



**FCC PART 15, SUBPART C
TEST REPORT**

for

DIGITAL TELEMETRY SYSTEM - Tx

Model: BT9000

Prepared for

BINSFELD ENGINEERING, INC.
4571 WEST MacFARLANE
MAPLE CITY, MICHIGAN 49664

Prepared by: Kyle Fujimoto

KYLE FUJIMOTO

Approved by: Scott McCutchan

SCOTT McCUTCHAN

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
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DATE: MARCH 27, 2000

	REPORT BODY	APPENDICES				TOTAL
		A	B	C	D	
PAGES	16	2	2	9	15	44

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1	Conducted Emissions Test Setup
2	Plot Map And Layout of Test Site



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: Digital Telemetry System - Tx
Model: BT9000
S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: Binsfeld Engineering, Inc.
4571 West MacFarlane
Maple City, Michigan 49664

Test Date: March 25, 2000

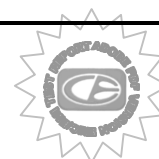
Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart C, Sections 15.205, 15.207, and 15.249

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	The EUT runs off a nine volt battery only and cannot be plugged into the AC public mains. Therefore, this test was not performed.
2	Radiated RF Emissions, 10 kHz - 9300 MHz	Complies with the limits of CFR Title 47, Part 15, 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 Digital Telemetry System - Tx Model: BT9000. 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 CFR Title 47, Part 15, 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

Binsfeld Engineering, Inc.

Stephen Tarsa Vice President - Operations

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 22, 2000.

2.5 Disposition of the Test Sample

The test sample was returned to Binsfeld Engineering, Inc. on March 27, 2000.

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
CFR Title 47, Subpart C.	FCC Rules – Radio frequency 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.



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 Digital Telemetry System - Tx Model: BT9000 (EUT) was connected to the BS900 Bridge Simulator via its +EXC, -EXC, +SEN, and -SEN ports. The EUT was also connected to a nine volt battery via its +9V and GND ports. The EUT was tested in three orthogonal axis and was transmitting data on a continuous basis. The antenna connector on the PCB has a reverse polarity SMA connector.

The final radiated data was taken in the mode above. Please see Appendix D for the data sheets.



4.1.1 Cable Construction and Termination

Cables 1-2 These are 4 inch unshielded cables connecting the EUT to the batter clip. They are hard wired at each end.

Cables 3-6 These are 1 meter unshielded cables connecting the EUT to the bridge simulator. They are hard wired at each end.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
DIGITAL TELEMETRY SYSTEM - Tx (EUT)	BINSFELD ENGINEERING, INC.	BT9000	N/A	HWN-BT9000
BRIDGE SIMULATOR	BINSFELD ENGINEERING, INC.	BS900	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	3638A08768	Dec. 14, 1999	Dec. 14, 2000
Preamplifier	Com Power	PA-102	1017	Jan. 11, 2000	Jan. 11, 2001
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	Nov. 10, 1999	Nov. 10, 2000
RF Attenuator	Sertek	412-10	N/A	Nov. 22, 1999	Nov. 22, 2000
LISN	Com Power	LI-215	12075	Nov. 13, 1999	Nov. 13, 2000
LISN	Com Power	LI-215	12078	Nov. 13, 1999	Nov. 13, 2000
Biconical Antenna	Com Power	AB-100	1548	Oct. 14, 1999	Oct. 14, 2000
Log Periodic Antenna	Com Power	AL-100	16039	Oct. 14, 1999	Oct. 14, 2000
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	D5251A 888	US74458128	N/A	N/A
Microwave Preamplifier	Com-Power	PA-122	25195	Jan. 13, 2000	Jan. 13, 2001
Horn Antenna	Antenna Research	DRG-118/A	1053	Dec. 8, 1995	N/A
Loop Antenna	Com-Power	AL-130	25309	April 13, 1999	April 13, 2000



6. TEST SITE DESCRIPTION

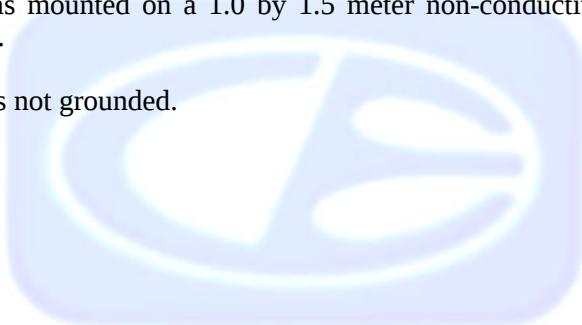
6.1 Test Facility Description

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 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 Com-Power Microwave Preamplifier Model: PA-122 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.

For the peak readings below 1000 MHz that were within 3 dB of the spec limit or higher, the quasi-peak adapter was used.

For the peak readings above 1000 MHz that were within 3dB of the spec limit or higher, the readings were averaged manually by narrowing the video filter down to 10 Hz and slowing the sweep time to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 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.



Radiated Emissions (Spurious and Harmonics) Test (con't)

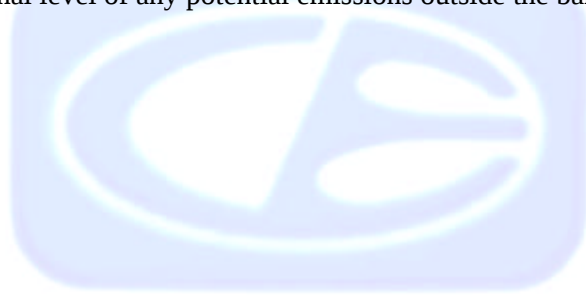
The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from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



7.2 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. Please see Appendix D for the spectral plots and data sheets.

The spectral plots were taken at a distance of 3 meters, using the PA-102 Preamplifier to boost the signal level of any potential emissions outside the band edges.



8. CONCLUSIONS

The Digital Telemetry System - Tx Model: BT9000 meets all of the specification limits defined in CFR Title 47, Part 15, Subpart C, sections 15.205, 15.207, and 15.249.





APPENDIX A

MODIFICATIONS TO THE EUT

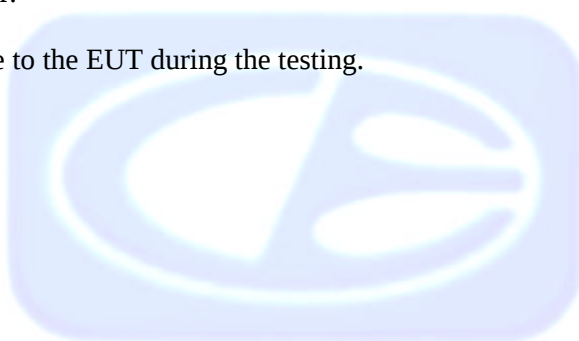


MODIFICATIONS TO THE EUT

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.

