

FCC PART 15, SUBPART B AND C
TEST METHOD: ANSI C63.4-1992

for

PARACOMM 900 MHz
RF MODEM - TX

Model: PARACOMM 900

Prepared for

PARAGON DYNAMICS, INC.
PO BOX 2677
STILLWATER, OK 74076

Prepared by: *Kyle Fujimoto*

KYLE FUJIMOTO

Approved by: *Scott McCutchan*

SCOTT McCUTCHAN

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: MARCH 29, 1999

	REPORT BODY	APPENDICES				TOTAL
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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: Paracomm 900 MHz RF Modem - Tx
 Model: PARACOMM 900
 S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: Paragon Dynamics, Inc.
 PO Box 2677
 Stillwater, OK 74076

Test Date: March 26, 1999

Test Specifications: EMI requirements
 FCC Title 47, Part 15 Subpart C, Sections 15.205, 15.207, and 15.249

Test Procedure: ANSI C63.4: 1992

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 450 kHz - 30 MHz	Complies with the limits of FCC Title 47, Part 15 Subpart B and Subpart C, section 15.207
2	Radiated RF Emissions, 10 kHz - 4200 MHz	Complies with the limits of FCC Title 47, Part 15, Subpart B and Subpart C, sections 15.205 and 15.249



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Paracomm 900 MHz RF Modem - Tx Model: PARACOMM 900. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by FCC Title 47, Part 15, Subpart B and Subpart C, sections 15.205, 15.207, and 15.249.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Paragon Dynamics, Inc.

Chuck Kriel Engineer

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer

Scott McCutchan Lab Manager

2.4 Date Test Sample was Received

The test sample was received on March 26, 1999

2.5 Disposition of the Test Sample

The test sample was returned to Paragon Dynamics, Inc. on March 29, 1999.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network



3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Subpart C.	FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.
FCC Title 47, Subpart B.	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators



4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Paracomm 900 MHz RF Modem - Tx Model: PARACOMM 900 (EUT) was connected to the Sony computer, and AC Adapter via its signal and power ports, respectively. The Sony computer was also connected to a monitor, printer, mouse, and keyboard via its video, parallel, mouse, and keyboard ports, respectively. The EUT was tested in three different orthogonal axis. The EUT was receiving text of scrolling "H's" and continuously transmitting them to the Paracomm 900 MHz RF Modem - Rx which was placed fifty feet away from the test site. The Paracomm 900 MHz RF Modem – Rx was connected to the Dell computer and AC Adapter via its signal and power ports, respectively. The Dell computer was also connected to a monitor, keyboard, and mouse via its video, keyboard, and mouse ports, respectively. The receiver received the scrolling "H's" from the EUT and sent them to the Dell computer to be displayed. The antenna and connector on the PCB have a reverse SMA connector.

Final radiated data as well as the final conducted data was taken in the mode above. Please see Appendix D for the data sheets.



4.1.1 Cable Construction and Termination

- Cable 1 This is a 6 inch braid and foil shielded cable connecting the EUT to cable #2. It has a ¼ inch metallic connector at the EUT end and a D-9 pin metallic connector at the other end. The shield of the cable was grounded to the chassis via the connectors.
- Cable 2 This is a 5 foot braid and foil shielded cable connecting the cable #1 to the Sony computer. It has a D-9 pin metallic connector at each end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.
- Cable 3 This is a 5 foot braid and foil shielded cable connecting the Sony computer to the printer. It has a D-25 pin metallic connector at the Sony computer end and a Centronics metallic type connector at the printer end. The shield of the cable was grounded to the chassis via the connectors.
- Cable 4 This is a 6 foot braid and foil shielded cable connecting the Sony computer to the monitor. It has a high density D-15 pin metallic connector at the Sony computer end and is hard wired into the monitor. The cable was bundled to a length of 1 meter. The shield of the cable was connected to the chassis via the connector.
- Cable 5 This is a 4 foot foil shielded cable connecting the Sony computer to the keyboard. It has a 6 pin metallic mini DIN connector at the Sony computer end and is hard wired into the keyboard. The shield of the cable was connected to the chassis via the connector.
- Cable 6 This is a 6 foot foil shielded cable connecting the Sony computer to the mouse. It has a 6 pin metallic mini DIN connector at the Sony computer end and is hard wired into the mouse. The shield of the cable was connected to the chassis via the connector.
- Cable 7 This is a 6 inch braid and foil shielded cable connecting the Paracomm 900 MHz RF Modem - Receiver to cable #8. It has a terminal block at the receiver end and a D-9 pin metallic connector at the other end. The shield of the cable was connected to the chassis via the connector at the cable #8 end only.
- Cable 8 This is a 5 foot braid and foil shielded cable connecting the cable #7 to the Dell computer. It has a D-9 pin metallic connector at each end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.
- Cable 9 This is a 6 foot braid and foil shielded cable connecting the Dell computer to the monitor. It has a high density D-15 pin metallic connector at the Dell computer end and is hard wired into the monitor. The cable was bundled to a length of 1 meter. The shield of the cable was connected to the chassis via the connector.
- Cable 10 This is a 6 foot foil shielded cable connecting the Dell computer to the mouse. It has a 6 pin metallic mini DIN connector at the Dell computer end and is hard wired into the mouse. The shield of the cable was connected to the chassis via the connector.
- Cable 11 This is a 6 foot foil shielded cable connecting the Dell computer to the mouse. It has a 6 pin metallic mini DIN connector at the Dell computer end and is hard wired into the mouse. The shield of the cable was connected to the chassis via the connector.



Cable Construction and Termination (con't)

Cable 12

This is a 6 foot unshielded cable connecting the EUT to the AC Adapter. It has a 1/8 inch power connector at the EUT end and is hard wired into the AC Adapter.

Cable 13

This is a 6 foot unshielded cable connecting the Paracomm 900 MHz RF Modem - Receiver to the AC Adapter. It has a 1/8 inch power connector at the receiver end and is hard wired into the AC Adapter.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
PARACOMM 900 MHZ RF MODEM - TX (EUT)	PARAGON DYNAMICS, INC.	PARACOMM 900	N/A	OIG- PARACOMM900
COMPUTER	SONY	PCV-240	5104422	DoC
MONITOR	PANASONIC	C1395	KH2530261	ACJ928KMX-F408
PRINTER	CITIZEN	LSP-10	1130060-73	DLK66TLSP-10
KEYBOARD	DELL	SK-1000REW	M960110227	GYUR26SK
MOUSE	LOGITECH	CQ38	OA54905022	DZLMO4
AC ADAPTER	GLOBTEK	AEC-3590A	N/A	N/A
COMPUTER	DELL	CT4KZ	MMP	DoC
MONITOR	PANASONIC	C1395	KH1250136	ACJ928KMX-F408
KEYBOARD	HEWLETT PACKARD	5125	B83709926	DoC
MOUSE	HEWLETT PACKARD	M-S34	LZB81657218	DZL211029
AC ADAPTER	GLOBTEK	AEC-3590A	N/A	N/A



5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566B	3638A08784	Nov. 16, 1998	Nov. 16, 1999
Preamplifier	Com Power	PA-102	1017	Feb. 16, 1998	Feb. 16, 1999
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	June 23, 1998	June 23, 1999
Biconical Antenna	Com Power	AB-100	1548	Oct. 15, 1998	Oct. 15, 1999
Log Periodic Antenna	Com Power	AL-100	1117	Oct. 15, 1998	Oct. 15, 1999
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	HP98561A	2522A05178	N/A	N/A
Printer	Hewlett Packard	2225A	2925S33268	N/A	N/A
Plotter	Hewlett Packard	7440A	8726K38417	N/A	N/A
Microwave Preamplifier	Hewlett Packard	8449B	3008A008766	Jan. 30, 1999	Jan. 30, 2000
Horn Antenna	Antenna Research	DRG-118/A	1053	Dec. 8, 1995	N/A
Loop Antenna	Com-Power	AL-130	25309	Feb. 5, 1999	Feb. 5, 2000



6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.



7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak detector was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 1992. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.45 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the HP 9000/300 in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.



7.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Hewlett Packard Microwave Preamplifier Model: 8449B was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data.



7.3 Band Edge Plots of the Low and High Channels

Spectral plots of both the low and high channels were taken of the EUT to show that the emissions at the band edges (902 and 928 MHz) were attenuated by at least 50 dB below the level of the fundamental or to the general radiated emissions limits in FCC Title 47, Subpart C, section 15.209, whichever is the lesser attenuation.



8. CONCLUSIONS

The Paracomm 900 MHz RF Modem - Tx Model: PARACOMM 900 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B and Subpart C, sections 15.205, 15.207, and 15.249.





APPENDIX A

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modifications:

No modifications were made to the EUT.





***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

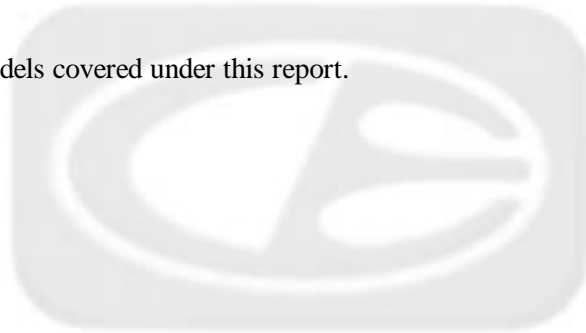


ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Paracomm 900 MHz RF Modem - Tx
Model: PARACOMM 900
S/N: N/A

There were no additional models covered under this report.





