

TEST SPECIFICATION:

FCC "Rules and Regulations", Part 15, Subpart C
Sections 15.231 (a-d), 15.207 & 15.205

Intentional Radiators

Periodic operation in the band 40.6 – 40.77 MHz & above 70 MHz

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name: Lowrey Remote Control for SU Series Organs

Kind of Equipment: Hand-Held RF Remote Control

Test Configuration: No external cables.

Transmitter FCC ID: PU2935-44601-000

Model Number: 935-044601-000

Serial Number: NA

Dates of Test: May 18, 2001

Test Conducted For: Lowrey Organ Company

825 East 26th Street

LaGrange Park, Illinois 60526

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EMC Test Services
1250 Peterson Drive, Wheeling, Illinois 60090, USA

Report No. 9052

SIGNATURE PAGE

Report Written By:

Arnom C. Rowe



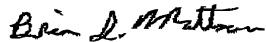
Test Engineer
EMC-001375-NE

Report Reviewed by:



Jack Prawica
Lab Manager

Report Approved by:



Brian J. Mattson
General Manager

Company Official:

Lowrey Organ Company

NVLAP Certificate of Accreditation available upon request.

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1.0 SUMMARY OF TEST REPORT

It was found that the Lowrey Remote Control for SU Series Organs S/N NA meets the radio interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.231 (a-d), 15.207 and 15.205 for Intentional Radiators operating in the 70 to 900 MHz Frequency Band with periodic operation.

This report contains the following number of pages.

Text, Data Summary & Charts: 46 pages

NOTE:

The conducted emissions test was not required because the EUT is powered from a DC power source. It does not have a line cord to plug into the A.C. power line.

2.0 INTRODUCTION

On May 18, 2001, a series of radio frequency interference measurements were performed on Hand-Held RF Remote Control, S/N NA. The tests were performed according to the procedures of FCC as stated in MP-1 "FCC Methods of Measurement for determining Compliance of Radio Control and Security Alarm Devices and Associated Receivers". Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.231 (a-d), 15.207 and 15.205 for Intentional Radiators operating in the 70 to 900 MHz Frequency Band with periodic operation.

4.0 TEST SET-UP

All conducted emission tests were performed in a shield enclosure or lab at D.L.S. electronic Systems, Inc. The conducted tests were performed with the test item placed on a non-conductive table located in the Test Room. The power line supplied was connected to a dual line impedance stabilization network located on the floor, a ground plane. The networks were constructed per the requirements of the American National Standards Institute, ANSI C63.4-1992, Section 4, (Figure2). The only ground supplied to the unit was through the third wire of the standard power cord when supplied.

All radiated emission tests were performed at D.L.S. Electronic Systems, Inc. The radiated tests were made with the test item placed on a non-conductive turntable located in the Test Room with the receive antenna placed three meters from the device under test. The equipment under test was set up according to ANSI C63.4-1992, Section 8, (Figures 9c and 9d).

5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the Peak or CISPR Detector Functions. This information was then used to determine the frequencies of maximum emissions. Manual measurements were performed on these frequencies using a peak detector function of the Receiver with the bandwidths specified by the FCC. Above 1000 MHz final data was taken using the Peak Detector.

Below 1000 MHz final data was taken using the fixed tuned receiver. Plots were made using the Peak Detector, with manual measurements made on the frequencies of interest, using the Peak, CISPR, and Average Detector Functions of the receiver. When average measurements were made using the fixed tuned receiver, the average was taken of a linear IF signal as specified by FCC and ANSI C63.4-1992.

The fundamental frequency was measured using the Average Detector and the CISPR Detector was used for measuring the Harmonics as stated in Section 15.209. From 10 kHz to 30 MHz a bandwidth of 9 kHz was used. From 30 MHz to 1000 MHz a bandwidth of 120 kHz was used and above 1000 MHz, a bandwidth of 1 MHz was used to ensure proper measurement of the narrowband signal.

A list of the equipment used can be found in Table 1. All equipment was calibrated per the instruction manuals supplied by the manufacturer.



