

DATE: 28 October 2008

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Next Play Ltd.

Equipment under test:

Voting Game Base

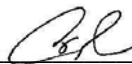
VG-Base 6000

Written by:



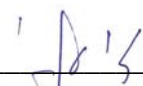
D. Shidlow, Documentation

Approved by:



A. Sharabi, Test Engineer

Approved by:



I. Raz, EMC Laboratory Manager

This report must not be reproduced, except in full, without the written permission of I.T.L. (Product Testing) Ltd.

This report relates only to items tested.

Measurement/Technical Report for Next Play Ltd.

Equipment under test:

Voting Game Base

FCC ID: WKT-VGB61

DATE: 28 October 2008

This report concerns: Original Grant: X
Class II Change:
Class I Change:

Equipment type:

Limits used:

47CFR15 Sub-part C

Measurement procedure used is ANSI C63.4-2003.

Application for Certification
prepared by:
Ishaiahou Raz
ITL (Product Testing) Ltd.
Kfar Bin Nun
D. N. Shimshon 99780
Israel
Tel: +972-8-979-7010
Fax: +972-8-979-7702
Email: sr az@itl.co.il

Applicant for this device:
(different from "prepared by")
Amir Shavit
Next Play Ltd.
20 Tuval St.
RamatGan 52522
Israel
Tel: +972-3-575-3030
Fax: +972-3-542-6969
Email: amir@nextplay.co.il

TABLE OF CONTENTS

1.	GENERAL INFORMATION	4
1.1	Administrative Information	4
1.2	List of Accreditations	5
1.3	Product Description	6
1.4	Test Methodology	6
1.5	Test Facility	6
1.6	Measurement Uncertainty	7
2.	PRODUCT LABELING	8
3.	SYSTEM TEST CONFIGURATION	9
3.1	Justification	9
3.2	EUT Exercise Software	9
3.3	Special Accessories	9
3.4	Equipment Modifications	9
3.5	Configuration of Tested System	10
4.	FIELD STRENGTH OF FUNDAMENTAL	11
4.1	Test Specification	11
4.2	Test Procedure	11
4.3	Measured Data	11
4.4	Test Instrumentation Used, Field Strength of Fundamental	14
5.	RADIATED MEASUREMENT PHOTOS	15
6.	SPURIOUS RADIATED EMISSION 9 KHZ-1000 MHZ	16
6.1	Measured Data	16
6.2	Test Instrumentation Used, Radiated Measurements	17
6.3	Field Strength Calculation	18
7.	SPURIOUS RADIATED EMISSION ABOVE 1 GHZ	19
7.1	Spurious Radiated Emission Above 1 GHz	19
7.2	Test Data	20
7.3	Test Instrumentation Used, Spurious Radiated Measurements Above 1 GHz	23
8.	APPENDIX A - CORRECTION FACTORS	24
8.1	Correction factors for CABLE	24
8.2	Correction factors for CABLE	25
8.3	Correction factors for CABLE	26
8.4	Correction factors for LOG PERIODIC ANTENNA	27
8.5	Correction factors for LOG PERIODIC ANTENNA	28
8.6	Correction factors for BICONICAL ANTENNA	29
8.7	Correction factors for ACTIVE LOOP ANTENNA	30

1. General Information

1.1 Administrative Information

Manufacturer:	Next Play Ltd.
Manufacturer's Address:	20 Tuval St. Ramat Gan 52522 Israel Tel: +972-3-575-3030 Fax: +972-3-575-8822
Manufacturer's Representative:	Amir Shavit
Equipment Under Test (E.U.T):	Voting Game Base
Equipment Model Name:	VG-Base 6000
Equipment Serial Number:	VGB6135
Date of Receipt of E.U.T:	15.07.08
Start of Test:	15.07.08
End of Test:	23.07.08
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15, Subpart C

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 *Product Description*

The platform consists of a central unit transmitting to the deployed operating stations and transferring the information to a personal computer by means of a simple data transfer cable.

Features:

- Full control over receipt and dispatch of messages from the stations.

- Expansion possibility to control 100 to 800 operating stations.

- Transmission and reception radius covers 100 meters in an open area. (If the area is larger, several antennas can be added).