No modifications were made to the EUT during the testing.





APPENDIX B

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

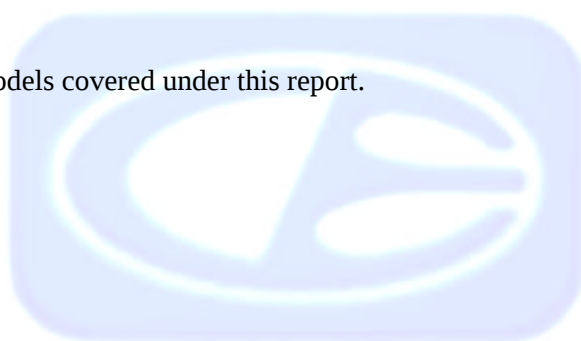


ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Digital Telemetry System - Tx
Model: BT9000
S/N: N/A

There were no additional models covered under this report.

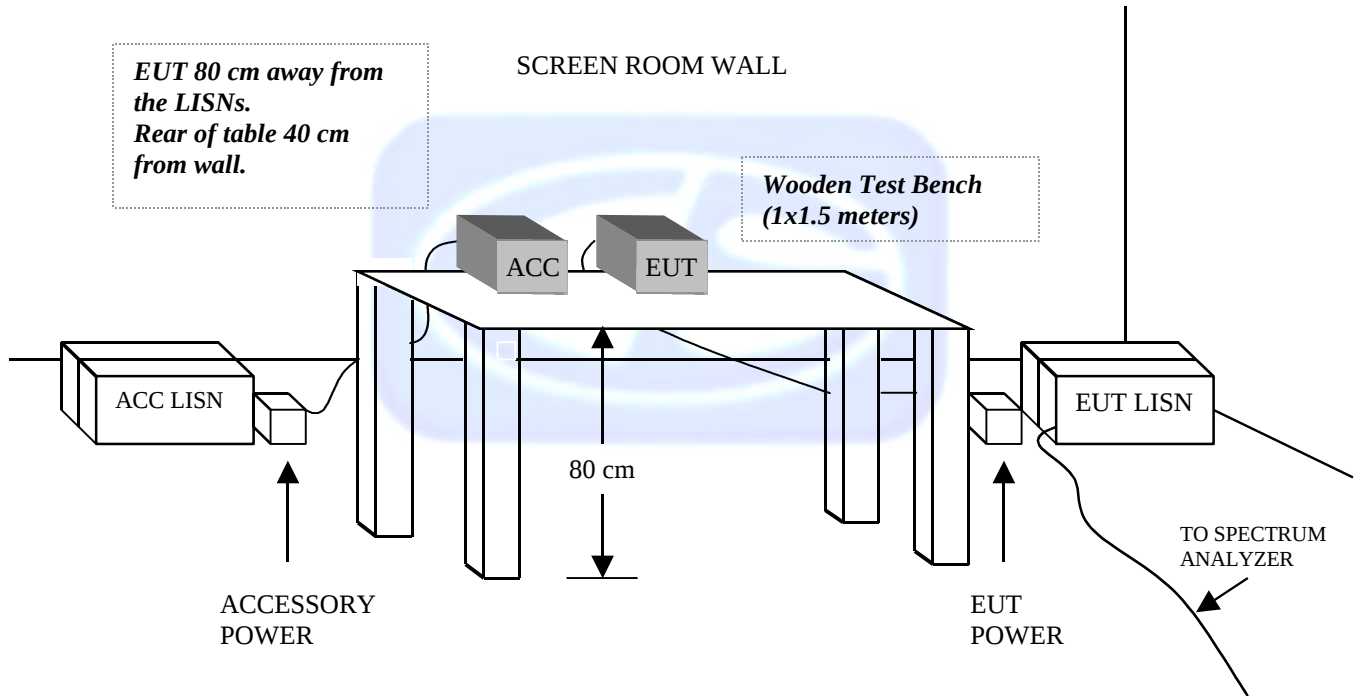




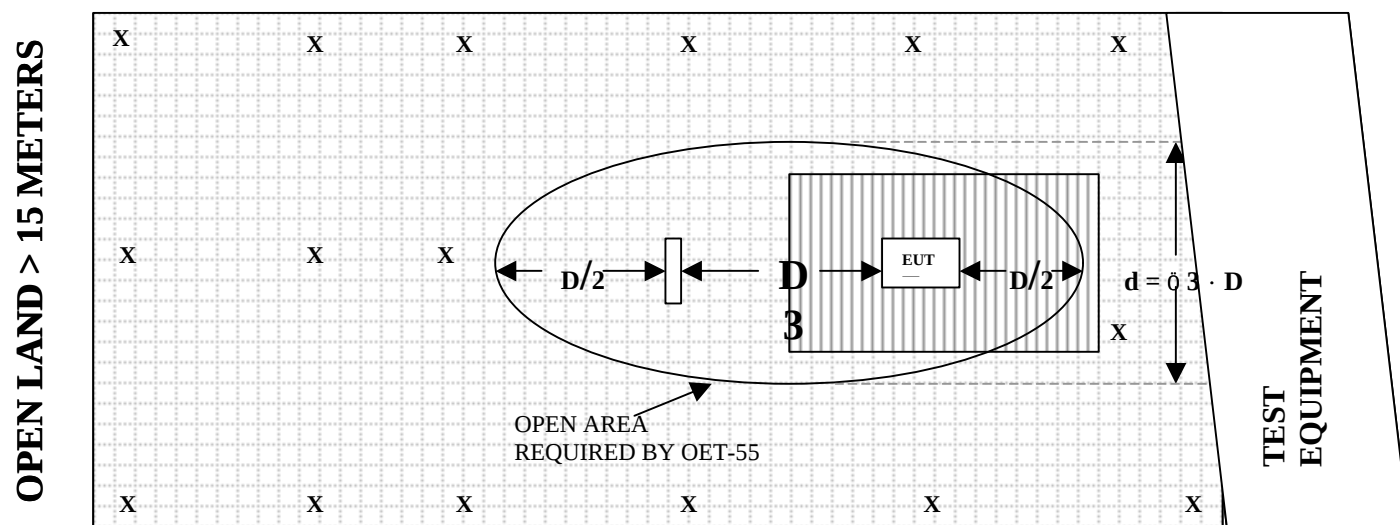
APPENDIX C

DIAGRAMS, CHARTS AND PHOTOS



FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS





FRONT VIEW

BINSFELD ENGINEERING, INC.
DIGITAL TELEMETRY SYSTEM - Tx
MODEL: BT9000
FCC SUBPART C - RADIATED EMISSIONS – 3-22-00

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



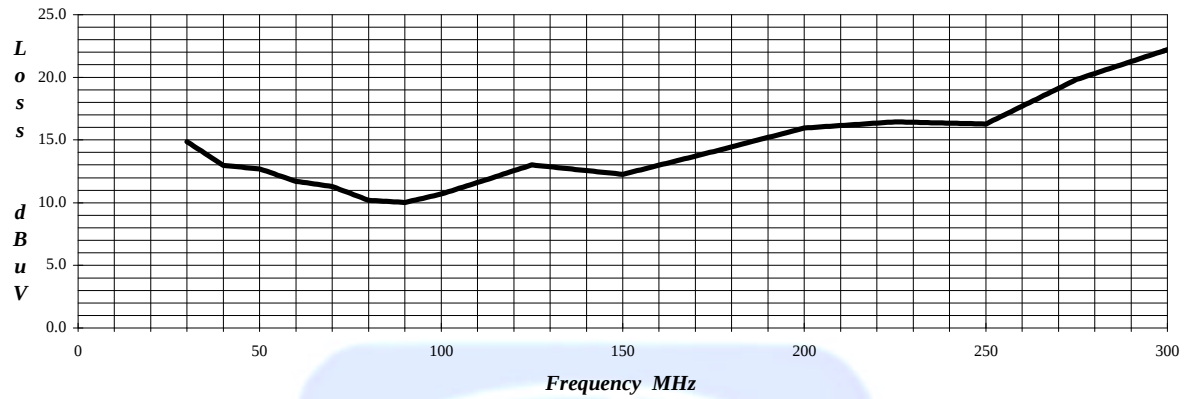
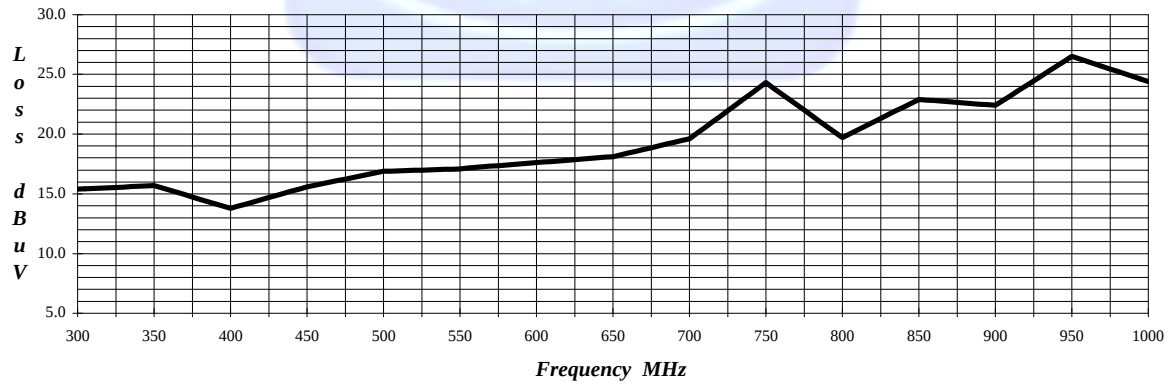
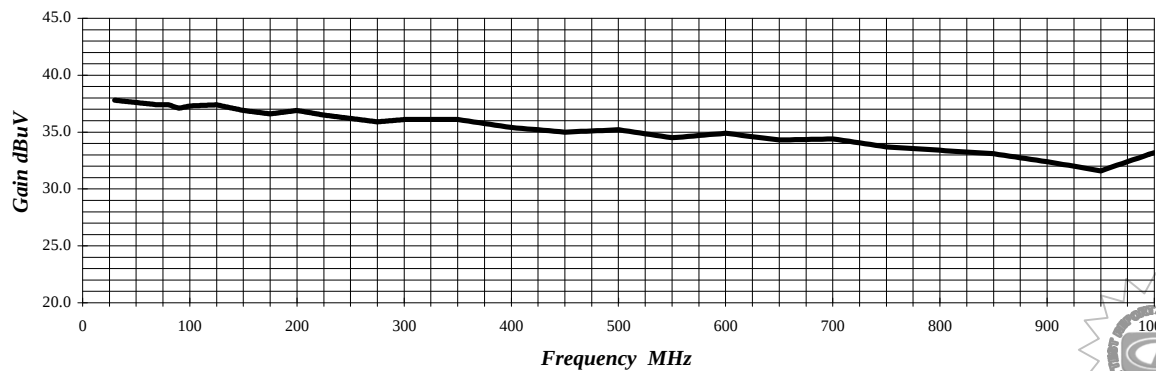


REAR VIEW

BINSFELD ENGINEERING, INC.
DIGITAL TELEMETRY SYSTEM - Tx
MODEL: BT9000
FCC SUBPART C - RADIATED EMISSIONS – 3-22-00

