FCC CERTIFICATION TEST REPORT

for

Brilliant Concepts International, Ltd.
2303-2308, Metropole Square
2 On Yiu Street, Shatin, N.T.
Hong Kong

FCC ID: PG5PS001BCI2001

February 23, 2001

WLL PROJECT #: 6345X

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STATEMENT OF QUALIFICATIONS

for

Chad M. Beattie

Washington Laboratories, Ltd.

I am a NARTE-Accredited EMC Test Laboratory Engineer, with an Associates in Electronic Systems Technology. I have ten years of electronics experience, the last six years being directly involved in EMI testing. I am qualified to perform EMC testing to the methods described in this test report. The measurements taken within this report are accurate within my ability to perform the tests and within the tolerance of the measuring instrumentation.

By: _____
Chad M. Beattie
Compliance Engineer

Date: February 23, 2001

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FCC ID: PG5PS001BCI2001

1.0 Introduction

This report has been prepared on behalf of Brilliant Concepts International, Ltd. to support the attached Application for Equipment Authorization. The test and application are submitted for a Periodic Intentional Radiator under Part 15.231 of the FCC Rules and Regulations. The Equipment Under Test was the PS-001 wireless remote control locator contained in the rechargeable base of a television remote control.

All measurements herein were performed according to the 1992 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and field Strength Instrumentation. Calibration checks are made periodically to verify proper performance of the measuring instrumentation.

All measurements are performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

All results reported herein relate only to the equipment tested. The measurement uncertainty of the data contained herein is ±2.3 dB. Refer to Appendix A for Statement of Measurement Uncertainty. This report shall not be used to claim product endorsement by NVLAP or any agency of the US Government.

1.1 Summary

The Brilliant Concepts International, Ltd. PS-001 complies with the limits for a Periodic Intentional Radiator under Part 15.231 of the FCC Rules and Regulations.

2.0 Description of Equipment Under Test (EUT)

The Brilliant Concepts International, Ltd. PS-001 (EUT) is a 311 MHz transmitter used for the purpose of locating a television remote control. The transmitter is located in an AC powered base that is also used as a cradle for the remote control for charging. Power is provided by 3 “AAA” rechargeable batteries that are replenished from a 120VAC wall adapter. When the “call” button on the base is pressed, the RF signal will be transmitted to the receiver (FCC DoC approval) located in the remote control. The remote control will then emit an audible signal for aid in locating the unit.

3.0 Test Configuration

To complete the FCC testing, the base unit was connected to the AC power and was configured to continuously transmit the call signal. All testing was performed at 120VAC.

3.1 Testing Algorithm

The transmitter was turned on and constantly transmitting. The unit was tested in one orthogonal plane as it is designed to sit on top of a table.

Worst case emissions are recorded in the data tables.

3.2 Conducted Emissions Testing

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the CPU was provided through a Solar Corporation 50 Ω/50 µH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 450 kHz to 30 MHz were measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

3.3 Radiated Emissions Testing

The EUT was placed on an 80 cm high 1 x 1.5 meters non-conductive motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Biconical and log periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to quasi-peak or peak, as appropriate. The measurement bandwidth on the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth. For measurements above 1 GHz, the measurements bandwidth was set to 1 MHz.

3.3.1 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are grouped into a composite antenna factor (AFc) and are supplied in the AFc column of Table 2. In addition, the Duty Cycle Correction Factor (Afd) is subtracted from the peak emission reading. The AFc in dB/m is algebraically added to the Spectrum Analyzer Voltage in dbµV to obtain the Radiated Electric Field in dBµV/m. This level is then compared with the FCC limit.

Example:

Spectrum Analyzer Voltage: VdBµV

Composite Antenna Factor: AFcdB/m

Electric Field: EdBµV/m = VdBµV – Afd + AFcdB/m

To convert to linear units: EµV/m = antilog (EdBµV/m/20)

Data is recorded in Table 2.

