MEDICAL DATA ELECTRONICS TEST REPORT

FOR THE

MEDICAL TRANSMITTER, DS-1

FCC PART 15 SUBPART C SECTIONS 15.242 AND 15.109

COMPLIANCE

DATE OF ISSUE: APRIL 9, 2002

PREPARED FOR:

Medical Data Electronics
12723 Wentworth Street
Arleta, CA 91331

P.O. No.: 592ML-144
W.O. No.: 78635

PREPARED BY:

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Date of test: April 8-9, 2002

Report No.: FC02-032

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	April 8-9, 2002
DATE OF RECEIPT:	April 8, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the Medical Transmitter, DS-1 with the requirements for FCC Part 15 Subpart C Sections 15.242 and 15.109 devices.
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	Medical Data Electronics 12723 Wentworth Street Arleta, CA 91331
REPRESENTATIVE:	Bill Costello
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92621

SUMMARY OF RESULTS

As received, the Medical Data Electronics Medical Transmitter, DS-1 was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart C Section 15.242
- FCC Part 15 Subpart B Section 15.109
- ANSI C63.4 (1992) method

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply. Conducted emissions not required for this device.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Manager of Engineering Services

Joyce Walker, Quality Assurance Administrative Manager

Septimiu Apahidean, EMC/Lab Manager

TEST PERSONNEL:

Eddie Wong, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The EUT tested by CKC Laboratories was a representative of a production unit. Medical ECG Telemetry Transmitter.

15.31(e) Voltage Variations
Not applicable to this device because it is battery powered.

15.31(m) Number Of Channels
This device can operate on 480 different channels from 608 to 614 MHz.

15.33(a) Frequency Ranges Tested
15.242 Radiated Emissions: 9 kHz – 7 GHz
15.109 Radiated Emissions: 30 MHz – 7 GHz

15.203 Antenna Requirements
The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Mode Of Operation

Eut Operating Frequency
The EUT was operating at 608-614 MHz.

EQUIPMENT UNDER TEST

Medical Transmitter
Manuf: Medical Data Electronics
Model: DS-1
Serial: 1402-1003
FCC ID: EHCDS1

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the Medical Transmitter, DS-1. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: Fundamental Highest Radiated Emission Levels - 15.242(c)

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
607.989	103.5	19.2	-28.1	5.3		99.9	106.0	-6.1	H-1
608.029	103.0	19.2	-28.1	5.3		99.4	106.0	-6.6	H-1
610.983	101.9	19.3	-28.0	5.3		98.5	106.0	-7.5	H-2
610.995	99.8	19.3	-28.0	5.3		96.4	106.0	-9.6	H-2
613.965	99.6	19.5	-28.0	5.4		96.5	106.0	-9.5	H-3
613.995	103.4	19.5	-28.0	5.4		100.3	106.0	-5.7	H-3

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.242(c)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
1 = 608 MHz
2 = 611 MHz
3 = 614 MHz

COMMENTS: See individual data sheets for test conditions.

Table 2: Six Highest Radiated Emission Levels - 15.242(c)

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
628.032	38.0	20.0	-27.9	5.4		35.5	46.0	-10.5	H-1
647.999	37.9	20.8	-27.8	5.5		36.4	46.0	-9.6	H-1
650.998	37.1	20.9	-27.8	5.5		35.7	46.0	-10.3	H-2
650.999	39.9	20.9	-27.8	5.5		38.5	46.0	-7.5	H-2
1215.914	56.3	24.2	-39.6	2.9		43.8	54.0	-10.2	H-1
3683.908	43.4	32.3	-37.5	6.2		44.4	54.0	-9.6	V-3

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.242(c)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
1 = 608 MHz
2 = 611 MHz
3 = 614 MHz

COMMENTS: See individual data sheets for test conditions.

Table 3: Six Highest Radiated Emission Levels - 15.109

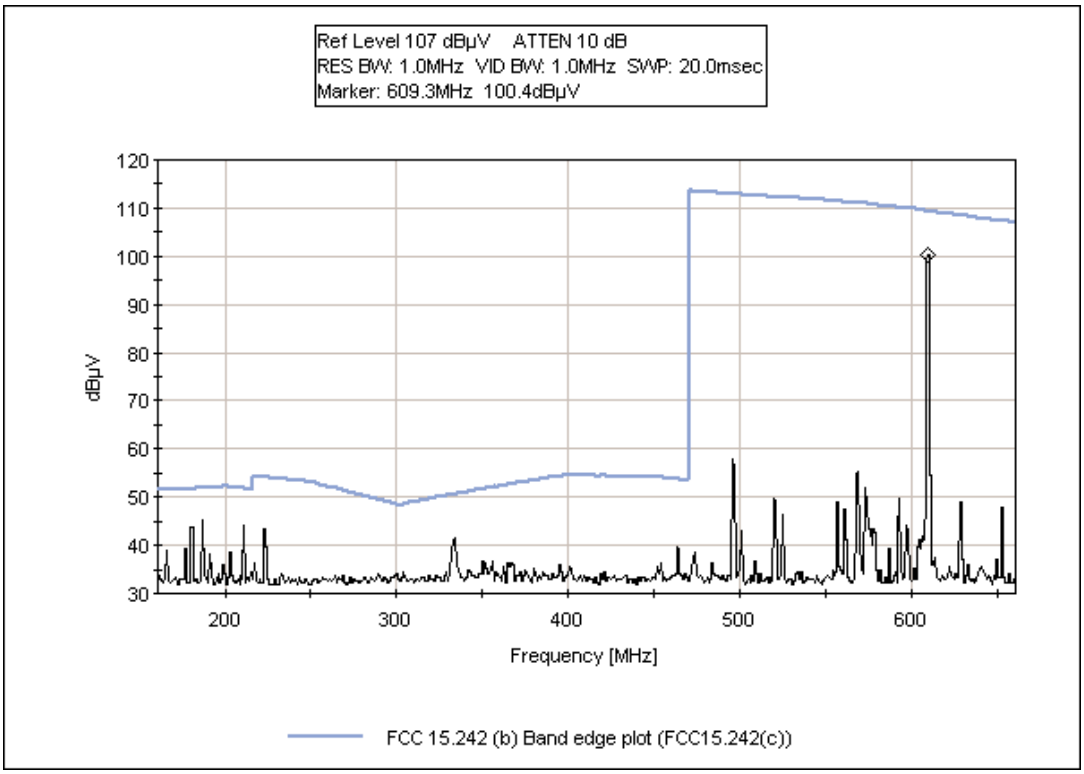
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
630.983	35.2	20.1	-27.9	5.4		32.8	46.0	-13.2	V
630.994	36.1	20.1	-27.9	5.4		33.7	46.0	-12.3	H
650.998	37.1	20.9	-27.8	5.5		35.7	46.0	-10.3	H
650.999	39.9	20.9	-27.8	5.5		38.5	46.0	-7.5	H
670.994	33.5	21.7	-27.9	5.5		32.8	46.0	-13.2	H
1221.987	55.8	24.2	-39.6	2.9		43.3	54.0	-10.7	H