DIAGRAMS, CHARTS AND PHOTOS



FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

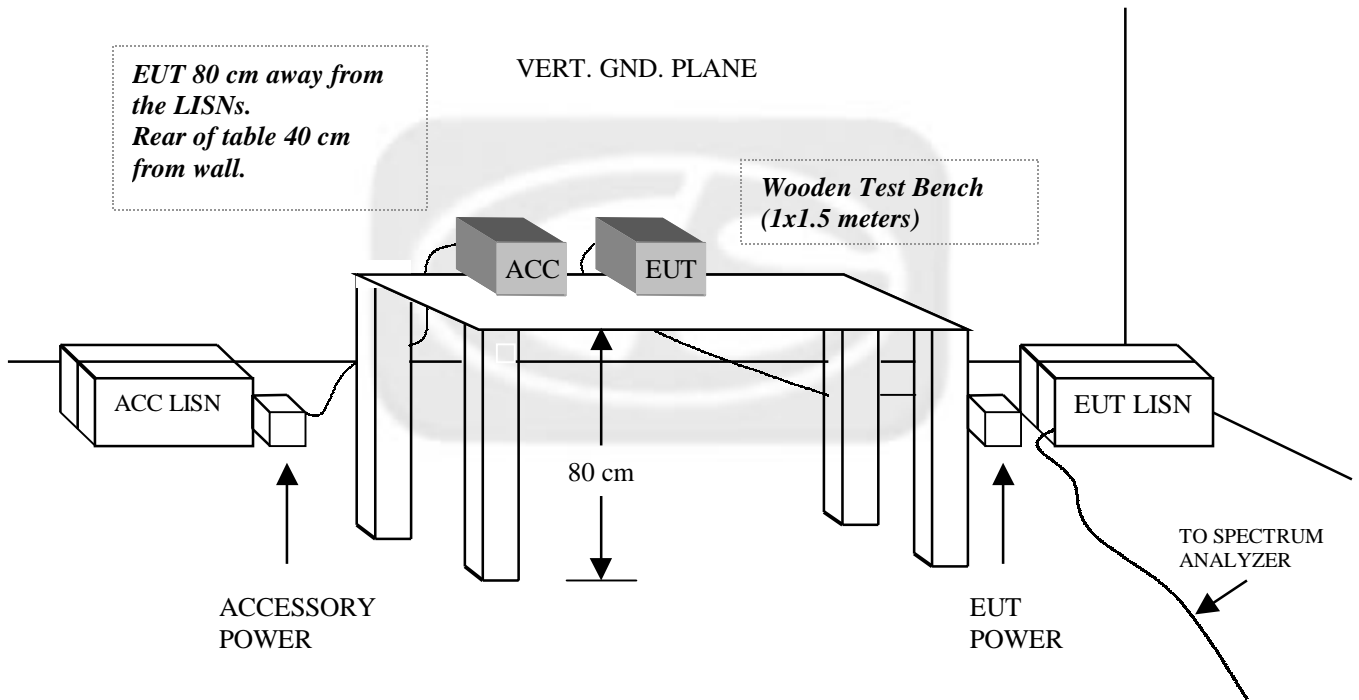
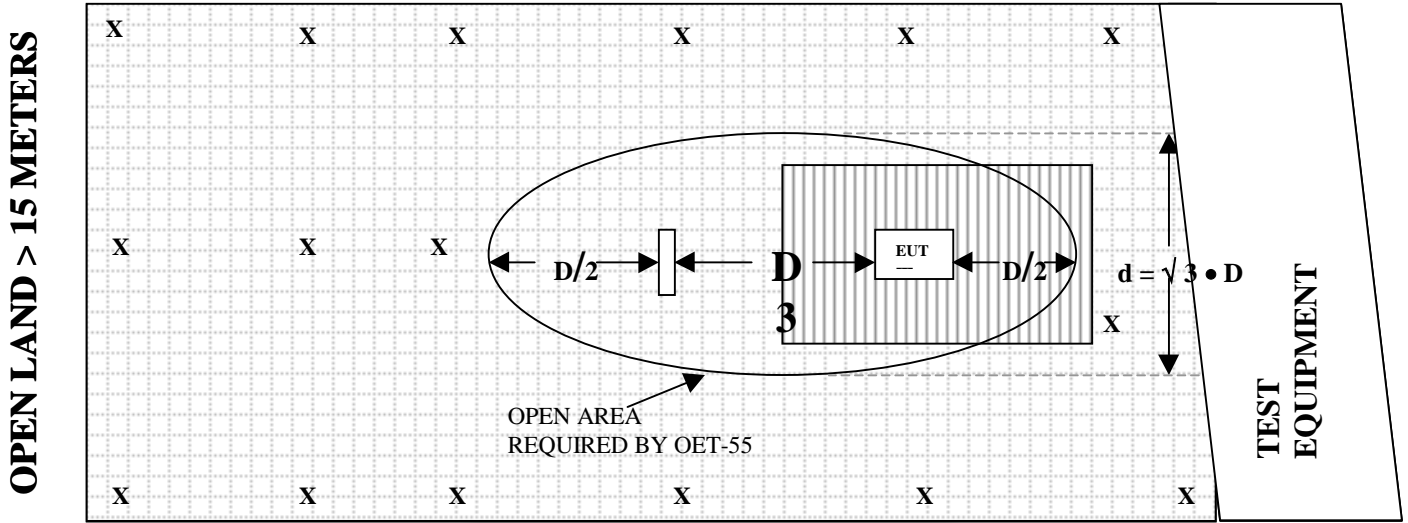


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

- | | | | |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |





FRONT VIEW

PARAGON DYNAMICS, INC.
PARACOMM 900 MHZ RF MODEM - TX
Model: PARACOMM 900
FCC SUBPART C - RADIATED EMISSIONS – 3-26-99

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**





REAR VIEW

PARAGON DYNAMICS, INC.
PARACOMM 900 MHZ RF MODEM - TX
Model: PARACOMM 900
FCC SUBPART C - RADIATED EMISSIONS – 3-26-99

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**





FRONT VIEW

PARAGON DYNAMICS, INC.
PARACOMM 900 MHZ RF MODEM - TX
Model: PARACOMM 900
FCC SUBPART C - CONDUCTED EMISSIONS – 3-26-99

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**





REAR VIEW

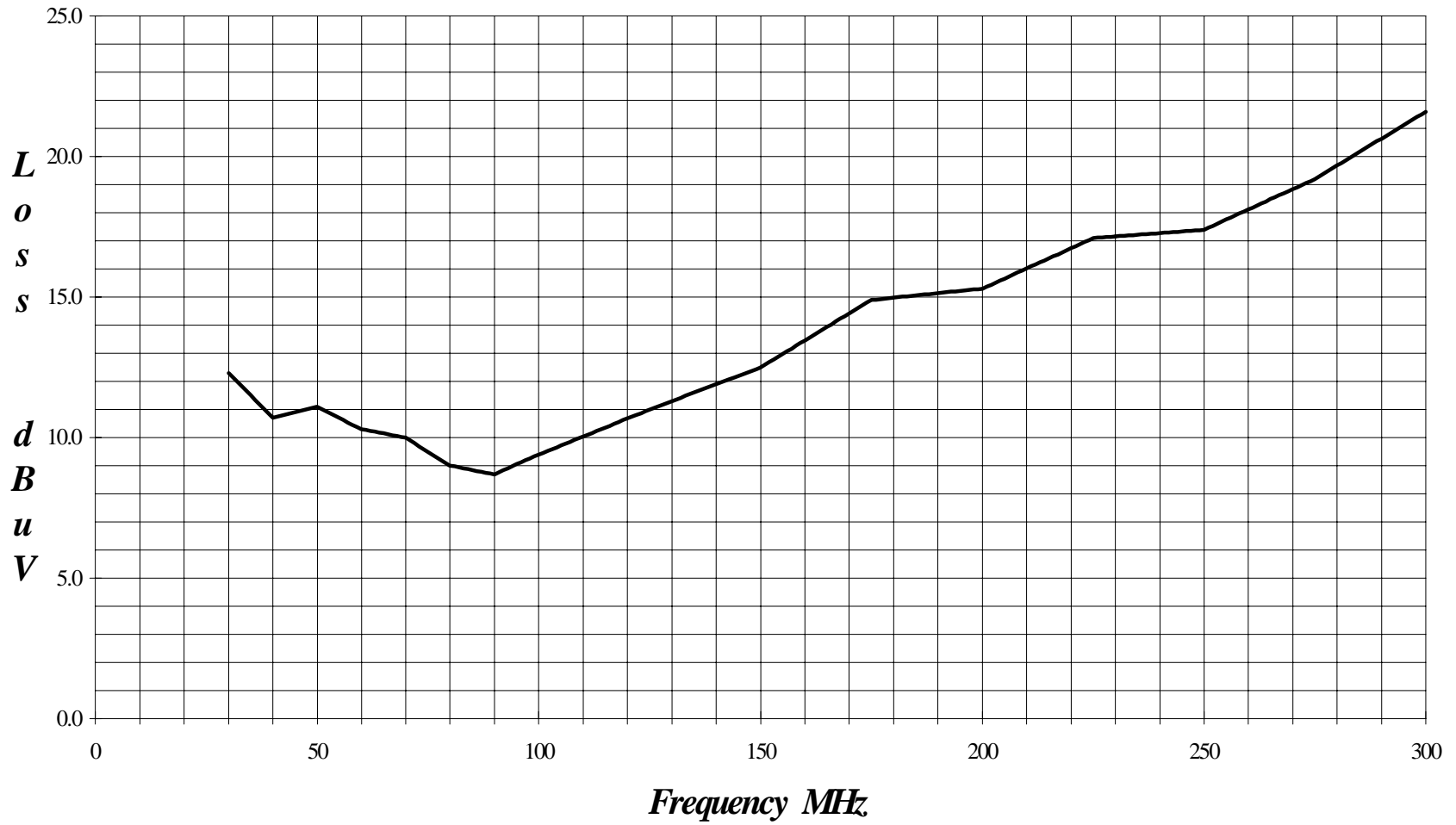
PARAGON DYNAMICS, INC.
PARACOMM 900 MHZ RF MODEM - TX
Model: PARACOMM 900
FCC SUBPART C - CONDUCTED EMISSIONS – 3-26-99