Table 1: FCC 15.231 Conducted Emissions Data

CLIENT: Brilliant Concepts
MODEL NO: PS-001-TX Base unit
DATE: Feb. 19, 2001
CLK SPEED(S): 311.79 MHz Fundamental
BY: Chad M. Beattie
JOB #: 6345RFFCC

LINE 1 - NEUTRAL

Frequency MHz	Voltage (Peak) dBuV	Voltage uV	FCC Limit uV	Margin dB	
0.48	30.3	32.7	250	-17.7	amb
2.42	29.4	29.5	250	-18.6	amb
11.13	30.8	34.7	250	-17.2	amb
15.91	30.3	32.7	250	-17.7	amb
21.37	29.8	30.9	250	-18.2	amb
25.85	30.2	32.4	250	-17.8	amb

LINE 2 - PHASE

Frequency MHz	Voltage (Peak) dBuV	Voltage uV	FCC Limit uV	Margin dB	
0.51	28.5	26.6	250	-19.5	amb
3.38	30.2	32.4	250	-17.8	amb
13.10	29.6	30.2	250	-18.4	amb
16.53	32.0	39.8	250	-16.0	amb
22.55	30.1	32.0	250	-17.9	amb
27.72	30.1	32.0	250	-17.9	amb

Table 2: FCC 15.231 3M Radiated Emissions Data

CLIENT: Rosselco/Brilliant Concepts
MODEL NO: PS-001-TX Base unit
DATE: March 10, 2001
CLK SPEED(S): 311.79 MHz Fundamental
BY: Mike Violette
JOB #: 6345
CONFIGURATION: TX frequency 311.818 MHz

Frequency MHz	Polarity H/V	Azimuth Degree	Antenna Height m	SA Level (Peak) dBuV	Duty Cycle dB	Corrected Level dBuV	AFc dB/m	E-Field dBuV/m	E-Field uV/m	Limit uV/m	Margin dB	
311.96	V	0.00	1.0	52.00	11.0	41.0	16.4	57.4	741.3	5825.5	-17.9	
623.92	V	270.00	1.0	32.00	11.0	21.0	24.0	45.0	177.5	582.6	-10.3	
935.88	V	180.00	1.0	20.00	11.0	9.0	28.7	37.7	76.4	582.6	-17.6	
1247.84	V	90.00	1.0	74.00	11.0	63.0	-10.7	52.3	411.9	582.6	-3.0	
1559.80	V	180.00	1.0	53.80	11.0	42.8	-8.6	34.2	51.4	582.6	-21.1	
1871.76	V	180.00	1.0	54.00	11.0	-11.0	-6.8	36.2	64.3	582.6	-19.1	
2183.72	V	90.00	1.0	45.78	11.0	34.8	-5.8	29.0	28.1	582.6	-26.3	
2495.68	V	90.00	1.0	45.10	11.0	34.1	-5.2	28.8	27.7	582.6	-26.5	
2807.64	V	0.00	1.0	43.00	11.0	32.0	-4.8	27.2	23.0	582.6	-28.1	amb
3119.60	V	0.00	1.0	44.00	11.0	33.0	-4.3	28.7	27.1	582.6	-26.6	amb
311.96	H	270.00	1.5	61.00	11.0	50.0	16.4	66.4	2084.5	5825.5	-8.9	
623.92	H	180.00	1.0	39.00	11.0	28.0	24.0	52.0	396.5	582.6	-3.3	
935.88	H	180.00	1.0	23.00	11.0	12.0	28.7	40.6	107.6	582.6	-14.7	
1247.84	H	90.00	1.0	74.30	11.0	63.3	-10.7	52.6	426.4	582.6	-2.7	
1559.80	H	90.00	1.0	58.10	11.0	47.1	-8.6	38.5	84.4	582.6	-16.8	
1871.76	H	0.00	1.0	53.00	11.0	42.0	-6.8	35.2	57.3	582.6	-20.1	
2183.72	H	90.00	1.0	46.00	11.0	35.0	-5.8	29.2	28.8	582.6	-26.1	
2495.68	H	45.00	1.0	47.20	11.0	36.2	-5.2	30.9	35.3	582.6	-24.4	
2807.64	H	0.00	1.0	43.20	11.0	32.2	-4.8	27.4	23.5	582.6	-27.9	amb
3119.60	H	0.00	1.0	44.00	11.0	33.0	-4.3	28.7	27.1	582.6	-26.6	amb