6.0 CONDUCTED EMISSION MEASUREMENTS

The conducted emissions were measured over the frequency range from .45 MHz to 30 MHz in accordance with the power line measurements. As specified in ANSI C63.4-1992. Since the device is operated from the public utility lines, the 120 vac 60 Hz power leads, high and low sides, were measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. All signals were then recorded. The allowed levels for Intentional Radiators can not exceed 250 uV (47.96 dBuV) at any frequency between 450 kHz and 30 MHz, as stated in Section 15.207a.

NOTE:

The conducted emissions test was not required because the EUT is powered from a DC power source. It does not have a line cord to plug into the A.C. power line.



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CONDUCTED DATA TAKEN DURING TESTING

PART 15.207

NOTE:

The conducted emissions test was not required because the EUT is powered from a DC power source. It does not have a line cord to plug into the A.C. power line.



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CONDUCTED GRAPHS TAKEN DURING TESTING

PART 15.207

NOTE:

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7.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS

The allowed radiated emissions for transmitters of this type can not exceed the following field strength limits at a distance of three meters as shown in Section 15.231b. The limits are show in the following table.

Fundamental Frequency in MHz	Field Strength of Fundamental (uV/m at 3m)	Field Strength of Harmonics (uV/m at 3m)
40.66 to 40.70	2250 (67.04 dBuV)	225 (47.04 dBuV)
70 to 130	1250 (61.94 dBuV)	125 (41.94 dBuV)
130 to 174	1250 (61.94 dBuV) to 3750 (71.48 dBuV)	125 (41.94 dBuV) to 375 (51.48 dBuV)
174 to 260	3750 (71.48 dBuV)	375 (51.48 dBuV)
260 to 470	3750 (71.48 dBuV) to 12500 (81.84 dBuV)	375 (51.48 dBuV) to 1250 (61.94 dBuV)
470 and above	12500 (81.84 dBuV)	1250 (61.94 dBuV)

NOTE:

As stated in 15.35b the 20 dB peak-to-average limit is applicable to all devices measured using an average detector.

For pulsed operation, the switches were set to generate its maximum “on” time, and measurements were made with the peak detector. As stated in Docket 86-422, the duty cycle of the pulse is determined from the total “on” time for the worst case condition during 100 msec. Using the percentage of the total “on” time over a 100 msec period, the total absolute average value was determined.



7.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (CON'T)

Preliminary radiation measurements were performed at a 3 meter test distance with the limits adjusted linearly when required. The frequency range from 9 kHz to over 960 MHz, depending upon the fundamental frequency as stated in Part 15.33a, was automatically scanned and plotted at various angles.

Measurements for the Lowrey Remote Control for SU Series Organs were made up to 5000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 418 MHz. For intentional radiators, the frequency range to be investigated is determined by the lowest radio frequency generated by the device without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency or 1000 MHz, whichever is lower.

At those frequencies where significant signals were detected, measurements were made at an open field test site, located at Genoa City, Wisconsin, FCC file number 31040/SIT, to determine the actual radiation levels.

All signals in the frequency range of 30 MHz to 200 MHz were measured with a Biconical Antenna or Tuned Dipoles as the pickup device. From 200 MHz to 1000 MHz, a Log Periodic or Tuned Dipoles were used, and above 1000 MHz a Double Ridge Horn Antenna was used. During the test, below 1000 MHz the equipment was rotated and the antenna was raised and lowered from 1 meter to 4 meters to find the maximum level. In order to find maximum emissions, the cables were moved through all the positions the equipment would be expected to experience in the field. Tests were made in both the horizontal and vertical planes of polarization with the Loop (rotated 360° around its vertical axis), Biconical and Log Periodic. The table was rotated to find the maximum emissions. Above 1000 MHz the antenna was set one meter off the ground plane and three meters from the test item. The table was rotated to find the maximum emissions.

When the equipment is out of limit at 3 meters, and the signals from the equipment at 30 meters cannot be recorded due to the background, a representative sample of these frequencies were measured at various distances such as 4, 5, 6, 8, 15 meters and the greatest distance that can be measured to demonstrate graphically that the emissions are dropping off and will be under the limit at the specified distance.



