REPORT NO:	F89022202
PRODUCT:	WIRELESS KEYBOARD
MODEL NO:	5090
SERIAL NO:	N/A
CLIENT:	Behavior Tech Computer Corp.
ADDRESS:	2F,No51,Tung Hsing Rd, Taipei, Taiwan, R.O.C.
ISSUED BY:	ADVANCE DATA TECHNOLOGY CORPORATION (ADT CORP.)
OFFICE ADDRESS:	11F, NO. 1, SEC. 4, NAN-KING EAST RD., TAIPEI, TAIWAN, R.O.C.
LABORATORY ADDRESS:	NO. 47, 14 LING, CHIA PAU TSUEN, LIN KOU HSIANG, TAIPEI HSIEN, TAIWAN, R.O.C.
TEST STANDARD:	47CFR Part 15, Subpart C (15.249)
TEST DATE:	March 20, 2000
TEST RESULT:	Pass

Accredited Laboratory

CONTENTS

1. CERTIFICATION

Issue Date: Apr. 05, 2000

PRODUCT	:	WIRELESS KEYBOARD
MODEL NO	:	5090
FCC ID	:	E5XKB5090TX
CLIENT	:	Behavior Tech Computer Corp.
TEST STANDARD:		FCC 47CFR Part 15, Subpart C (Section 15.249) ANSI C63.4-1992

We, **ADVANCE DATA TECHNOLOGY CORPORATION,** hereby certify that one sample of the designated sample has been tested in our facility. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate representation of the measurements of the sample's characteristics and the energy emitted under the conditions herein specified.

TESTED BY:	Ellis Wu **Ellis Wu**	**DATE:** 4/5/2000
CHECKED BY:	Delphine Hsu **Delphine Hsu**	**DATE:** 4/5/2000
APPROVED BY:	Alan Lane **Dr. Alan Lane, Manager**	**DATE:** 4/5/2000

2. SUMMARY OF TEST RESULTS & GENERAL STATEMENT OF CERTIFICATION

The EUT has been tested according to the following specifications:

47 CFR Part 15, Subpart C			
PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)	TEST RESULT
15.107, 15.109	**AC Power Conducted Emissions Spec.:48 dBuV**	**N/A**	**N/A**
15.249	**Transmitter Radiated Emissions Spec.:Table 15.209&15.249**	**Yes**	**Minimum passing margin is –6.3 dBuV At 177.00 MHz**
15.249 (c)	**Band Edge Measurements Spec.:15.249(c)**	**Yes**	**Under at least 50 dB**

Note 1 **:** The EUT has been tested according to the EUT' s specifications. All operating frequencies had been evaluated, and the worst data were found at the data rate of 910.2 and 919.7 MHz.

3. GENERAL INFORMATION

3.1 General Description of EUT

Product	:	**Wireless Keyboard**
Model No	:	**5090**
Power Supply	:	**4.5VDC (three AA batteries)**
Modulation Type	:	**FM**
Transfer Rate	:	**19.2 kbps**
Operating Frequency	:	**910.2 ~ 919.7 MHz**
Number of Channel	:	**12**
Channel Spacing	:	**0.5 MHz**
Rated RF output power level	:	**0.002mW (Maximum)**
Associated devices	:	**N/A**

Note: The 5090RF is not only a radio frequency multi-channel keyboard but also a multimedia keyboard. This wireless keyboard is designed to make your life easier. It is just the right size and weight thus makes it easy to hold in hand or put on your laps, anywhere in the room. It' s easy to touch and is quiet to the ears. Very wide angle and long-distance detection frees you from your desktop. In addition, with sleep mode power saving and "book-on-keyboard protection", it' s even easier to use battery in any environment.

For other detailed information, please refer to user' s manual.

3.2 Description of Test mode

The EUT has 12 channels for data transmission. According to Part 15, Sec. 15.31(m), the channel 1 and 12 were chose for evaluation.
Below is the channel & frequency table:

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	910.2 MHz	5	914.2 MHz	9	917.2 MHz
2	910.7 MHz	6	914.7 MHz	10	917.7 MHz
3	912.2 MHz	7	915.2 MHz	11	919.2 MHz
4	912.7 MHz	8	915.7 MHz	12	919.7 MHz

The EUT was tested with 2 modes, as the following:

Mode	Receiver Module	Channel Frequency
Mode 1	Using BTC RF Transmitter Module	Channel 1 (910.2 MHz)
		Channel 12 (919.7 MHz)
Mode 2	Using RF-LINK Systems INC. RF Transmitter Module	Channel 1 (910.2 MHz)
		Channel 12 (919.7 MHz)

All two modes were tested separately and their data are recorded in this report.

3.3 Test Methodology

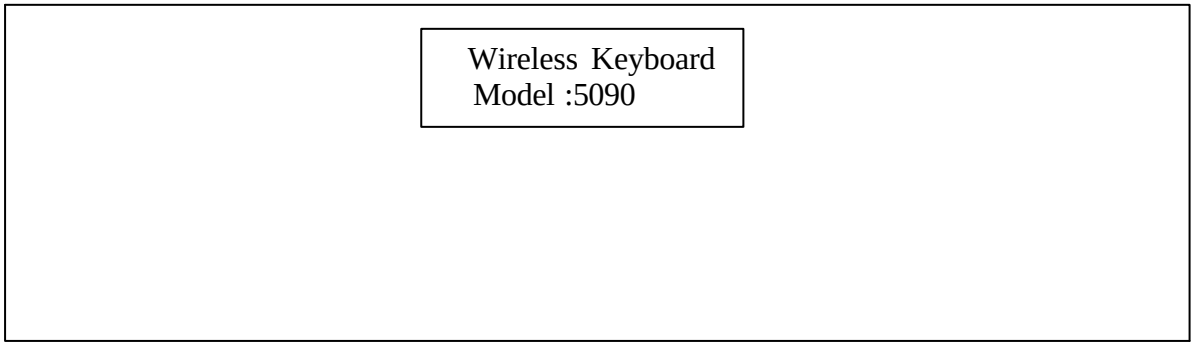
These tests were conducted on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C. (15.249)

Both conducted and radiated emissions measurements were conducted in accordance with ANSI C63.4:1992.