- Synchronized speed of data collection from hundreds of stations averages under 0.6 seconds.

- Transfer of data to a specific station or a group of stations.

- Performance of up and running tests for all the stations.

- Full wireless deactivation of end stations.

Antenna Gain: 6dBi

1.4 *Test Methodology*

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 *Test Facility*

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing August 22, 2006).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 *Measurement Uncertainty*

Radiated Emission

The Open Site complies with the ± 4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. Product Labeling

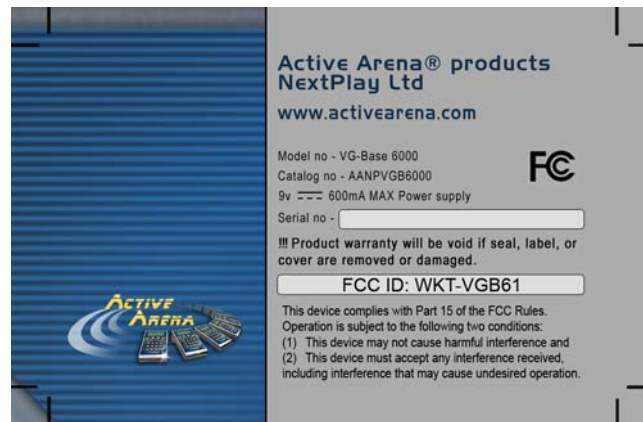


Figure 1. FCC Label



Figure 2. Label Location on EUT

3. System Test Configuration

3.1 *Justification*

The system includes two units, BASE and terminal. The terminal must receive base message in order to transmit data. The maximum data rate is 8mSec in 1 second, from both unit and base. There are no options or add ons to the units in the system but a PC must be connected to the base and send commands for proper operation. The units will continue to transfer keep alive messages without PC but data is useless.

The system supports 100 end units for each base. Each unit can send no more than 8 mSec of data.

The terminal is powered from internal rechargeable batteries while the base can be power from batteries or external 9V power adaptor.

During terminal charging all the communication disable.

Radiated emission screening was performed in 3 orthogonal orientations. The worst case orientation was the vertical position.

3.2 *EUT Exercise Software*

The Terminal embedded SW has the following routines:

Charging routine: Disable communication, starts charging process. When charger disconnected – switch power to off.

Normal operation:

Communication: waits for base message, when get message – Transmit last keypad data or last data in the buffer or update display of the terminal.

Keypad monitoring: monitor keys entered by the user.

External power monitor: if power connected – switch to charging state.

3.3 *Special Accessories*

No special accessories were needed to achieve compliance.

3.4 *Equipment Modifications*

Initially the EUT failed to meet the requirements of the specification.

The manufacturer took the following corrective action:

Transmitted power was reduced by 2 dB

3.5 Configuration of Tested System

The configuration of the tested system is described below.

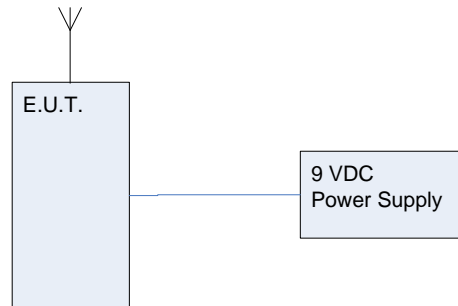


Figure 3. Configuration of Tested System

4. Field Strength of Fundamental

4.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.249(a)

4.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

The E.U.T. was placed on a non-conductive table, 0.8 meters above the O.A.T.S. ground plane.

The EMI receiver was set to the E.U.T. Fundamental Frequency and Peak Detection.

The turntable and antenna mast were adjusted for maximum level reading on the EMI receiver.

The measurement was performed for vertical and horizontal polarizations of the test antenna.

4.3 Measured Data

JUDGEMENT: Passed by 5.73 dB

The EUT met the FCC Part 15, Subpart C, Section 15.249(a) specification requirements.

The details of the highest emissions are given in *Figure 4*.