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**RADIATED DATA TAKEN FOR FUNDAMENTAL
EMISSION MEASUREMENTS**

PART 15.225



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EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB _P V/m	DELTA LIMIT dB
1 Max Peak	418.0400 MHz	86.39	
2 Average	418.0400 MHz	76.92	1.55dB

@ 3 meters Limit = 80 dB_PV/m

Title: Field Strength of Fundamental
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical, 1.1m Ant. Height, 315°
Date: 18.MAY.2001 13:29:27

$$\begin{aligned} & 86.39 \text{ dB}_P V/m \\ & - 7.94 \text{ dB doff} \\ & \hline & 78.45 \text{ dB}_P V/m \\ & \hline & = 1.55 \text{ dB Margin} \end{aligned}$$

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ESI #503

EDIT PEAK LIST			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB

Title: 30 - 100 MHz *RADIATED EMISSIONS*
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 13:48:09

No Significant Emissions Found in this
Frequency Range

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB

Title: 100 - 200 MHz RADIATED EMISSIONS
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 13:43:05

No Significant Emissions Found in this
Frequency Range

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EST #503

EDIT PEAK LIST (Final) Measurement Results			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB _P V/m	DELTA LIMIT dB

Title: 200 - 500 MHz (not including Fundamental)
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 17.MAY.2001 11:37:07

No Significant Emissions Found in this
Frequency Range

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	---	Trace2:	FCC3MB
Trace3:	---	Trace4:	---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
1 Max Peak	836.1000 MHz	57.83	10.11 dB
2 Average	836.1000 MHz	48.25	2.25

1.1 m, 135°

@ 3 meters Limit = 60 dB μ V/m

Title: 500 - 1000 MHz Radiated Emissions
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 13:00:59

57.83 dB μ V/m
- 7.94 dB dcl
49.89 dB μ V/m
= 10.11 dB margin

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: FCC3MB	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
1 Max Peak	1.2541 GHz	49.72	18.22 dB
2 Average	1.2541 GHz	39.51	-14.48
1 Max Peak	1.6722 GHz	49.58	12.36 dB
2 Average	1.6722 GHz	39.10	-14.89

@ 3 meters

1 m, 225°
1.2 m, 225°

Title: 1 - 2 GHz RADIATED EMISSIONS
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 11:44:22

①

$$\begin{aligned} \text{Limit} &= 60 \text{ dB}_{\mu}\text{V/m} \\ 49.72 \text{ dB}_{\mu}\text{V/m} \\ - 7.94 \text{ dB dcef} \\ \hline 41.78 \text{ dB}_{\mu}\text{V/m} \\ = 18.22 \text{ dB margin} \end{aligned}$$

②

$$\begin{aligned} \text{Restricted Band Limit} &= 54 \text{ dB}_{\mu}\text{V/m} \\ 49.58 \text{ dB}_{\mu}\text{V/m} \\ - 7.94 \text{ dB dcef} \\ \hline 41.64 \text{ dB}_{\mu}\text{V/m} \\ = 12.36 \text{ dB margin} \end{aligned}$$

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: FCC3MB	Trace3: ---	Trace4: ---
①	TRACE	FREQUENCY	LEVEL dB μ V/m
②	2 Max Peak	2.0903 GHz	44.92
③	2 Max Peak	2.5083 GHz	51.41
④	2 Max Peak	2.9264 GHz	58.04
		3.3444 GHz	52.17

(Margin dB)

@ 1 meter

Limit = 69.54 dB μ V/m

Title: 2 - 5 GHz RADIATED EMISSIONS (PEAK DETECTOR)

Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 10:18:06

①	②	③	④
44.92 dB μ V/m	51.41 dB μ V/m	58.04 dB μ V/m	52.17 dB μ V/m
- 7.94 dB decf			
36.98 dB μ V/m	43.47 dB μ V/m	50.10 dB μ V/m	44.23 dB μ V/m

= 32.56 dB margin = 26.07 dB margin = 19.44 dB margin = 25.31 dB margin

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: FCC3MB	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
2 Average	2.0903 GHz	34.30	-19.69
2 Average	2.5083 GHz	41.31	-12.68
2 Average	2.9264 GHz	47.87	-6.12
2 Average	3.3444 GHz	41.45	-12.55