3.4 Support Units List

N/A

3.5 Configuration of System Under Test



4. GENERAL INFORMATION OF TEST FACILITY

4.1 Test Lab.:

☑ **Lin Kuo EMC Lab.**

No. 47, 14 Ling, Chia Pau Tsuen, Lin Kuo Hsiang, Taipei, Taiwan, R.O.C.

☐ **Hsin Chu EMC Lab.**

No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, R.O.C.

4.2 Calibration Interval :

All calibration interval of the test sites and test instruments is 12 months. The calibrations are traceable to NML/ROC and NIST/USA.

5. TEST PROCEDURES AND TEST RESULTS

5.1 Conducted Emission Measurement

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limited are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

5.2 Radiated Emission Measurement

5.2.1 Test instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	**8590L**	**3544A01176**	**Apr 28, 2000**
HP Preamplifier	**8447D**	**2944A08485**	**May 01, 2000**
HP Preamplifier	**8347A**	**3307A01088**	**Sep. 09, 2000**
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**839013/007 839379/002**	**Aug. 27, 2000**
SCHWARZBECK Tunable Dipole Antenna	**VHA 9103 UHA 9105**	**E101051 E101055**	**Nov. 25, 2000**
CHASE BILOG Antenna	**CBL6112A**	**2221**	**Aug. 10, 2000**
SCHWARZBECK Horn Antenna	**BBHA9120-D**	**D130**	**Jul. 09, 2000**
SCHWARZBECK Horn Antenna	**BBHA9170**	**123**	**Jan. 31, 2001**
EMCO Turn Table	**1060**	**1115**	**N/A**
SHOSHIN Tower	**AP-4701**	**A6Y005**	**N/A**
Open Field Test Site	**Site 5**	**ADT-R05**	**Aug. 09, 2000**

The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

5.2.2 Test Procedure

a. The EUT was placed on the top of a turn table 0.8 meter above ground at a 3-meter open field site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.

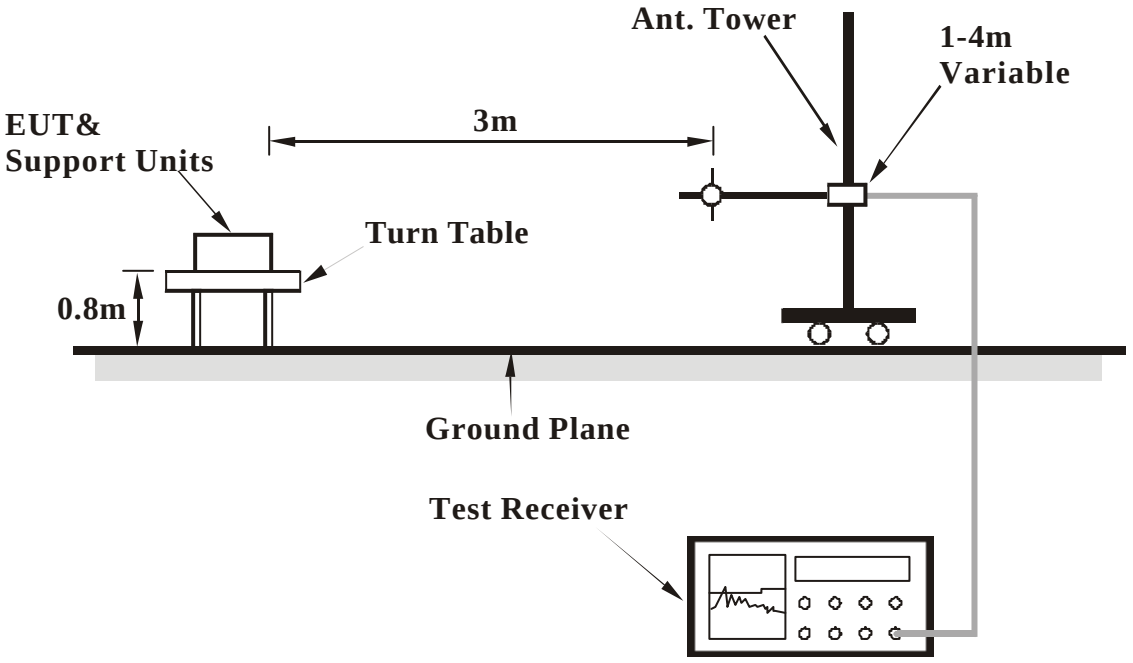
c. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission the EUT was arranged to its worst case and then tuned the antenna height from 1 meter to 4 meter and turned the turn table from 0 degree to 360 degrees to find the maximum reading.