Table 3: System Under Test

FCC ID: PG5 PS001BCI2001

EUT:	Rosselco/Brilliant Concepts International, Ltd M/N: PS-001
FCC ID:	PG5 PS001BCI2001
Power Supply:	WSL AC-DC Adaptor; M/N: 12200DF; S/N: SE 257216

Table 4: Interface Cables Used

The PS-001 does not use external cables or ports.

The EUT (base unit) was powered via a non-shielded AC power cord.

Table 5: Measurement Equipment Used

The following equipment is used to perform measurements:

Hewlett-Packard Spectrum Analyzer: HP8564E
Hewlett-Packard Spectrum Analyzer: HP8568B
Hewlett-Packard Spectrum Analyzer: HP8593A
Hewlett-Packard Quasi-Peak Adapter: HP85650A
Hewlett-Packard Preselector: HP85685A
Hewlett-Packard Preamplifier: HP8449B
Antenna Research Associates, Inc. Biconical Log Periodic Antenna: LPB-2520A (Site 2)
Antenna Research Associates, Inc. Horn Antenna: DRG-118/A
Solar 50 Ω/50 µH Line Impedance Stabilization Network: 8012-50-R-24-BNC
Solar 50 Ω/50 µH Line Impedance Stabilization Network: 8028-50-TS-24-BNC
AH Systems, Inc. Portable Antenna Mast: AMS-4 (Site 2)
AH Systems, Inc. Motorized Turntable (Site 2)
RG-214 semi-rigid coaxial cable
RG-223 double-shielded coaxial cable

EXHIBIT 1

DUTY CYCLE CALCULATIONS

The following page shows spectrum analyzer plots of the transmitter coding. The following calculations show the worst case 100 ms duty cycle correction used for calculating the average level of the carrier, harmonics, and emissions.