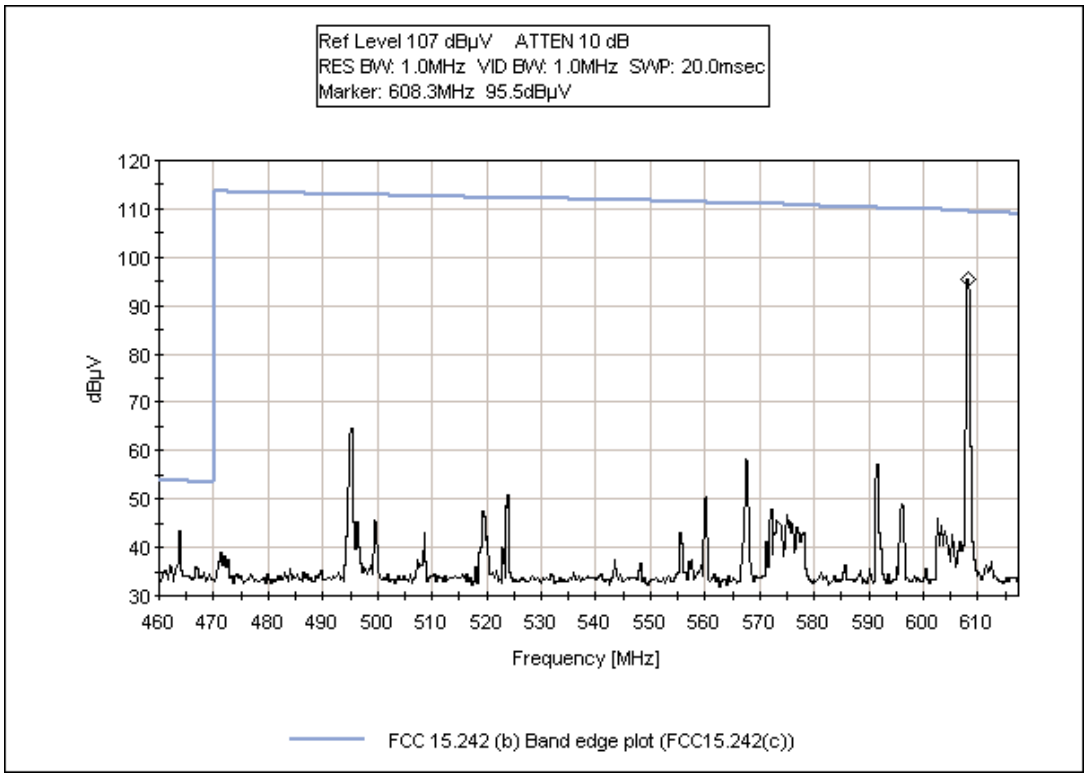
Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart B Section 15.109
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

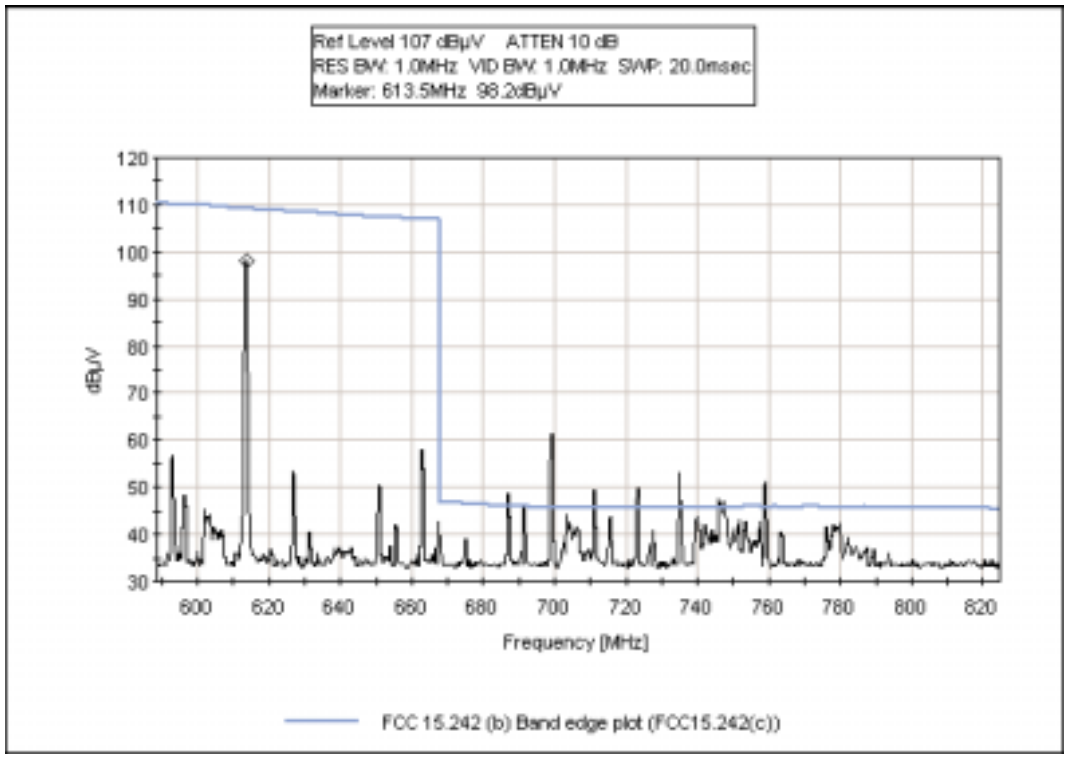
COMMENTS: Battery operated, handheld medical Transmitter placed on the wooden table. EUT is set in continuos transmission mode. All 4 patient leads connected to a simulator. TX= 611.00 MHz. Spec limit : 30-88 MHz = 100uV/m @3m = 40.0dBuV @3m. 88-216MHz = 150uV/m @3m = 43.dBuV @3m. 216-960MHz = 200uV/m @3m = 46.0dBuV @3m. Above 960 MHz = 500uV/m @3m = 54.0 dBuV @3m. Measurement BW 30MHz-1000MHz: RBW=VBW =120KHz 1000MHz-7000MHz: RBW=VBW=1MHz. 17°C, 66% relative humidity.