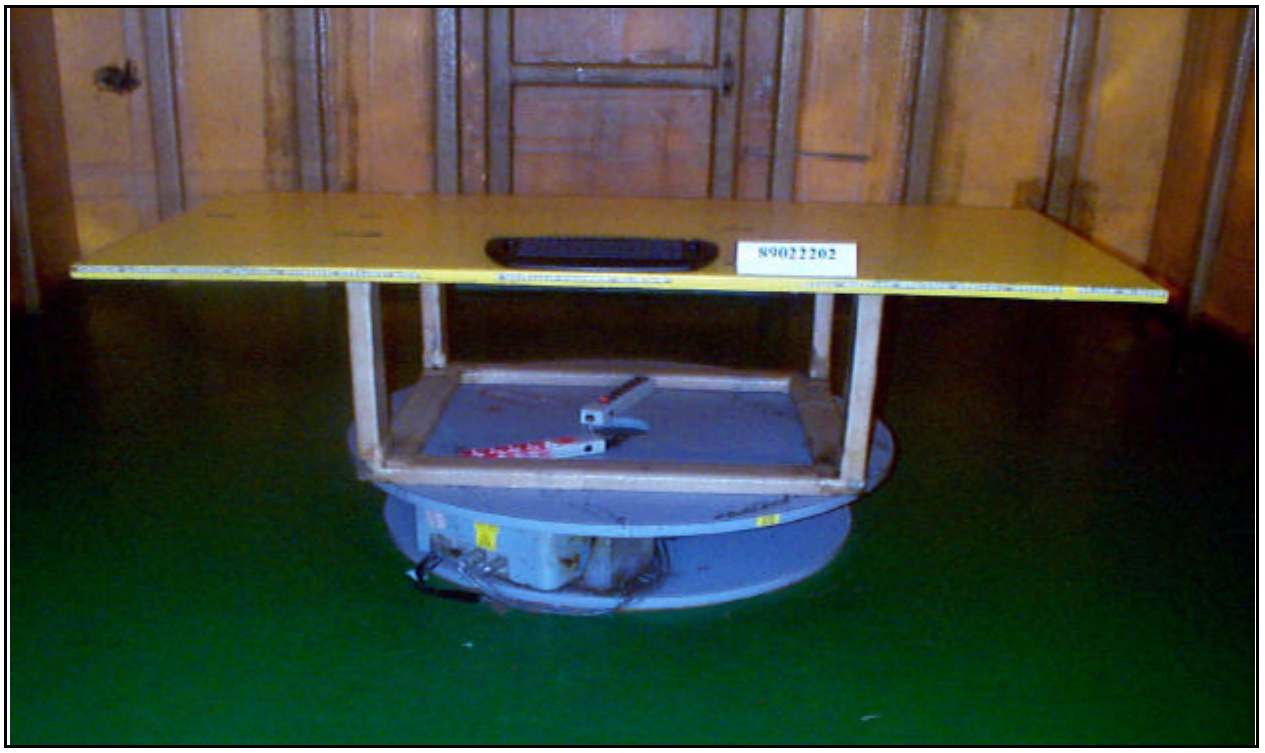
e. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and peak values of EUT will be reported. Otherwise the emissions which do not have 10 dB margin will be re-tested one by one using the quasi- peak method or average method as specified and then reported. Data sheet peak mode and QP mode.

5.2.3 Test Setup



5.2.4 Photograph of Test Setup



5.2.5 EUT Operating condition

1. Power on the keyboard (battery operated)
2. Adjust the frequency channel to Channel 1(lowest channel)
3. Set EMI test program provided by manufacture, EUT transmit data at operated frequencies.
4. Repeat the step 1 to 3 to evaluate Channel 12 (highest channel)

5.2.6 Climate Condition

The temperature and related humidity: 25 degree C and 65%RH

5.2.7 Test Results

5.4.7.1 Mode 1

Channel 1 (910.2 MHz) ANTENNA POLARITY: Vertical		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
44.19	**10.9**	**20.2**	**31.1**	**40.0**	**-8.9**	**99**	**77**
140.09	**12.6**	**22.4**	**35.0**	**43.5**	**-8.5**	**99**	**366**
154.85	**11.9**	**19.2**	**31.1**	**43.5**	**-12.4**	**109**	**310**
176.96	**10.9**	**17.4**	**28.3**	**43.5**	**-15.2**	**99**	**5**
184.33	**10.6**	**17.7**	**28.3**	**43.5**	**-15.2**	**99**	**358**
889.53	**23.4**	**15.1**	**38.5**	**46.0**	**-7.5**	**99**	**327**
906.21	**23.5**	**10.2**	**33.7**	**46.0**	**-12.3**	**170**	**35**
***910.20**	**23.5**	**41.8**	**65.3**	**94.0**	**-28.7**	**168**	**26**

Channel 1 (910.2 MHz) Antenna Polarity: Horizontal		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
44.22	**17.9**	**10.9**	**28.8**	**40.0**	**-11.2**	**320**	**312**
184.33	**10.6**	**20.4**	**31.0**	**43.5**	**-14.5**	**212**	**-2**
213.82	**11.1**	**21.3**	**32.4**	**43.5**	**-11.1**	**151**	**73**
228.57	**12.2**	**20.9**	**33.1**	**46.0**	**-12.9**	**130**	**73**
899.53	**23.4**	**16.1**	**39.5**	**46.0**	**-6.5**	**118**	**278**
906.21	**23.5**	**14.0**	**37.5**	**46.0**	**-8.5**	**112**	**84**
***910.20**	**23.5**	**47.1**	**70.6**	**94.0**	**-23.4**	**114**	**77**
914.20	**23.6**	**14.5**	**38.1**	**46.0**	**-7.9**	**110**	**101**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5." * " : Fundamental Frequency