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



LAB "D" BICONICAL ANTENNA AB-100 S/N 01548 Cal: 10-14-99**LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 16039 Cal: 10-14-99****PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS PA-102 S/N: 1017 Lab "D"
Effective 1-16-99**

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: JANUARY 13, 2000

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	34.4	9.0	30.7
1.1	34.1	9.5	31.5
1.2	34.2	10.0	31.0
1.3	34.1	10.5	31.4
1.4	33.9	11.0	30.7
1.5	33.8	11.5	29.5
1.6	33.0	12.0	27.8
1.7	33.3	12.5	31.4
1.8	33.3	13.0	31.0
1.9	31.9	13.5	31.0
2.0	32.7	14.0	31.5
2.5	31.8	14.5	30.2
3.0	31.7	15.0	29.2
3.5	31.9	15.5	30.1
4.0	31.0	16.0	29.0
4.5	31.4	16.5	27.8
5.0	31.1	17.0	30.8
5.5	31.0	17.5	31.5
6.0	32.0	18.0	30.8
6.5	31.6		
7.0	32.3		
7.5	32.9		
8.0	32.1		
8.5	31.6		



E-FIELD ANTENNA FACTOR CALIBRATION

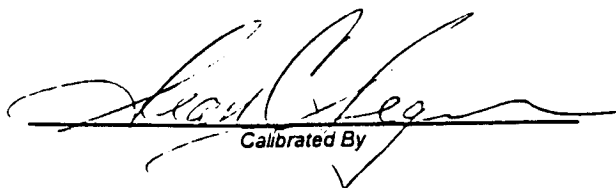
$$E(\text{dB V/m}) = V_o(\text{dB V}) + AFE(\text{dB/m})$$