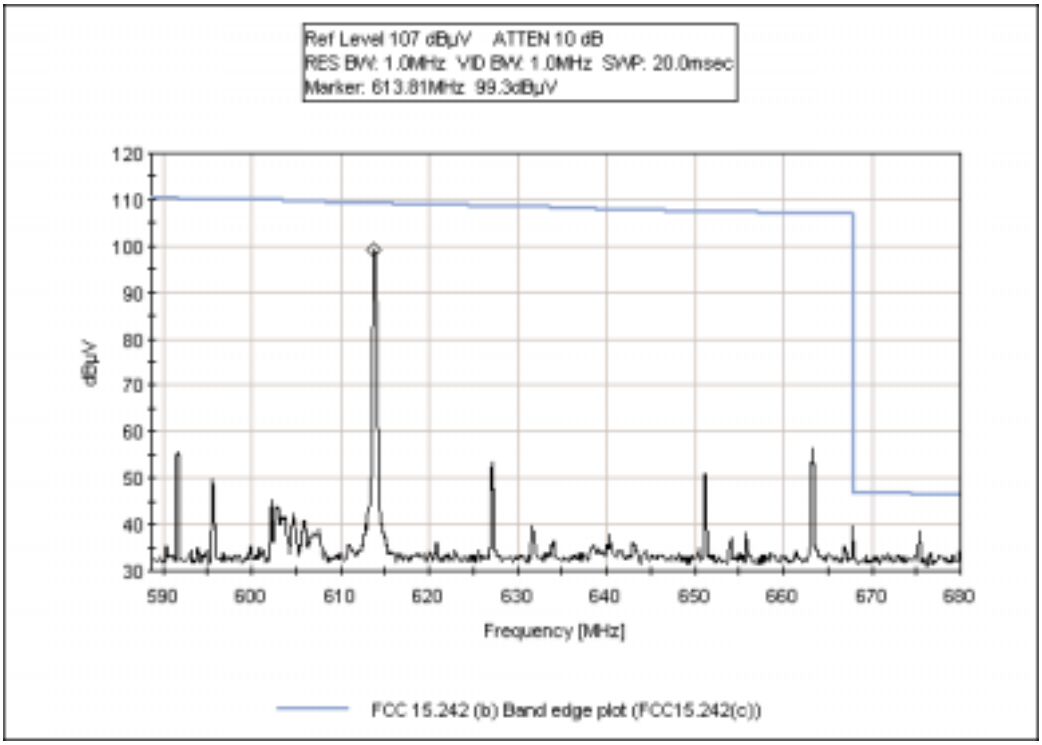
15.242(b) BAND EDGE PLOT – 608 MHz





15.242(b) BAND EDGE PLOT – 614 MHz





TEMPERATURE AND HUMIDITY DURING TESTING
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

MEASUREMENT UNCERTAINTY
Measurement uncertainty associated with data in this report is a ± 2.94dB for radiated emissions.

EUT SETUP
The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated emissions data of the Medical Transmitter, DS-1, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS
The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated emissions data for the Medical Transmitter, DS-1. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. The horn antenna was used for frequencies above 1000 MHz.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

FCC SECTION 15.35:
TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	7 GHz	1 MHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Medical Transmitter, DS-1.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

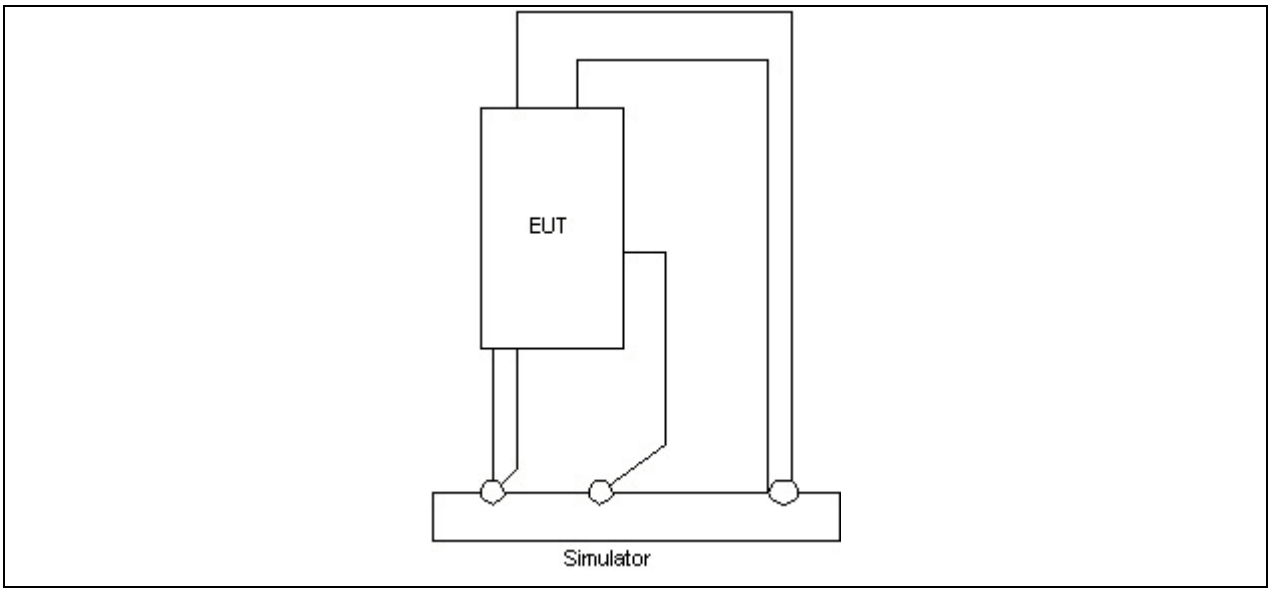
During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 88 MHz was scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. The frequency range of 100 to 300 MHz was then scanned in the same manner using the biconical antenna and the peaks recorded. Lastly, a scan of the FM band from 88 to 110 MHz was made, using a reduced resolution bandwidth and frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 to 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 to 1000 MHz was again scanned. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

