

*FCC PART 15, SUBPART C
TEST REPORT*

for

**MEDICAL TRANSCEIVER
Model: DT4500**

Prepared for

VITALCOM
15222 DEL AMO AVENUE
TUSTIN, CALIFORNIA 92780

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KYLE FUJIMOTO

Approved by: *Scott McCutchan*

SCOTT McCUTCHAN

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DATE: MAY 26, 2000

	REPORT BODY	APPENDICES				TOTAL
		A	B	C	D	
PAGES	15	2	2	9	18	46

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TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	4
SUMMARY OF TEST RESULTS	4
1. PURPOSE	5
2. ADMINISTRATIVE DATA	6
2.1 Location of Testing	6
2.2 Traceability Statement	6
2.3 Cognizant Personnel	6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
3. APPLICABLE DOCUMENTS	7
4. Description of Test Configuration	8
4.1 Description of Test Configuration - EMI	8
4.1.1 Cable Construction and Termination	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	10
5.1 EUT and Accessory List	10
5.2 EMI Test Equipment	11
6. TEST SITE DESCRIPTION	12
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
7. Test Procedures	13
7.1 Radiated Emissions (Spurious and Harmonics) Test	13
7.3 RF Band Edges	14
8. CONCLUSIONS	15



LIST OF APPENDICES

APPENDIX	TITLE
A	Modifications to the EUT
B	Additional Models Covered Under This Report
C	Diagrams, Charts and Photos • Test Setup Diagrams • Radiated Emissions Photos • Antenna and Effective Gain Factors
D	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
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: Medical Transceiver
Model: DT4500
S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: Vitalcom
15222 Del Amo Avenue
Tustin, California 92780

Test Dates: May 18 and 26, 2000

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart C, Sections 15.205, 15.209, and 15.242

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	This test was not performed because the EUT is powered by a nine volt battery.
2	Radiated RF Emissions, 10 kHz – 6130 MHz	Complies with the limits of CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209 and 15.242



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Medical Transceiver Model: DT4500. 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, 15.209, and 15.242.



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

Vitalcom

Gus Testa RF 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 May 18, 2000.

2.5 Disposition of the Test Sample

The test sample was returned to Vitalcom on May 18, 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 (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.



4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Specifics of the EUT and Peripherals Tested

The Medical Transceiver Model: DT4500 (EUT) was connected to a laptop and six ECG leads via its serial and ECG ports, respectively.. The EUT is powered by a nine volt battery. The EUT was tested in three orthogonal axis with the low, middle, and high channels tested. The EUT was continuously transmitting and receiving. The laptop was used to program the EUT to remain on the same channel for testing purposes. The antenna are the ECG leads and have a special non-standard ECG bulkhead connector.

Note: During the preliminary investigation, it was determined the EUT had the highest emissions when the EUT was in its X-axis.

The final radiated data was taken in both the transmitting and receiving modes. Please see Appendix D for the data sheets.



4.1.1 Cable Construction and Termination

- Cable 1** This is a 5 foot braid and foil shielded cable connecting the printer to the laptop. It has a Centronics metallic type connector at the printer end and a D-25 pin metallic connector at the laptop 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 2** This is a 2 meter braid and foil shielded cable connecting the laptop to cable #3. It has a D-9 pin metallic connector at the laptop end and a D-25 pin metallic connector at the other end. This cable along with cable #3 was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connector.
- Cable 3** This is a 2 meter braid and foil shielded cable connecting the EUT to cable #2. It has a D-9 pin metallic connector at the laptop end and a D-25 pin metallic connector at the other end. This cable along with cable #2 was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connector.
- Cable 4** This is a 6 foot unshielded cable connecting the laptop to the AC Adapter. It has a 1/8 inch power connector 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
MEDICAL TRANSCIVER (EUT)	VITALCOM	DT4500	N/A	BQIOODT-4500
PRINTER	CITIZEN	LSP-10	1215253-83	DLK66TLSP-10
LAPTOP	DELL	TS30G5	6267046BYK0287A	IIRTS30GS



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, 1999	Jan. 11, 2000
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	Dec. 14, 1999	Dec. 14, 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
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	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	May 25, 2000	May 25, 2001



6. TEST SITE DESCRIPTION

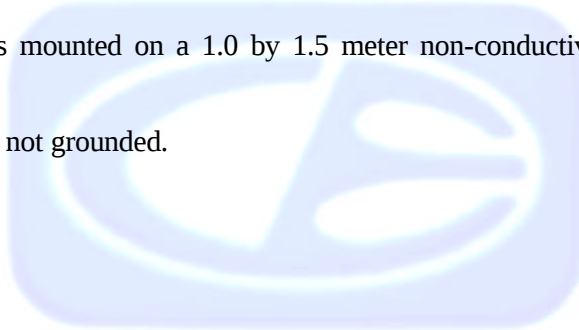
6.1 Test Facility Description

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 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.

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 using a duty cycle of 35%. Please see the duty cycle exhibit for how this was obtained.

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 6.13 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.

7.3

RF Band Edges

Spectral plots of both the low and high channels were taken of the EUT to show that the emissions at the band edges (608 and 614 MHz) were attenuated to the general radiated emissions limits in FCC Title 47, Subpart C, section 15.209. The spectral plots and data sheets are located in Appendix D.