Channel1 (910.2MHz) Antenna Polarity: Vertical		**Detector Function : Peak Average**				**6dB Bandwidth : 1 MHz.**				**Distance : 3 M Frequency Range : Above 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1820.40	32.7	18.2	-	50.9	-	74.0	54	-23.1	-	111	217
2730.60	34.8	14.5	-	49.3	-	74.0	54	-24.7	-	107	61
3640.80	38.5	13.8	-	52.3	-	74.0	54	-21.7	-	108	77
4551.00	-	-	-	-	-	-	-	-	-	-	-
5461.20	-	-	-	-	-	-	-	-	-	-	-

Channel 1 (910.2MHz) Antenna Polarity: Horizontal		**Detector Function : Peak Average**				**6dB Bandwidth : 1 MHz.**				**Distance : 3 M Frequency Range : Above 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
2730.60	34.8	14.3	-	49.1	-	74.0	54	-24.9	-	111	79
2730.60	34.8	18.5	14.3	53.3	49.1	74.0	54	-20.7	-24.9	99	90
1820.40	32.7	18.6	-	51.3	-	74	54	-22.7	-	99	90
3640.80	38.5	13.8	-	52.3	-	74.0	54	-21.7	-	99	85
5461.20	-	-	-	-	-	-	-	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

Channel 12 (919.7 MHz) Antenna Polarity: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
140.10	**12.6**	**21.4**	**34.0**	**43.5**	**-9.5**	**99**	**4**
147.46	**12.3**	**21.5**	**33.8**	**43.5**	**-9.7**	**99**	**362**
154.84	**11.9**	**19.6**	**31.5**	**43.5**	**-12.0**	**99**	**362**
176.96	**10.9**	**19.6**	**30.5**	**43.5**	**-13.0**	**99**	**10**
184.33	**10.6**	**19.5**	**30.1**	**43.5**	**-13.4**	**99**	**360**
915.72	**23.6**	**9.4**	**33.0**	**46.0**	**-13.0**	**118**	**34**
***919.70**	**23.6**	**39.6**	**63.2**	**94.0**	**-30.8**	**102**	**32**
923.72	**23.7**	**8.9**	**32.6**	**46.0**	**-13.4**	**116**	**33**

Channel 12 (919.7 MHz) Antenna Polarity: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
44.21	**10.9**	**17.2**	**28.1**	**40.0**	**-11.9**	**328**	**289**
176.95	**10.9**	**19.5**	**30.4**	**43.5**	**-13.1**	**241**	**1**
184.31	**10.6**	**20.1**	**30.7**	**43.5**	**-12.8**	**184**	**317**
199.05	**10.2**	**23.4**	**33.6**	**43.5**	**-9.9**	**132**	**352**
213.82	**11.1**	**22.6**	**33.7**	**43.5**	**-9.8**	**151**	**57**
915.72	**23.6**	**12.7**	**36.3**	**46.0**	**-9.7**	**109**	**85**
***919.70**	**23.6**	**44.5**	**68.1**	**94.0**	**-25.9**	**109**	**70**
923.72	**23.7**	**14.0**	**37.7**	**46.0**	**-8.3**	**109**	**81**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5." * " : Fundamental Frequency

Channel 12(919.7MHz) Antenna Polarity: Vertical		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1839.30	32.8	11.5	-	44.3	-	74.0	54	-29.7	-	99	283
2759.10	34.9	14.2	-	49.1	-	74.0	54	-24.9	-	99	19
3678.82	38.5	13.0	-	51.5	-	74.0	54	-22.5	-	99	282
4598.50	-	-	-	-	-	-	-	-	-	-	-
5518.20	-	-	-	-	-	-	-	-	-	-	-

Channel 12(919.7MHz) Antenna Polarity: Horizontal		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1839.30	32.8	14.6	-	47.4	-	74.0	54	-26.6	-	99	250
2759.30	34.9	14.9	-	49.8	-	74.0	54	-24.2	-	99	336
3679.00	38.5	13.9	-	52.4	-	74.0	54	-21.6	-	99	173
4598.50	-	-	-	-	-	-	-	-	-	-	-
5518.20	-	-	-	-	-	-	-	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5.4.7.3 Mode 2

Channel 1 (910.2 MHz) Antenna Polarity: Vertical		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
68.30	**6.5**	**24.1**	**30.6**	**40.0**	**-9.4**	**99**	**259**
176.99	**10.9**	**25.1**	**36.0**	**43.5**	**-7.5**	**99**	**246**
243.35	**13.2**	**18.6**	**31.8**	**46.0**	**-14.2**	**99**	**15**
250.83	**13.7**	**21.5**	**35.2**	**46.0**	**-10.8**	**99**	**361**
722.65	**22.0**	**12.0**	**34.0**	**46.0**	**-12.0**	**99**	**245**
899.50	**23.4**	**14.7**	**38.1**	**46.0**	**-7.9**	**99**	**295**
***910.20**	**23.5**	**43.9**	**67.4**	**94.0**	**-26.6**	**174**	**109**
914.22	**8.4**	**23.6**	**32.0**	**46.0**	**-14.0**	**177**	**106**

Channel 1 (910.2 MHz) Antenna Polarity: Horizontal		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
177.00	**10.9**	**26.3**	**37.2**	**43.5**	**-6.3**	**194**	**254**
184.35	**10.6**	**19.8**	**30.4**	**43.5**	**-13.1**	**265**	**299**
236.00	**12.7**	**20.2**	**32.9**	**46.0**	**-13.1**	**133**	**209**
309.73	**15.2**	**17.9**	**33.1**	**46.0**	**-12.9**	**110**	**16**
457.35	**18.8**	**16.0**	**34.8**	**46.0**	**-11.2**	**99**	**321**
906.22	**23.5**	**9.7**	**33.2**	**46.0**	**-12.8**	**113**	**361**
***910.20**	**23.5**	**52.7**	**76.2**	**94.0**	**-17.8**	**105**	**361**
914.22	**23.6**	**14.8**	**38.4**	**46.0**	**-7.6**	**116**	**60**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5." * " : Fundamental Frequency