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

(949) 587-9800

Antenna Calibration

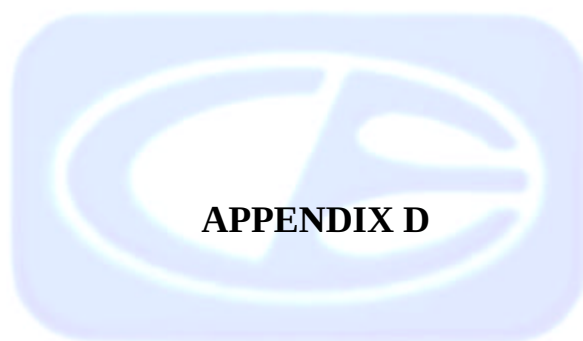
Antenna Type:		Loop Antenna	
Model:		AL-130	
Serial Number:		25309	
Calibration Date:		4/13/99	
Frequency MHz	Magnetic (dB/m)	Electric dB/m	
0.01	-40.6	10.9	
0.02	-41.5	10.0	
0.03	-39.9	11.6	
0.04	-40.2	11.3	
0.05	-41.5	10.0	
0.06	-41.1	10.4	
0.07	-41.3	10.2	
0.08	-41.6	9.9	
0.09	-41.7	9.8	
0.1	-41.7	9.8	
0.2	-44.0	7.5	
0.3	-41.6	9.9	
0.4	-41.6	9.9	
0.5	-41.7	9.8	
0.6	-41.5	10.0	
0.7	-41.4	10.1	
0.8	-41.5	10.0	
0.9	-41.6	9.9	
1	-41.2	10.3	
2	-40.5	11.0	
3	-40.8	10.7	
4	-41.0	10.5	
5	-40.5	11.0	
6	-40.5	11.0	
7	-40.7	10.8	
8	-40.8	10.7	
9	-40.1	11.4	
10	-40.4	11.1	
12	-41.0	10.5	
14	-42.1	9.4	
15	-42.3	9.2	
16	-42.7	8.8	
18	-41.0	10.5	
20	-41.1	10.4	
25	-43.4	8.1	
30	-45.3	6.2	

Trans. Antenna Height

2 meter

Receiving Antenna Height

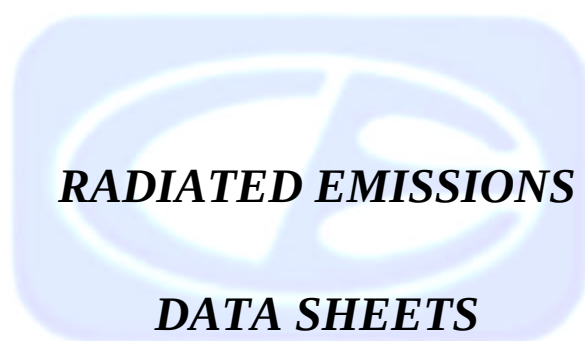
2 meter



APPENDIX D

DATA SHEETS





RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
903.3000	54.4	54.3 Q	H	1.0	90	X	LOW	22.7	4.6	0.0	81.6	-12.4	94.0	
903.3000	62.5	62.4 Q	H	1.0	90	Y	LOW	22.7	4.6	0.0	89.7	-4.3	94.0	
903.3000	62.0	61.9 Q	H	2.5	90	Z	LOW	22.7	4.6	0.0	89.2	-4.8	94.0	
903.3000	61.7	61.6 Q	V	1.0	90	X	LOW	22.7	4.6	0.0	88.9	-5.1	94.0	
903.3000	63.9	63.8 Q	V	1.5	90	Y	LOW	22.7	4.6	0.0	91.1	-2.9	94.0	
903.3000	54.7	54.6 Q	V	1.5	90	Z	LOW	22.7	4.6	0.0	81.9	-12.1	94.0	
912.4000	55.0	54.9 Q	H	1.5	90	X	MID	23.4	4.6	0.0	82.9	-11.1	94.0	
912.4000	59.9	59.8 Q	H	1.5	90	Y	MID	23.4	4.6	0.0	87.8	-6.2	94.0	
912.4000	61.1	61.0 Q	H	1.5	90	Z	MID	23.4	4.6	0.0	89.0	-5.0	94.0	
912.4000	59.2	59.1 Q	V	1.0	90	X	MID	23.4	4.6	0.0	87.1	-6.9	94.0	
912.4000	61.4	61.3 Q	V	2.0	90	Y	MID	23.4	4.6	0.0	89.3	-4.7	94.0	
912.4000	50.6	50.5 Q	V	1.0	90	Z	MID	23.4	4.6	0.0	78.5	-15.5	94.0	
921.3000	57.1	57.0 Q	H	1.0	90	X	HI	24.2	4.6	0.0	85.8	-8.2	94.0	
921.3000	60.1	60.0 Q	H	1.0	90	Y	HI	24.2	4.6	0.0	88.8	-5.2	94.0	
921.3000	59.8	59.7 Q	H	1.0	0	Z	HI	24.2	4.6	0.0	88.5	-5.5	94.0	
921.3000	58.1	58.0 Q	V	1.0	0	X	HI	24.2	4.6	0.0	86.8	-7.2	94.0	
921.3000	58.3	58.2 Q	V	1.0	90	Y	HI	24.2	4.6	0.0	87.0	-7.0	94.0	
921.3000	52.1	52.0 Q	V	1.0	90	Z	HI	24.2	4.6	0.0	80.8	-13.2	94.0	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)