APPENDIX A

TEST SETUP DIAGRAM AND PHOTOGRAPHS

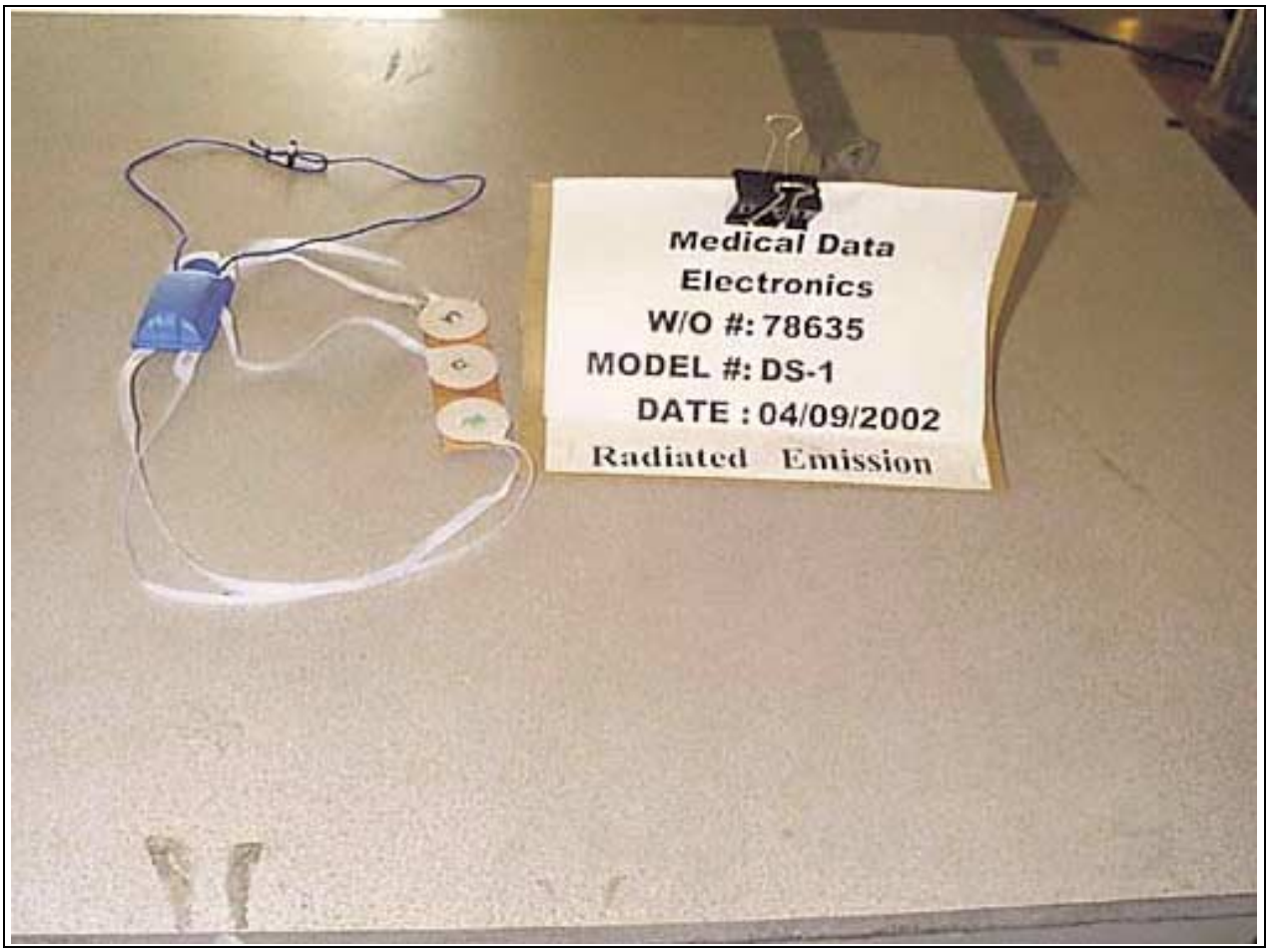
EQUIPMENT TEST SETUP DIAGRAM



PHOTOGRAPH SHOWING RADIATED EMISSIONS

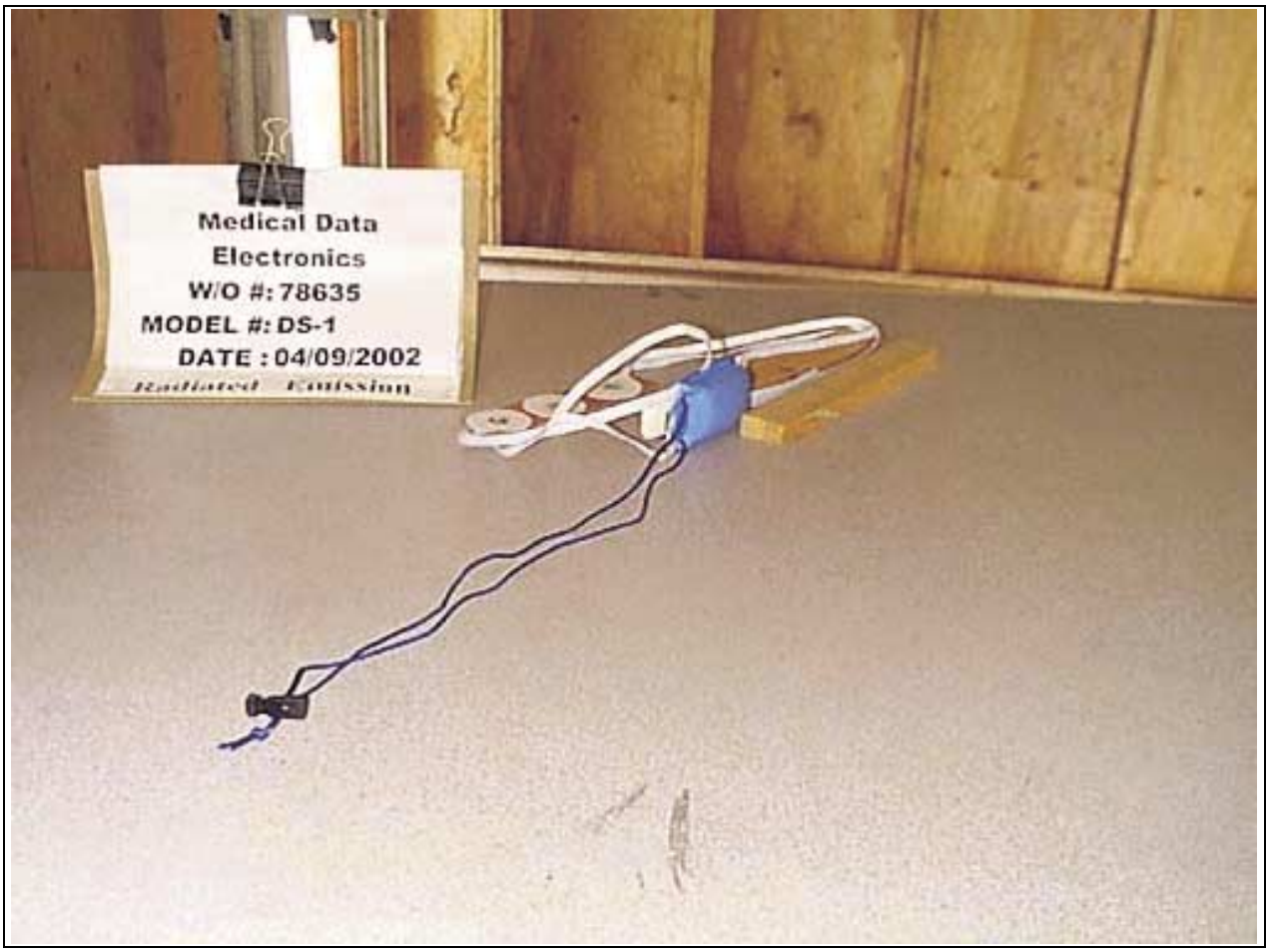
Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Side View

