P-
0.000	116.000000	1.5	3	13.4	14.9	3		6 P-
0.000	120.000000	8.4	3	13.7	22.1	3		13 P-
0.000	124.000000	1.0	3	14.1	15.0	3		6 P-
0.000	128.000000	12.9	3	14.3	27.3	3		23 P-
0.000	132.000000	.6	3	14.6	15.1	3		6 P-
0.000	136.000000	10.4	3	14.8	25.1	3		18 P-
0.000	140.000000	5.6	3	15.0	20.6	3		11 P-
0.000	144.000000	10.1	3	15.2	25.3	3		18 P-
0.000	148.000000	5.2	3	15.4	20.6	3		11 P-
0.000	156.000000	4.4	3	15.5	20.0	3		10 P-
0.000	160.000000	11.1	3	15.6	26.6	3		21 P-
0.000	164.000000	5.7	3	15.6	21.3	3		12 P-
0.000	168.000000	7.7	3	15.7	23.4	3		15 P-
0.000	172.000000	8.7	3	15.7	24.3	3		16 P-
0.000	176.000000	7.4	3	15.8	23.2	3		14 P-
0.000	180.000000	12.2	3	16.1	28.3	3		26 P-
0.000	188.000000	7.0	3	16.7	23.6	3		15 P-
0.000	200.000000	.1	3	17.4	17.5	3		7 P-
0.000	204.000000	6.9	3	17.6	24.5	3		17 P-
0.000	212.000000	-2.7	3	17.8	15.2	3		6 P-
0.000	216.000000	4.9	3	18.0	22.9	3		14 P-
0.000	220.000000	2.2	3	18.1	20.4	3		10 P-
0.000	224.000000	5.3	3	18.3	23.6	3		15 P-
0.000	228.000000	6.7	3	18.5	25.2	3		18 P-
0.000	232.000000	4.4	3	18.6	23.0	3		14 P-
0.000	236.000000	4.2	3	18.8	23.0	3		14 P-

EMISSIONS (RXE)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 11:09, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	240.000000	12.5	3	19.0	31.5	3	38	P-
0.000	244.000000	4.8	3	19.1	23.9	3	16	P-
0.000	248.000000	5.5	3	19.1	24.6	3	17	P-
0.000	252.000000	4.4	3	19.6	24.0	3	16	P-
0.000	256.000000	5.5	3	20.3	25.9	3	20	P-
0.000	260.000000	4.7	3	21.1	25.8	3	19	P-
0.000	264.000000	7.0	3	22.0	29.0	3	28	P-
0.000	268.000000	4.8	3	22.8	27.6	3	24	P-
0.000	272.000000	6.5	3	23.6	30.0	3	32	P-
0.000	276.000000	4.4	3	24.4	28.8	3	27	P-
0.000	280.000000	4.4	3	25.1	29.6	3	30	P-
0.000	284.000000	3.6	3	25.9	29.5	3	30	P-
0.000	288.000000	8.2	3	26.6	34.8	3	55	P-
0.000	292.000000	3.8	3	27.4	31.2	3	36	P-
0.000	296.000000	4.3	3	28.1	32.4	3	42	P-
0.000	300.000000	5.5	3	28.8	34.3	3	52	P-
0.000	304.000000	8.5	3	18.5	27.0	3	22	P-
0.000	308.000000	9.5	3	18.7	28.2	3	26	P-
0.000	312.000000	9.7	3	19.0	28.6	3	27	P-
0.000	316.000000	5.2	3	19.2	24.4	3	17	P-
0.000	320.000000	11.3	3	19.5	30.8	3	35	P-
0.000	324.000000	4.1	3	19.7	23.8	3	16	P-
0.000	328.000000	5.5	3	19.9	25.4	3	19	P-
0.000	332.000000	4.6	3	20.2	24.7	3	17	P-
0.000	336.000000	7.4	3	20.4	27.8	3	25	P-
0.000	340.000000	6.9	3	20.7	27.6	3	24	P-
0.000	344.000000	7.9	3	20.9	28.8	3	27	P-
0.000	348.000000	3.5	3	21.1	24.6	3	17	P-
0.000	352.000000	3.1	3	21.3	24.4	3	17	P-
0.000	356.000000	2.3	3	21.6	23.9	3	16	P-
0.000	360.000000	5.3	3	21.8	27.0	3	22	P-
0.000	364.000000	1.7	3	22.0	23.7	3	15	P-
0.000	368.000000	7.6	3	22.2	29.8	3	31	P-
0.000	372.000000	3.7	3	22.4	26.1	3	20	P-
0.000	376.000000	3.8	3	22.6	26.4	3	21	P-
0.000	380.000000	3.7	3	22.8	26.5	3	21	P-
0.000	392.000000	.3	3	23.4	23.7	3	15	P-
0.000	395.993000	7.1	3	23.6	30.7	3	34	P-
0.000	396.000000	.9	3	23.6	24.5	3	17	P-
0.000	400.013000	5.3	3	23.8	29.1	3	29	P-
0.000	404.020000	7.1	3	23.8	30.9	3	35	P-
0.000	408.015000	9.1	3	23.8	32.9	3	44	P-
0.000	411.998000	6.8	3	23.8	30.6	3	34	P-
0.000	416.008000	8.7	3	23.8	32.5	3	42	P-
0.000	419.998000	8.3	3	23.8	32.1	3	40	P-
0.000	424.000000	6.0	3	23.8	29.8	3	31	P-