TEST PERSONNEL:

Tester Signature: 

Date: 29.10.08

Typed/Printed Name: A. Sharabi

Field Strength of Fundamental

E.U.T Description Voting Game Base
Model Number VG-Base 6000
Serial Number: VGB6135

Specification: F.C.C., Part 15, Subpart C 15.249(a)

Antenna Polarization: Horizontal/Vertical

Test Distance: 3 meters

Detector: Peak

Freq.	Pol.	Peak Reading (*)	Specification	Margin
(MHz)	V/H	(dBμV/m)	(dBμV/m)	(dB)
922.22	H	82.02	94.0	-11.98
922.22	V	88.27	94.0	-5.73

**Figure 4. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL/VERTICAL.
Detector: Peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

* "Peak Amp." includes "Correction Factors.

"Correction Factors" = Antenna Correction Factor + Cable Loss.

Field Strength of Fundamental

E.U.T Description Voting Game Base
 Model Number VG-Base 6000
 Serial Number: VGB6135

Specification: F.C.C., Part 15, Subpart C 15.249(a)

Antenna Polarization: Vertical

Test Distance: 3 meters

Detector: Peak

13:07:26 JUL 23, 2008

ACTV DET: PEAK
 MEAS DET: PEAK QP AVG
 MKR 922.2038 MHz
 88.27 dB μ V/m

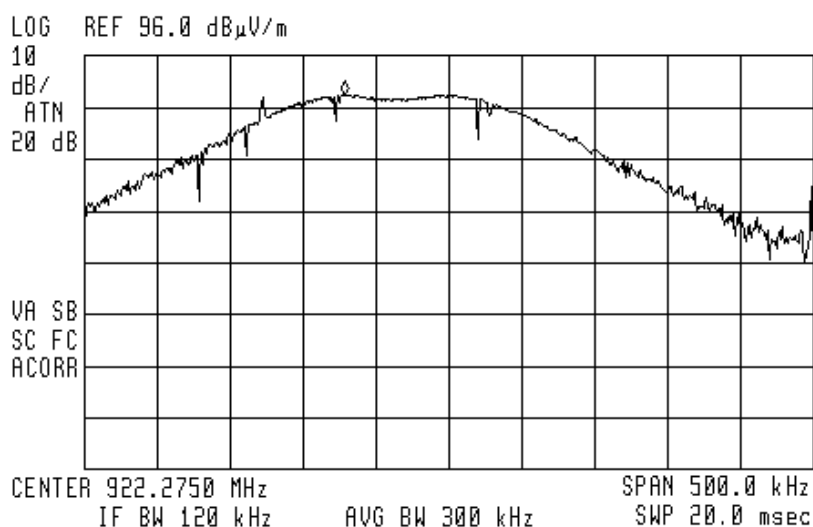


Figure 5. Field Strength of Fundamental. Antenna Polarization: VERTICAL.
Detector: Peak

4.4 *Test Instrumentation Used, Field Strength of Fundamental*

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 12, 2007	1 year
RF Section	HP	85420E	3705A00248	November 12, 2007	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 22, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

5. Radiated Measurement Photos



Figure 6. Radiated Emission Test

6. Spurious Radiated Emission 9 kHz-1000 MHz

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.

The frequency range 9kHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30 MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

During this test the E.U.T. was operated in continuous transmission to enable better detection of signals.

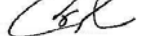
6.1 Measured Data

JUDGEMENT: Passed

The signals in the band 9 kHz – 1000 MHz were 20dB below the specification limit.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 15.249 specification.

TEST PERSONNEL:

Tester Signature: 

Date: 29.10.08

Typed/Printed Name: A. Sharabi

6.2 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 12, 2007	1 year
RF Section	HP	85420E	3705A00248	November 12, 2007	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	March 23, 2008	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 15, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

6.3 **Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{V/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

FS:	Field Strength [dB μ V/m]
RA:	Receiver Amplitude [dB μ V]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]

7. Spurious Radiated Emission Above 1 GHz

7.1 *Spurious Radiated Emission Above 1 GHz*

The E.U.T operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.

The emission levels were compared to the requirement of Section 15.249.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used. The test distance was 3 meters.

In the frequency range 2.9-9.2 GHz, a spectrum analyzer including a low noise amplifier was used. The test distance was 3 meters. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.).