APPENDIX B

TEST EQUIPMENT LIST

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
9kHz-30 MHz						
Active loop antenna	2014	Emco	6502	2014	073101	073102
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
30 MHz- 1000MHz						
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
Bicon Antenna	306	AH	SAS200/540	220	092401	092402
Log Periodic Antenna	331	AH	SAS 00/516	330	092401	092402
Pre-amp	00309	HP	8447D	1937A02548	090501	090502
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
Pre-amp to SA cable	NA	Harbour	RG223/U	Cable#10	071601	071602
1000MHz-7000MHz						
Horn Antenna	0849	EMCO	3115	6246	091201	091202
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202
¼" Heliax Coaxial Cable	NA	Andrew	LDF1-50	Cable#18 (70 ft)	091101	091102
1.5 GHz HPF	01415	HP	8400-80037	3643A00026	030502	030503

APPENDIX C: MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Medical Data Electronics**
Specification: **FCC 15.242 (c)(15.209) >30 MHz**
Work Order #: **78635** Date: 04/09/2002
Test Type: **Maximized Emissions** Time: 10:25:43
Equipment: **Medical Transmitter** Sequence#: 2
Manufacturer: Medical Data Electronics Tested By: Eddie Wong
Model: DS-1
S/N: 1402-1003

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Medical Transmitter*	Medical Data Electronics	DS-1	1402-1003

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Battery operated, handheld medical Transmitter placed on the wooden table. EUT is set in continuos transmission mode. All 4 patient leads connected to a simulator TX= 608.012 MHz. Spec limit: Fundamental: 200mV/m at 3 meter = 106 dBuV. Out of band: 0.009-0.490 MHz = 2400/F(kHz) uV/m @ 300m = 48.5dBuV - 13.8dBuV @300m. 0.490-1.705 MHz = 24000/F(kHz) uV/m @30m = 33.8dBuV - 22.9dBuV @30m. 1.705-30 MHz = 30uV/m @ 30m = 29.5dBuV @30m. 30-88 MHz = 100uV/m @3m = 40.0dBuV @3m. 88-216MHz = 150uV/m @3m = 43.5dBuV @3m. 216-960MHz = 200uV/m @3m = 46.0dBuV @3m. Above 960 MHz = 500uV/m @3m = 54.0dBuV @3m. Measurement BW 9-150 kHz: RBW=VBW=200KHz. 150KHz-30 MHz: RBW=VBW=9kHz. 30MHz-1000MHz: RBW=VBW=120kHz. 1000MHz-7000MHz: RBW=VBW=1MHz. 17°C, 66% relative humidity.

Transducer Legend:

T1=15.31 40dB/Dec Correction	T2=Active Loop Antenna
T3=Bicon 092401	T4=Log 331 092401
T5=Cable #10 071601	T6=Cable #15 120602
T7=Preamp 8447D 090501	T8=Horn Antenna sn6246
T9=Heliax #18 70' 11Sept2001	T10=HP3017A sn3123A00281 11-Sept-01
T11=1.5GHz High Pass Filter, A/N 01415	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	607.989M	103.5	+0.0 +0.4 +0.0	+0.0 +4.9 +0.0	+0.0 -28.1 +0.0	+19.2 +0.0	+0.0	99.9	106.0 Fundamental	-6.1	Horiz
2	608.029M	103.0	+0.0 +0.4 +0.0	+0.0 +4.9 +0.0	+0.0 -28.1 +0.0	+19.2 +0.0	+0.0	99.4	106.0 Fundamental, third orthogonal side	-6.6	Horiz
3	647.999M	37.9	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.8 +0.0	+0.0	36.4	46.0	-9.6	Horiz