EMISSIONS (RXE)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 11:09, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	428.000000	7.9	3	23.8	31.7	3	39	P-
0.000	432.000000	4.8	3	23.8	28.5	3	27	P-
0.000	436.000000	6.3	3	23.8	30.1	3	32	P-
0.000	440.000000	4.9	3	23.8	28.7	3	27	P-
0.000	444.025000	5.3	3	23.8	29.1	3	28	P-
0.000	448.025000	4.1	3	23.8	27.9	3	25	P-
0.000	456.025000	3.4	3	23.8	27.2	3	23	P-
0.000	468.025000	4.1	3	23.8	27.8	3	25	P-
0.000	472.025000	3.5	3	23.8	27.2	3	23	P-
0.000	484.025000	4.9	3	23.7	28.6	3	27	P-
0.000	488.025000	3.5	3	23.7	27.2	3	23	P-
0.000	492.025000	7.8	3	23.7	31.5	3	38	P-
0.000	496.025000	4.2	3	23.7	27.9	3	25	P-
0.000	500.025000	6.8	3	23.7	30.5	3	33	P-
0.000	504.025000	3.5	3	23.9	27.3	3	23	P-
0.000	508.000000	3.9	3	24.0	27.9	3	25	P-
0.000	512.000000	-2.4	3	24.2	21.8	3	12	P-
0.000	520.000000	.2	3	24.5	24.7	3	17	P-
0.000	524.000000	4.1	3	24.7	28.7	3	27	P-
0.000	528.000000	.3	3	24.8	25.1	3	18	P-
0.000	532.000000	4.2	3	25.0	29.2	3	29	P-
0.000	536.000000	-.7	3	25.1	24.4	3	17	P-
0.000	540.000000	1.1	3	25.2	26.3	3	21	P-
0.000	548.000000	1.3	3	25.6	26.8	3	22	P-
0.000	552.000000	1.8	3	25.7	27.5	3	24	P-
0.000	556.000000	.1	3	25.8	26.0	3	20	P-
0.000	560.000000	4.9	3	25.9	30.8	3	35	P-
0.000	564.000000	1.3	3	26.1	27.4	3	23	P-
0.000	568.000000	-.1	3	26.2	26.1	3	20	P-
0.000	576.000000	-.4	3	26.5	26.1	3	20	P-
0.000	580.000000	-1.2	3	26.6	25.4	3	19	P-
0.000	592.000000	-1.7	3	27.0	25.2	3	18	P-
0.000	596.000000	1.3	3	27.1	28.4	3	26	P-
0.000	600.000000	-.3	3	27.2	26.9	3	22	P-
0.000	604.000000	-1.2	3	27.3	26.0	3	20	P-
0.000	608.000000	-.1	3	27.3	27.2	3	23	P-
0.000	612.000000	-.3	3	27.4	27.0	3	22	P-
0.000	616.000000	-2.7	3	27.4	24.8	3	17	P-
0.000	620.000000	-1.6	3	27.5	25.9	3	20	P-
0.000	624.000000	-.8	3	27.5	26.8	3	22	P-
0.000	628.000000	-6.8	3	27.6	20.8	3	11	P-
0.000	632.000000	-1.0	3	27.6	26.6	3	21	P-
0.000	636.000000	-1.1	3	27.7	26.5	3	21	P-
0.000	640.000000	-.3	3	27.7	27.4	3	23	P-
0.000	644.000000	-.8	3	27.8	26.9	3	22	P-
0.000	648.000000	-1.0	3	27.8	26.9	3	22	P-