7.2 Test Data

JUDGEMENT: Passed by 1.2 dB

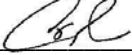
The margin between the emission level and the specification limit is 1.2 dB in the worst case at the frequency of 18841.00 MHz, horizontal and vertical polarization.

All other signals not included in the result tables are at least 20dB below the specification limit.

The EUT met the requirements of the F.C.C. Part 15, Subpart C Section 15.249, specification.

The details of the highest emissions are given in *Figure 7* to *Figure 8*.

TEST PERSONNEL:

Tester Signature: 

Date: 29.10.08

Typed/Printed Name: A. Sharabi

Spurious Radiated Emission Above 1 GHz

E.U.T Description Voting Game Base
Model Number VG-Base 6000
Serial Number: VGB6135

Specification: F.C.C., Part 15, Subpart C, 15.249

Antenna Polarization: Frequency range: 1.0 GHz to 9.2 GHz
Horizontal/Vertical
Test Distance: 3 meters Detector: Peak

Freq.	Peak Result*	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dB μ V/m)	(H/L)	(dB μ V/m)	(dB)
1844.10	65.9	H	74.0	-8.1
1844.10	72.8	V	74.0	-1.2

Figure 7. Spurious Radiated Emission. Antenna Polarization: HORIZONTAL/Vertical. Detector: Peak

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

*"Peak Result" includes correction factor.

"Correction Factor" = Antenna Factor + Cable Loss

Spurious Radiated Emission Above 1 GHz

E.U.T Description Voting Game Base
Model Number VG-Base 6000
Serial Number: VGB6135

Specification: F.C.C., Part 15, Subpart C, 15.249

Antenna Polarization: Frequency range: 1.0 GHz to 9.2 GHz
Horizontal/Vertical
Test Distance: 3 meters Detector: Average

Freq.	Average Result*	Polarization	Average Specification	Average Margin
(MHz)	(dB μ V/m)	(H/L)	(dB μ V/m)	(dB)
1844.10	45.9	H	54.0	-8.1
1844.10	52.8	V	54.0	-1.2

Figure 8. Spurious Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL. Detector: Average

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

*"Average Result" includes correction factor.

"Correction Factor" = Antenna Factor + Cable Loss

7.3 Test Instrumentation Used, Spurious Radiated Measurements Above 1 GHz

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3906A00276	November 12, 2007	1 year
RF Section	HP	85420E	3705A00248	November 12, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 4, 2007	2 year
Spectrum Analyzer	HP	8592L	3926A01204	March 5, 2008	1 year

8. APPENDIX A - CORRECTION FACTORS

8.1 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.5	1200.0	7.5
20.0	0.7	1400.0	8.2
30.0	1.0	1600.0	9.0
40.0	1.2	1800.0	9.6
50.0	1.3	2000.0	10.7
60.0	1.5	2300.0	11.1
70.0	1.6	2600.0	11.8
80.0	1.7	2900.0	12.8
90.0	1.8		
100.0	1.9		
150.0	2.4		
200.0	2.7		
250.0	3.0		
300.0	3.3		
350.0	3.7		
400.0	4.0		
450.0	4.3		
500.0	4.7		
600.0	4.9		
700.0	5.4		
800.0	5.8		
900.0	6.3		
1000.0	6.7		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

8.2 Correction factors for CABLE
from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY	CORRECTION
(GHz)	FACTOR
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

8.3 Correction factors for CABLE
from spectrum analyzer
to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.
2. The cable is used for measurements above 2.9 GHz.
3. The overall length of the cable is 10 meters.

8.4 Correction factors for

LOG PERIODIC ANTENNA

**Type LPD 2010/A
at 3 and 10 meter ranges.**

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	11.4
400.0	14.5
500.0	15.2
600.0	17.3
700.0	19.0
850.0	20.1
1000.0	22.2

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.2
400.0	14.4
500.0	15.2
600.0	17.2
700.0	19.0
850.0	20.1
1000.0	22.1

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range,
and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission
Test EMI Receiver".

8.5 Correction factors for

LOG PERIODIC ANTENNA

**Type SAS-200/511
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

8.6 Correction factors for BICONICAL ANTENNA
Type BCD-235/B,
at 3 meter range

FREQUENCY (MHz)	APE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

8.7 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2