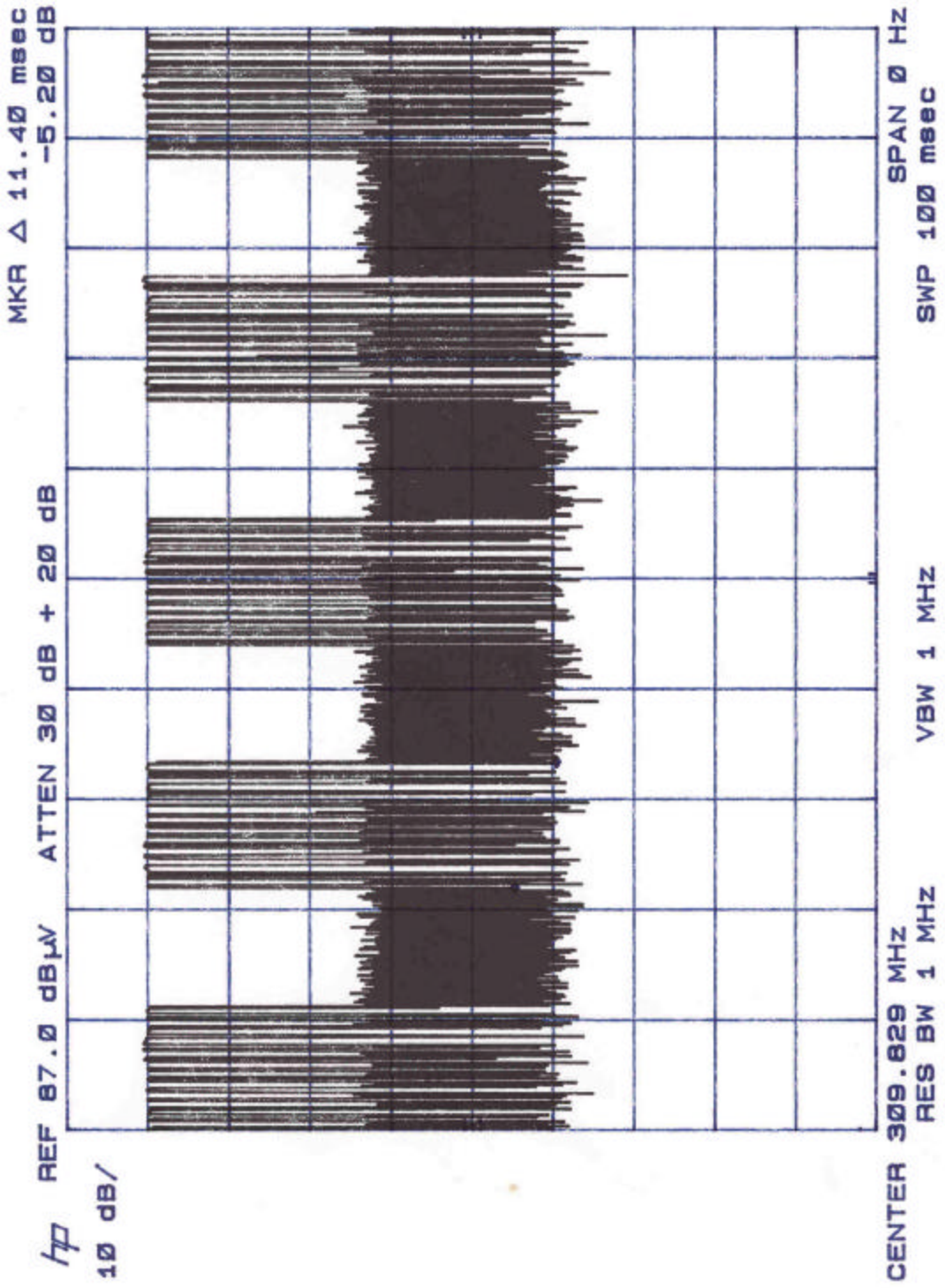
Plot 1 shows that the transmitter on time over a 100 ms period. Plot 2 depicts the pulse train period of 22.2 ms and shows that the pulse train consists of 2 pulse widths. The pulse widths are measured on Plots 3 and 4. From these plots, the following duty cycle correction factor is calculated.

ON TIME PER PULSE TRAIN:

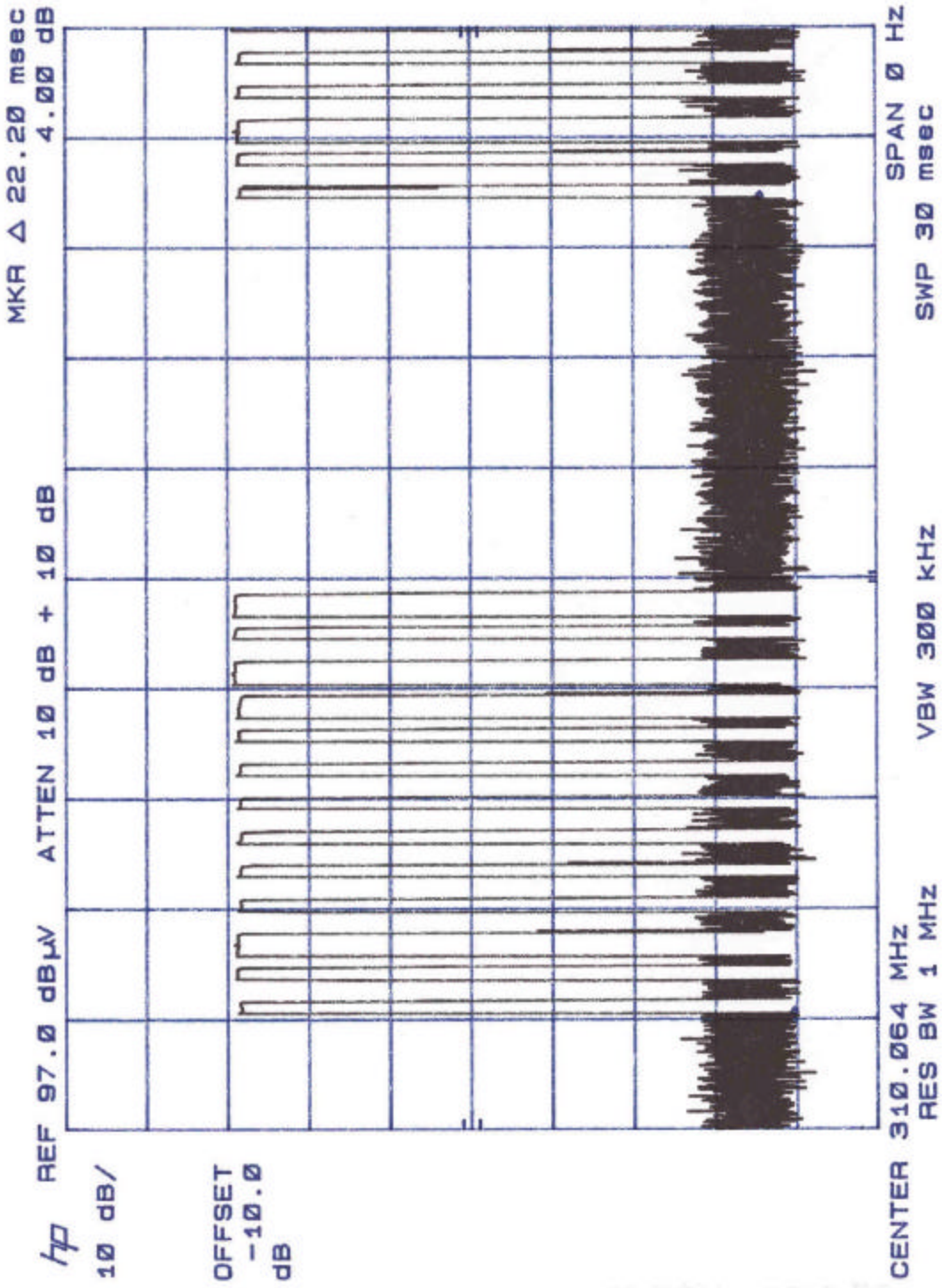
(9 x 380 us) + (4 x 700 us) = 6.22 ms ON TIME PER 22.2 ms Pulse Train