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



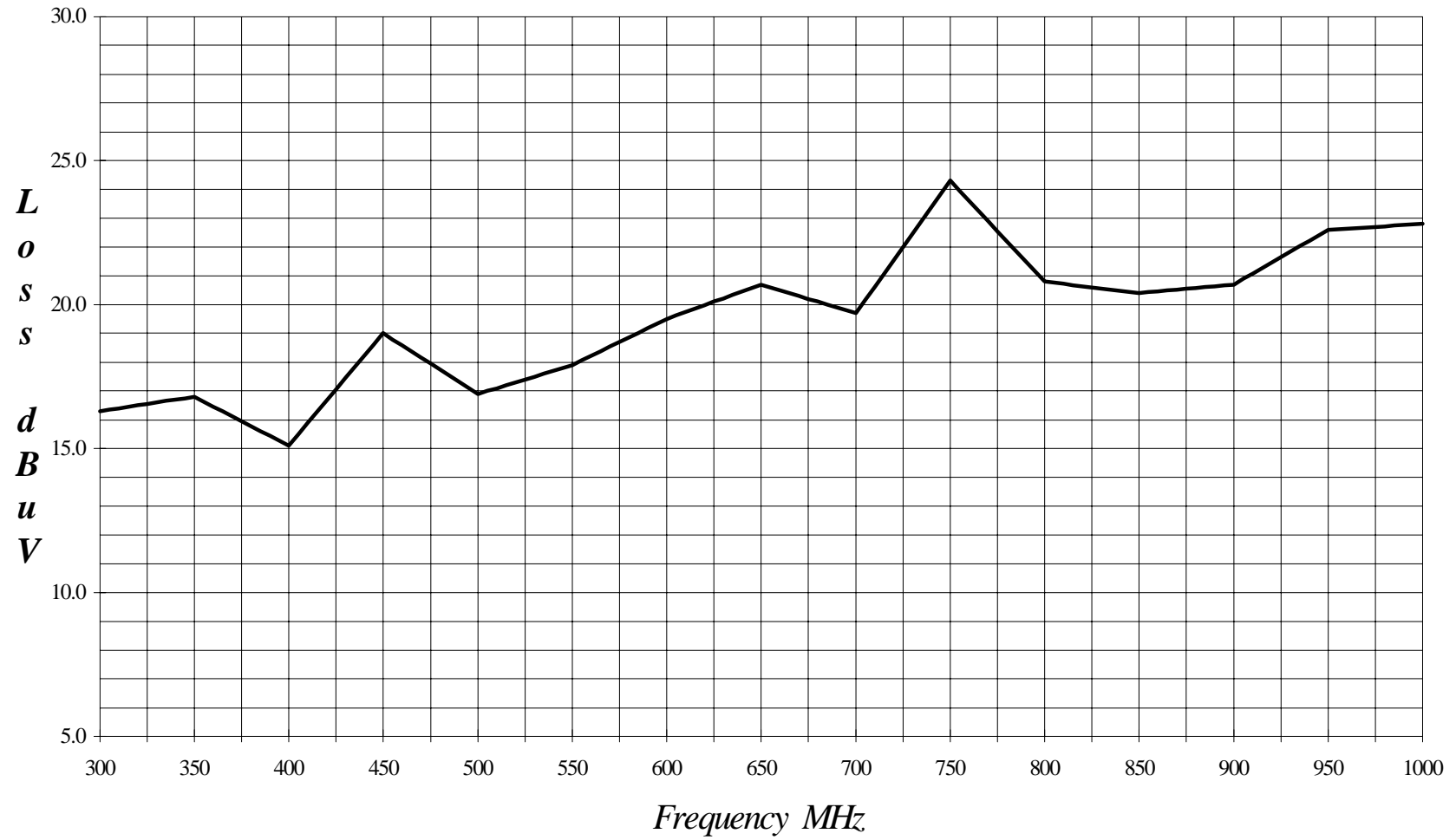
Cal: 10/15/98

LAB 'D' BICONICAL ANTENNA AB-100 S/N 01548

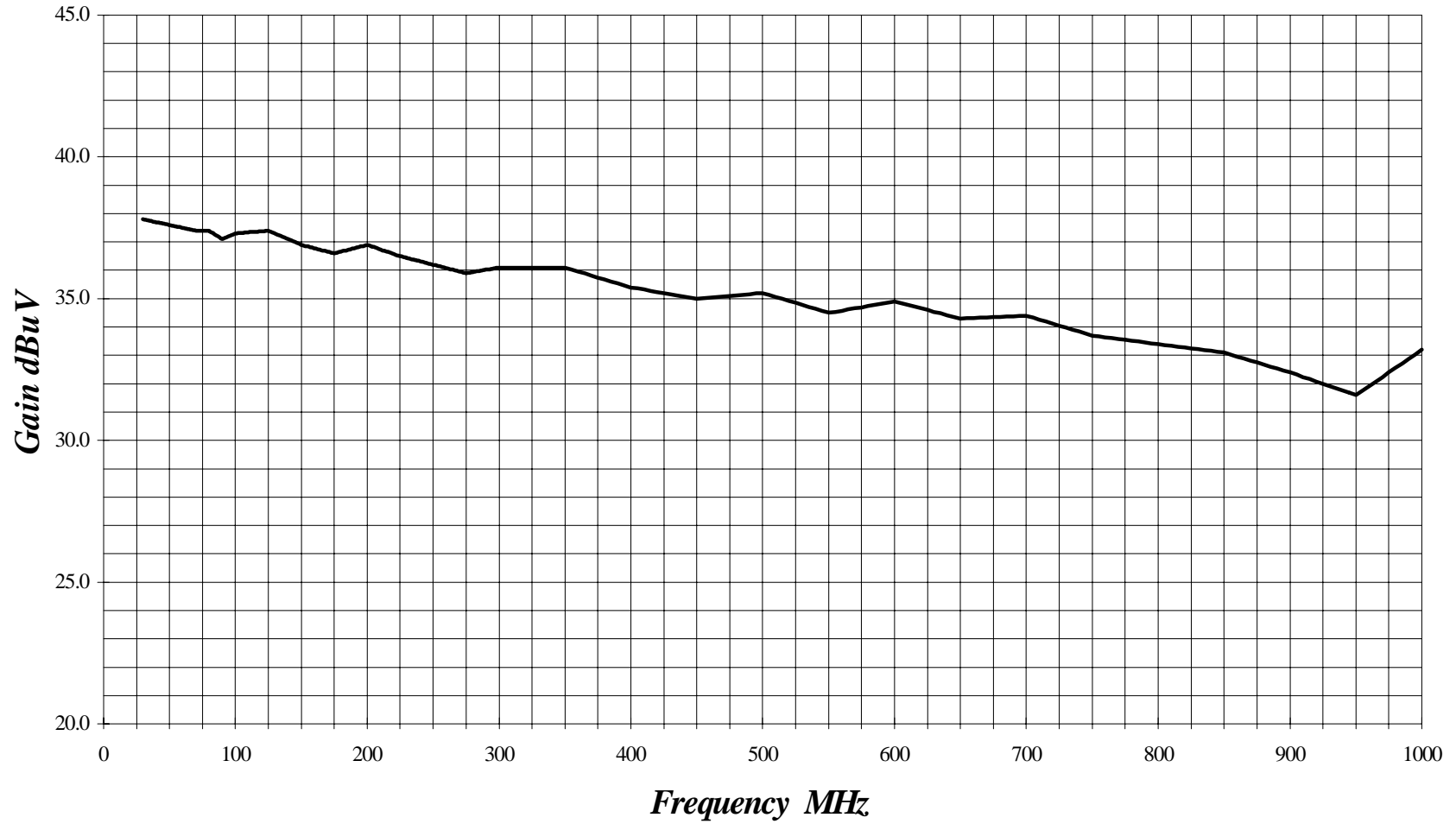


Cal: 10/15/98

LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 01117



PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS PA-102 S/N: 1017



HEWLETT PACKARD 8449B

MICROWAVE PREAMPLIFIER

S/N: 3008A008766

CALIBRATION DATE: JANUARY 30, 1999

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	36.9	9.5	34.3
1.1	36.3	10.0	33.7
1.2	36.4	10.5	34.1
1.3	36.2	11.0	33.7
1.4	36.3	11.5	34.0
1.5	35.7	12.0	33.9
1.6	35.9	12.5	34.4
1.7	35.7	13.0	32.9
1.8	35.6	13.5	31.6
1.9	35.5	14.0	31.8
2.0	35.4	14.5	31.9
2.5	35.6	15.0	32.2
3.0	35.2	15.5	32.8
3.5	35.2	16.0	32.4
4.0	34.3	16.5	32.1
4.5	34.1	17.0	32.3
5.0	34.3	17.5	30.3
5.5	33.0	18.0	31.5
6.0	34.1	18.5	31.2
6.5	34.5	19.0	32.2
7.0	34.3	19.5	32.0
7.5	33.9	20.0	32.0
8.0	34.5	20.5	33.2
8.5	34.5	21.0	30.9
9.0	34.4	22.0	32.1