EMISSIONS (RXE)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 11:09, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	652.000000	-5.9	3	27.9	22.0	3	13	P-
0.000	656.000000	-.9	3	27.9	27.1	3	23	P-
0.000	664.000000	-4.4	3	28.0	23.6	3	15	P-
0.000	668.000000	-.9	3	28.1	27.2	3	23	P-
0.000	672.000000	-1.5	3	28.1	26.7	3	22	P-
0.000	676.000000	-1.2	3	28.2	27.0	3	22	P-
0.000	680.000000	.2	3	28.2	28.4	3	26	P-
0.000	684.000000	-.2	3	28.2	28.0	3	25	P-
0.000	688.000000	.1	3	28.3	28.4	3	26	P-
0.000	692.000000	-3.9	3	28.3	24.4	3	17	P-
0.000	700.000000	-1.4	3	28.4	27.0	3	22	P-
0.000	704.000000	-.6	3	28.5	27.8	3	25	P-
0.000	708.000000	-.9	3	28.5	27.6	3	24	P-
0.000	712.000000	-.7	3	28.6	27.8	3	25	P-
0.000	716.000000	-1.7	3	28.6	26.9	3	22	P-
0.000	720.000000	-2.0	3	28.7	26.7	3	22	P-
0.000	724.000000	-.7	3	28.7	28.1	3	25	P-
0.000	728.000000	-2.0	3	28.8	26.8	3	22	P-
0.000	732.000000	-1.2	3	28.8	27.6	3	24	P-
0.000	736.000000	-1.1	3	28.9	27.8	3	24	P-
0.000	740.000000	-2.9	3	28.9	26.1	3	20	P-
0.000	744.000000	-2.0	3	29.0	27.0	3	22	P-
0.000	748.000000	-2.1	3	29.0	26.9	3	22	P-
0.000	760.000000	-1.8	3	29.2	27.4	3	23	P-
0.000	764.000000	-4.5	3	29.3	24.8	3	17	P-
0.000	768.000000	-5.3	3	29.4	24.1	3	16	P-
0.000	772.000000	-.6	3	29.4	28.8	3	28	P-
0.000	776.000000	-.9	3	29.5	28.7	3	27	P-
0.000	780.000000	-3.4	3	29.6	26.2	3	20	P-
0.000	784.000000	-3.2	3	29.6	26.4	3	21	P-
0.000	788.000000	-.4	3	29.7	29.3	3	29	P-
0.000	792.000000	-4.9	3	29.8	24.9	3	18	P-
0.000	796.000000	-1.1	3	29.8	28.7	3	27	P-
0.000	800.000000	-1.0	3	29.9	28.9	3	28	P-
0.000	804.000000	-6.0	3	29.9	23.9	3	16	P-
0.000	808.000000	-.1	3	29.9	29.8	3	31	P-
0.000	812.000000	-2.1	3	29.9	27.9	3	25	P-
0.000	816.000000	-3.5	3	30.0	26.5	3	21	P-
0.000	820.000000	-2.0	3	30.0	28.0	3	25	P-
0.000	824.000000	-1.8	3	30.0	28.2	3	26	P-
0.000	832.000000	-.4	3	30.0	29.6	3	30	P-
0.000	836.000000	-3.5	3	30.0	26.5	3	21	P-
0.000	840.000000	-1.4	3	30.0	28.6	3	27	P-
0.000	844.000000	-1.5	3	30.0	28.5	3	27	P-
0.000	848.000000	-.3	3	30.0	29.8	3	31	P-
0.000	896.000000	-1.9	3	30.2	28.3	3	26	P-

EMISSIONS (RXE)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 11:09, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	900.000000	-3.6	3	30.2	26.6	3	21	P-
0.000	904.000000	-5.1	3	30.6	25.5	3	19	P-
0.000	908.000000	-2.5	3	31.0	28.5	3	26	P-
0.000	912.000000	-3.1	3	31.4	28.3	3	26	P-
0.000	916.000000	-5.6	3	31.7	26.2	3	20	P-
0.000	920.000000	-4.9	3	32.1	27.2	3	23	P-
0.000	924.000000	-5.5	3	32.5	27.0	3	22	P-
0.000	928.000000	-4.1	3	32.9	28.8	3	27	P-
0.000	944.000000	-4.2	3	34.4	30.2	3	32	P-
0.000	948.000000	-3.0	3	34.7	31.8	3	39	P-
0.000	952.000000	-5.5	3	35.1	29.6	3	30	P-
0.000	956.000000	-4.8	3	35.5	30.7	3	34	P-
0.000	960.000000	-3.8	3	35.9	32.1	3	40	P-
0.000	964.000000	-1.6	3	36.2	34.7	3	54	P-
0.000	968.000000	-5.7	3	36.6	30.9	3	35	P-
0.000	976.000000	-3.3	3	37.3	34.0	3	50	P-
0.000	980.000000	-2.0	3	37.7	35.7	3	61	P-
0.000	984.000000	-3.6	3	38.1	34.5	3	53	P-
0.000	988.000000	-5.0	3	38.5	33.4	3	47	P-
0.000	992.000000	-7.3	3	38.8	31.5	3	38	P-
0.000	996.000000	-4.0	3	39.2	35.2	3	57	P-
0.000	1000.000000	-1.5	3	39.5	39.0	3	89	P-