= 6.22 ms/22.2 ms = 0.280 Duty Cycle
= 28% Duty Cycle
= -11 dB AFd

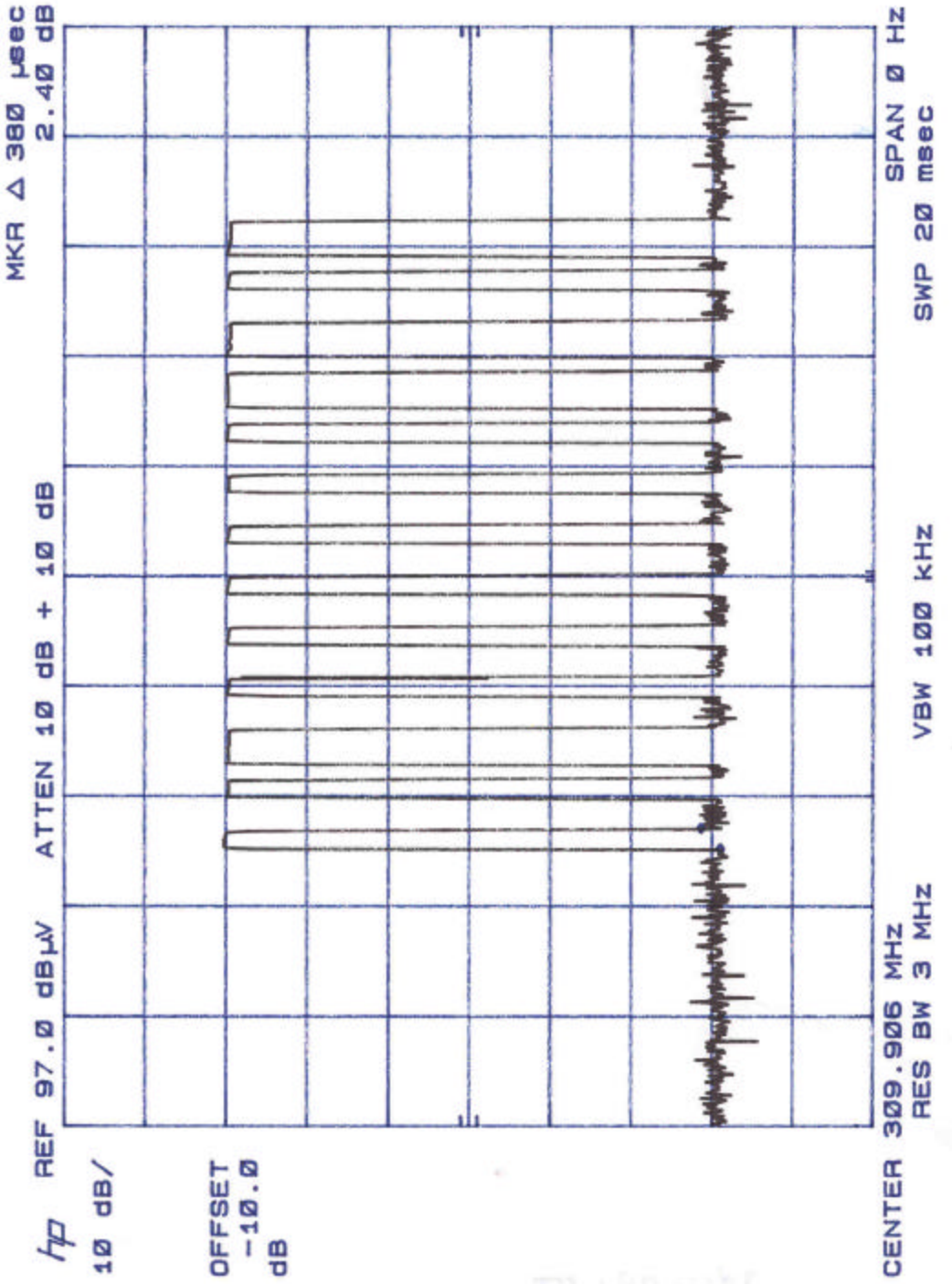
Duty Cycle Plot 1



Duty Cycle Plot 2



Duty Cycle Plot 3



Duty Cycle Plot 4

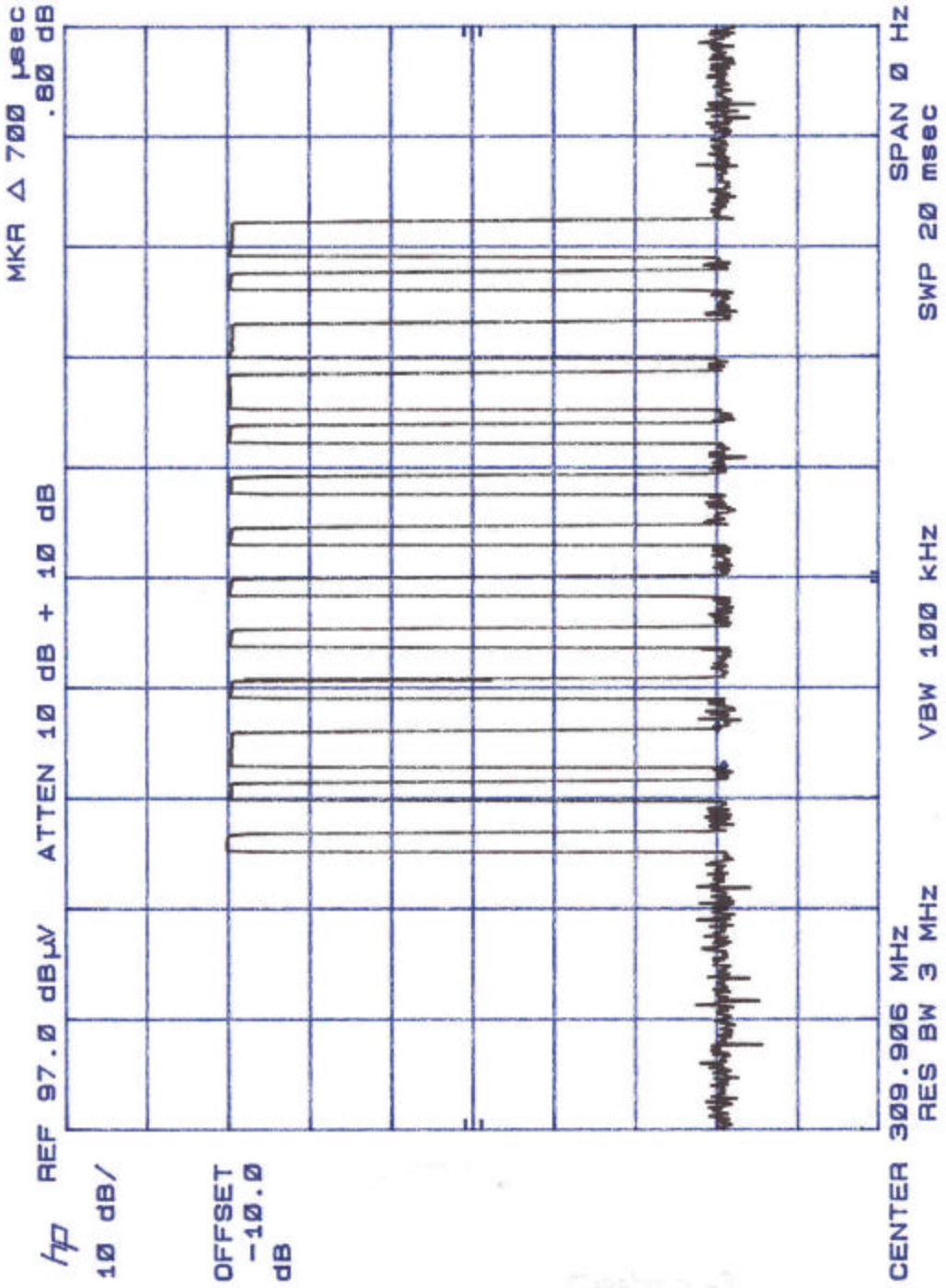