8. CONCLUSIONS

The Medical Transceiver Model: DT4500 meets all of the specification limits defined in CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.242.



APPENDIX A

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.242 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

Medical Transceiver

Model: DT4500

S/N: N/A

There were no additional models covered under this report.



APPENDIX C

DIAGRAMS, CHARTS AND PHOTOS



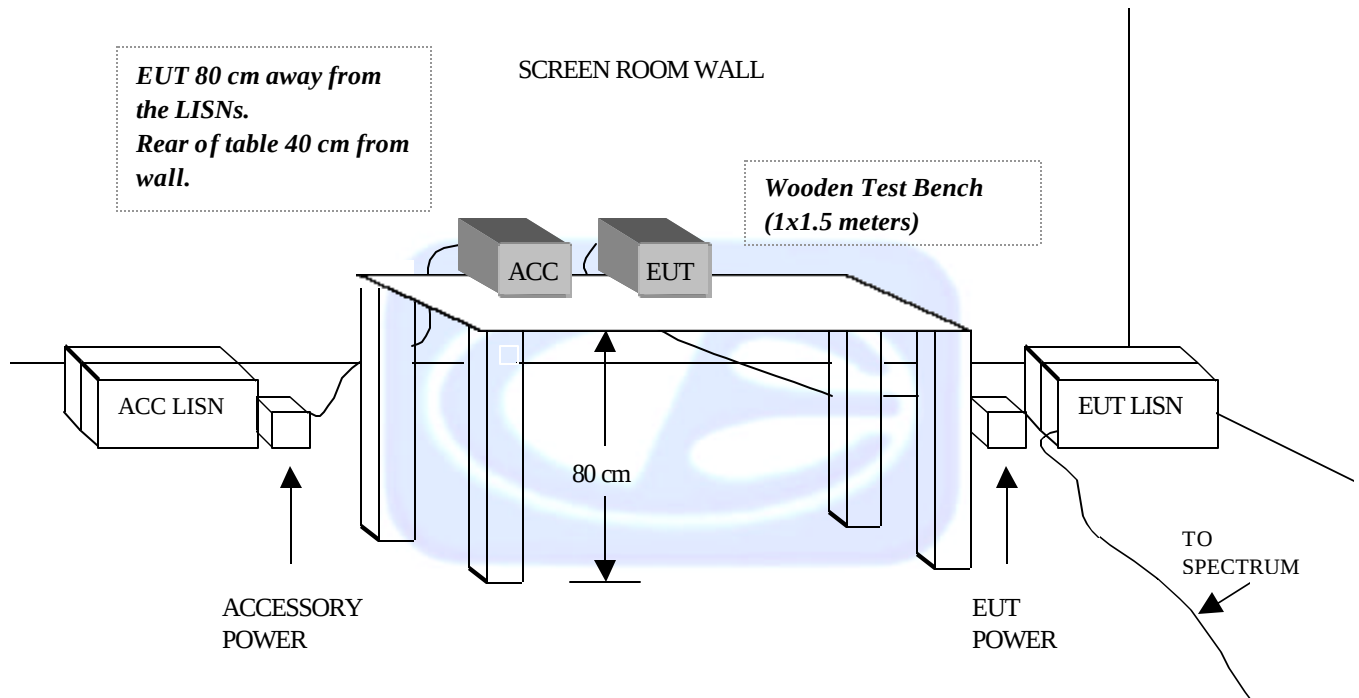
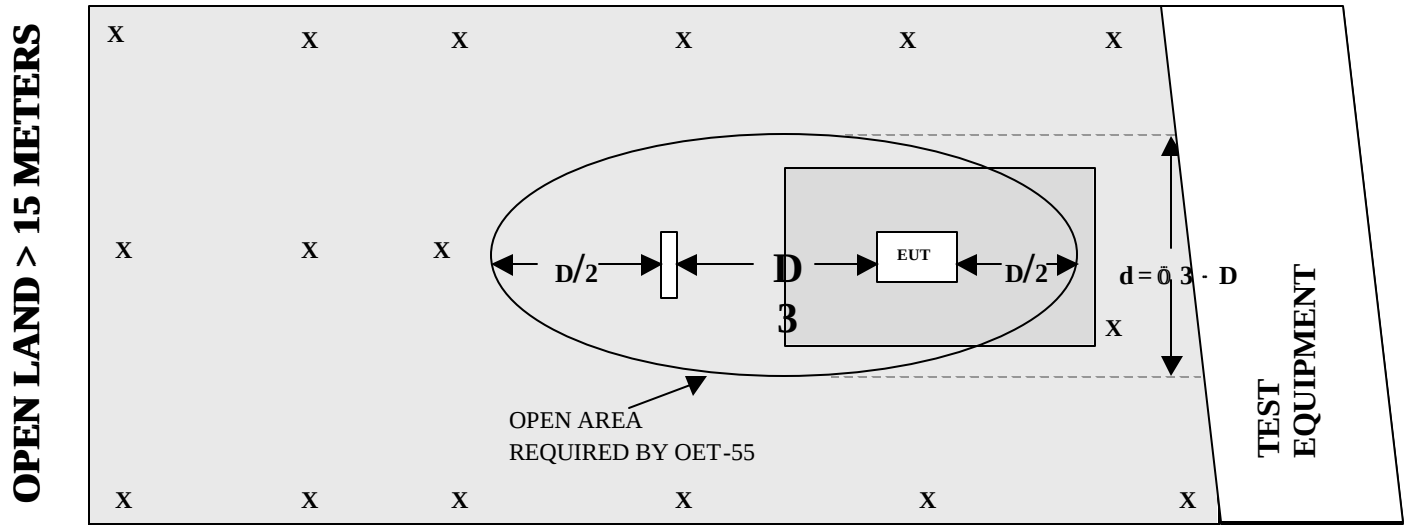
FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