4	1215.914M	56.3	+0.0 +0.0 +2.9	+0.0 +0.0 -39.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0	43.8	54.0	-10.2	Horiz
5	628.032M	38.0	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -27.9 +0.0	+20.0 +0.0	+0.0	35.5	46.0	-10.5	Horiz
6	648.019M	35.7	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.8 +0.0	+0.0	34.2	46.0 Third orthogonal side	-11.8	Horiz
7	647.989M	35.6	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.8 +0.0	+0.0	34.1	46.0	-11.9	Vert
8	668.000M	34.1	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.9 +0.0	+21.5 +0.0	+0.0	33.2	46.0	-12.8	Horiz
9	607.985M	96.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0	+0.0	92.9	106.0 Fundamental	-13.1	Vert
10	303.997M	35.1	+0.0 +0.3 +0.0	+0.0 +3.3 +0.0	+0.0 -28.3 +0.0	+22.2 +0.0	+0.0	32.6	46.0	-13.4	Horiz
11	628.009M	34.7	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -27.9 +0.0	+20.0 +0.0	+0.0	32.2	46.0	-13.8	Vert
12	660.016M	31.4	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+21.3 +0.0	+0.0	30.4	46.0	-15.6	Horiz
13	1824.033M	46.8	+0.0 +0.0 +3.6	+0.0 +0.0 -38.5	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0	38.3	54.0	-15.7	Vert
14	768.110M	30.0	+0.0 +0.5 +0.0	+0.0 +5.6 +0.0	+0.0 -27.8 +0.0	+21.9 +0.0	+0.0	30.2	46.0	-15.8	Vert
15	1824.020M	46.5	+0.0 +0.0 +3.6	+0.0 +0.0 -38.5	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0	38.0	54.0	-16.0	Horiz
16	2843.670M	40.0	+0.0 +0.0 +4.6	+0.0 +0.0 -38.0	+0.0 +0.0 +0.7	+0.0 +29.3	+0.0	36.6	54.0	-17.4	Vert
17	303.990M	30.8	+0.0 +0.3 +0.0	+0.0 +3.3 +0.0	+0.0 -28.3 +0.0	+22.2 +0.0	+0.0	28.3	46.0	-17.7	Vert
18	624.006M	30.8	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -28.0 +0.0	+19.9 +0.0	+0.0	28.1	46.0	-17.9	Horiz
19	587.998M	31.8	+0.0 +0.4 +0.0	+0.0 +4.8 +0.0	+0.0 -28.2 +0.0	+18.7 +0.0	+0.0	27.5	46.0	-18.5	Horiz
20	1216.014M	47.2	+0.0 +0.0 +2.9	+0.0 +0.0 -39.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0	34.7	54.0	-19.3	Vert

21	3648.069M	30.1	+0.0 +0.0 +6.2	+0.0 +0.0 -37.5	+0.0 +0.0 +1.0	+0.0 +31.3	+0.0	31.1	54.0	-22.9	Horiz
22	227.006M	30.3	+0.0 +0.3 +0.0	+0.0 +2.7 +0.0	+17.4 -28.3	+0.0 +0.0	+0.0	22.4	46.0	-23.6	Horiz
23	1808.813M	37.8	+0.0 +0.0 +3.6	+0.0 +0.0 -38.5	+0.0 +0.0 +0.5	+0.0 +25.7	+0.0	29.1	54.0	-24.9	Horiz
24	3.208M	19.6	-40.0 +0.0 +0.0	+11.3 +0.3 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0	+0.0	-8.8	29.5	-38.3	None

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Medical Data Electronics**
Specification: **FCC 15.242 (c)(15.209) >30 MHz**
Work Order #: **78635** Date: 04/09/2002
Test Type: **Maximized Emissions** Time: 10:19:06
Equipment: **Medical Transmitter** Sequence#: 3
Manufacturer: Medical Data Electronics Tested By: Eddie Wong
Model: DS-1
S/N: 1402-1003

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Medical Transmitter*	Medical Data Electronics	DS-1	1402-1003

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Battery operated, handheld medical Transmitter placed on the wooden table. EUT is set in continuos transmission mode. All 4 patient leads connected to a simulator. TX= 611.00 MHz. Spec limit: Fundamental: 200mV/m at 3 meter = 106 dBuV. Out of band: 0.009-0.490 MHz = 2400/F(kHz) uV/m @ 300m = 48.5dBuV - 13.8dBuV @300m. 0.490-1.705 MHz = 24000/F(kHz) uV/m @30m = 33.8dBuV - 22.9dBuV @30m. 1.705-30 MHz = 30uV/m @ 30m = 29.5dBuV @30m. 30-88 MHz = 100uV/m @3m = 40.0dBuV @3m. 88-216MHz = 150uV/m @3m = 43.5dBuV @3m. 216-960MHz = 200uV/m @3m = 46.0 dBuV @3m. Above 960 MHz = 500uV/m @3m = 54.0dBuV @3m. Measurement BW 9-150 kHz: RBW=VBW=200kHz. 150KHz-30 MHz: RBW=VBW=9kHz. 30MHz-1000MHz: RBW=VBW=120KHz. 1000MHz-7000MHz: RBW=VBW=1MHz. 17°C, 66% relative humidity.

Transducer Legend:

T1=15.31 40dB/Dec Correction	T2=Active Loop Antenna
T3=Bicon 092401	T4=Log 331 092401
T5=Cable #10 071601	T6=Cable #15 120602
T7=Preamp 8447D 090501	T8=Horn Antenna sn6246
T9=Heliax #18 70' 11Sept2001	T10=HP3017A sn3123A00281 11-Sept-01
T11=1.5GHz High Pass Filter, A/N 01415	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	650.999M	39.9	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.9 +0.0	+0.0	38.5	46.0	-7.5	Horiz
2	610.983M	101.9	+0.0 +0.4 +0.0	+0.0 +4.9 +0.0	+0.0 -28.0 +0.0	+19.3 +0.0	+0.0	98.5	106.0 Fundamental	-7.5	Horiz
3	610.995M	99.8	+0.0 +0.4 +0.0	+0.0 +4.9 +0.0	+0.0 -28.0 +0.0	+19.3 +0.0	+0.0	96.4	106.0 Fundamental, third orthogonal side	-9.6	Horiz