COMPATIBLE
ELECTRONICS

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1806.6000	49.8	A	H	3.0	90	X	LOW	24.5	3.5	33.3	44.5	-9.5	54.0	
1806.6000	51.1	A	H	1.0	270	Y	LOW	24.5	3.5	33.3	45.8	-8.2	54.0	
1806.6000	52.8	A	H	3.0	90	Z	LOW	24.5	3.5	33.3	47.5	-6.5	54.0	
1806.6000	57.3	56.8 A	V	1.5	90	X	LOW	24.5	3.5	33.3	51.5	-2.5	54.0	
1806.6000	54.6	A	V	1.5	0	Y	LOW	24.5	3.5	33.3	49.3	-4.7	54.0	
1806.6000	52.1	A	V	1.5	90	Z	LOW	24.5	3.5	33.3	46.8	-7.2	54.0	
1824.8000	46.7	A	H	1.0	90	X	MID	24.5	3.5	33.3	41.4	-12.6	54.0	
1824.8000	48.7	A	H	3.0	90	Y	MID	24.5	3.5	33.3	43.4	-10.6	54.0	
1824.8000	48.8	A	H	1.0	90	Z	MID	24.5	3.5	33.3	43.5	-10.5	54.0	
1824.8000	51.5	A	V	1.0	90	X	MID	24.5	3.5	33.3	46.2	-7.8	54.0	
1824.8000	50.0	A	V	1.0	90	Y	MID	24.5	3.5	33.3	44.7	-9.3	54.0	
1824.8000	50.8	A	V	1.0	90	Z	MID	24.5	3.5	33.3	45.5	-8.5	54.0	
1842.6000	48.6	A	H	1.0	90	X	HI	24.5	3.5	33.3	43.3	-10.7	54.0	
1842.6000	47.6	A	H	3.0	90	Y	HI	24.5	3.5	33.3	42.3	-11.7	54.0	
1842.6000	48.4	A	H	1.5	270	Z	HI	24.5	3.5	33.3	43.1	-10.9	54.0	
1842.6000	52.1	A	V	2.5	90	X	HI	24.5	3.5	33.3	46.8	-7.2	54.0	
1842.6000	49.5	A	V	1.5	90	Y	HI	24.5	3.5	33.3	44.2	-9.8	54.0	
1842.6000	47.2	A	V	1.0	90	Z	HI	24.5	3.5	33.3	41.9	-12.1	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2709.9000	45.4	A	H	1.0	0	X	LOW	28.2	4.5	31.8	46.3	-7.7	54.0	
2709.9000	44.8	A	H	1.0	90	Y	LOW	28.2	4.5	31.8	45.7	-8.3	54.0	
2709.9000	50.0	A	H	3.0	90	Z	LOW	28.2	4.5	31.8	50.9	-3.1	54.0	
2709.9000	52.0	50.4 A	V	1.5	0	X	LOW	28.2	4.5	31.8	51.3	-2.7	54.0	
2709.9000	49.0	A	V	1.5	90	Y	LOW	28.2	4.5	31.8	49.9	-4.1	54.0	
2709.9000	49.9	A	V	1.5	270	Z	LOW	28.2	4.5	31.8	50.8	-3.2	54.0	
2737.2000	45.7	A	H	1.0	0	X	MID	28.2	4.5	31.8	46.6	-7.4	54.0	
2737.2000	49.5	A	H	3.0	0	Y	MID	28.2	4.5	31.8	50.4	-3.6	54.0	
2737.2000	50.0	A	H	1.5	270	Z	MID	28.2	4.5	31.8	50.9	-3.1	54.0	
2737.2000	50.8	49.1 A	V	2.5	90	X	MID	28.2	4.5	31.8	50.0	-4.0	54.0	
2737.2000	49.8	A	V	1.0	90	Y	MID	28.2	4.5	31.8	50.7	-3.3	54.0	
2737.2000	48.8	A	V	1.5	270	Z	MID	28.2	4.5	31.8	49.7	-4.3	54.0	
2763.9000	45.8	A	H	1.0	90	X	HI	29.7	4.6	31.7	48.4	-5.6	54.0	
2763.9000	47.3	A	H	1.5	90	Y	HI	29.7	4.6	31.7	49.9	-4.1	54.0	
2763.9000	47.0	A	H	2.0	90	Z	HI	29.7	4.6	31.7	49.6	-4.4	54.0	
2763.9000	49.3	46.8 A	V	3.0	0	X	HI	29.7	4.6	31.7	49.4	-4.6	54.0	
2763.9000	49.9	47.8 A	V	1.5	90	Y	HI	29.7	4.6	31.7	50.4	-3.6	54.0	
2763.9000	48.9	46.3 A	V	1.0	90	Z	HI	29.7	4.6	31.7	48.9	-5.1	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3613.2000	45.0	A	H	1.5	90	X	LOW	29.6	5.0	31.9	47.7	-6.3	54.0	
3613.2000	41.1	A	H	1.5	90	Y	LOW	29.6	5.0	31.9	43.8	-10.2	54.0	
3613.2000	45.4	A	H	1.5	90	Z	LOW	29.6	5.0	31.9	48.1	-5.9	54.0	
3613.2000	48.0	A	V	1.5	90	X	LOW	29.6	5.0	31.9	50.7	-3.3	54.0	
3613.2000	46.9	A	V	2.0	90	Y	LOW	29.6	5.0	31.9	49.6	-4.4	54.0	
3613.2000	43.9	A	V	1.5	90	Z	LOW	29.6	5.0	31.9	46.6	-7.4	54.0	
3649.6000	43.9	A	H	1.5	90	X	MID	29.6	5.0	31.9	46.6	-7.4	54.0	
3649.6000	45.1	A	H	3.0	90	Y	MID	29.6	5.0	31.9	47.8	-6.2	54.0	
3649.6000	45.2	A	H	1.0	90	Z	MID	29.6	5.0	31.9	47.9	-6.1	54.0	
3649.6000	45.6	A	V	1.0	90	X	MID	29.6	5.0	31.9	48.3	-5.7	54.0	
3649.6000	47.1	A	V	2.0	90	Y	MID	29.6	5.0	31.9	49.8	-4.2	54.0	
3649.6000	46.1	A	V	1.0	90	Z	MID	29.6	5.0	31.9	48.8	-5.2	54.0	
3685.2000	44.2	A	H	1.0	90	X	HI	29.6	5.0	31.9	46.9	-7.1	54.0	
3685.2000	42.9	A	H	1.0	90	Y	HI	29.6	5.0	31.9	45.6	-8.4	54.0	
3685.2000	44.2	A	H	2.0	90	Z	HI	29.6	5.0	31.9	46.9	-7.1	54.0	
3685.2000	46.0	A	V	1.5	0	X	HI	29.6	5.0	31.9	48.7	-5.3	54.0	
3685.2000	47.3	A	V	1.0	90	Y	HI	29.6	5.0	31.9	50.0	-4.0	54.0	
3685.2000	46.8	A	V	1.5	270	Z	HI	29.6	5.0	31.9	49.5	-4.5	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)