EXHIBIT 2

CARRIER BANDWIDTH DATA

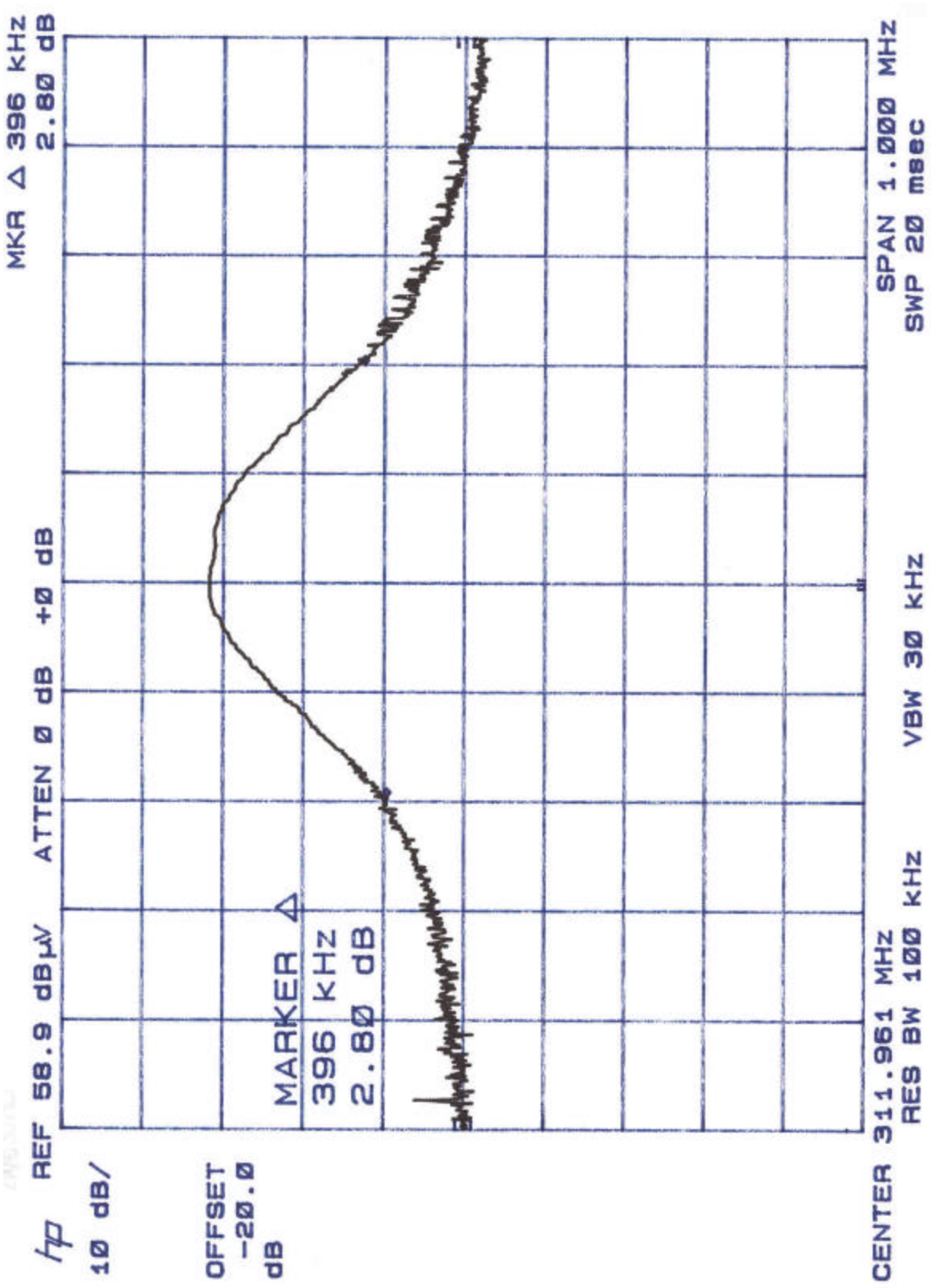
The 20 dB modulated bandwidth shall be no wider than 0.25% of the center frequency.

Bandwidth Limit = Carrier Frequency x .0025

Bandwidth Limit = 311.8 MHz x .0025 = 780 kHz

Measured EUT Bandwidth = 396 kHz

Bandwidth Plot



Appendix A

Statement of Measurement Uncertainty

For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2}$ = ±2.3 dB.