



FCC ID: IOU0630S02

**REPORT NO:** RF89042101  
**PRODUCT:** Wireless LAN PCI Card  
**MODEL NO:** NWH630, NCP130, WL102  
**SERIAL NO:** N/A  
**CLIENT:** NATIONAL DATACOMM CORPORATION.  
**ADDRESS:** 4F, No 24-2, INDUSTRY EAST 4<sup>th</sup> ROAD,  
Science Park Hsinchu, 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 B & C  
**TEST DATE:** March 31, 2000  
**TEST RESULT:** Pass

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Accredited Laboratory



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# 1. CERTIFICATION

Issue Date: April 28, 2000

**PRODUCT:** Wireless LAN PCI Card

**MODEL NO:** NWH630, NCP130, WL102

**FCC ID:** IOU0630S02

**CLIENT:** National Datacomm Corporation.  
ZyXEL Communications Corporation.

**TEST STANDARD:** FCC 47CFR Part 15, Subpart C (Section 15.247) and Subpart B  
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.

<b>TESTED BY:</b>	<u>James Lee</u> James Lee	<b>DATE:</b> <u>5/4/2000</u>
<b>PREPARED BY:</b>	<u>Delphine Hsu</u> Delphine Hsu	<b>DATE:</b> <u>5/4/2000</u>
<b>APPROVED BY:</b>	<u>Alan Lane</u> Dr. Alan Lane, Manager	<b>DATE:</b> <u>5/4/2000</u>



## 2. SUMMARY OF TEST RESULTS & GENERAL STATEMENT OF CERTIFICATION

The EUT has been tested according to the EUT's specifications and the following requirements, and the worst case were found at the data rate and modulation type of 11Mb/s(CCK).

47 CFR Part 15, Subpart C			
PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)	TEST RESULT
15.107	AC Power Conducted Emissions Spec.: 48 dBuV	Yes	Minimum passing margin is -5.7 dBuV At 0.51 MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Spec.: min. 500 kHz	Yes	9.51 MHz > 500 kHz
15.247(b)	Maximum Peak Output Power Spec.: max. 30 dBm	Yes	13.34 dBm < 30 dBm
15.247(c)	Transmitter Radiated Emissions Spec.: Table 15.209	Yes	Minimum passing margin is -1.4 dBuV At 4873.91 MHz
15.247(d)	Power Spectral Density Spec.: max. 8dBm	Yes	-7.28 dBm < 8 dBm
15.247(e)	Processing Gain of Direct Sequence Spread Spectrum System Spec.: min. 10 dB	Yes	11.4dB 10dB

**Note 1 :** The digital circuits and receiver portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B, Class B – computing Devices(FCC Doc). The engineering test report can be provided upon FCC requests.



### 3. GENERAL INFORMATION

#### 3.1 General Description of EUT

<b>Product:</b>	Wireless LAN PCI Card
<b>Model No:</b>	NWH630, NCP130, WL102
<b>Power Supply:</b>	DC Power from PC
<b>Radio Technology:</b>	Direct Sequence Spread Spectrum
<b>Modulation Type:</b>	QPSK, CCK
<b>Data Rate:</b>	1 / 2 / 5.5 / 11 Mbps
<b>Operating Frequency:</b>	2412 ~ 2462 MHz
<b>Number of Channel:</b>	11
<b>Channel Spacing:</b>	5 MHz
<b>Power Rating:</b>	Max. 14dBm
<b>Associated devices:</b>	N/A

*Note: 1. NWH630, NCP130, WL102 are the same products, they have different product names because of market requirement for OEM.*

*2. The wireless LAN PCI Card, InstantWave was designed with a "Maximizing the convenience of networking" philosophy in mind. You will find that InstantWave is very easy to configure and use.*

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



### 3.2 Description of Test mode

The EUT has 11 channels for data transmission. According to Part 15 Sec. 15.31(m), the channel 1, 6 and 11 were chosen for evaluation.

Mode	Channel	Frequency (MHz)
1	1	2412 MHz
2	6	2437 MHz
3	11	2462 MHz

### 3.3 Test Methodology

All tests were executed on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C.