EMISSIONS (TX1)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 08:41, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	4.000000	8.3	3	13.4	21.7	30		12 P-
0.000	8.000000	5.7	3	11.5	17.2	30		7 P-
0.000	12.000000	5.3	3	10.7	16.0	30		6 P-
0.000	16.000000	2.9	3	9.3	12.2	30		4 P-
0.000	20.000000	.1	3	7.4	7.5	30		2 P-
0.000	24.000000	4.3	3	6.5	10.8	30		3 P-
0.000	28.000000	1.3	3	8.1	9.4	30		3 P-
0.000	32.000000	-.9	3	13.6	12.6	3		4 A-
0.000	36.000000	-.3	3	14.3	14.0	3		5 A-
0.000	40.000000	2.2	3	14.0	16.2	3		6 A-
0.000	44.000000	-3.2	3	13.2	10.1	3		3 A-
0.000	48.000000	4.8	3	13.3	18.1	3		8 P-
0.000	52.000000	6.9	3	13.3	20.2	3		10 P-
0.000	56.000000	17.8	3	12.9	30.7	3		34 P-
0.000	64.000000	17.3	3	11.2	28.6	3		27 P-
0.000	68.000000	14.2	3	10.1	24.3	3		16 P-
0.000	76.000000	11.0	3	9.3	20.3	3		10 P-
0.000	80.000000	14.5	3	9.2	23.7	3		15 P-
0.000	84.000000	3.6	3	9.7	13.3	3		5 P-
0.000	112.000000	9.7	3	13.0	22.7	3		14 P-
0.000	116.000000	4.1	3	13.4	17.5	3		7 P-
0.000	120.000000	2.8	3	13.7	16.6	3		7 P-
0.000	124.000000	.9	3	14.1	15.0	3		6 P-
0.000	128.000000	3.7	3	14.3	18.0	3		8 P-
0.000	132.000000	6.7	3	14.6	21.2	3		11 P-
0.000	136.000000	3.9	3	14.8	18.7	3		9 P-
0.000	140.000000	3.1	3	15.0	18.1	3		8 P-
0.000	144.000000	6.6	3	15.2	21.8	3		12 P-
0.000	156.000000	3.5	3	15.5	19.0	3		9 P-
0.000	160.000000	5.9	3	15.6	21.5	3		12 P-
0.000	164.000000	3.4	3	15.6	19.0	3		9 P-
0.000	168.000000	6.0	3	15.7	21.6	3		12 P-
0.000	172.000000	4.3	3	15.7	20.0	3		10 P-
0.000	176.000000	2.4	3	15.8	18.2	3		8 P-
0.000	180.000000	1.4	3	16.1	17.5	3		8 P-
0.000	188.000000	5.0	3	16.7	21.6	3		12 P-
0.000	200.000000	6.6	3	17.4	24.0	3		16 P-
0.000	204.000000	-1.1	3	17.6	16.5	3		7 P-
0.000	212.000000	-1.2	3	17.8	16.7	3		7 P-
0.000	220.000000	8.3	3	18.1	26.4	3		21 P-
0.000	224.000000	-.6	3	18.3	17.7	3		8 P-
0.000	228.000000	5.8	3	18.5	24.3	3		16 P-
0.000	232.000000	3.9	3	18.6	22.5	3		13 P-
0.000	236.000000	3.9	3	18.8	22.7	3		14 P-
0.000	240.000000	18.0	3	19.0	37.0	3		70 P-
0.000	244.000000	.1	3	19.1	19.1	3		9 P-

EMISSIONS (TX1)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 08:41, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	248.000000	2.9	3	19.1	22.1	3	13	P-
0.000	252.000000	-2.1	3	19.6	17.5	3	8	P-
0.000	260.000000	2.3	3	21.1	23.4	3	15	P-
0.000	264.000000	3.4	3	22.0	25.4	3	19	P-
0.000	268.000000	3.5	3	22.8	26.2	3	20	P-
0.000	272.000000	6.1	3	23.6	29.6	3	30	P-
0.000	276.000000	4.2	3	24.4	28.6	3	27	P-
0.000	280.000000	11.1	3	25.1	36.3	3	65	P-
0.000	284.000000	-.7	3	25.9	25.2	3	18	P-
0.000	288.000000	7.4	3	26.6	34.0	3	50	P-
0.000	292.000000	-0.0	3	27.4	27.4	3	23	P-
0.000	296.000000	1.6	3	28.1	29.7	3	31	P-
0.000	300.000000	-1.4	3	28.8	27.4	3	23	P-
0.000	304.000000	5.5	3	18.5	24.0	3	16	P-
0.000	308.000000	.4	3	18.7	19.2	3	9	P-
0.000	312.000000	2.8	3	19.0	21.8	3	12	P-
0.000	316.000000	1.3	3	19.2	20.5	3	11	P-
0.000	320.000000	8.7	3	19.5	28.2	3	26	P-
0.000	324.000000	-.6	3	19.7	19.1	3	9	P-
0.000	328.000000	.8	3	19.9	20.8	3	11	P-
0.000	332.000000	-1.4	3	20.2	18.8	3	9	P-
0.000	336.000000	-.9	3	20.4	19.5	3	9	P-
0.000	340.000000	.9	3	20.7	21.5	3	12	P-
0.000	344.000000	5.8	3	20.9	26.7	3	22	P-
0.000	348.000000	2.7	3	21.1	23.8	3	15	P-
0.000	352.000000	-.6	3	21.3	20.8	3	11	P-
0.000	356.000000	-.1	3	21.6	21.5	3	12	P-
0.000	360.000000	4.0	3	21.8	25.8	3	19	P-
0.000	364.000000	-.4	3	22.0	21.6	3	12	P-
0.000	368.000000	3.1	3	22.2	25.3	3	18	P-
0.000	372.000000	-.9	3	22.4	21.5	3	12	P-
0.000	376.008000	6.0	3	22.6	28.6	3	27	P-
0.000	380.008000	8.5	3	22.8	31.3	3	37	P-
0.000	384.008000	8.1	3	23.0	31.1	3	36	P-
0.000	388.008000	11.1	3	23.2	34.3	3	52	P-
0.000	392.008000	9.9	3	23.4	33.3	3	46	P-
0.000	396.013000	14.8	3	23.6	38.4	3	83	P-
0.000	400.008000	14.0	3	23.8	37.8	3	78	P-
0.000	404.008000	17.5	3	23.8	41.2	3	115	P-
0.000	404.008000	13.1	3	23.8	36.9	3	70	P-
0.000	408.008000	11.6	3	23.8	35.4	3	59	P-
0.000	412.008000	10.4	3	23.8	34.2	3	51	P-
0.000	416.008000	9.4	3	23.8	33.2	3	46	P-
0.000	420.020000	9.1	3	23.8	32.9	3	44	P-
0.000	424.008000	6.6	3	23.8	30.4	3	33	P-
0.000	427.995000	7.2	3	23.8	31.0	3	35	P-