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

VITALCOM
MEDICAL TRANSCIEVER
MODEL: DT4500

FCC SUBPART C - RADIATED EMISSIONS – 5-18-00 AND 5-25-00

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





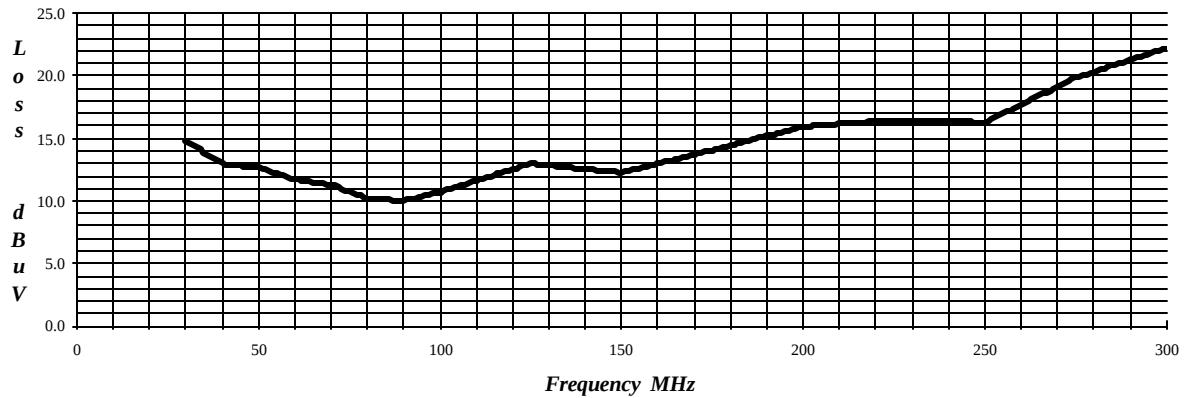
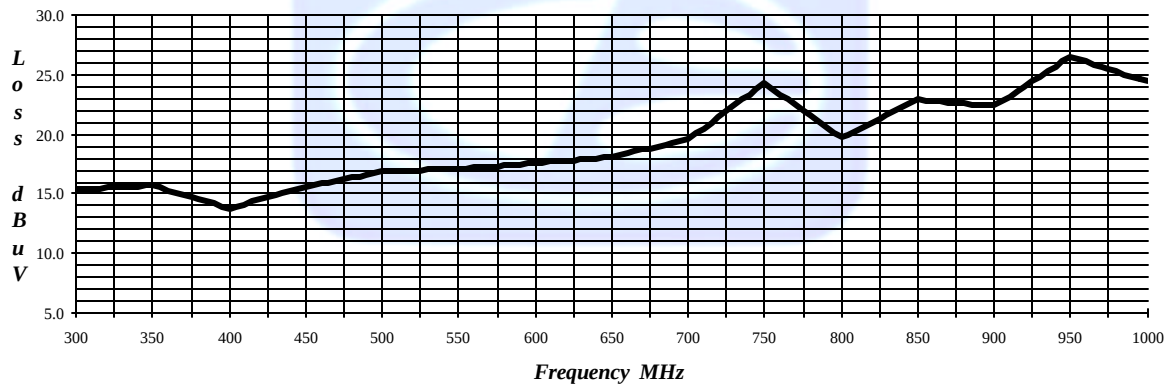
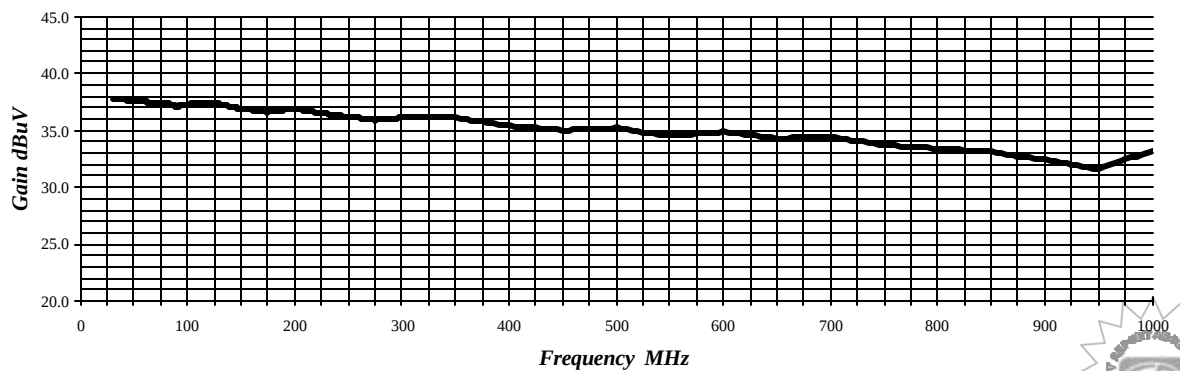
REAR VIEW