4	650.998M	37.1	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.9 +0.0	+0.0	35.7	46.0 Third orthogonal side	-10.3	Horiz
5	1221.987M	55.8	+0.0 +0.0 +2.9	+0.0 +0.0 -39.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0	43.3	54.0	-10.7	Horiz
6	630.994M	36.1	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -27.9 +0.0	+20.1 +0.0	+0.0	33.7	46.0	-12.3	Horiz
7	610.976M	97.1	+0.0 +0.4 +0.0	+0.0 +4.9 +0.0	+0.0 -28.0 +0.0	+19.3 +0.0	+0.0	93.7	106.0 Fundamental	-12.3	Vert
8	670.994M	33.5	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.9 +0.0	+21.7 +0.0	+0.0	32.8	46.0	-13.2	Horiz
9	630.983M	35.2	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -27.9 +0.0	+20.1 +0.0	+0.0	32.8	46.0	-13.2	Vert
10	305.476M	33.6	+0.0 +0.3 +0.0	+0.0 +3.3 +0.0	+0.0 -28.3 +0.0	+22.1 +0.0	+0.0	31.0	46.0	-15.0	Horiz
11	659.983M	30.9	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+21.2 +0.0	+0.0	29.8	46.0	-16.2	Horiz
12	1832.972M	45.9	+0.0 +0.0 +3.6	+0.0 +0.0 -38.4	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0	37.5	54.0	-16.5	Vert
13	305.504M	31.8	+0.0 +0.3 +0.0	+0.0 +3.3 +0.0	+0.0 -28.3 +0.0	+22.1 +0.0	+0.0	29.2	46.0	-16.8	Vert
14	1221.993M	49.6	+0.0 +0.0 +2.9	+0.0 +0.0 -39.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0	37.1	54.0	-16.9	Vert
15	651.000M	30.0	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.8 +0.0	+20.9 +0.0	+0.0	28.6	46.0	-17.4	Vert
16	1534.567M	46.2	+0.0 +0.0 +3.4	+0.0 +0.0 -38.8	+0.0 +0.0 +0.9	+0.0 +24.7	+0.0	36.4	54.0	-17.6	Horiz
17	670.986M	29.1	+0.0 +0.4 +0.0	+0.0 +5.1 +0.0	+0.0 -27.9 +0.0	+21.7 +0.0	+0.0	28.4	46.0	-17.6	Vert
18	620.950M	31.1	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -28.0 +0.0	+19.7 +0.0	+0.0	28.2	46.0	-17.8	Horiz
19	616.483M	31.2	+0.0 +0.4 +0.0	+0.0 +5.0 +0.0	+0.0 -28.0 +0.0	+19.6 +0.0	+0.0	28.2	46.0	-17.8	Horiz

20	213.454M	30.7	+0.0 +0.3 +0.0	+0.0 +2.7 +0.0	+17.1 -28.3 +0.0	+0.0 +0.0	+0.0	22.5	43.5	-21.0	Vert
21	1826.005M	39.0	+0.0 +0.0 +3.6	+0.0 +0.0 -38.4	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0	30.6	54.0	-23.4	Vert
22	18.750M	15.6	-40.0 +0.0 +0.0	+10.4 +0.8 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0	+0.0	-13.2	29.5	-42.7	None

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Customer: **Medical Data Electronics**
Specification: **FCC 15.242(c)**
Work Order #: **78635** Date: 04/09/2002
Test Type: **Maximized Emissions** Time: 10:12:00
Equipment: **Medical Transmitter** Sequence#: 1
Manufacturer: Medical Data Electronics Tested By: Eddie Wong
Model: DS-1
S/N: 1402-1003

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Medical Transmitter*	Medical Data Electronics	DS-1	1402-1003

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Battery operated, handheld medical Transmitter placed on the wooden table. EUT is set in continuos transmission mode. All 4 patient leads connected to a simulator. TX = 613.9875.000 MHz. Spec limit: Fundamental: 200mV/m at 3 meter = 106 dBuV. Out of band: 0.009-0.490 MHz = 2400/F(kHz) uV/m @ 300m = 48.5dBuV - 13.8dBuV @300m. 0.490-1.705 MHz = 24000/F(kHz) uV/m @30m = 33.8dBuV - 22.9dBuV @30m. 1.705-30 MHz = 30uV/m @ 30m = 29.5 dBuV @30m. 30-88 MHz = 100uV/m @3m = 40.0dBuV @3m. 88-216MHz = 150uV/m @3m = 43.5dBuV @3m. 216-960MHz = 200uV/m @3m = 46.0 dBuV @3m. Above 960 MHz = 500uV/m @3m = 54.0dBuV @3m. Measurement BW 9-150 kHz: RBW=VBW=200kHz. 150KHz-30 MHz: RBW=VBW=9kHz. 30MHz-1000MHz: RBW=VBW=120klHz. 1000MHz-7000MHz: RBW=VBW=1MHz. 17°C, 66% relative humidity.

Transducer Legend:

T1=15.31 40dB/Dec Correction	T2=Active Loop Antenna
T3=Log 331 092401	T4=Cable #10 071601
T5=Cable #15 120602	T6=Preamp 8447D 090501
T7=Horn Antenna sn6246	T8=Heliax #18 70' 11Sept2001
T9=HP3017A sn3123A00281 11-Sept-01	T10=1.5GHz High Pass Filter, A/N 01415

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	613.995M	103.4	+0.0 +5.0 +0.0	+0.0 -28.0 +0.0	+19.5 +0.0	+0.4 +0.0	+0.0	100.3	106.0 Fundamental, third orthogonal side	-5.7	Horiz
2	613.965M	99.6	+0.0 +5.0 +0.0	+0.0 -28.0	+19.5 +0.0	+0.4 +0.0	+0.0	96.5	106.0 Fundamental	-9.5	Horiz
3	3683.908M	43.4	+0.0 +0.0 -37.5	+0.0 +0.0 +0.9	+0.0 +31.4	+0.4 +6.2	+0.0	44.4	54.0	-9.6	Vert
4	654.006M	36.7	+0.0 +5.1 +0.0	+0.0 -27.8	+21.0 +0.0	+0.4 +0.0	+0.0	35.4	46.0	-10.6	Horiz