EMISSIONS (TX1)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 08:41, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	431.995000	2.7	3	23.8	26.5	3	21	P-
0.000	435.995000	2.6	3	23.8	26.4	3	21	P-
0.000	439.995000	2.7	3	23.8	26.5	3	21	P-
0.000	443.995000	2.6	3	23.8	26.4	3	21	P-
0.000	447.995000	2.9	3	23.8	26.7	3	22	P-
0.000	455.995000	6.6	3	23.8	30.3	3	33	P-
0.000	459.995000	5.2	3	23.8	29.0	3	28	P-
0.000	467.995000	4.5	3	23.8	28.2	3	26	P-
0.000	471.995000	2.1	3	23.8	25.9	3	20	P-
0.000	483.995000	.9	3	23.7	24.6	3	17	P-
0.000	487.995000	2.3	3	23.7	26.0	3	20	P-
0.000	491.995000	3.1	3	23.7	26.8	3	22	P-
0.000	495.995000	2.8	3	23.7	26.5	3	21	P-
0.000	499.995000	3.4	3	23.7	27.1	3	23	P-
0.000	503.995000	1.2	3	23.9	25.1	3	18	P-
0.000	507.995000	1.4	3	24.0	25.4	3	19	P-
0.000	519.995000	.7	3	24.5	25.2	3	18	P-
0.000	523.995000	-.1	3	24.7	24.6	3	17	P-
0.000	531.995000	1.2	3	25.0	26.1	3	20	P-
0.000	539.995000	-1.6	3	25.2	23.7	3	15	P-
0.000	543.995000	-1.7	3	25.4	23.7	3	15	P-
0.000	547.995000	-1.9	3	25.6	23.7	3	15	P-
0.000	551.995000	1.4	3	25.7	27.0	3	22	P-
0.000	555.995000	-1.1	3	25.8	24.7	3	17	P-
0.000	559.995000	2.8	3	25.9	28.8	3	27	P-
0.000	563.995000	-.9	3	26.1	25.2	3	18	P-
0.000	568.008000	-.4	3	26.2	25.8	3	20	P-
0.000	572.008000	-1.4	3	26.3	24.9	3	18	P-
0.000	576.008000	-0.0	3	26.5	26.4	3	21	P-
0.000	580.008000	-.3	3	26.6	26.3	3	21	P-
0.000	592.008000	-.6	3	27.0	26.4	3	21	P-
0.000	596.008000	-6.8	3	27.1	20.3	3	10	P-
0.000	600.008000	-.2	3	27.2	27.0	3	22	P-
0.000	604.008000	-.4	3	27.3	26.9	3	22	P-
0.000	608.008000	-2.1	3	27.3	25.2	3	18	P-
0.000	612.008000	-3.7	3	27.4	23.7	3	15	P-
0.000	616.008000	-2.8	3	27.4	24.6	3	17	P-
0.000	620.008000	-.8	3	27.5	26.7	3	22	P-
0.000	624.008000	-2.3	3	27.5	25.2	3	18	P-
0.000	628.008000	-1.7	3	27.6	25.9	3	20	P-
0.000	632.008000	-1.6	3	27.6	26.1	3	20	P-
0.000	636.008000	-2.7	3	27.7	25.0	3	18	P-
0.000	640.008000	-1.2	3	27.7	26.5	3	21	P-
0.000	644.008000	1.2	3	27.8	29.0	3	28	P-
0.000	648.008000	-1.5	3	27.8	26.3	3	21	P-
0.000	652.008000	-2.2	3	27.9	25.7	3	19	P-