VITALCOM
MEDICAL TRANSCIVER
MODEL: DT4500

FCC SUBPART C - RADIATED EMISSIONS – 5-18-00 AND 5-25-00

**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

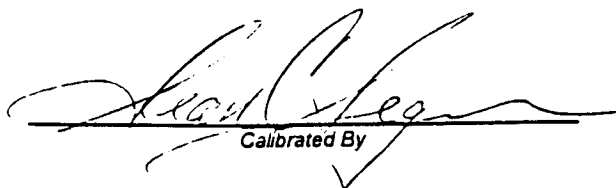
$$E(\text{dB V/m}) = V_o(\text{dB V}) + AFE(\text{dB/m})$$

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

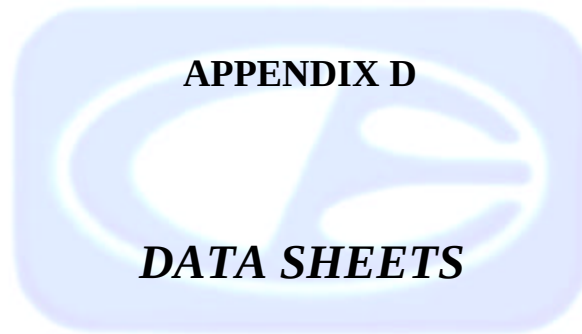

Calibrated By

Com-Power Corporation

(949) 587-9800

Antenna Calibration

Antenna Type:		Loop Antenna
Model:		AL-130
Serial Number:		25309
Calibration Date:		05/25/00
Frequency MHz	Magnetic (dB/m)	Electric dB/m
0.009	-41.0	10.5
0.01	-41.0	10.5
0.02	-41.9	9.6
0.05	-41.9	9.6
0.075	-41.8	9.7
0.1	-42.2	9.3
0.15	-42.2	9.3
0.25	-40.7	10.8
0.5	-42.1	9.4
0.75	-40.9	10.6
1	-41.3	10.2
2	-40.8	10.7
3	-41.1	10.4
4	-41.2	10.3
5	-40.7	10.8
10	-40.6	10.9
15	-42.0	9.5
20	-42.0	9.5
25	-42.9	8.6
30	-42.3	9.2
Trans. Antenna Height		2 meter
Receiving Antenna Height		2 meter



RADIATED EMISSIONS
DATA SHEETS FOR THE TRANSMITTER PORTION



RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



**COMPATIBLE
ELECTRONICS**

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35%
MODEL	DT4500	PEAK TO AVG	-9.1 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
608.7000	79.8	79.7 Q	H	1.0	180	X	LOW	17.7	3.5	0.0	100.9	-5.1	106.0	
608.7000	83.5	83.4 Q	V	1.0	180	X	LOW	17.7	3.5	0.0	104.6	-1.4	106.0	
611.2040	78.4	78.3 Q	H	1.0	180	X	MID	17.7	3.5	0.0	99.5	-6.5	106.0	
611.2040	83.5	83.4 Q	V	1.0	180	X	MID	17.7	3.5	0.0	104.6	-1.4	106.0	
612.9650	78.3	78.2 Q	H	1.0	180	X	HI	17.8	3.5	0.0	99.5	-6.5	106.0	
612.9650	83.4	83.3 Q	V	1.0	180	X	HI	17.8	3.5	0.0	104.6	-1.4	106.0	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



**COMPATIBLE
ELECTRONICS**

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35%
MODEL	DT4500	PEAK TO AVG	-9.1 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1217.4000	63.2	54.1 A	H	1.0	180	X	LOW	22.3	2.8	34.2	45.0	-9.0	54.0	
1217.4000	64.8	55.7 A	V	1.0	270	X	LOW	22.3	2.8	34.2	46.6	-7.4	54.0	
1222.4080	60.6	51.5 A	H	1.0	270	X	MID	22.3	2.8	34.2	42.4	-11.6	54.0	
1222.4080	61.1	52.0 A	V	1.0	0	X	MID	22.3	2.8	34.2	42.9	-11.1	54.0	
1225.9300	65.1	56.0 A	H	1.0	270	X	HI	22.3	2.8	34.2	46.9	-7.1	54.0	
1225.9300	67.6	58.5 A	V	1.0	270	X	HI	22.3	2.8	34.2	49.4	-4.6	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



COMPATIBLE
ELECTRONICS

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35%
MODEL	DT4500	PEAK TO AVG	-9.1 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1826.1000	53.2	44.1 A	H	1.0	90	X	LOW	24.5	3.5	33.3	38.8	-15.2	54.0	
1826.1000	49.7	40.6 A	V	1.0	180	X	LOW	24.5	3.5	33.3	35.3	-18.7	54.0	
1833.6120	48.6	39.5 A	H	1.0	180	X	MID	24.5	3.5	33.3	34.2	-19.8	54.0	
1833.6120	52.7	43.6 A	V	1.0	180	X	MID	24.5	3.5	33.3	38.3	-15.7	54.0	
1838.8950	54.1	45.0 A	H	1.0	270	X	HI	24.5	3.5	33.3	39.7	-14.3	54.0	
1838.8950	46.4	37.3 A	V	1.0	180	X	HI	24.5	3.5	33.3	32.0	-22.0	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