COMPATIBLE
ELECTRONICS

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4516.5000	45.6	A	H	2.0	90	X	LOW	30.9	5.6	31.4	50.7	-3.3	54.0	
4516.5000	44.1	A	H	2.0	90	Y	LOW	30.9	5.6	31.4	49.2	-4.8	54.0	
4516.5000	47.0	42.3 A	V	3.0	90	Z	LOW	30.9	5.6	31.4	47.4	-6.6	54.0	
4516.5000	45.2	A	V	1.5	90	X	LOW	30.9	5.6	31.4	50.3	-3.7	54.0	
4516.5000	47.8	43.5 A	V	1.5	0	Y	LOW	30.9	5.6	31.4	48.6	-5.4	54.0	
4516.5000	49.0	45.3 A	V	1.5	90	Z	LOW	30.9	5.6	31.4	50.4	-3.6	54.0	
4562.0000	48.1	44.9 A	H	1.5	90	X	MID	30.9	5.6	31.4	50.0	-4.0	54.0	
4562.0000	45.7	A	H			Y	MID	30.9	5.6	31.4	50.8	-3.2	54.0	
4562.0000	45.9	41.7 A	H	1.0	90	Z	MID	30.9	5.6	31.4	46.8	-7.3	54.0	
4562.0000	43.9	A	V	1.0	90	X	MID	30.9	5.6	31.4	49.0	-5.0	54.0	
4562.0000	49.2	45.8 A	V	3.0	0	Y	MID	30.9	5.6	31.4	50.9	-3.1	54.0	
4562.0000	49.5	46.4 A	V	1.5	270	Z	MID	30.9	5.6	31.4	51.5	-2.6	54.0	
4606.5000	47.3	44.0 A	H	2.5	90	X	HI	30.9	5.6	31.4	49.1	-4.9	54.0	
4606.5000	45.7	A	H	1.0	0	Y	HI	30.9	5.6	31.4	50.8	-3.2	54.0	
4606.5000	46.2	42.1 A	H	2.0	0	Z	HI	30.9	5.6	31.4	47.2	-6.8	54.0	
4606.5000	47.3	44.2 A	V	1.5	0	X	HI	30.9	5.6	31.4	49.3	-4.7	54.0	
4606.5000	50.8	48.3 A	V	2.0	0	Y	HI	30.9	5.6	31.4	53.4	-0.6	54.0	
4606.5000	47.0	43.7 A	V	2.5	90	Z	HI	30.9	5.6	31.4	48.8	-5.2	54.0	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments	
5419.8000	39.7	A	H	3.0	90	X	LOW	32.4	6.0	31.0	47.1	-6.9	54.0		
5419.8000	40.1	A	H	3.0	90	Y	LOW	32.4	6.0	31.0	47.5	-6.5	54.0		
5419.8000	41.3	A	H	1.0	90	Z	LOW	32.4	6.0	31.0	48.7	-5.3	54.0		
5419.8000	42.0	A	V	1.0	90	X	LOW	32.4	6.0	31.0	49.4	-4.6	54.0		
5419.8000	45.8	40.3	A	V	1.0	90	Y	LOW	32.4	6.0	31.0	47.7	-6.3	54.0	
5419.8000	46.5	42.4	A	V	1.0	90	Z	LOW	32.4	6.0	31.0	49.8	-4.2	54.0	
5474.4000	44.4	38.8	A	H	3.0	90	X	MID	32.4	6.0	31.0	46.2	-7.8	54.0	
5474.4000	44.9	38.6	A	H	3.0	0	Y	MID	32.4	6.0	31.0	46.0	-8.0	54.0	
5474.4000	43.1	A	H	2.0	90	Z	MID	32.4	6.0	31.0	50.5	-3.5	54.0		
5474.4000	43.7	37.5	A	V	1.5	90	X	MID	32.4	6.0	31.0	44.9	-9.1	54.0	
5474.4000	45.4	39.8	A	V	1.5	0	Y	MID	32.4	6.0	31.0	47.2	-6.8	54.0	
5474.4000	46.9	42.8	A	V	1.5	270	Z	MID	32.4	6.0	31.0	50.2	-3.8	54.0	
5527.8000	45.8	41.3	A	H	3.0	90	X	HI	32.4	6.0	31.0	48.7	-5.3	54.0	
5527.8000	44.8	39.8	A	H	3.0	90	Y	HI	32.4	6.0	31.0	47.2	-6.8	54.0	
5527.8000	43.9	37.4	A	H	2.0	90	Z	HI	32.4	6.0	31.0	44.8	-9.2	54.0	
5527.8000	46.7	41.7	A	V	1.5	0	X	HI	32.4	6.0	31.0	49.1	-4.9	54.0	
5527.8000	45.7	39.8	A	V	2.0	0	Y	HI	32.4	6.0	31.0	47.2	-6.8	54.0	
5527.8000	45.4	40.1	A	H	3.0	0	Z	HI	32.4	6.0	31.0	47.5	-6.5	54.0	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)



COMPATIBLE
ELECTRONICS

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	N/A
MODEL	BT9000	PEAK TO AVG	N/A
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments	
6323.1000	43.1	34.7	A	H	2.0	90	X	LOW	34.3	6.9	31.6	44.3	-9.7	54.0	
6323.1000	42.9	34.1	A	H	3.0	0	Y	LOW	34.3	6.9	31.6	43.7	-10.3	54.0	
6323.1000	43.9	34.5	A	H	1.0	90	Z	LOW	34.3	6.9	31.6	44.1	-9.9	54.0	
6323.1000	43.8	36.3	A	V	1.0	90	X	LOW	34.3	6.9	31.6	45.9	-8.1	54.0	
6323.1000	39.3		A	V	1.0	90	Y	LOW	34.3	6.9	31.6	48.9	-5.1	54.0	
6323.1000	38.3		A	V	1.0	90	Z	LOW	34.3	6.9	31.6	47.9	-6.1	54.0	
6386.8000	43.1	35.5	A	H	1.5	90	X	MID	34.3	6.9	31.6	45.1	-8.9	54.0	
6386.8000	41.3		A	H	1.0	90	Y	MID	34.3	6.9	31.6	50.9	-3.1	54.0	
6386.8000	37.9		A	H	1.0	90	Z	MID	34.3	6.9	31.6	47.5	-6.5	54.0	
6386.8000	42.6	34.0	A	V	1.5	90	X	MID	34.3	6.9	31.6	43.6	-10.4	54.0	
6386.8000	36.7		A	V	1.0	90	Y	MID	34.3	6.9	31.6	46.3	-7.7	54.0	
6386.8000	39.5		A	V	1.0	270	Z	MID	34.3	6.9	31.6	49.1	-4.9	54.0	
6449.1000	42.8	34.6	A	H	1.5	90	X	HI	34.3	6.9	31.6	44.2	-9.8	54.0	
6449.1000	41.3		A	H	1.0	90	Y	HI	34.3	6.9	31.6	50.9	-3.1	54.0	
6449.1000	38.9		A	H	1.0	90	Z	HI	34.3	6.9	31.6	48.5	-5.5	54.0	
6449.1000	44.3	36.3	A	V	1.5	0	X	HI	34.3	6.9	31.6	45.9	-8.1	54.0	
6449.1000	41.5	32.4	A	V	1.0	90	Y	HI	34.3	6.9	31.6	42.0	-12.0	54.0	
6449.1000	43.4	35.5	A	H	2.0	270	Z	HI	34.3	6.9	31.6	45.1	-8.9	54.0	