Title: 2 - 5 GHz RADIATED EMISSIONS (AVERAGE DETECTOR)
Comment A: Lowrey, Hand Held Remote
Comment B: Vertical
Date: 18.MAY.2001 10:44:12

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ESI #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	---	Trace2:	---
Trace3:	---	Trace4:	---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
1 Max Peak	418.0400 MHz	87.72	0.22 dB
2 Average	418.0400 MHz	78.04	

@ 3 meters Limit = 80 dB μ V/m

Title: Field Strength of Fundamental
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal, 2.2m Ant. Height, 90°
Date: 18.MAY.2001 13:20:49

87.72 dB μ V/m
- 7.94 dB dclcf
79.78 dB μ V/m
= 0.22 dB Margin

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EST #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB _μ V/m	DELTA LIMIT dB

Title: 30 - 100 MHz RADIATED EMISSIONS
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 18.MAY.2001 13:58:30

No Significant Emissions Found in this
Frequency Range

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ESI #503

EDIT PEAK LIST			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB

Title: 100 - 200 MHz RADIATED EMISSIONS
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 17.MAY.2001 10:43:05

No Significant Emissions Found in this
Frequency Range

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EST #503

EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB _u V/m	DELTA LIMIT dB

RADIATED EMISSIONS

Title: 200 - 500 MHz (not including Fundamental)
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 17.MAY.2001 12:50:20

No Significant Emissions Found in this
Frequency Range

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EDIT PEAK LIST (Final Measurement Results)			
Trace1:	---	Trace2:	FCC3MB
Trace3:	---	Trace4:	---
TRACE	FREQUENCY	LEVEL dB _μ V/m	DELTA LIMIT dB
1 Max Peak	836.1000 MHz	59.48	3.82 (8.46)
2 Average	836.1000 MHz	49.82	1 m, 22.5° (MARGIN)

@ 3 meters Limit = 60 dB_μV/m

Title: 500 - 1000 MHz
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 18.MAY.2001 13:07:05

$$\begin{aligned} & 59.48 \text{ dB}_{\mu}\text{V/m} \\ & - 7.94 \text{ dB deep} \\ & 51.54 \text{ dB}_{\mu}\text{V/m} \\ & = \underline{8.46 \text{ dB margin}} \end{aligned}$$

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EDIT PEAK LIST (Final Measurement Results)				
Trace1: ---	Trace2: ---	Trace3: ---	Trace4: ---	
①	TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
②	1 Max Peak	1.6721 GHz	53.47	8.47 dB
	1 Max Peak	1.2544 GHz	53.03	14.91 dB
	2 Average	1.2541 GHz	45.43	
	2 Average	1.6726 GHz	41.43	

@ 3 meters

Title: 1 - 2 GHz RADIATED EMISSIONS
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 18.MAY.2001 09:25:39

① Restricted Band
Limit = 54 dB μ V/m
53.47 dB μ V/m
- 7.94 dB
45.53 dB μ V/m
= 8.47 dB margin

② Limit = 60 dB μ V/m
53.03 dB μ V/m
- 7.94 dB
45.09 dB μ V/m
= 14.91 dB margin

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EDIT PEAK LIST (Final Measurement Results)			
Trace1:	---	Trace2:	FCC3MB
Trace3:	---	Trace4:	---
①	TRACE	FREQUENCY	LEVEL dB _μ V/m
②	2 Max Peak	2.0903 GHz	46.73
③	2 Max Peak	2.5083 GHz	52.51
④	2 Max Peak	2.9264 GHz	59.15
④	2 Max Peak	3.3444 GHz	50.13
			-7.27 (30.75) -1.49 (24.97) 5.15 (18.33) -3.86 (27.35)
			1m, 225° 1m, 315° 1m, 135° 1m, 315°
			(MARGIN dB)
			④ @ 1 meter Limit = 69.54 dB _μ V/m

Title: 2 - 5 GHz RADIATED EMISSIONS (PEAK)
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 18.MAY.2001 09:59:53

①	②	③	④
46.73 dB _μ V/m - 7.94 dB doctf 38.79 dB _μ V/m = 30.75 dB margin	52.51 dB _μ V/m - 7.94 dB doctf 44.57 dB _μ V/m = 24.97 dB margin	59.15 dB _μ V/m - 7.94 dB doctf 51.21 dB _μ V/m = 18.33 dB margin	50.13 dB _μ V/m - 7.94 dB doctf 42.19 dB _μ V/m = 27.35 dB margin