COMPATIBLE
ELECTRONICS

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35%
MODEL	DT4500	PEAK TO AVG	-9.1 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2434.8000	41.1	32.0 A	H	1.0	180	X	LOW	28.2	4.5	31.8	32.9	-21.1	54.0	
2434.8000	39.8	30.7 A	V	1.0	270	X	LOW	28.2	4.5	31.8	31.6	-22.4	54.0	
2444.8160	39.4	30.3 A	H	1.0	180	X	MID	28.2	4.5	31.8	31.2	-22.8	54.0	
2444.8160	40.9	31.8 A	V	1.0	270	X	MID	28.2	4.5	31.8	32.7	-21.3	54.0	
2451.8600	30.5	21.4 A	H	1.0	180	X	HI	28.2	4.5	31.8	22.3	-31.7	54.0	
2451.8600	44.1	35.0 A	V	1.0	180	X	HI	28.2	4.5	31.8	35.9	-18.1	54.0	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



**COMPATIBLE
ELECTRONICS**

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35%
MODEL	DT4500	PEAK TO AVG	-9.1 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3043.5000	41.9	32.8 A	H	1.0	270	X	LOW	35.2	4.6	31.7	40.9	-13.1	54.0	
3043.5000	41.1	32.0 A	V	1.0	270	X	LOW	35.2	4.6	31.7	40.1	-13.9	54.0	
3056.0200	41.9	32.8 A	H	1.0	270	X	MID	35.2	4.6	31.7	40.9	-13.1	54.0	
3056.0200	39.3	30.2 A	V	1.0	90	X	MID	35.2	4.6	31.7	38.3	-15.7	54.0	
3064.8250	38.6	29.5 A	H	1.0	90	X	HI	35.2	4.6	31.7	37.6	-16.4	54.0	
3064.8250	41.1	32.0 A	V	1.0	270	X	HI	35.2	4.6	31.7	40.1	-13.9	54.0	

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

Note: No Harmonics nor emissions found
after the 5th Harmonic

Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/18/2000

Manufacturer : VITALCOM

Time : 12.21

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

Specification: Fcc_B Test distance: 3.0 mtrs

Lab: D

Distance correction factor(20*log(test/spec))

: 0.00

Test Mode : VERTICAL POLARIZATION 30 TO 300 MHz

SPURIOUS EMISSIONS

TEMPERATURE 80 DEGREES F.

RELATIVE HUMIDITY 45%

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	30.02	55.20	0.70	14.86	38.30	32.46	40.00	-7.54
2V	40.06	60.50	0.80	12.96	38.60	35.66	40.00	-4.34
3V	50.06	50.30	0.90	12.67	38.70	25.17	40.00	-14.83
4V	60.06	48.00	0.80	11.72	38.80	21.72	40.00	-18.28
5V	73.83	52.90	1.00	10.91	38.86	25.95	40.00	-14.05
6V	80.06	56.10	1.00	10.22	38.80	28.52	40.00	-11.48
7V	86.73	49.80	1.13	10.09	38.67	22.36	40.00	-17.64
8V	101.38	56.70	1.31	10.87	38.61	30.26	43.50	-13.24
9V	104.99	55.50	1.32	11.19	38.64	29.37	43.50	-14.13
10V	109.99	54.70	1.34	11.65	38.68	29.01	43.50	-14.49
11V	110.04	56.70	1.34	11.65	38.68	31.01	43.50	-12.49
12V	114.67	56.40	1.36	12.07	38.72	31.11	43.50	-12.39
13V	115.54	58.80	1.36	12.15	38.72	33.59	43.50	-9.91
14V	120.04	64.20	1.38	12.56	38.76	39.38	43.50	-4.12
15V	128.93	60.20	1.43	12.89	38.78	35.74	43.50	-7.76
16V	143.29	60.30	1.55	12.45	38.73	35.57	43.50	-7.93
17V	151.05	51.10	1.60	12.33	38.70	26.32	43.50	-17.18
18V	159.98	56.00	1.60	12.98	38.74	31.84	43.50	-11.66
19V	189.95	51.70	1.72	15.19	38.68	29.93	43.50	-13.57
20V	199.92	54.40	1.80	15.94	38.60	33.54	43.50	-9.96
21V	200.51	61.70	1.80	15.96	38.60	40.86	43.50	-2.64
22V	200.51	61.04	1.80	15.96	38.60	40.20Qp	43.50	-3.30
23V	210.03	50.30	1.84	16.15	38.68	29.61	43.50	-13.89
24V	224.86	56.00	1.90	16.44	38.80	35.54	46.00	-10.46
25V	239.67	39.80	2.02	16.34	38.68	19.47	46.00	-26.53
26V	250.81	46.40	2.10	16.39	38.60	26.29	46.00	-19.71
27V	263.72	47.50	2.15	18.22	38.55	29.33	46.00	-16.67
28V	267.32	51.10	2.17	18.74	38.53	33.47	46.00	-12.53

Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/18/2000

Manufacturer : VITALCOM

Time : 13.44

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor(20*log(test/spec)) : 0.00

Test Mode : HORIZONTAL POLARIZATION 30 TO 300 MHz

SPURIOUS EMISSIONS

TEMPERATURE 80 DEGREES F.