11317 Frederick Avenue, Beltsville, MD 20705

E-FIELD ANTENNA FACTOR CALIBRATION

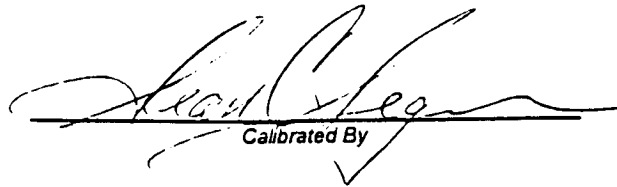
$$E(\text{dB V/m}) = V_o(\text{dB V}) + AFE(\text{dB/m})$$

Model number : DRG-118/A

Frequency GHz	AFE dB/m	Gain dBi
1	22.3	8.0
2	26.7	9.5
3	29.7	10.1
4	29.5	12.8
5	32.3	12.0
6	32.4	13.4
7	36.1	11.0
8	37.4	10.9
9	36.8	12.5
10	39.5	10.7
11	39.6	11.5
12	39.8	12.0
13	39.7	12.8
14	41.8	11.3
15	41.9	11.9
16	38.1	16.3
17	41.0	13.9
18	46.5	8.9

Serial number : 1053
Job number : 96-092
Remarks : 3 meter calibration
Standards : LPD-118/A, TE-1000

Temperature : 72° F
Humidity : 56 %
Traceability : A01887
Date : December 08, 1995



Calibrated By

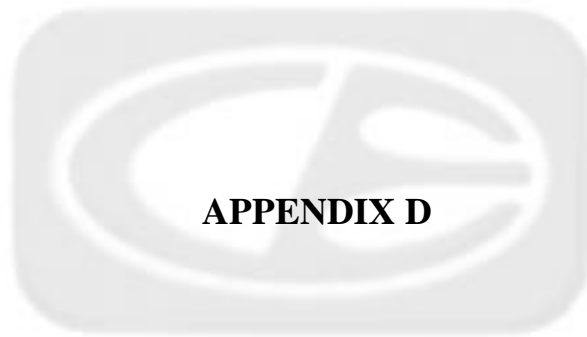
COM-POWER CORPORATION

LOOP ANTENNA

S/N: 25309

CALIBRATION DATE: FEBRUARY 5, 1999

FREQUENCY (MHz)	ELECTRIC FACTOR (Db/m)	FREQUENCY (MHz)	ELECTRIC FACTOR (Db/m)
0.01	11.0	1	10.4
0.02	9.9	2	10.8
0.03	11.5	3	10.8
0.04	11.2	4	10.6
0.05	9.9	5	11.4
0.06	10.4	6	11.5
0.07	10.2	7	11.2
0.08	9.9	8	11.7
0.09	9.8	9	12.7
0.1	9.7	10	10.7
0.2	7.5	12	10.1
0.3	9.9	14	10.1
0.4	9.8	15	10.6
0.5	9.8	16	10.7
0.6	10.0	18	10.0
0.7	10.0	20	10.0
0.8	9.9	25	10.3
0.9	9.9	30	10.1



APPENDIX D

DATA SHEETS



RADIATED EMISSIONS (FCC SUBPART C, SECTION 15.249)



COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
903.41	103.3	103.2	1.0	180	0.0	20.8	5.0	37.3	91.7	-2.3	94.0	Low Channel / Y Axis
903.41	94.1	94.0	1.0	90	0.0	20.8	5.0	37.3	82.5	-11.5	94.0	Low Channel / X Axis
903.41	95.3	95.2	1.0	0	0.0	20.8	5.0	37.3	83.7	-10.3	94.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
903.41	86.0	85.9	1.0	90	0.0	20.8	5.0	37.3	74.4	-19.6	94.0	Low Channel / Y Axis
903.41	99.0	98.9	1.0	270	0.0	20.8	5.0	37.3	87.4	-6.6	94.0	Low Channel / X Axis
903.41	98.6	98.5	1.5	270	0.0	20.8	5.0	37.3	87.0	-7.0	94.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
912.43	103.2	103.1	1.0	180	0.0	21.2	5.0	37.2	92.1	-1.9	94.0	Mid Channel / Y Axis
912.43	89.4	89.3	1.5	270	0.0	21.2	5.0	37.2	78.3	-15.7	94.0	Mid Channel / X Axis
912.43	90.9	90.8	1.5	270	0.0	21.2	5.0	37.2	79.8	-14.2	94.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
912.43	90.1	90.0	1.0	90	0.0	21.2	5.0	37.2	79.0	-15.0	94.0	Mid Channel / Y Axis
912.43	99.4	99.3	1.0	90	0.0	21.2	5.0	37.2	88.3	-5.7	94.0	Mid Channel / X Axis
912.43	90.6	90.5	1.5	270	0.0	21.2	5.0	37.2	79.5	-14.5	94.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
921.46	101.0	100.9	1.0	180	0.0	21.5	5.0	37.0	90.4	-3.6	94.0	High Channel / Y Axis
921.46	89.0	88.9	1.5	90	0.0	21.5	5.0	37.0	78.4	-15.6	94.0	High Channel / X Axis
921.46	93.0	92.9	1.5	180	0.0	21.5	5.0	37.0	82.4	-11.6	94.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
921.46	87.0	86.9	1.5	90	0.0	21.5	5.0	37.0	76.4	-17.6	94.0	High Channel / Y Axis
921.46	95.1	95.0	1.0	180	0.0	21.5	5.0	37.0	84.5	-9.5	94.0	High Channel / X Axis
921.46	97.8	97.7	1.0	270	0.0	21.5	5.0	37.0	87.2	-6.8	94.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYEED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
1.81	53.8	51.2	1.0	180	0.0	24.5	3.9	33.6	46.0	-8.0	54.0	Low Channel / Y Axis
1.81	54.4	52.3	1.0	0	0.0	24.5	3.9	33.6	47.1	-6.9	54.0	Low Channel / X Axis
1.81	56.4	55.0	1.0	0	0.0	24.5	3.9	33.6	49.8	-4.2	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
1.81	58.0	56.6	2.0	90	0.0	24.5	3.9	33.6	51.4	-2.6	54.0	Low Channel / Y Axis
1.81	50.6	46.9	2.0	180	0.0	24.5	3.9	33.6	41.7	-12.3	54.0	Low Channel / X Axis
1.81	54.6	52.6	1.0	0	0.0	24.5	3.9	33.6	47.4	-6.6	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
1.82	57.1	56.0	1.0	0	0.0	24.5	3.9	33.6	50.8	-3.2	54.0	Mid Channel / Y Axis
1.82	58.0	56.1	3.0	90	0.0	24.5	3.9	33.6	50.9	-3.1	54.0	Mid Channel / X Axis
1.82	54.0	52.5	1.5	90	0.0	24.5	3.9	33.6	47.3	-6.7	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
1.82	55.8	54.1	2.0	90	0.0	24.5	3.9	33.6	48.9	-5.1	54.0	Mid Channel / Y Axis
1.82	52.2	49.2	1.5	90	0.0	24.5	3.9	33.6	44.0	-10.0	54.0	Mid Channel / X Axis
1.82	54.4	52.0	1.0	270	0.0	24.5	3.9	33.6	46.8	-7.2	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
1.84	54.0	51.6	2.0	180	0.0	24.5	3.9	33.6	46.4	-7.6	54.0	High Channel / Y Axis
1.84	57.3	55.6	1.0	180	0.0	24.5	3.9	33.6	50.4	-3.6	54.0	High Channel / X Axis
1.84	54.5	52.4	2.0	90	0.0	24.5	3.9	33.6	47.2	-6.8	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
1.84	59.0	57.8	1.0	1.5	0.0	24.5	3.9	33.6	52.6	-1.4	54.0	High Channel / Y Axis
1.84	52.2	49.2	2.0	270	0.0	24.5	3.9	33.6	44.0	-10.0	54.0	High Channel / X Axis
1.84	52.7	49.9	1.0	180	0.0	24.5	3.9	33.6	44.7	-9.3	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED



COMPATIBLE
ELECTRONICS

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
2.71	48.0	40.9	2.0	180	0.0	28.2	5.6	33.9	40.8	-13.2	54.0	Low Channel / Y Axis
2.71	47.9	43.1	3.0	90	0.0	28.2	5.6	33.9	43.0	-11.0	54.0	Low Channel / X Axis
2.71	49.7	45.2	1.0	180	0.0	28.2	5.6	33.9	45.1	-8.9	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
2.71	50.0	48.5	2.5	90	0.0	28.2	5.6	33.9	48.4	-5.6	54.0	Low Channel / Y Axis
2.71	48.2	42.4	3.0	90	0.0	28.2	5.6	33.9	42.3	-11.7	54.0	Low Channel / X Axis
2.71	48.9	42.5	2.0	90	0.0	28.2	5.6	33.9	42.4	-11.6	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
2.74	45.8	40.5	2.0	0	0.0	28.2	5.6	33.9	40.4	-13.6	54.0	Mid Channel / Y Axis
2.74	50.0	45.9	1.0	180	0.0	28.2	5.6	33.9	45.8	-8.2	54.0	Mid Channel / X Axis
2.74	47.6	44.3	1.5	180	0.0	28.2	5.6	33.9	44.2	-9.8	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
2.74	50.1	46.3	1.0	90	0.0	28.2	5.6	33.9	46.2	-7.8	54.0	Mid Channel / Y Axis
2.74	49.5	45.1	1.5	180	0.0	28.2	5.6	33.9	45.0	-9.0	54.0	Mid Channel / X Axis
2.74	49.0	45.3	1.5	180	0.0	28.2	5.6	33.9	45.2	-8.8	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
2.76	47.8	42.7	2.0	180	0.0	29.7	6.4	33.6	45.2	-8.8	54.0	High Channel / Y Axis
2.76	48.4	43.3	2.0	180	0.0	29.7	6.4	33.6	45.8	-8.2	54.0	High Channel / X Axis
2.76	45.7	38.1	1.5	90	0.0	29.7	6.4	33.6	40.6	-13.4	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
2.76	48.7	44.0	2.0	90	0.0	29.7	6.4	33.6	46.5	-7.5	54.0	High Channel / Y Axis
2.76	49.0	45.1	2.0	90	0.0	29.7	6.4	33.6	47.6	-6.4	54.0	High Channel / X Axis
2.76	49.0	44.2	1.0	0	0.0	29.7	6.4	33.6	46.7	-7.3	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
3.61	47.8	43.6	2.0	0	0.0	29.6	7.0	33.5	46.7	-7.3	54.0	Low Channel / Y Axis
3.61	45.7	39.4	1.5	180	0.0	29.6	7.0	33.5	42.5	-11.5	54.0	Low Channel / X Axis
3.61	44.1	34.0	1.5	90	0.0	29.6	7.0	33.5	37.1	-16.9	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
3.61	47.2	42.7	2.0	0	0.0	29.6	7.0	33.5	45.8	-8.2	54.0	Low Channel / Y Axis
3.61	45.4	38.8	2.0	90	0.0	29.6	7.0	33.5	41.9	-12.1	54.0	Low Channel / X Axis
3.61	45.2	34.8	3.0	180	0.0	29.6	7.0	33.5	37.9	-16.1	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
3.65	48.1	43.2	1.0	180	0.0	29.6	7.0	33.5	46.3	-7.7	54.0	Mid Channel / Y Axis
3.65	47.9	43.6	1.0	180	0.0	29.6	7.0	33.5	46.7	-7.3	54.0	Mid Channel / X Axis
3.65	48.2	44.1	1.5	90	0.0	29.6	7.0	33.5	47.2	-6.8	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
3.65	46.9	41.7	1.0	90	0.0	29.6	7.0	33.5	44.8	-9.2	54.0	Mid Channel / Y Axis
3.65	47.9	45.3	2.0	270	0.0	29.6	7.0	33.5	48.4	-5.6	54.0	Mid Channel / X Axis
3.65	48.5	44.8	1.0	180	0.0	29.6	7.0	33.5	47.9	-6.1	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
3.69	46.8	42.1	2.0	90	0.0	29.6	7.0	33.5	45.2	-8.8	54.0	High Channel / Y Axis
3.69	44.3	36.6	2.0	180	0.0	29.6	7.0	33.5	39.7	-14.3	54.0	High Channel / X Axis
3.69	46.1	40.5	2.0	180	0.0	29.6	7.0	33.5	43.6	-10.4	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
3.69	47.5	43.6	2.0	0	0.0	29.6	7.0	33.5	46.7	-7.3	54.0	High Channel / Y Axis
3.69	46.9	41.0	2.0	0	0.0	29.6	7.0	33.5	44.1	-9.9	54.0	High Channel / X Axis
3.69	46.6	41.0	1.5	0	0.0	29.6	7.0	33.5	44.1	-9.9	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
4.52	47.4	42.6	3.0	90	0.0	30.9	8.0	32.9	48.6	-5.4	54.0	Low Channel / Y Axis
4.52	46.3	34.6	1.0	180	0.0	30.9	8.0	32.9	40.6	-13.4	54.0	Low Channel / X Axis
4.52	46.6	39.6	1.0	180	0.0	30.9	8.0	32.9	45.6	-8.4	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
4.52	48.8	44.7	1.0	90	0.0	30.9	8.0	32.9	50.7	-3.3	54.0	Low Channel / Y Axis
4.52	47.2	39.8	3.0	180	0.0	30.9	8.0	32.9	45.8	-8.2	54.0	Low Channel / X Axis
4.52	49.0	44.3	1.5	180	0.0	30.9	8.0	32.9	50.3	-3.7	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
4.56	45.7	40.1	1.0	180	0.0	30.9	8.0	32.9	46.1	-7.9	54.0	Mid Channel / Y Axis
4.56	46.0	40.3	1.0	180	0.0	30.9	8.0	32.9	46.3	-7.7	54.0	Mid Channel / X Axis
4.56	46.2	39.2	1.0	180	0.0	30.9	8.0	32.9	45.2	-8.8	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
4.56	45.7	40.4	1.0	180	0.0	30.9	8.0	32.9	46.4	-7.6	54.0	Mid Channel / Y Axis
4.56	46.6	40.1	1.0	180	0.0	30.9	8.0	32.9	46.1	-7.9	54.0	Mid Channel / X Axis
4.56	46.3	40.0	2.5	180	0.0	30.9	8.0	32.9	46.0	-8.0	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
4.60	48.4	44.0	3.0	90	0.0	30.9	8.0	32.9	50.0	-4.0	54.0	High Channel / Y Axis
4.60	45.3	38.6	2.0	0	0.0	30.9	8.0	32.9	44.6	-9.4	54.0	High Channel / X Axis
4.60	45.0	38.0	2.0	0	0.0	30.9	8.0	32.9	44.0	-10.0	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
4.60	48.4	43.5	2.0	180	0.0	30.9	8.0	32.9	49.5	-4.5	54.0	High Channel / Y Axis
4.60	44.4	36.0	2.0	180	0.0	30.9	8.0	32.9	42.0	-12.0	54.0	High Channel / X Axis
4.60	47.9	41.9	2.0	0	0.0	30.9	8.0	32.9	47.9	-6.1	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYED. ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED

RADIATED EMISSIONS (FCC SUBPART C, SECTION 15.249)

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
5.42	40.8	34.1	2.0	0	0.0	32.4	9.2	32.7	43.0	-11.0	54.0	Low Channel / Y Axis
5.42	41.1	39.3	2.0	90	0.0	32.4	9.2	32.7	48.2	-5.8	54.0	Low Channel / X Axis
5.42	42.0	33.1	3.0	90	0.0	32.4	9.2	32.7	42.0	-12.0	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
5.42	38.7	30.6	1.5	90	0.0	32.4	9.2	32.7	39.5	-14.5	54.0	Low Channel / Y Axis
5.42	41.5	30.4	2.0	90	0.0	32.4	9.2	32.7	39.3	-14.7	54.0	Low Channel / X Axis
5.42	39.2	30.5	1.0	270	0.0	32.4	9.2	32.7	39.4	-14.6	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
5.47	43.2	35.0	1.0	90	0.0	32.4	9.2	32.7	43.9	-10.1	54.0	Mid Channel / Y Axis
5.47	40.9	30.5	1.0	180	0.0	32.4	9.2	32.7	39.4	-14.6	54.0	Mid Channel / X Axis
5.47	39.9	30.5	2.5	90	0.0	32.4	9.2	32.7	39.4	-14.6	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
5.47	41.8	30.1	1.0	90	0.0	32.4	9.2	32.7	39.0	-15.0	54.0	Mid Channel / Y Axis
5.47	38.1	30.6	1.5	180	0.0	32.4	9.2	32.7	39.5	-14.5	54.0	Mid Channel / X Axis
5.47	44.3	36.3	2.5	270	0.0	32.4	9.2	32.7	45.2	-8.8	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
5.52	40.7	31.2	1.5	0	0.0	32.4	9.2	32.7	40.1	-13.9	54.0	High Channel / Y Axis
5.52	40.1	30.4	2.0	90	0.0	32.4	9.2	32.7	39.3	-14.7	54.0	High Channel / X Axis
5.52	39.5	30.7	2.0	90	0.0	32.4	9.2	32.7	39.6	-14.4	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
5.52	38.1	29.8	2.0	90	0.0	32.4	9.2	32.7	38.7	-15.3	54.0	High Channel / Y Axis
5.52	39.7	29.9	2.0	180	0.0	32.4	9.2	32.7	38.8	-15.2	54.0	High Channel / X Axis
5.52	39.3	30.6	2.0	90	0.0	32.4	9.2	32.7	39.5	-14.5	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED



COMPATIBLE
ELECTRONICS

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
6.32	43.4	33.2	1.0	0	0.0	34.3	9.8	32.5	44.8	-9.2	54.0	Low Channel / Y Axis
6.32	39.1	33.3	1.0	180	0.0	34.3	9.8	32.5	44.9	-9.1	54.0	Low Channel / X Axis
6.32	41.0	32.1	1.0	90	0.0	34.3	9.8	32.5	43.7	-10.3	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
6.32	42.5	34.4	1.5	90	42.3	34.3	9.8	32.5	46.0	-8.0	54.0	Low Channel / Y Axis
6.32	43.1	33.2	2.0	90	0.0	34.3	9.8	32.5	44.8	-9.2	54.0	Low Channel / X Axis
6.32	41.1	33.4	1.0	270	0.0	34.3	9.8	32.5	45.0	-9.0	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
6.39	41.6	33.6	1.0	90	0.0	34.3	9.8	32.5	45.2	-8.8	54.0	Mid Channel / Y Axis
6.39	40.8	32.4	1.0	180	0.0	34.3	9.8	32.5	44.0	-10.0	54.0	Mid Channel / X Axis
6.39	41.6	32.7	1.0	90	0.0	34.3	9.8	32.5	44.3	-9.7	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
6.39	44.3	32.7	2.0	0	0.0	34.3	9.8	32.5	44.3	-9.7	54.0	Mid Channel / Y Axis
6.39	42.7	32.9	1.0	180	0.0	34.3	9.8	32.5	44.5	-9.5	54.0	Mid Channel / X Axis
6.39	43.8	36.5	1.5	270	0.0	34.3	9.8	32.5	48.1	-5.9	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
6.45	42.9	31.8	3.0	0	0.0	34.3	9.8	32.5	43.4	-10.6	54.0	High Channel / Y Axis
6.45	41.5	32.3	3.0	90	0.0	34.3	9.8	32.5	43.9	-10.1	54.0	High Channel / X Axis
6.45	40.7	32.4	2.0	90	0.0	34.3	9.8	32.5	44.0	-10.0	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
6.45	40.8	31.9	1.0	90	0.0	34.3	9.8	32.5	43.5	-10.5	54.0	High Channel / Y Axis
6.45	42.5	32.0	1.5	90	0.0	34.3	9.8	32.5	43.6	-10.4	54.0	High Channel / X Axis
6.45	40.4	32.7	3.0	0	0.0	34.3	9.8	32.5	44.3	-9.7	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHZ, QUASI-PEAK MEASUREMENT IS EMPLOYEED, ABOVE 1 GHZ, AVERAGE MEASUREMENT IS EMPLOYED

RADIATED EMISSIONS



COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / Y Axis
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / X Axis
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / Y Axis
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / X Axis
7.23	".."	".."	".."	".."	0.0	36.1	10.3	33.0	".."	".."	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / Y Axis
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / X Axis
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / Y Axis
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / X Axis
7.30	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / Y Axis
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / X Axis
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / Y Axis
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / X Axis
7.37	".."	".."	".."	".."	0.0	36.8	10.8	33.7	".."	".."	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

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".." NO HARMONIC FOUND FOR THIS PARTICULAR READING

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / Y Axis
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / X Axis
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / Y Axis
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / X Axis
8.13	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / Y Axis
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / X Axis
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / Y Axis
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / X Axis
8.21	"--"	"--"	"--"	"--"	0.0	37.4	11.2	32.9	"--"	"--"	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / Y Axis
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / X Axis
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / Y Axis
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / X Axis
8.29	"--"	"--"	"--"	"--"	0.0	37.1	11.5	32.7	"--"	"--"	54.0	High Channel / Z Axis

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** DELTA = SPEC LIMIT - CORRECTED READING

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"--" NO HARMONIC FOUND FOR THIS PARTICULAR READING

RADIATED EMISSIONS

COMPANY	PARAGON DYNAMICS, INC.	DATE	3/26/99
EUT	ParaComm 900 MHz RF Modem - Tx	ANTENNAS	HORN
MODEL	ParaComm 900	POLARIZATION	SEE BELOW
S/N	TX99047014	TEST DISTANCE	3 METERS
EUT MODE	LOW, MEDIUM, AND HIGH CHANNELS	LAB	D

Frequency GHz	Peak Reading (dBuV)	Average or Quasi-Peak (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
VERTICAL ANTENNA POLARIZATION												
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / Y Axis
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / X Axis
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / Z Axis
HORIZONTAL POLARIZATION												
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / Y Axis
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / X Axis
9.03	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Low Channel / Z Axis
VERTICAL ANTENNA POLARIZATION												
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / Y Axis
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / X Axis
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / Z Axis
HORIZONTAL POLARIZATION												
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / Y Axis
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / X Axis
9.12	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	Mid Channel / Z Axis
VERTICAL POLARIZATION												
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / Y Axis
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / X Axis
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / Z Axis
HORIZONTAL POLARIZATION												
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / Y Axis
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / X Axis
9.21	"--"	"--"	"--"	"--"	0.0	36.8	12.1	33.2	"--"	"--"	54.0	High Channel / Z Axis

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

*** BELOW 1 GHz, QUASI-PEAK MEASUREMENT IS EMPLOYEED, ABOVE 1 GHz, AVERAGE MEASUREMENT IS EMPLOYED

"--" NO HARMONIC FOUND FOR THIS PARTICULAR READING

Test location: Compatible Electronics
 Customer : PARAGON DYNAMICS, INC. Date : 3/26/1999
 Manufacturer : PARAGON DYNAMICS, INC. Time : 10.31
 EUT name : PARACOMM 900 MHz RF MODEM - T_k Model: PARACOMM 900
 Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
 Distance correction factor(20*log(test/spec)) : 0.00
 Test Mode :
 SPURIOUS EMISSIONS
 TEMPERATURE 61 DEGREES F., RELATIVE HUMIDITY 75%
 TESTED BY: Kyle Fujimoto
 KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	32.09	53.80	0.82	11.97	38.60	27.99	40.00	-12.01
2V	34.55	53.20	0.85	11.57	38.60	27.02	40.00	-12.98
3V	42.60	55.40	0.93	10.80	38.60	28.53	40.00	-11.47
4V	58.75	51.40	1.09	10.40	38.60	24.29	40.00	-15.71
5V	66.22	61.40	1.16	10.11	38.60	34.08	40.00	-5.92
6V	69.95	59.70	1.20	10.00	38.60	32.30	40.00	-7.70
7V	201.03	48.90	1.90	15.37	38.78	27.39	43.50	-16.11
8V	231.02	59.20	1.90	17.17	38.32	39.94	46.00	-6.06
9V	300.08	45.30	2.40	16.30	38.50	25.50	46.00	-20.50
10V	320.07	47.10	2.44	16.50	38.54	27.50	46.00	-18.50
11V	336.12	53.00	2.47	16.66	38.57	33.56	46.00	-12.44
12V	352.10	47.90	2.51	16.73	38.58	28.56	46.00	-17.44
13V	384.93	55.90	2.71	15.61	38.32	35.90	46.00	-10.10
14V	386.70	47.00	2.72	15.55	38.31	26.97	46.00	-19.03
15V	390.25	45.90	2.74	15.43	38.28	25.79	46.00	-20.21
16V	400.05	49.20	2.80	15.10	38.20	28.90	46.00	-17.10
17V	432.19	52.90	2.80	17.61	37.94	35.37	46.00	-10.63
18V	458.12	45.70	2.85	18.66	37.88	29.33	46.00	-16.67
19V	466.69	51.40	2.90	18.30	37.97	34.63	46.00	-11.37
20V	500.03	49.60	3.10	16.90	38.30	31.30	46.00	-14.70
21V	666.65	48.80	3.73	20.37	38.07	34.83	46.00	-11.17
22V	720.25	43.20	3.88	21.56	38.00	30.65	46.00	-15.35

Test location: Compatible Electronics
 Customer : PARAGON DYNAMICS, INC. Date : 3/26/1999
 Manufacturer : PARAGON DYNAMICS, INC. Time : 11.52
 EUT name : PARACOMM 900 MHz RF MODEM - Tx Model: PARACOMM 900
 Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
 Distance correction factor(20*log(test/spec)) : 0.00
 Test Mode :
 SPURIOUS EMISSIONS
 TEMPERATURE 61 DEGREES F., RELATIVE HUMIDITY 75%
 TESTED BY: *Kyle Fujimoto*
 KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	53.40	55.30	1.03	10.83	38.60	28.56	40.00	-11.44
2H	170.50	55.10	1.76	14.47	38.42	32.91	43.50	-10.59
3H	201.19	44.40	1.90	15.39	38.78	22.90	43.50	-20.60
4H	231.00	51.30	1.90	17.17	38.32	32.04	46.00	-13.96
5H	325.11	44.80	2.45	16.55	38.55	25.25	46.00	-20.75
6H	366.73	51.00	2.60	16.23	38.47	31.37	46.00	-14.63
7H	639.51	52.30	3.66	20.45	38.08	38.32	46.00	-7.68



PARAGON DYNAMICS, INC.