EMISSIONS (TX1)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 08:41, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	656.008000	4.1	3	27.9	32.0	3	40	P-
0.000	664.008000	-2.9	3	28.0	25.1	3	18	P-
0.000	668.008000	-1.2	3	28.1	26.9	3	22	P-
0.000	672.008000	-.7	3	28.1	27.4	3	23	P-
0.000	676.008000	-.8	3	28.2	27.4	3	23	P-
0.000	680.008000	.2	3	28.2	28.4	3	26	P-
0.000	684.008000	-1.2	3	28.2	27.1	3	23	P-
0.000	688.008000	-1.2	3	28.3	27.0	3	22	P-
0.000	692.008000	.2	3	28.3	28.6	3	27	P-
0.000	700.008000	-5.1	3	28.4	23.3	3	15	P-
0.000	704.008000	-5.0	3	28.5	23.4	3	15	P-
0.000	708.008000	-2.4	3	28.5	26.1	3	20	P-
0.000	712.008000	-1.7	3	28.6	26.8	3	22	P-
0.000	716.008000	-1.3	3	28.6	27.3	3	23	P-
0.000	720.008000	-2.7	3	28.7	26.0	3	20	P-
0.000	724.008000	-2.2	3	28.7	26.5	3	21	P-
0.000	728.008000	-.4	3	28.8	28.4	3	26	P-
0.000	732.008000	-2.0	3	28.8	26.9	3	22	P-
0.000	736.008000	-3.7	3	28.9	25.2	3	18	P-
0.000	740.008000	-4.4	3	28.9	24.6	3	17	P-
0.000	744.008000	-2.7	3	29.0	26.3	3	21	P-
0.000	748.008000	-2.1	3	29.0	26.9	3	22	P-
0.000	760.008000	-5.7	3	29.2	23.5	3	15	P-
0.000	764.008000	-4.5	3	29.3	24.8	3	17	P-
0.000	768.008000	-2.5	3	29.4	26.9	3	22	P-
0.000	772.008000	-3.0	3	29.4	26.4	3	21	P-
0.000	776.008000	-2.0	3	29.5	27.5	3	24	P-
0.000	780.008000	-1.2	3	29.6	28.3	3	26	P-
0.000	784.008000	-4.5	3	29.6	25.1	3	18	P-
0.000	788.008000	-.2	3	29.7	29.5	3	30	P-
0.000	792.008000	-2.4	3	29.8	27.4	3	23	P-
0.000	796.008000	-.7	3	29.8	29.1	3	28	P-
0.000	800.008000	.9	3	29.9	30.8	3	35	P-
0.000	804.008000	-1.2	3	29.9	28.7	3	27	P-
0.000	808.008000	-.2	3	29.9	29.8	3	31	P-
0.000	812.008000	-1.6	3	29.9	28.4	3	26	P-
0.000	816.008000	-3.0	3	30.0	27.0	3	22	P-
0.000	820.008000	-2.5	3	30.0	27.4	3	24	P-
0.000	828.008000	-3.0	3	30.0	27.0	3	22	P-
0.000	832.008000	-1.3	3	30.0	28.7	3	27	P-
0.000	836.008000	-.6	3	30.0	29.4	3	30	P-
0.000	840.008000	-1.1	3	30.0	29.0	3	28	P-
0.000	844.008000	-0.0	3	30.0	30.0	3	32	P-
0.000	848.008000	-7.1	3	30.0	22.9	3	14	P-
0.000	868.008000	-2.8	3	30.1	27.3	3	23	P-
0.000	872.008000	-4.5	3	30.1	25.6	3	19	P-

EMISSIONS (TX1)

SOUTHWEST MICROWAVE INC., System 315

1999-APR-13, 08:41, TUE

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC. dBuV/m	@m	CALC. uV/m	FLAG
0.000	876.008000	-5.7	3	30.1	24.5	3	17	P-
0.000	880.008000	1.4	3	30.1	31.6	3	38	P-
0.000	884.008000	.4	3	30.2	30.6	3	34	P-
0.000	888.008000	3.1	3	30.2	33.3	3	46	P-
0.000	892.008000	0.0	3	30.2	30.2	3	32	P-
0.000	896.008000	-3.8	3	30.2	26.4	3	21	P-
0.000	900.008000	-3.3	3	30.2	26.9	3	22	P-
0.000	904.008000	-5.9	3	30.6	24.7	3	17	P-
0.000	908.008000	-4.1	3	31.0	26.9	3	22	P-
0.000	912.008000	-2.9	3	31.4	28.5	3	27	P-
0.000	916.008000	-1.8	3	31.7	30.0	3	31	P-
0.000	920.008000	-1.2	3	32.1	31.0	3	35	P-
0.000	924.008000	-3.9	3	32.5	28.7	3	27	P-
0.000	928.008000	-6.0	3	32.9	26.9	3	22	P-
0.000	936.008000	4.4	3	33.6	38.0	3	79	P-
0.000	940.008000	2.1	3	34.0	36.1	3	64	P-
0.000	944.008000	-1.7	3	34.4	32.7	3	43	P-
0.000	948.008000	-5.4	3	34.7	29.3	3	29	P-
0.000	952.008000	-4.9	3	35.1	30.2	3	32	P-
0.000	956.008000	-1.6	3	35.5	33.9	3	49	P-
0.000	964.000000	-1.6	3	36.2	34.7	3	54	P-
0.000	968.000000	-5.1	3	36.6	31.5	3	38	P-
0.000	972.000000	-4.5	3	37.0	32.5	3	42	P-
0.000	976.000000	-3.6	3	37.3	33.8	3	49	P-
0.000	980.000000	-7.2	3	37.7	30.5	3	34	P-
0.000	984.000000	-3.0	3	38.1	35.1	3	57	P-
0.000	988.000000	-3.9	3	38.5	34.5	3	53	P-
0.000	992.000000	-4.2	3	38.8	34.6	3	54	P-
0.000	996.000000	-3.0	3	39.2	36.1	3	64	P-
0.000	1000.000000	-.1	3	39.5	39.4	3	93	P-