RELATIVE HUMIDITY 45%

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	30.02	53.50	0.70	14.86	38.30	30.76	40.00	-9.24
2H	42.02	57.60	0.82	12.90	38.62	32.70	40.00	-7.30
3H	67.89	56.30	0.96	11.42	38.88	29.80	40.00	-10.20
4H	73.78	55.50	1.00	10.92	38.86	28.55	40.00	-11.45
5H	97.64	58.40	1.28	10.57	38.60	31.65	43.50	-11.85
6H	115.80	58.40	1.36	12.17	38.73	33.21	43.50	-10.29
7H	128.94	60.10	1.43	12.89	38.78	35.64	43.50	-7.86
8H	159.96	53.00	1.60	12.97	38.74	28.83	43.50	-14.67
9H	186.21	50.70	1.69	14.91	38.71	28.59	43.50	-14.91
10H	189.96	54.90	1.72	15.19	38.68	33.13	43.50	-10.37
11H	199.93	61.20	1.80	15.94	38.60	40.34	43.50	-3.16
12H	200.54	60.10	1.80	15.96	38.60	39.26	43.50	-4.24
13H	239.93	56.20	2.02	16.34	38.68	35.88	46.00	-10.12
14H	267.32	59.00	2.17	18.74	38.53	41.38	46.00	-4.62
15H	272.11	50.70	2.19	19.42	38.51	33.80	46.00	-12.20
16H	274.88	57.70	2.20	19.81	38.50	41.21	46.00	-4.79
17H	279.90	54.80	2.22	20.30	38.52	38.80	46.00	-7.20
18H	280.08	53.80	2.22	20.31	38.52	37.81	46.00	-8.19
19H	289.90	49.40	2.26	21.25	38.56	34.35	46.00	-11.65

Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/18/2000

Manufacturer : VITALCOM

Time : 13.56

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor(20*log(test/spec)) : 0.00

Test Mode : HORIZONTAL POLARIZATION 30 TO 1000 MHz

SPURIOUS EMISSIONS

TEMPERATURE 80 DEGREES F.

RELATIVE HUMIDITY 45%

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	309.76	50.40	2.36	15.46	38.60	29.62	46.00	-16.38
2H	312.12	48.20	2.37	15.48	38.60	27.45	46.00	-18.55
3H	334.21	49.60	2.51	15.59	38.60	29.10	46.00	-16.90
4H	372.63	37.60	2.65	14.81	38.60	16.46	46.00	-29.54
5H	376.12	47.10	2.65	14.68	38.60	25.83	46.00	-20.17
6H	383.51	48.60	2.67	14.39	38.60	27.06	46.00	-18.94
7H	398.26	45.90	2.70	13.83	38.60	23.82	46.00	-22.18
8H	413.00	49.20	2.73	14.24	38.47	27.69	46.00	-18.31
9H	462.86	49.60	2.88	15.93	38.05	30.36	46.00	-15.64
10H	590.04	41.20	3.44	17.51	38.48	23.68	46.00	-22.32
11H	693.28	40.60	3.70	19.44	38.31	25.42	46.00	-20.58

Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/18/2000

Manufacturer : VITALCOM

Time : 14.06

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor(20*log(test/spec)) : 0.00

Test Mode : VERTICAL POLARIZATION 300 TO 1000 MHz

SPURIOUS EMISSIONS

TEMPERATURE 80 DEGREES F.

RELATIVE HUMIDITY 45%

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	309.73	53.70	2.36	15.46	38.60	32.92	46.00	-13.08
2V	324.51	42.00	2.45	15.54	38.60	21.39	46.00	-24.61
3V	339.26	49.60	2.54	15.62	38.60	29.16	46.00	-16.84
4V	398.28	46.30	2.70	13.83	38.60	24.22	46.00	-21.78
5V	459.18	46.80	2.86	15.84	38.06	27.43	46.00	-18.57
6V	472.15	43.40	2.93	16.17	38.01	24.49	46.00	-21.51



Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/26/2000

Manufacturer : VITALCOM

Time : 17.51

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

Specification: Fcc_B Test distance: 3.0 mtrs

Lab: D

Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$)

: 0.00

Test Mode :

NO EMISSIONS FOUND BETWEEN 10 kHz AND 30 MHz
FOR THE EUT IN EITHER POLARIZATION

RADIATED EMISSIONS
DATA SHEETS FOR THE RECEIVER PORTION



Test location: Compatible Electronics

Customer : VITALCOM

Date : 5/18/2000

Manufacturer : VITALCOM

Time : 14.38

EUT name : MEDICAL TRANSCEIVER

Model: DT4500

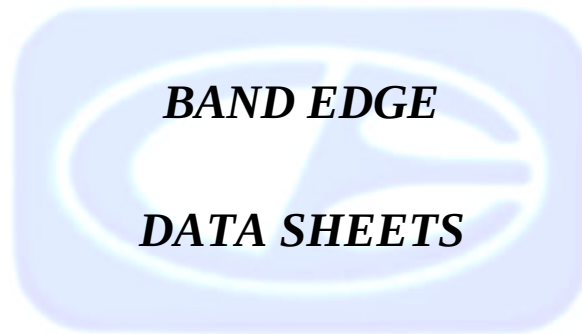
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00