5	633.976M	36.3	+0.0 +5.0 +0.0	+0.0 -27.9	+20.3 +0.0	+0.4 +0.0	+0.0	34.1	46.0	-11.9	Horiz
6	1227.974M	52.9	+0.0 +0.0 -39.6	+0.0 +0.0	+0.0 +24.2	+0.0 +3.0	+0.0	40.5	54.0	-13.5	Vert
7	613.966M	95.5	+0.0 +5.0 +0.0	+0.0 -28.0	+19.5 +0.0	+0.4 +0.0	+0.0	92.4	106.0 Fundamental	-13.6	Vert
8	306.990M	34.3	+0.0 +3.3 +0.0	+0.0 -28.3	+21.9 +0.0	+0.3 +0.0	+0.0	31.5	46.0	-14.5	Horiz
9	3683.926M	38.1	+0.0 +0.0 -37.5	+0.0 +0.0 +0.9	+0.0 +31.4	+0.0 +6.2	+0.0	39.1	54.0	-14.9	Horiz
10	1227.880M	51.2	+0.0 +0.0 -39.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0 +3.0	+0.0	38.8	54.0	-15.2	Horiz
11	2845.362M	41.5	+0.0 +0.0 -38.0	+0.0 +0.0 +0.7	+0.0 +29.3	+0.0 +4.6	+0.0	38.1	54.0	-15.9	Vert
12	1841.965M	46.3	+0.0 +0.0 -38.4	+0.0 +0.0 +0.6	+0.0 +25.9	+0.0 +3.6	+0.0	38.0	54.0	-16.0	Horiz
13	1841.967M	46.1	+0.0 +0.0 -38.4	+0.0 +0.0 +0.6	+0.0 +25.9	+0.0 +3.6	+0.0	37.8	54.0	-16.2	Vert
14	653.982M	30.9	+0.0 +5.1 +0.0	+0.0 -27.8	+21.0 +0.0	+0.4 +0.0	+0.0	29.6	46.0	-16.4	Vert
15	633.980M	31.7	+0.0 +5.0 +0.0	+0.0 -27.9	+20.3 +0.0	+0.4 +0.0	+0.0	29.5	46.0	-16.5	Vert
16	1759.703M	45.6	+0.0 +0.0 -38.5	+0.0 +0.0 +0.4	+0.0 +25.6	+0.0 +3.6	+0.0	36.7	54.0	-17.3	Horiz
17	307.001M	31.5	+0.0 +3.3 +0.0	+0.0 -28.3	+21.9 +0.0	+0.3 +0.0	+0.0	28.7	46.0	-17.3	Vert
18	624.091M	28.3	+0.0 +5.0 +0.0	+0.0 -28.0	+19.9 +0.0	+0.4 +0.0	+0.0	25.6	46.0	-20.4	Vert
19	19.518M	15.3	-40.0 +0.8 +0.0	+10.3 +0.0	+0.0 +0.0	+0.0 +0.0	+0.0	-13.6	29.5	-43.1	None

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Medical Data Electronics**
Specification: **FCC 15.109 Class B**
Work Order #: **78635** Date: 04/09/2002
Test Type: **Maximized Emissions** Time: 10:19:06
Equipment: **Medical Transmitter** Sequence#: 3
Manufacturer: Medical Data Electronics Tested By: Eddie Wong
Model: DS-1
S/N: 1402-1003

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Medical Transmitter*	Medical Data Electronics	DS-1	1402-1003

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Battery operated, handheld medical Transmitter placed on the wooden table. EUT is set in continuos transmission mode. All 4 patient leads connected to a simulator. TX= 611.00 MHz. Spec limit : 30-88 MHz = 100uV/m @3m = 40.0dBuV @3m. 88-216MHz = 150uV/m @3m = 43.dBuV @3m. 216-960MHz = 200uV/m @3m = 46.0dBuV @3m. Above 960 MHz = 500uV/m @3m = 54.0 dBuV @3m. Measurement BW 30MHz-1000MHz: RBW=VBW=120KHz 1000MHz-7000MHz: RBW=VBW=1MHz. 17°C, 66% relative humidity.

Transducer Legend:

T1=Bicon 092401	T2=Log 331 092401
T3=Cable #10 071601	T4=Cable #15 120602
T5=Preamp 8447D 090501	T6=Horn Antenna sn6246
T7=Heliax #18 70' 11Sept2001	T8=HP3017A sn3123A00281 11-Sept-01
T9=1.5GHz High Pass Filter, A/N 01415	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	650.999M	39.9	+0.0 -27.8 +0.0	+20.9 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	38.5	46.0	-7.5	Horiz
2	650.998M	37.1	+0.0 -27.8 +0.0	+20.9 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	35.7	46.0 Third orthogonal side	-10.3	Horiz
3	1221.987M	55.8	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0 +2.9	+0.0 -39.6	+0.0	43.3	54.0	-10.7	Horiz
4	630.994M	36.1	+0.0 -27.9 +0.0	+20.1 +0.0	+0.4 +0.0	+5.0 +0.0	+0.0	33.7	46.0	-12.3	Horiz
5	670.994M	33.5	+0.0 -27.9 +0.0	+21.7 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	32.8	46.0	-13.2	Horiz

6	630.983M	35.2	+0.0 -27.9 +0.0	+20.1 +0.0	+0.4 +0.0	+5.0 +0.0	+0.0	32.8	46.0	-13.2	Vert
7	305.476M	33.6	+0.0 -28.3 +0.0	+22.1 +0.0	+0.3 +0.0	+3.3 +0.0	+0.0	31.0	46.0	-15.0	Horiz
8	659.983M	30.9	+0.0 -27.8 +0.0	+21.2 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	29.8	46.0	-16.2	Horiz
9	1832.972M	45.9	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0 +3.6	+0.0 -38.4	+0.0	37.5	54.0	-16.5	Vert
10	305.504M	31.8	+0.0 -28.3 +0.0	+22.1 +0.0	+0.3 +0.0	+3.3 +0.0	+0.0	29.2	46.0	-16.8	Vert
11	1221.993M	49.6	+0.0 +0.0 +0.0	+0.0 +24.2	+0.0 +2.9	+0.0 -39.6	+0.0	37.1	54.0	-16.9	Vert
12	651.000M	30.0	+0.0 -27.8 +0.0	+20.9 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	28.6	46.0	-17.4	Vert
13	1534.567M	46.2	+0.0 +0.0 +0.9	+0.0 +24.7	+0.0 +3.4	+0.0 -38.8	+0.0	36.4	54.0	-17.6	Horiz
14	670.986M	29.1	+0.0 -27.9 +0.0	+21.7 +0.0	+0.4 +0.0	+5.1 +0.0	+0.0	28.4	46.0	-17.6	Vert
15	620.950M	31.1	+0.0 -28.0 +0.0	+19.7 +0.0	+0.4 +0.0	+5.0 +0.0	+0.0	28.2	46.0	-17.8	Horiz
16	616.483M	31.2	+0.0 -28.0 +0.0	+19.6 +0.0	+0.4 +0.0	+5.0 +0.0	+0.0	28.2	46.0	-17.8	Horiz
17	213.454M	30.7	+17.1 -28.3 +0.0	+0.0 +0.0	+0.3 +0.0	+2.7 +0.0	+0.0	22.5	43.5	-21.0	Vert
18	1826.005M	39.0	+0.0 +0.0 +0.6	+0.0 +25.8	+0.0 +3.6	+0.0 -38.4	+0.0	30.6	54.0	-23.4	Vert