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: ---	Trace2: FCC3MB	Trace3: ---	Trace4: ---
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB
2 Average	2.0903 GHz	36.21	-17.78
2 Average	2.5083 GHz	42.66	-11.33
2 Average	2.9264 GHz	50.02	-3.97
2 Average	3.3444 GHz	40.18	-13.81

Title: 2 - 5 GHz RADIATED EMISSIONS (AVERAGE)
Comment A: Lowrey, Hand Held Remote
Comment B: Horizontal
Date: 18.MAY.2001 10:53:58

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8.0 PULSED OPERATION (Duty Cycle Correction Factor)

The radiated emission measurements made at D.L.S. Electronic Systems, Inc., for the Lowrey Remote Control for SU Series Organs, Model Number 935-044601-000, are shown by the graphs on the following pages. The actual total on time during the 100 msec is **40.08 msec** with a total off time of 59.92 msec resulting in a **7.96 Duty Cycle Correction Factor**.

FCC Part 15, Section 15.231b, states that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission, but in no case less than 10 seconds.

To find the actual total on time during the 100 msec period, the data word “on” time, 4.008016 msec is multiplied by 10 (the number of data words per 100 msec), yielding 40.08 msec (actual on time). Taking this number and dividing it by the 100 msec period gives us 0.40. We then take the Log of 0.40 and multiply it by 20. This gives us a **7.96 dB Duty Cycle Correction Factor**.

The following method was used to determine the Duty Cycle Correction Factor:

Total on time during 100 msec.

4.008016 usec on time + 0 usec additional bit on time = 4.008016 msec (data word on time)

4.008016 usec (data on time) * 10 (number of data words per 100 msec) = 40.08 msec total on time

40.08 msec (total on time) / 100 msec = 0.40 Duty Cycle

20*LOG10 0.40 = 7.96 dB Duty Cycle Correction Factor

NOTE:

As stated in Section 6.5, a maximum of 20 dB can be used.

See the following pages for the graphs of the actual measurements that were made:



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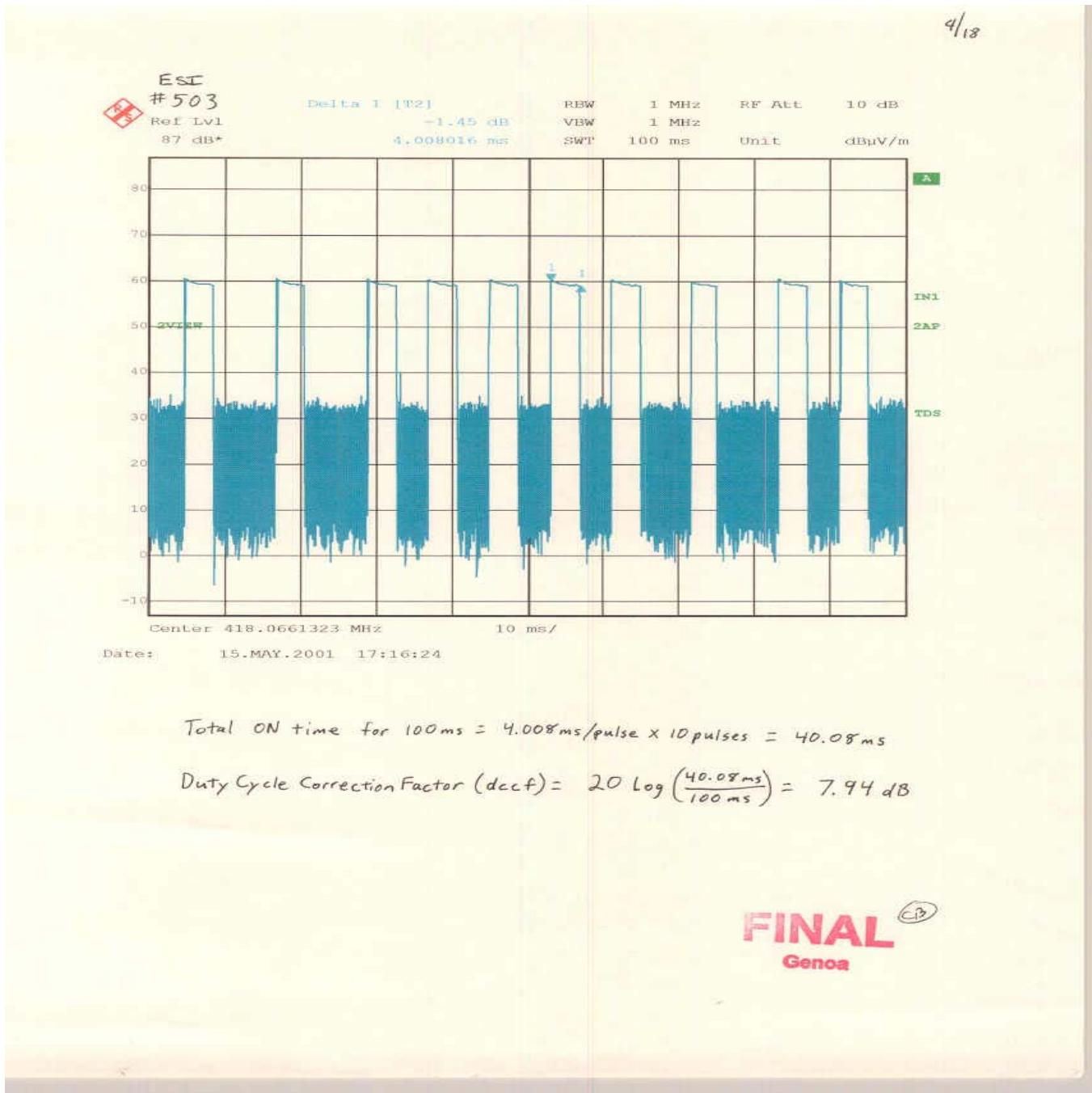
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PULSED OPERATION CHARTS TAKEN DURING TESTING

PART 15.231

GRAPHS TAKEN OF THE PULSE TRAIN SHOWING THE FOLLOWING:

1. NUMBER OF BITS PER DATA WORD
2. NUMBER OF PULSES PER 100 MSEC
3. OFF TIME BETWEEN DATA WORDS
4. DATA WORD ON TIME



9.0 BANDWIDTHS

The bandwidth of the transmitter shall be confined to the following specifications as specified in Section 15.231c & d:

40.66 to 40.7 MHz	±.01% within the band edges
70.00 to 900 MHz	.25% of the center frequency
Above 900 MHz	.50% of the center frequency

The bandwidth is determined at the points 20 dB down from the modulated carrier.