Test Mode : RECEIVING MODE FOR THE EUT

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	537.69	35.00	3.48	17.04	38.88	16.64	46.00	-29.36
2V	539.88	38.20	3.50	17.05	38.94	19.81	46.00	-26.19
3V	541.92	38.10	3.52	17.06	38.99	19.69	46.00	-26.31
4H	537.86	34.70	3.48	17.04	38.88	16.33	46.00	-29.67
5H	540.69	32.00	3.51	17.05	38.96	13.60	46.00	-32.40
6H	541.79	35.30	3.52	17.06	38.99	16.89	46.00	-29.11

NO OTHER EMISSIONS FROM THE RECEIVER FOUND FOR THE EUT



BAND EDGE OF LOW CHANNEL
REF 100.0 dB μ V ATTEN 10 dB

MKR 608.000 MHz
32.20 dB μ V

hp

10 dB/

DL
75.0
dB μ V

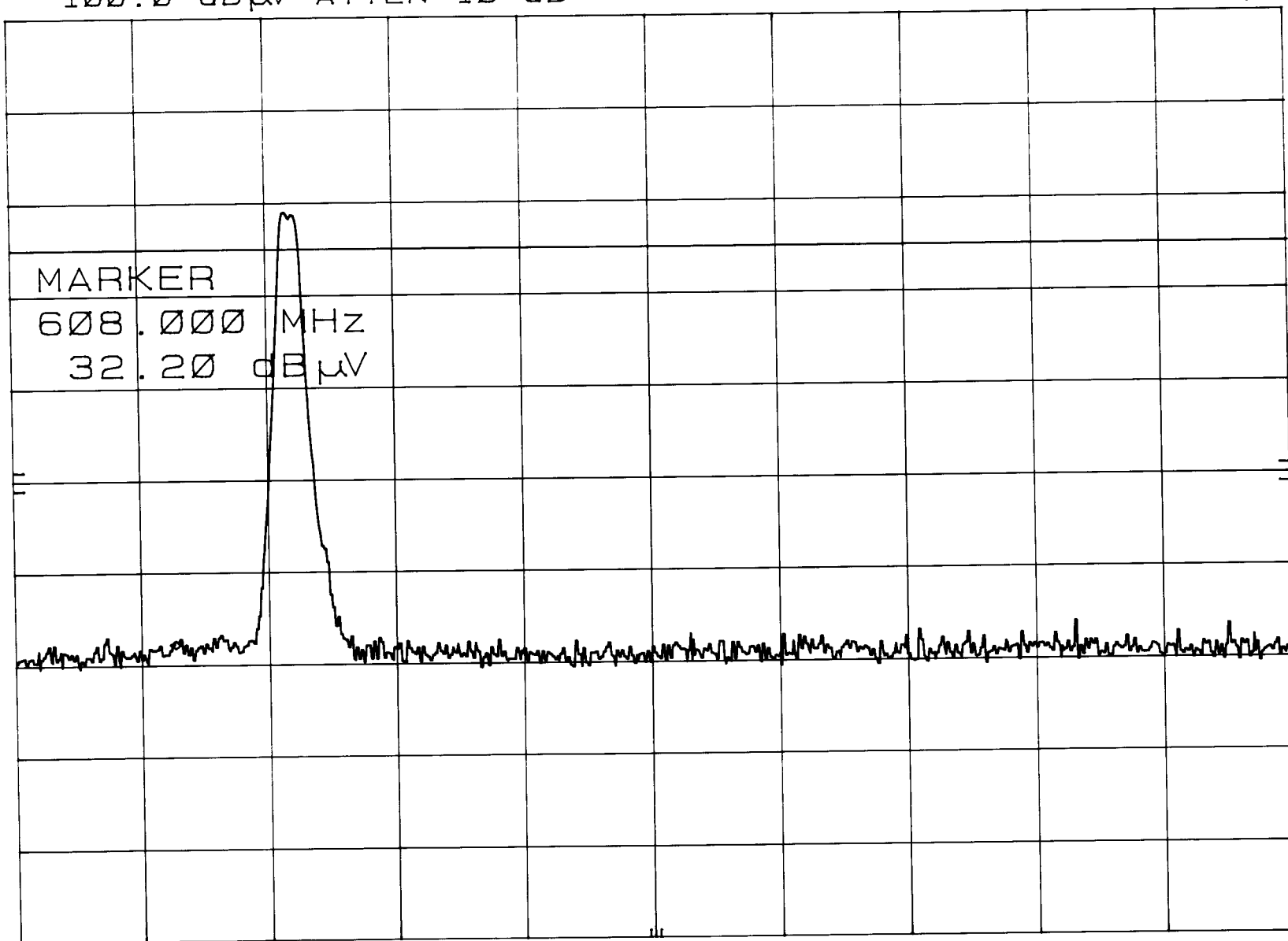
MARKER
608.000 MHz
32.20 dB μ V

CORR'D

START 607.00 MHz
RES BW 1 MHz

VBW 1 MHz

STOP 615.00 MHz
SWP 20.0 msec



BAND EDGE OF HIGH CHANNEL