PARACOMM 900 MHz RF MODEM - Tx

MODEL: PARACOMM 900

FCC C - BLACK LEAD

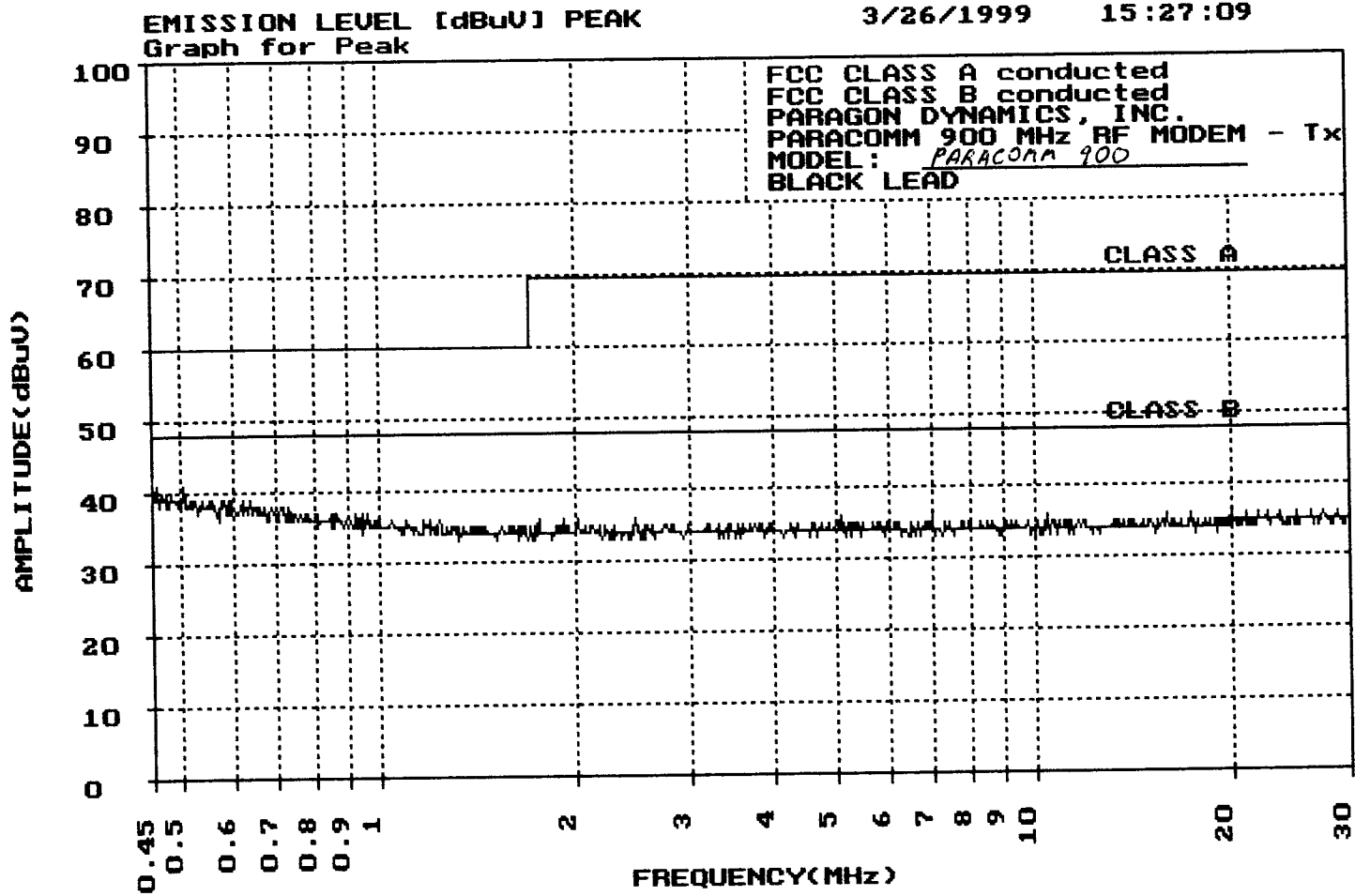
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

20 highest peaks above -50.00 dB of CLASS B limit line

Peak criteria : 0.30 dB, Curve : Peak

Peak# Freq(Mhz) Amp(dBuV) Limit(dB) Delta(dB)

1	0.452	42.59	48.00	-5.41
2	0.504	41.09	48.00	-6.91
3	0.460	41.09	48.00	-6.91
4	0.482	40.69	48.00	-7.31
5	0.474	40.49	48.00	-7.51
6	0.456	40.39	48.00	-7.61
7	0.466	40.09	48.00	-7.91
8	0.579	39.99	48.00	-8.01
9	0.589	39.89	48.00	-8.11
10	0.524	39.89	48.00	-8.11
11	0.515	39.89	48.00	-8.11
12	0.537	39.69	48.00	-8.31
13	0.489	39.69	48.00	-8.31
14	0.485	39.69	48.00	-8.31
15	0.496	39.59	48.00	-8.41
16	0.594	39.39	48.00	-8.61
17	0.574	39.39	48.00	-8.61
18	0.558	39.39	48.00	-8.61
19	0.635	39.19	48.00	-8.81
20	0.620	39.09	48.00	-8.91



COMPATIBLE
ELECTRONICS



PARAGON DYNAMICS, INC.

PARACOMM 900 MHz RF MODEM - Tx

MODEL: PARACOMM 900

FCC C - WHITE LEAD

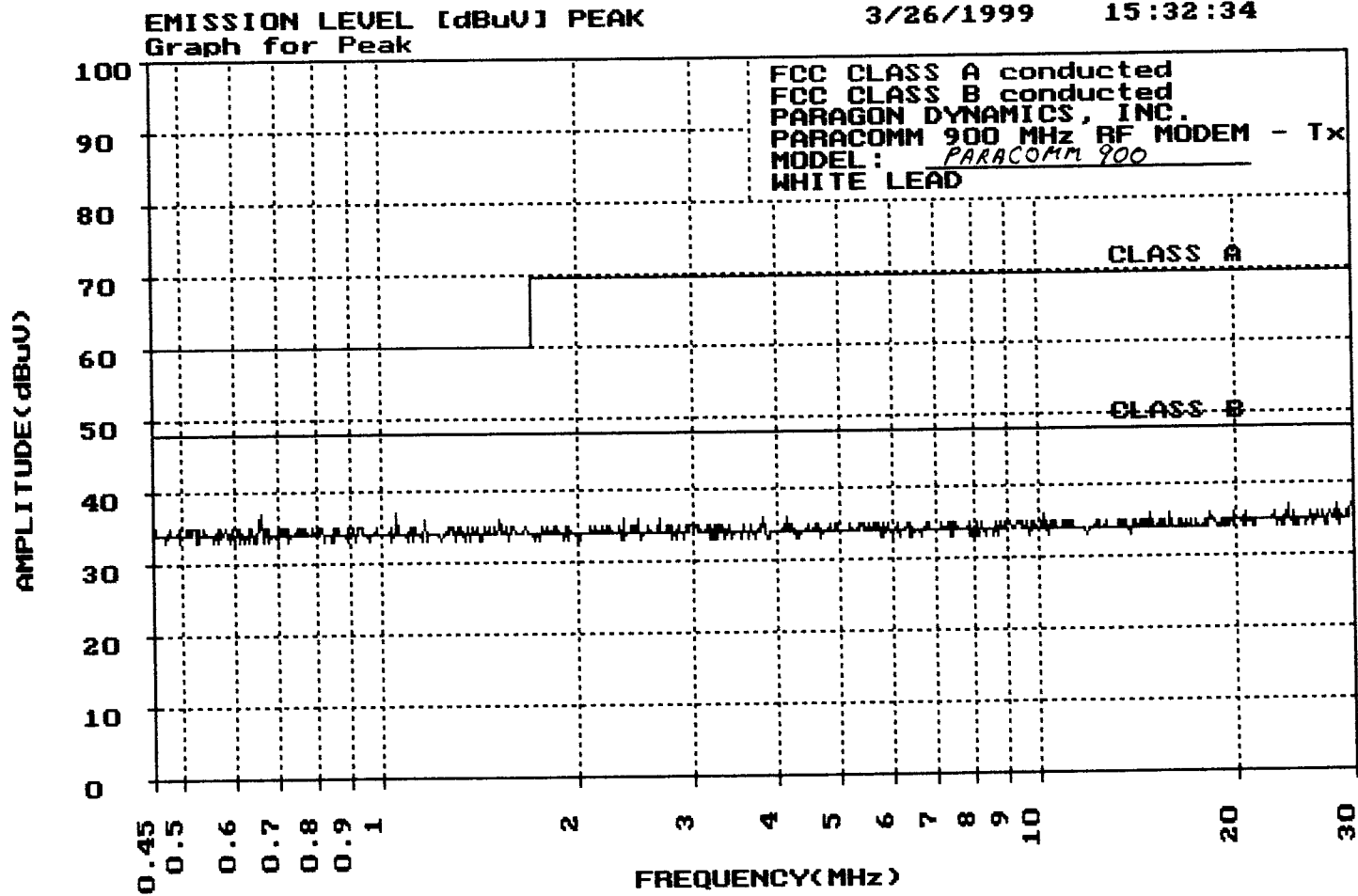
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

20 highest peaks above -50.00 dB of CLASS B limit line

Peak criteria : 0.30 dB, Curve : Peak

Peak# Freq(MHz) Amp(dBuV) Limit(dB) Delta(dB)