Channel 1 (910.2MHz) ANTENNA POLARITY: Vertical		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1820.40	32.7	16.4	-	49.1	-	74.0	54	-24.9	-	156	121
2730.60	34.8	16.9	-	51.7	-	74.0	54	-22.3	-	99	54
3640.80	38.5	13.8	-	52.3	-	74.0	54	-21.7	-	99	284
4551.00	-	-	-	-	-	-	-	-	-	-	-
5461.20	-	-	-	-	-	-	-	-	-	-	-

Channel 1 (910.2MHz) Antenna Polarity: Horizontal		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1820.40	32.7	17.4	-	20.1	-	74.0	54	-23.9	-	99	99
2730.60	34.8	16.1	-	50.9	-	74.0	54	-23.1	-	99	307
3640.80	38.5	13.5	-	52.0	-	74.0	54	-22.0	-	99	184
4551.00	-	-	-	-	-	-	-	-	-	-	-
5461.20	-	-	-	-	-	-	-	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

Channel 12 (919.7 MHz) Antenna Polarity: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
47.95	9.1	21.6	30.7	40.0	-9.3	99	71
120.05	12.9	13.2	26.1	43.5	-17.4	99	204
203.15	10.4	20.3	30.7	43.5	-12.8	99	44
250.83	13.7	15.4	29.1	46.0	-16.9	99	343
516.20	20.1	11.0	31.1	46.0	-14.9	218	186
816.02	22.7	11.3	34.0	46.0	-12.0	122	355
*919.72	23.6	44.8	68.4	94.0	-25.6	162	102
923.73	23.7	7.0	30.7	46.0	-15.3	154	111

Channel 12 (919.7 MHz) Antenna Polarity: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
169.63	11.2	19.2	30.4	43.5	-13.1	137	318
184.35	10.6	22.7	33.3	43.5	-10.2	99	20
203.18	10.4	26.1	36.5	43.5	-7.0	132	90
228.65	12.2	21.6	33.8	46.0	-12.2	196	23
250.75	13.7	19.8	33.5	46.0	-12.5	202	108
457.25	18.8	18.2	37.0	46.0	-9.0	101	293
*919.73	23.6	53.1	76.7	94.0	-17.3	107	76
923.73	23.7	14.3	38.0	46.0	-8.0	107	348

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5." * " : Fundamental Frequency

Channel 12(919.7MHz) Antenna Polarity: Vertical		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1839.32	32.8	10.6	-	43.4	-	74.0	54	-30.6	-	197	288
2759.14	34.9	16.0	-	50.9	-	74.0	54	-23.1	-	99	243
3679.00	38.5	13.9	-	52.4	-	74.0	54	-21.6	-	99	327
4598.50	-	-	-	-	-	-	-	-	-	-	-
5518.20	-	-	-	-	-	-	-	-	-	-	-

Channel 12(919.7MHz) Antenna Polarity: Horizontal		Detector Function : Peak Average		6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.			
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1839.32	32.8	15.4	-	48.2	-	74.0	54	-25.8	-	99	271
2759.11	34.9	16.3	-	51.2	-	74.0	54	-22.8	-	157	146
3679.18	38.5	12.8	-	51.3	-	74.0	54	-22.7	-	168	333
4598.50	-	-	-	-	-	-	-	-	-	-	-
5518.20	-	-	-	-	-	-	-	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5.3 BAND EDGES MEASUREMENT

5.3.1 Test Instruments

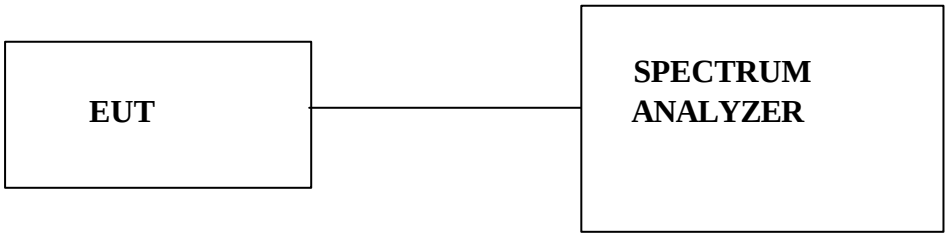
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**848926/005 846839/018**	**Dec 03, 2000**
HP PLOTTER	**7475A**	**2641V27755**	**N/A**

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

5.3.2 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with convenient frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

5.3.3 Test Setup



5.3.4 EUT Operating condition

1. Power on the keyboard (battery operated)
2. Adjust the frequency channel to Channel 1(lowest channel)
3. Set EMI test program provided by manufacture, EUT transmit data at operated frequencies.
4. Repeat the step 1 to 3 to evaluate Channel 12 (highest channel)