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

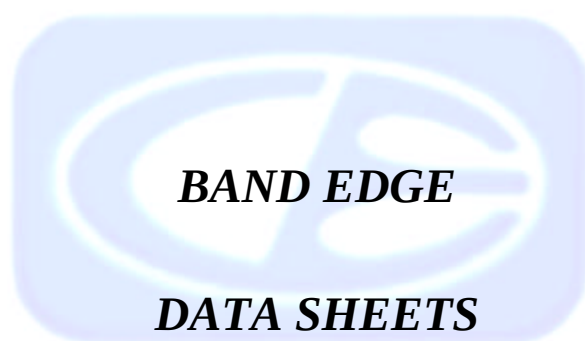
** DELTA = SPEC LIMIT - CORRECTED READING

Test location: Compatible Electronics
 Customer : Binsfeld Engineering Date : 3/25/2000
 Manufacturer : Binsfeld Engineering Time : 8.56
 EUT name : Digital Telemetry System - Tx Model: BT9000
 Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
 Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00
 Test Mode : Spurious Emissions 30 MHz to 1000 MHz
 Horizontal and Vertical Polarization
 Temperature 55 Degrees F., Relative Humidity 88%
 Tested By: Kyle Fujimoto
 Kyle Fujimoto

Pol	Freq	Rdng	Cable	Ant	Amp	Cor'd	limit	Delta
	MHz	dBuV	loss	factor	gain	rdg = R	= L	R-L
			dB	dB	dB	dBuV	dBuV/m	dB
30 MHz to 300 MHz								
1V	40.70	52.20	0.81	12.94	38.61	27.34	40.00	-12.66
2V	75.07	45.40	1.00	10.77	38.85	18.32	40.00	-21.68
3V	80.07	48.30	1.00	10.22	38.80	20.72	40.00	-19.28
4V	85.07	47.10	1.10	10.12	38.70	19.63	40.00	-20.37
5V	185.09	49.00	1.68	14.83	38.72	26.79	43.50	-16.71
6V	210.10	50.30	1.84	16.15	38.68	29.61	43.50	-13.89
7V	215.13	50.00	1.86	16.25	38.72	29.39	43.50	-14.11
8V	220.09	51.80	1.88	16.34	38.76	31.26	46.00	-14.74
9V	260.10	49.00	2.14	17.71	38.56	30.29	46.00	-15.71
10V	295.10	40.10	2.28	21.74	38.58	25.54	46.00	-20.46
11H	120.09	49.90	1.38	12.56	38.76	25.08	43.50	-18.42
12H	215.09	48.70	1.86	16.25	38.72	28.09	43.50	-15.41
300 MHz to 1000 MHz								
13H	340.15	56.20	2.54	15.63	38.60	35.77	46.00	-10.23
14H	350.12	56.20	2.60	15.68	38.60	35.88	46.00	-10.12
15H	360.12	54.40	2.62	15.29	38.60	33.71	46.00	-12.29
16V	300.73	55.80	2.30	15.41	38.60	34.92	46.00	-11.08
17V	310.12	48.30	2.36	15.46	38.60	27.53	46.00	-18.47
18V	320.11	48.30	2.42	15.52	38.60	27.64	46.00	-18.36
19V	900.48	54.20	4.60	22.47	37.50	43.77	46.00	-2.23
20V	900.48	53.59	4.60	22.47	37.50	43.16Qp	46.00	-2.84
21V	924.55	46.70	4.55	24.41	37.60	38.07	46.00	-7.93

Test location: Compatible Electronics
Customer : Binsfeld Engineering
Manufacturer : Binsfeld Engineering
EUT name : Digital Telemetry System - Tx
Specification: Fcc_B Test distance: 3.0 mtrs
Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00
Test Mode : Spurious Emissions 10 kHz to 30 MHz
Horizontal and Vertical Polarization
Temperature 55 Degrees F., Relative Humidity 88%
Tested By: Kyle Fujimoto