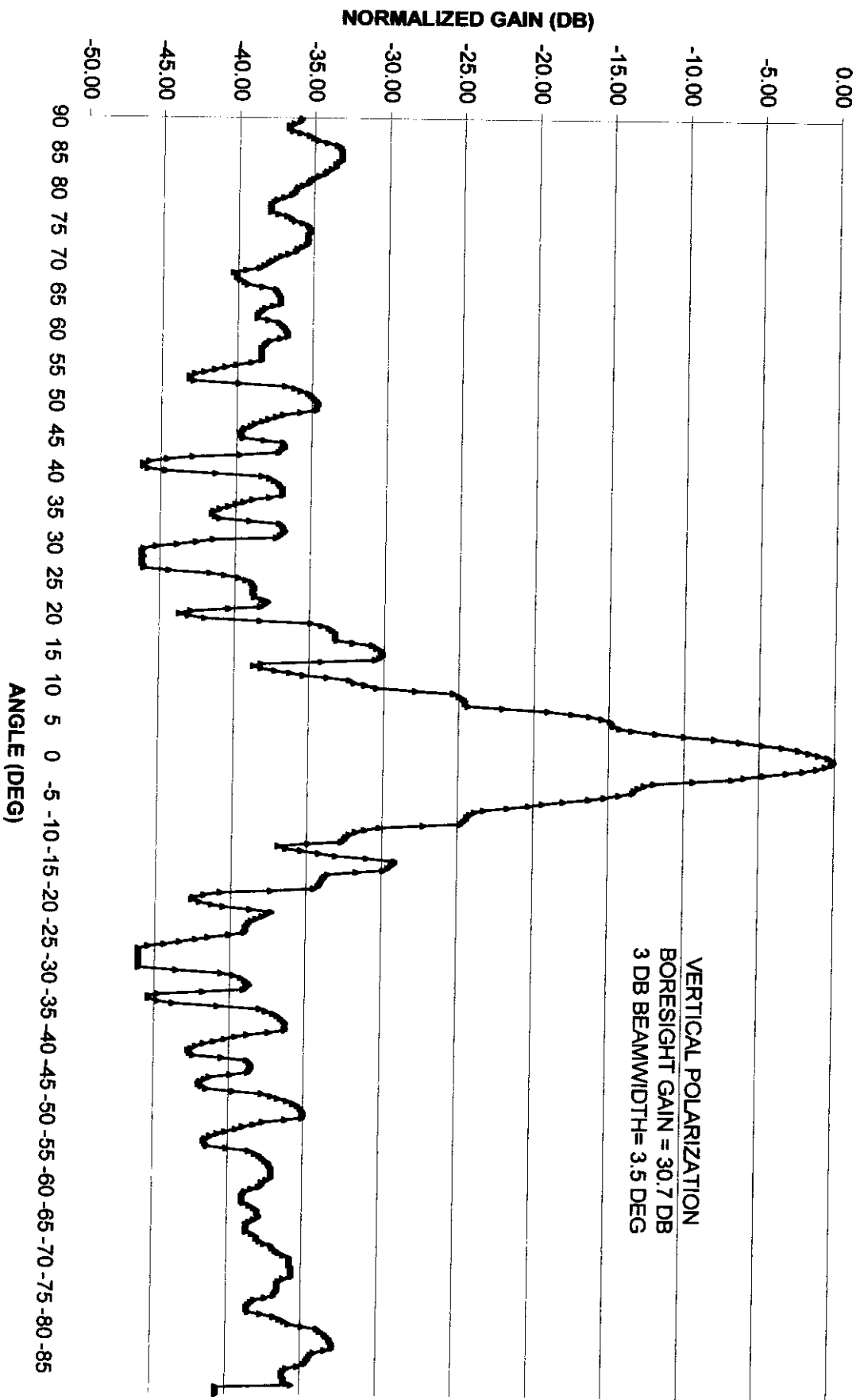
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MAY 03 1999