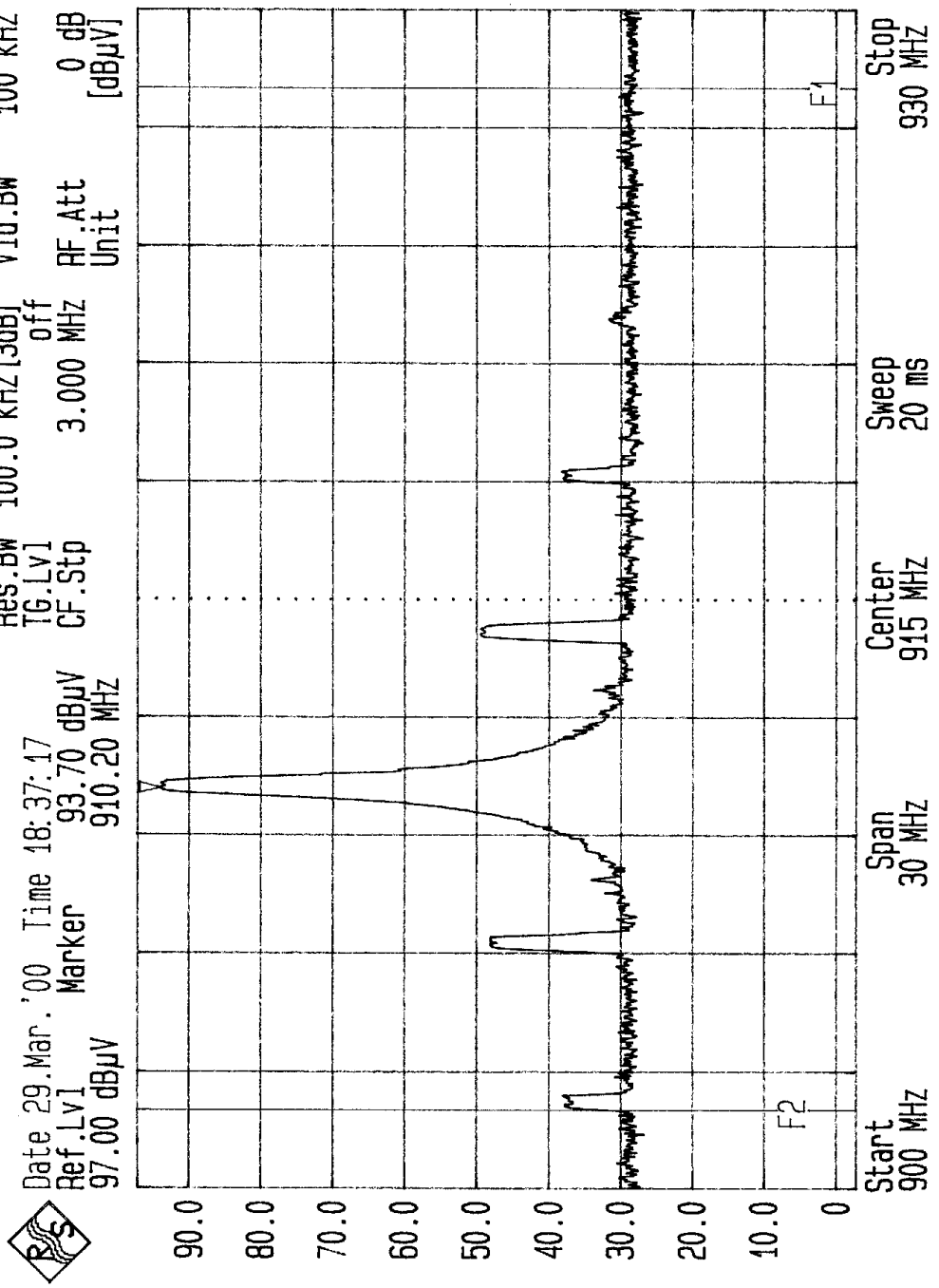
5.3.5 Climate Condition

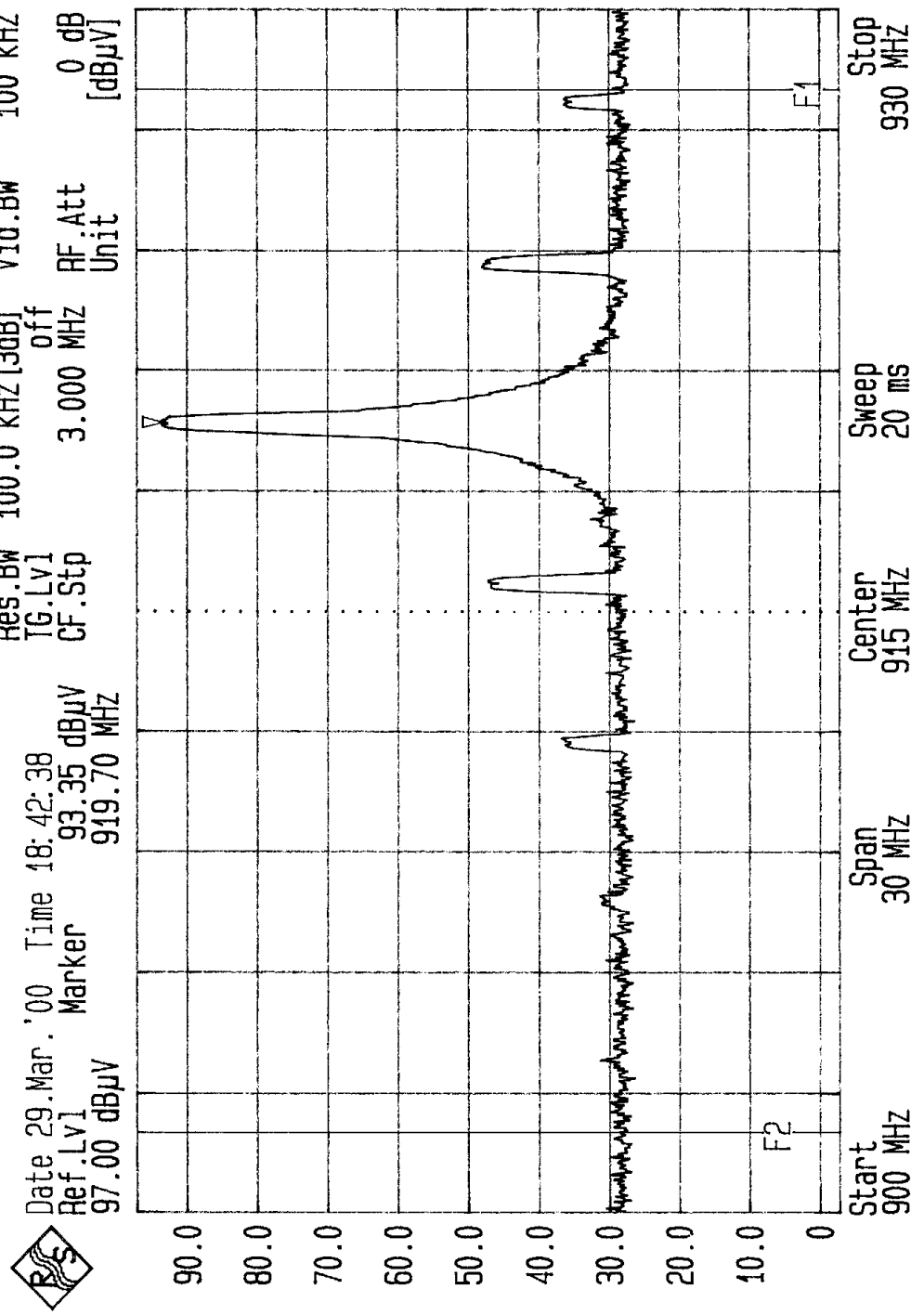
The temperature and related humidity: 25 degree C and 65%RH