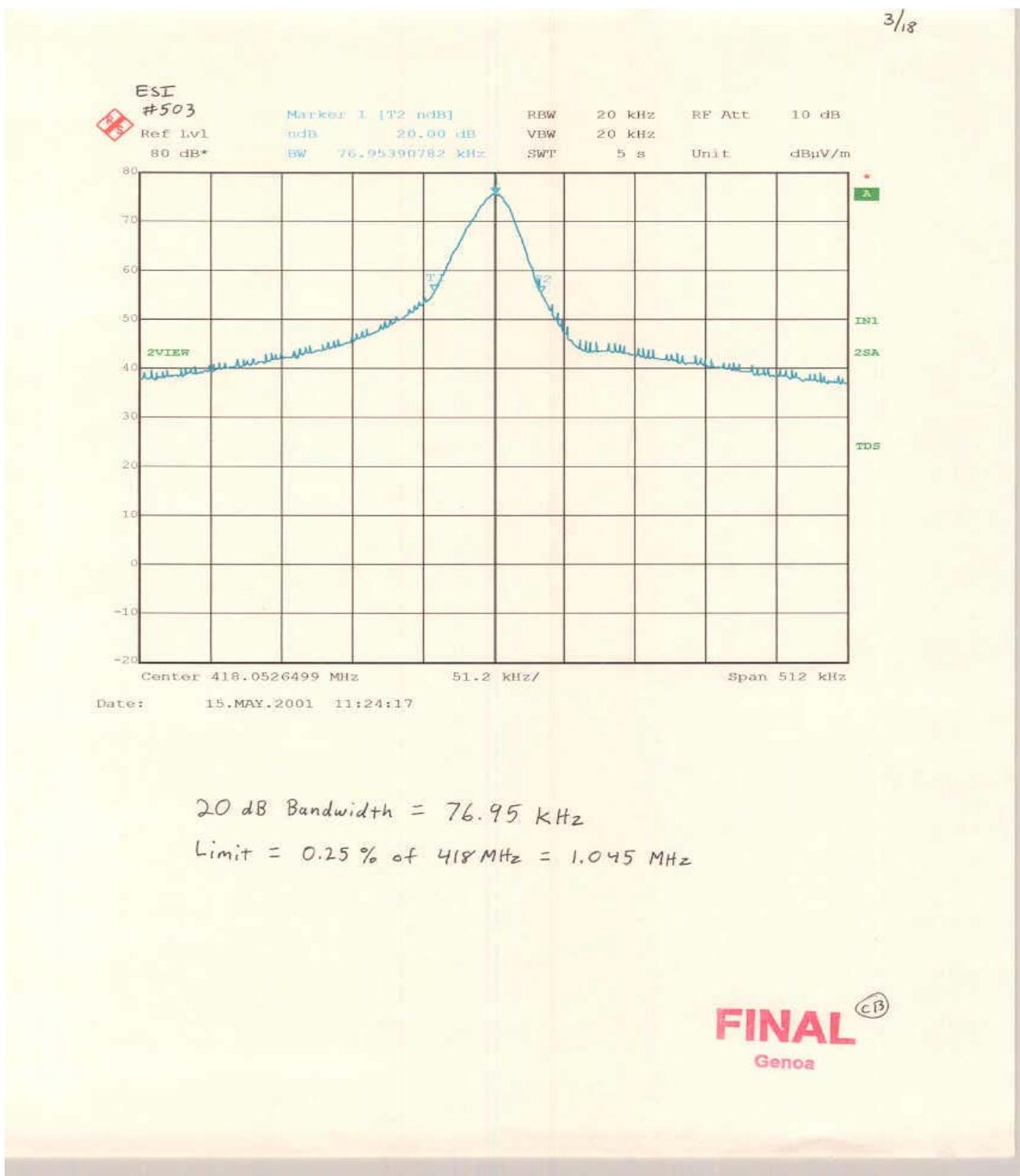
As shown by the graph on the following page, the bandwidth for the Lowrey Remote Control for SU Series Organs was measured at **76.95 kHz**, which meets the above specification. With a fundamental frequency of **418 MHz**, the FCC Bandwidth limit is **1.045 MHz** MHz when multiplying the fundamental by **.25%**.



EMC Test Services
1250 Peterson Drive, Wheeling, Illinois 60090, USA

Report No. 9052

DATA TAKEN OF THE FUNDAMENTAL **FREQUENCY AND BANDWIDTH**



10.0 RESTRICTED BANDS

As stated in Section 15.205a, the fundamental emission from the Lowrey Remote Control for SU Series Organs shall not fall within any of the bands listed below:

Frequency in MHz	Frequency in MHz	Frequency in MHz	Frequency in GHz
.0900 to .1100	162.0125 to 167.17	2310.0 to 2390	9.30 to 9.50
.4900 to .5100	167.7200 to 173.20	2483.5 to 2500	10.60 to 12.70
2.1735 to 2.1905	240.000 to 285.00	2655.0 to 2900	13.25 to 13.40
8.362 to 8.3660	322.200 to 335.40	3260.0 to 3267	14.47 to 14.50
13.36 to 13.410	399.900 to 410.00	3332.0 to 3339	15.35 to 16.20
25.50 to 25.670	608.000 to 614.00	3345.8 to 3358	17.70 to 21.40
37.50 to 38.250	960.000 to 1240.00	3600.0 to 4400	22.01 to 23.13
73.00 to 75.500	1300.000 to 1427.00	4500.0 to 5250	23.60 to 24.00
108.00 to 121.94	1435.000 to 1626.50	5350.0 to 5450	31.20 to 31.80
123.00 to 138.00	1660.000 to 1710.00	7250.0 to 7750	36.43 to 36.50
149.90 to 150.00	1718.800 to 1722.20	8025.0 to 8500	ABOVE 38.60
156.70 to 156.90	2200.000 to 2300.00	9000.0 to 9200	

NOTE:

The noise floor within the Restricted Bands for the EMC Receiver and HP Spectrum Analyzer typically lies 20 dB below the limit.