No Emissions Found in Either Polarization
From 10 kHz to 30 MHz for the EUT



BAND EDGE OF LOW CHANNEL
REF 110.0 dB μ V ATTEN 20 dB

MKR 901.889 MHz
54.60 dB μ V

hp
10 dB/

DL
101.4
dB μ V

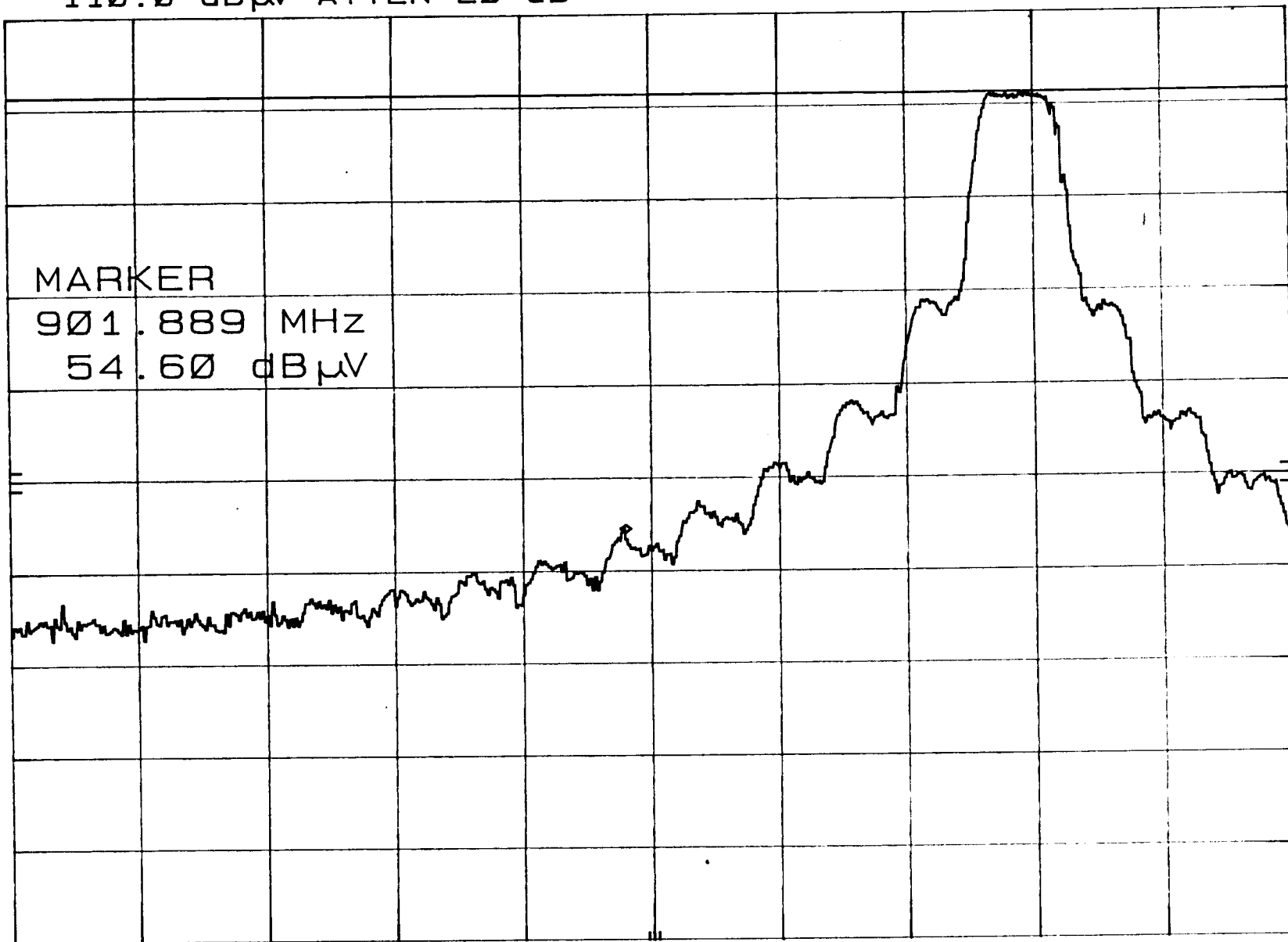
MARKER
901.889 MHz
54.60 dB μ V

CORR'D

CENTER 901.99 MHz
RES BW 1 MHz

VBW 1 MHz

SPAN 5.00 MHz
SWP 20.0 msec



BAND EDGE OF HIGH CHANNEL

MKR 928.003 MHz

hp

REF 110.0 dB μ V ATTN 20 dB

42.80 dB μ V

10 dB/

DL
97.7
dB μ V

MARKER
928.003 MHz
42.80 dB μ V

CORR'D

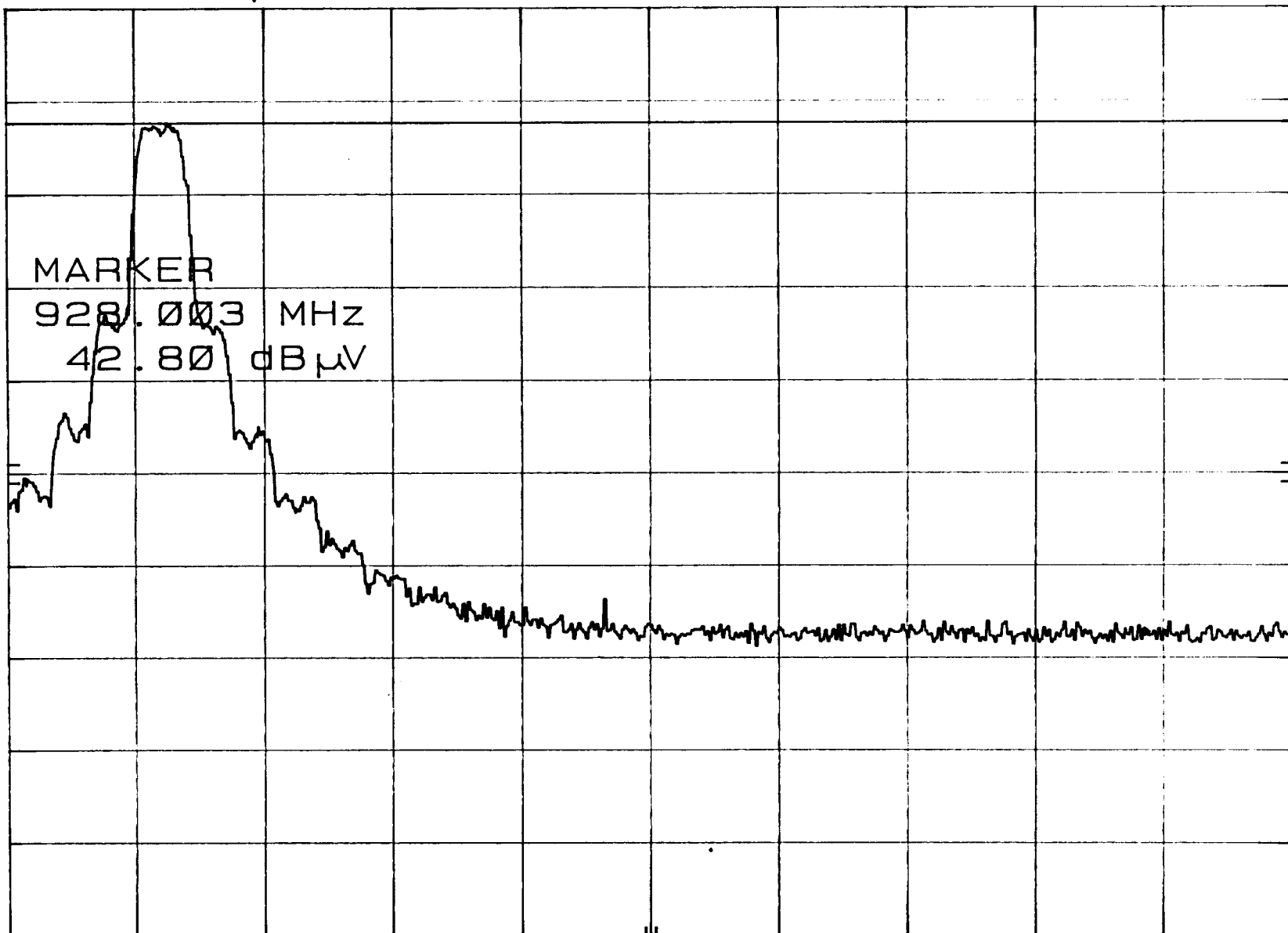
START 920.40 MHz

RES BW 1 MHz

VBW 1 MHz

STOP 929.00 MHz

SWP 20.0 msec



RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)



**COMPATIBLE
ELECTRONICS**

COMPANY	BINSFELD ENGINEERING	DATE	3/22/00
EUT	DITIAL TELEMTRY SYSTEM - Tx	DUTY CYCLE	0.00 %
MODEL	BT9000	PEAK TO AVG	0 dB
S/N	11	TEST DIST.	3 METERS
TEST ENGINEER	Kyle Fujimoto	LAB	D

[illegible]

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