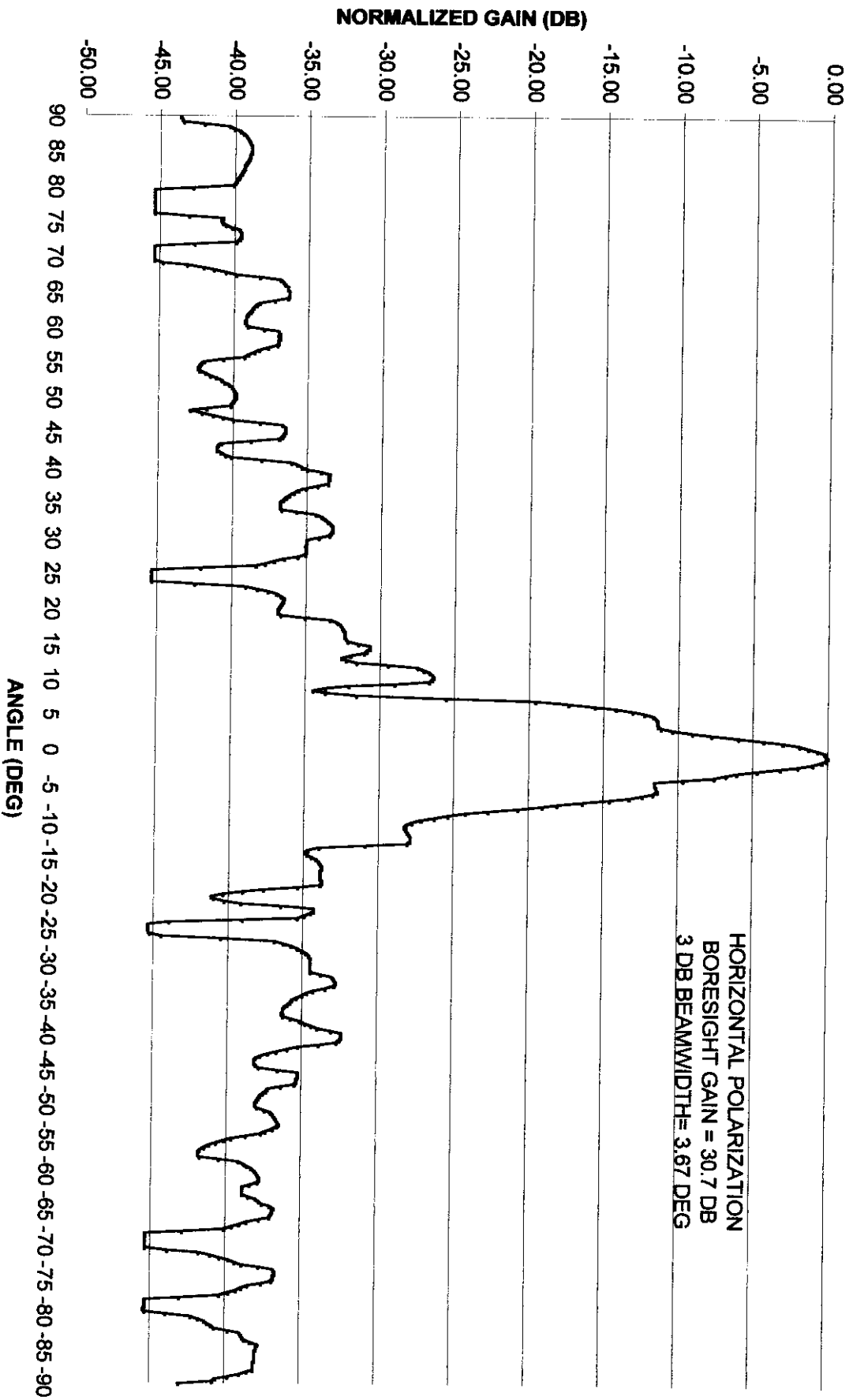
SOUTHWEST MICROWAVE

MODEL 316

MODEL 316 ANTENNA PATTERN



MODEL 316 ANTENNA PATTERN



FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

Southwest Microwave, Inc.
2922 S. Roosevelt Street
Tempe, AZ 85282-2042

Dear FCC Customer:

RE: CALL SIGN/ID

4-23-99
CA6315
CA6316

FCC CODE #1

FCC CODE #2

Re: Return of Unprocessable Application

This is to notify you that your application package is being returned for the following reasons:

4-28-99

- () No application/filing accompanied your submission.
- () Application Form _____ is not accepted in this P. O. Box.
- () No remittance accompanied your submission. Please refer to the appropriate Fee Filing Guide.
- () The remittance for payment type code _____ is now \$ _____
- () Your check is not acceptable for this reason _____
- (X) Multiple checks for a single application are not accepted
- () No remittance advice (FCC Form 159) accompanied your submission.
- () The payment type code is needed.
- () The remittance advice form is incomplete or obsolete.
- () Multiple quantities (quantities greater than 1) are not accepted for this payment type code. Each transaction must be listed separately on FCC Form 159 Remittance Advice.
- () When paying with a single remittance and filing for more than one applicant, or filing more than one call sign/identifier, each item must be listed individually on FCC Form 159/159C Remittance Advice.
- () Multiple payment type codes listed are not accepted in this P. O. Box. Please refer to the Filing Guide and prepare a separate filing for each P. O. Box.
- () The credit card section of FCC Form 159 Remittance Advice needs _____ Expiration date _____ Signature
- () Block 3 must be completed to authorize a credit card charge, only the credit card holder can complete this item.
- () OTHER

new check is attached

PLEASE REPLACE WITH ONE
CHECK FOR \$1880.00

Please refer to the enclosed fee filing guide for further instructions, and mail your corrected application, remittance advice form and payment to the appropriate P. O. Box in Pittsburgh, PA.

If you have further questions, please contact the Fee Section at 1-888-225-5322 202-418-1995

Sincerely,
Billings & Collections Branch

Enclosures:

Filing Guide

Check(s) #

FCC Form(s)

For Office Use Only:

Rec'd. in P. O. Box #

Proc #1

Proc #2

45854 45855
FCC 159
2 FCC 731

315

1499

1645

PN-1