5.3.6 Test Results

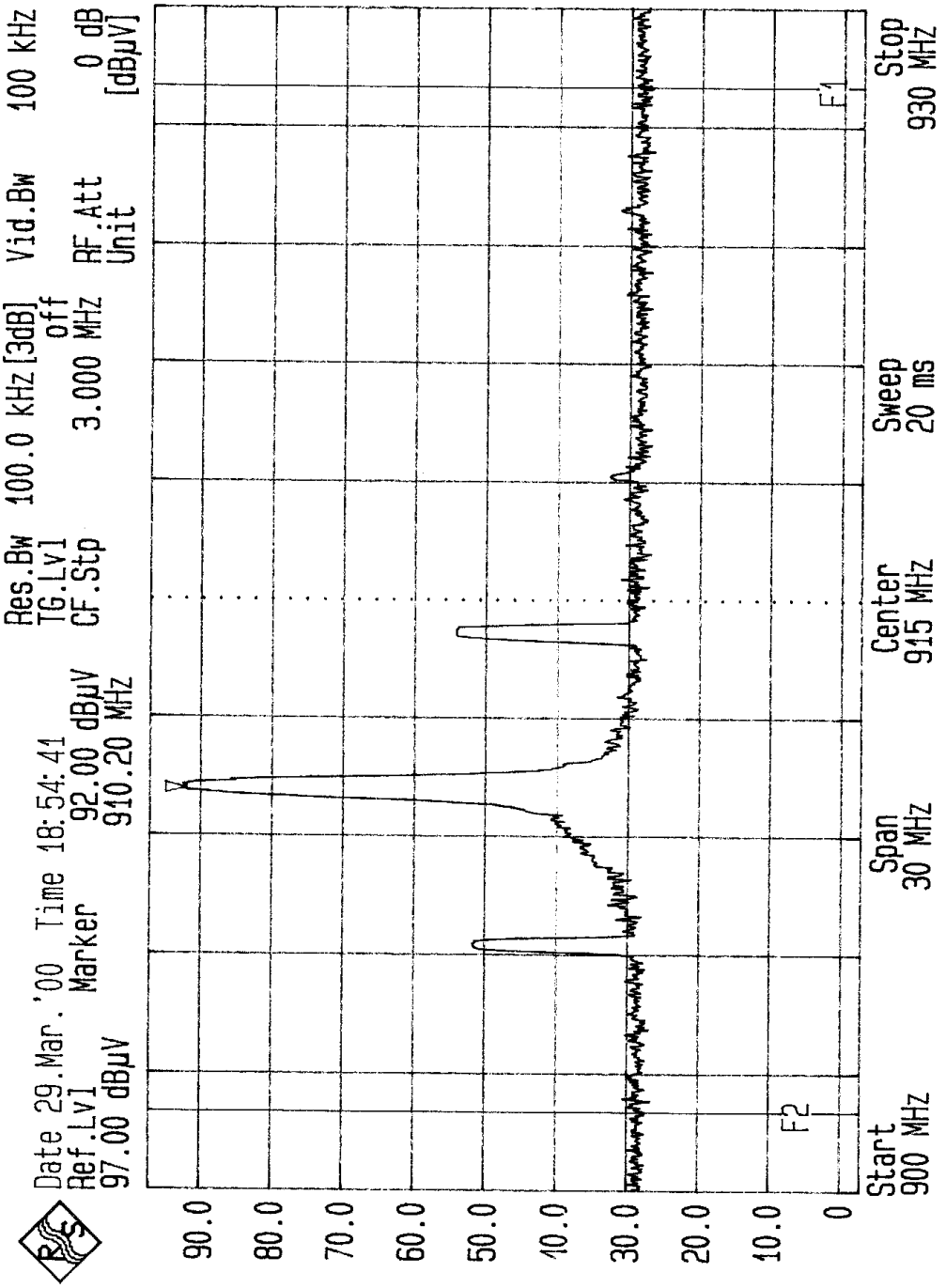
The spectrum plots are attached as below.