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11.0 PHOTO INFORMATION AND TEST SET-UP

The test set-up can be seen on the accompanying photo page.

Item 0 Lowrey Remote Control for SU Series Organs
FCC ID#: PU2935-44601-000 SN: NA

Item 1

Item 2

Item 3

Item 4

Item 5

Item 6

Item 7

Item 8

Item 9

Item 10



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12.0 CONDUCTED PHOTOS TAKEN DURING TESTING.

The equipment under test is battery operated and will not at any time be plug into the Public Utility lines, therefore the conducted test was not performed.

12.0 RADIATED PHOTOS TAKEN DURING TESTING



12.0 RADIATED PHOTOS TAKEN DURING TESTING





13.0 CHANGE INFORMATION

The following changes were implemented during the testing and must be incorporated into the production units to ensure compliance.

Change 1. Replaced R1 with 0 ohm link.

Change 2. Changed value of R2 to 720 ohm.

Change 3.

Change 4.

Change 5.



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13.0 CHANGE INFORMATION (CON'T)

Change 6.

Change 7.

Change 8.

Change 9.

Change 10.

The responsibility of implementing the changes listed in this report is accepted or I certify that no changes were made

by _____
Signature _____ Title _____

for _____
Company Name _____ Date _____



14.0 RESULTS OF TESTS

The emission test results can be seen on pages at the end of this report. Data sheets indicating the open field radiated measurements can also be found with this report. Those points on the radiated charts shown with a yellow mark are background frequencies that were verified during the test.

15.0 CONCLUSION

It was found that the Lowrey Remote Control for SU Series Organs, Model Number 935-044601-000, S/N NA 12 the radio interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.231 (a-b), 15.207 and 15.205 for Intentional Radiators operating in the Frequency Band.

NOTE:

The conducted emissions test was not required because the EUT is powered from an DC power source. It does not have a line cord to plug into the A.C. power line.



TABLE 1 - EQUIPMENT LIST

Test Equipment	Manufacturer/ Description	Model Number	Serial Number	Frequency Range	Cal Due Date
*Spectrum Analyzer	Hewlett/ Packard	8566B	2240A 02041	25 Hz – 22 GHz	10/01
Quasi-Peak Adapter	Hewlett/ Packard	85650A	2043A 00121	10 kHz – 1 GHz	10/01
***Spectrum Analyzer	Hewlett/ Packard	8591A	3009A 00700	9 kHz- 1.8 GHz	3/02
Receiver	Electrometrics	EMC-25	772	.01-1000 MHz	10/01
Meter Module	Electrometrics	Mark-III			
		CRM-25	162	.01-1000 MHz	10/01
Receiver	Electrometrics	EMC-25	804	.01-1000 MHz	10/01
Meter Module	Electrometrics	Mark-III			
		CRM-25	138	.01-1000 MHz	10/01
Receiver	Electrometrics	EMC-25	645	.01-1000 MHz	10/01
Meter Module	Electrometrics	Mark-III			
		CRM-25	116	.01-1000 MHz	10/01
Receiver	Electrometrics	EMC-30	44168	.01-1000 MHz	9/01
		Mark-III			
Antenna	Electrometrics	BIA-25	2453	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	1114	200 - 1000 MHz	4/02
Antenna	Electrometrics	BIA-25	2614	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	1205	200 - 1000 MHz	4/02
Antenna	Electrometrics	BIA-25	4785	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	4895	200 - 1000 MHz	4/02
Antenna	EMCO	6502	143	.01-30 MHz	10/00

*Firmware Version 29.9.86 Software Version 85864C Rev A

**Firmware Version 14.1.85 Software Version 85864C Rev A

***Firmware Version 5.1.3 Software Version 82301-12029 Rev C

I/O Initial Calibration Only