1	28.308	37.42	48.00	-10.58
2	1.056	37.21	48.00	-10.79
3	0.657	37.10	48.00	-10.90
4	23.931	37.09	48.00	-10.91
5	23.726	36.59	48.00	-11.41
6	19.798	36.59	48.00	-11.41
7	28.066	36.50	48.00	-11.50
8	27.583	36.47	48.00	-11.53
9	3.819	36.44	48.00	-11.56
10	20.576	36.42	48.00	-11.58
11	26.472	36.40	48.00	-11.60
12	28.671	36.34	48.00	-11.66
13	22.754	36.29	48.00	-11.71
14	10.199	36.24	48.00	-11.76
15	1.168	36.21	48.00	-11.79
16	29.396	36.18	48.00	-11.82
17	4.136	36.14	48.00	-11.86
18	24.441	36.10	48.00	-11.90
19	25.916	36.07	48.00	-11.93
20	15.791	36.06	48.00	-11.94



COMPATIBLE
ELECTRONICS

BAND EDGE AT 902 MHz
REF 110.0 dB μ V ATTEN 20 dB

MKR 902.000 MHz
47.70 dB μ V

hp

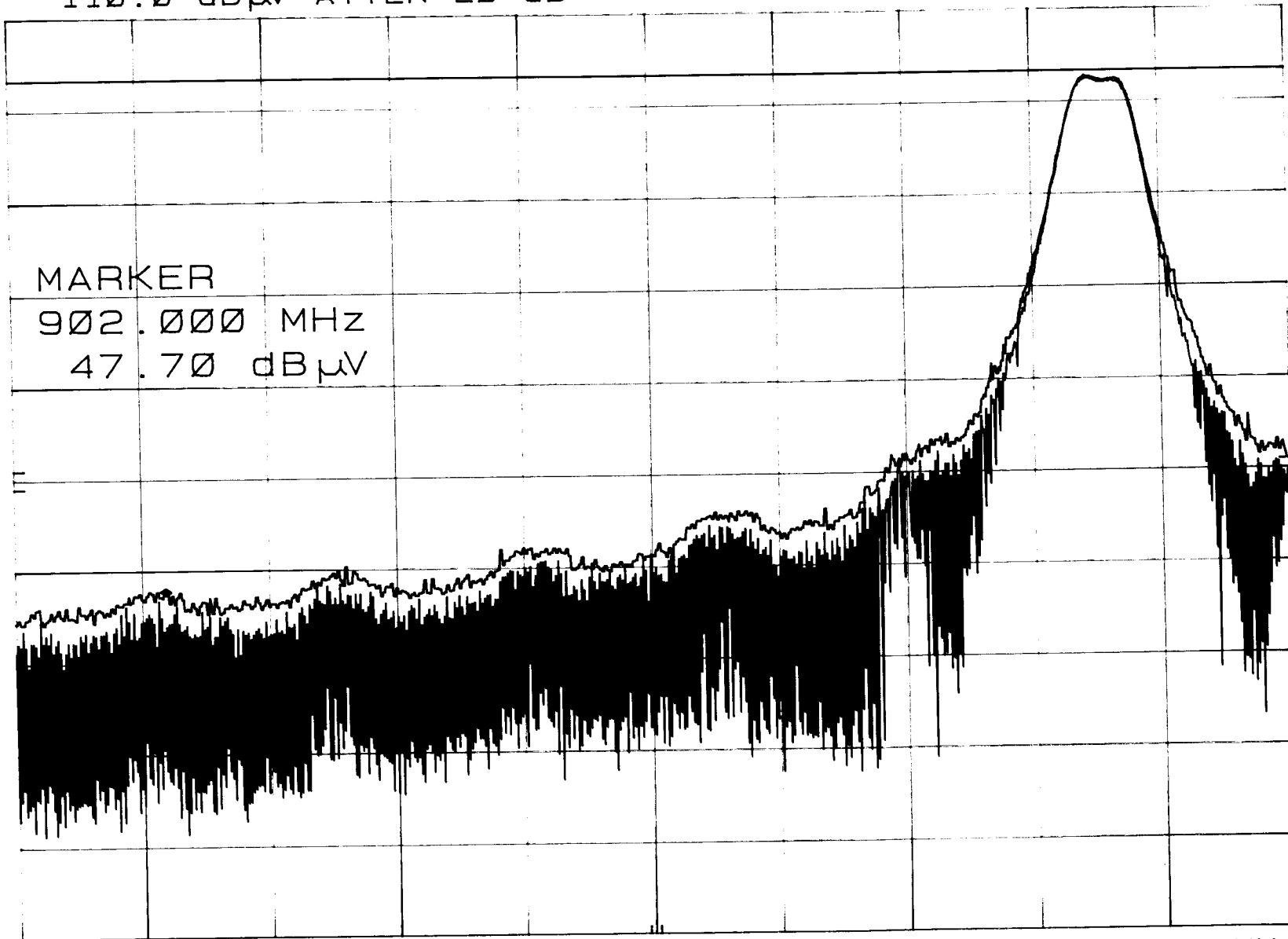
10 dB/

MARKER

DL
103.3
dB μ V

902.000 MHz
47.70 dB μ V

CORR'D



START 901.76 MHz
RES BW 1 MHz

VBW 1 MHz

STOP 903.76 MHz
SWP 20.0 msec

BAND EDGE AT 928 MHZ
REF 110.0 dB μ V ATTEN 20 dB

MKR 928.001 MHz
42.80 dB μ V

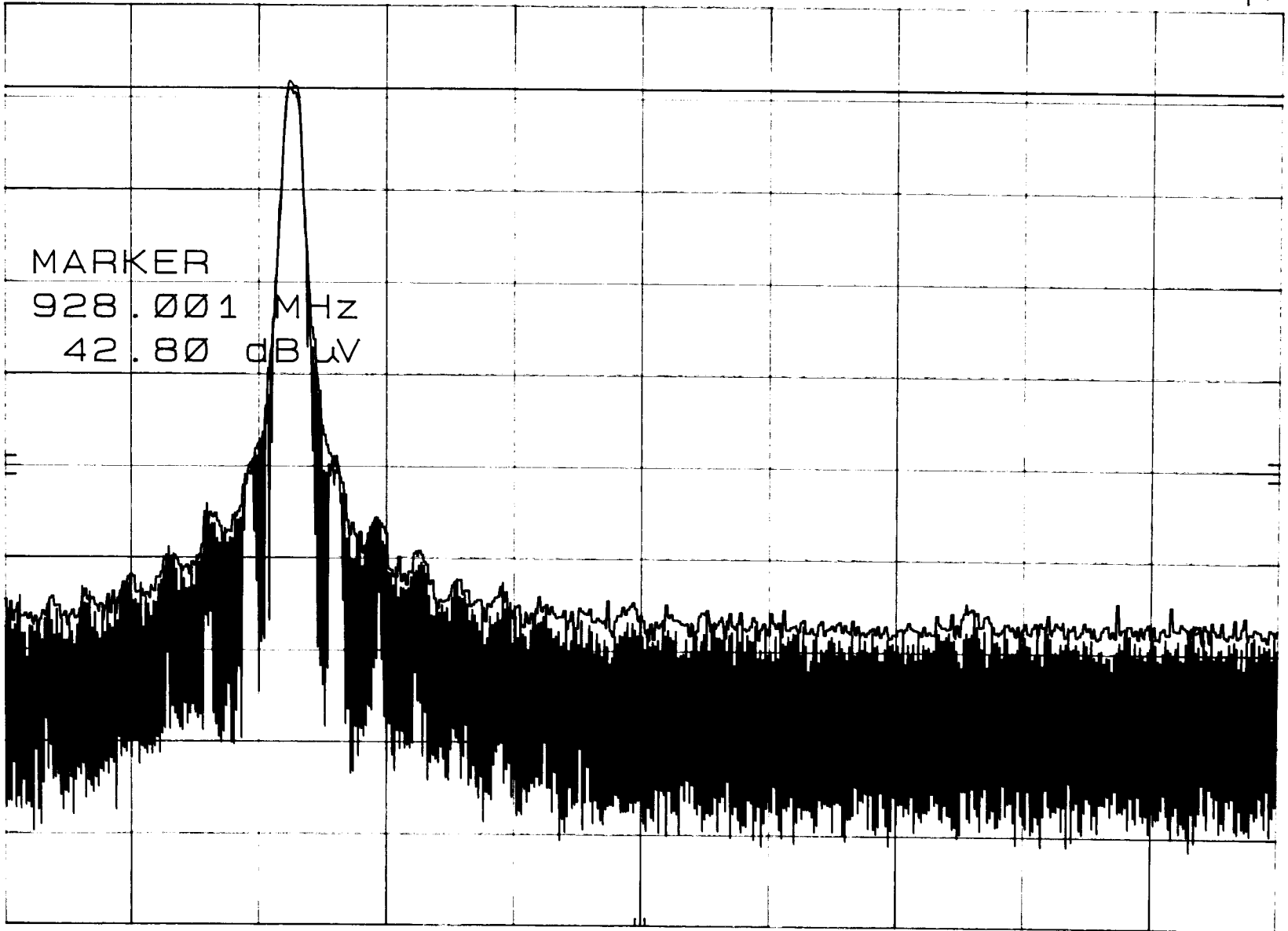
hp

10 dB/

DL
101.0
dB μ V

MARKER
928.001 MHz
42.80 dB μ V

CORR'D



CENTER 923.98 MHz
RES BW 1 MHz

VBW 1 MHz

SPAN 9.24 MHz
SWP 20.0 msec