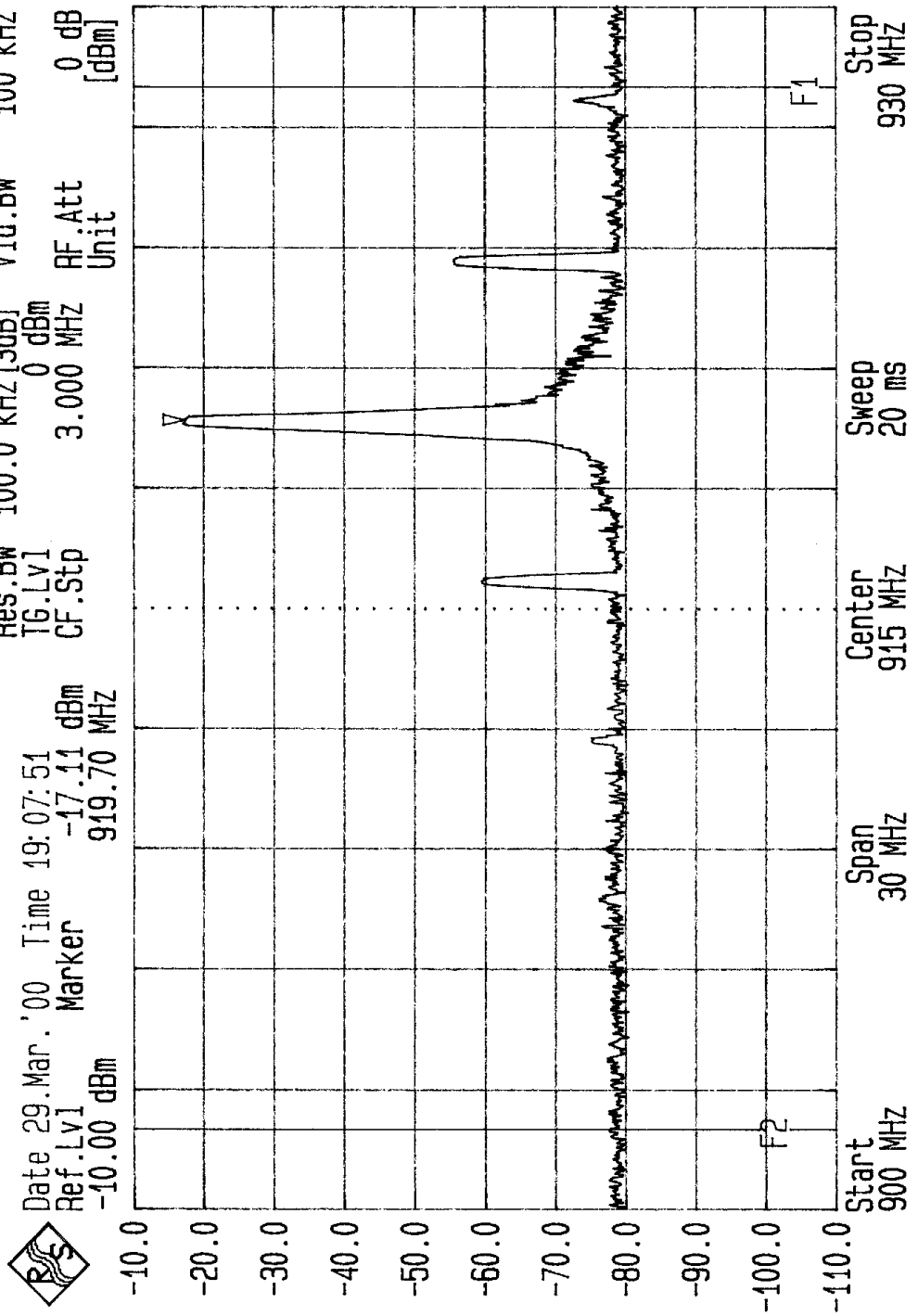
5.6.3.1 Mode 1


Date 29.Mar.'00 Time 18:37:17
Ref.Lvl 97.00 dBµV
Marker 93.70 dBµV 910.20 MHz
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 3.000 MHz RF.Att 0 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
F1
F2
Start 900 MHz
Span 30 MHz
Center 915 MHz
Sweep 20 ms
Stop 930 MHz


Date 29.Mar.'00 Time 18:42:38
Ref.Lvl
97.00 dBµV
Marker
93.35 dBµV
919.70 MHz
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
F2
F1
Start 900 MHz
Span 30 MHz
Center 915 MHz
Sweep 20 ms
Stop 930 MHz

Mode 2


Date 29.Mar.'00 Time 18:54:41
Ref.Lvl
97.00 dBµV
Marker
92.00 dBµV
910.20 MHz
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
10.0
30.0
20.0
10.0
0
F1
F2
Start 900 MHz
Span 30 MHz
Center 915 MHz
Sweep 20 ms
Stop 930 MHz


Date 29.Mar.'00 Time 19:07:51
Ref.Lvl
-10.00 dBm
Marker
-17.11 dBm
919.70 MHz
Res.Bw 100.0 kHz [3dB]
TG.Lvl 0 dBm
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
F1
F2
Start 900 MHz
Span 30 MHz
Center 915 MHz
Sweep 20 ms
Stop 930 MHz

Appendix A Lab. licenses

NVLAP

NVLAP Lab Code: 200102-0 and 200376-0

ADT Corp. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results.

FCC

The Open Area Test Sites, and conducted measurement facilities are located in Newberg, OR,. These sites have been fully described in reports filed with the FCC (Federal Communications Commission), and accepted by the FCC in letters maintained in our files.