REF 100.0 dB μ V ATTEN 10 dB

MKR 614.032 MHz
31.10 dB μ V

hp
10 dB/

DL
75.0
dB μ V

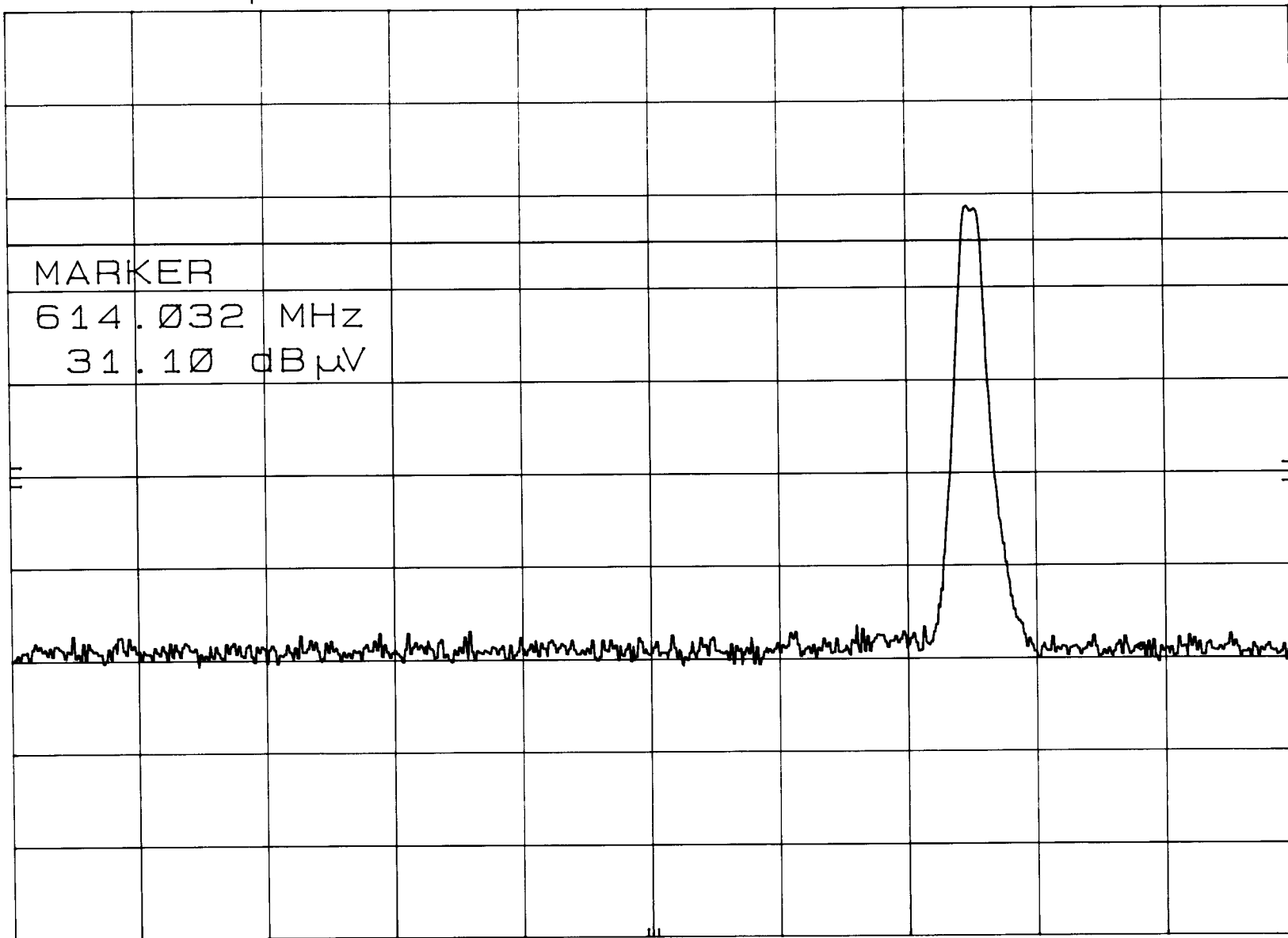
MARKER
614.032 MHz
31.10 dB μ V

CORR'D

START 607.00 MHz
RES BW 1 MHz

VBW 1 MHz

STOP 615.00 MHz
SWP 20.0 msec



RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.242)



COMPATIBLE
ELECTRONICS

COMPANY	VITALCOM	DATE	5/18/00
EUT	MEDICAL TRANSCEIVER	DUTY CYCLE	35.00 %
MODEL	DT4500	PEAK TO AVG	-9.12 dB
S/N	N/A	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)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
608.0000	32.2	32.1 Q	V	1.0	180	X	LOW	17.7	3.5	38.3	15.0	-31.0	46.0	BAND EDGE AT LOW CH.
614.0000	31.3	31.0 Q	V	1.0	180	X	LOW	17.7	3.5	38.3	13.9	-32.1	46.0	BAND EDGE AT HIGH CH.

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