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

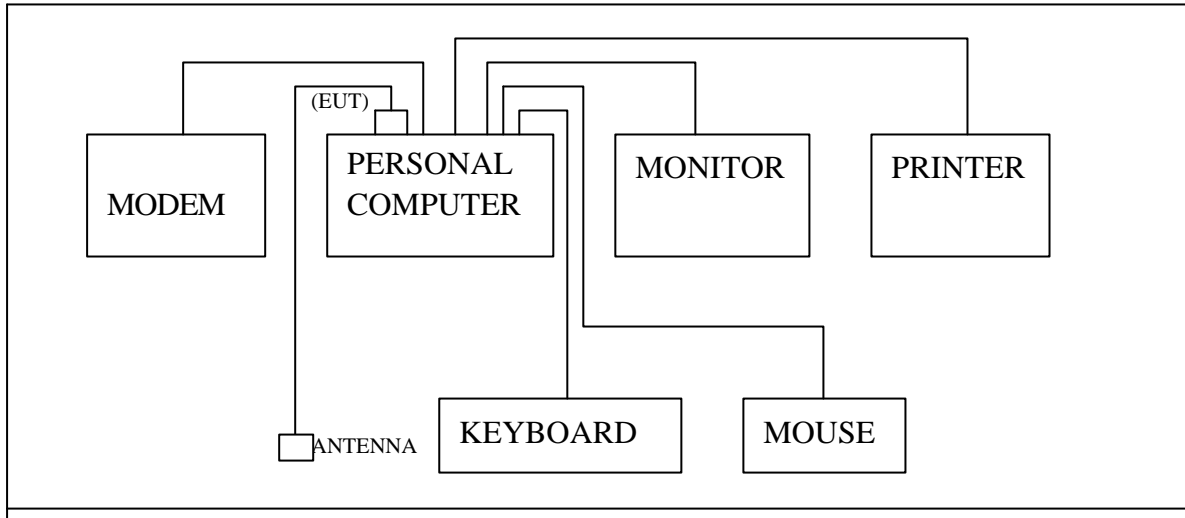


### 3.4 Support Units

No	Product	Brand	Model No.	Serial No.	FCC ID / DoC
1	PC	IBM	2187-12W	1S218714ABNA000V	FCC DoC Approved
Cable: Non-shielded power (1.8m)					
2	Monitor	HP	D2846	JP74912250	FCC DoC Approved
Cable : Non-shielded power (1.8 m) Shielded signal (1.5 m)					
3	Modem	ACCEX	1414	980020531	IFAXDM1414
Cable : Non-shielded power (1.9 m) Shielded signal (1.2 m)					
4	Printer	HP	2225C	2442S63076	BS46XU2225C
Cable : Non-shielded power (1.8 m) Shielded signal (1.2 m)					
5	Keyboard	FORWARD	FAD-104GA	FDKB8110111	F4ZDA-104G
Cable : Shielded signal (1.8 m)					
6	Mouse	LOGITECH	M-S43	LZE00703207	DZL211106
Cable : Shielded signal (1.4 m)					



### 3.5 Configuration of Tested System





## 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 :

Calibration interval of all 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

#### 5.1.1 Test Instruments

ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 7, 2000
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 8, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 13, 2000
EMCO L.I.S.N.	3825/2	9504-2359	July 13, 2000
Shielded Room	Site 3	ADT-C03	NA

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

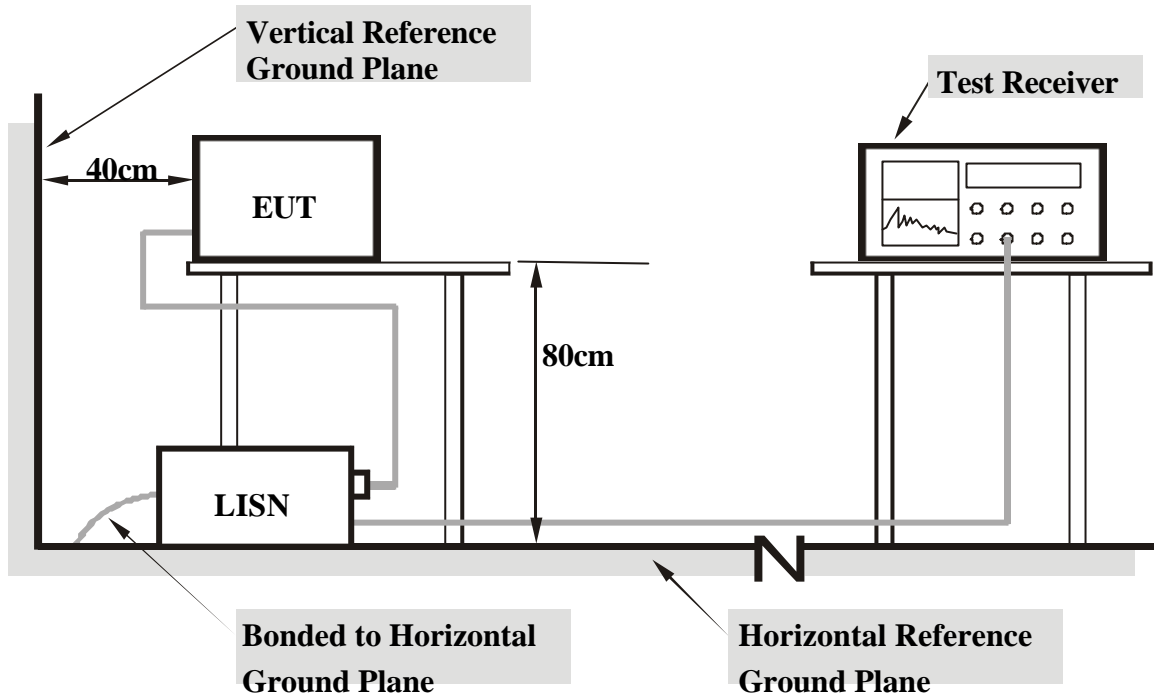
#### 5.1.2 Test Procedure

The EUT was placed 0.4 meter far away from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 / 50 μH coupling impedance for the measuring instrument.

Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

The frequency range from 450 kHz to 30 MHz was searched. The emission levels under limits by over 10dB is not reported.

### 5.1.3 Test Setup



- Note: 1. Support units were connected to second LISN.**  
**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80cm away from other units and metal planes.**

### 5.1.4 Photograph of Test Setup





**5.1.5 EUT Operating condition**

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually. "H" patterns and other messages were sent to support units and be displayed on the screen of Monitor.

**5.1.6 Climate Condition**

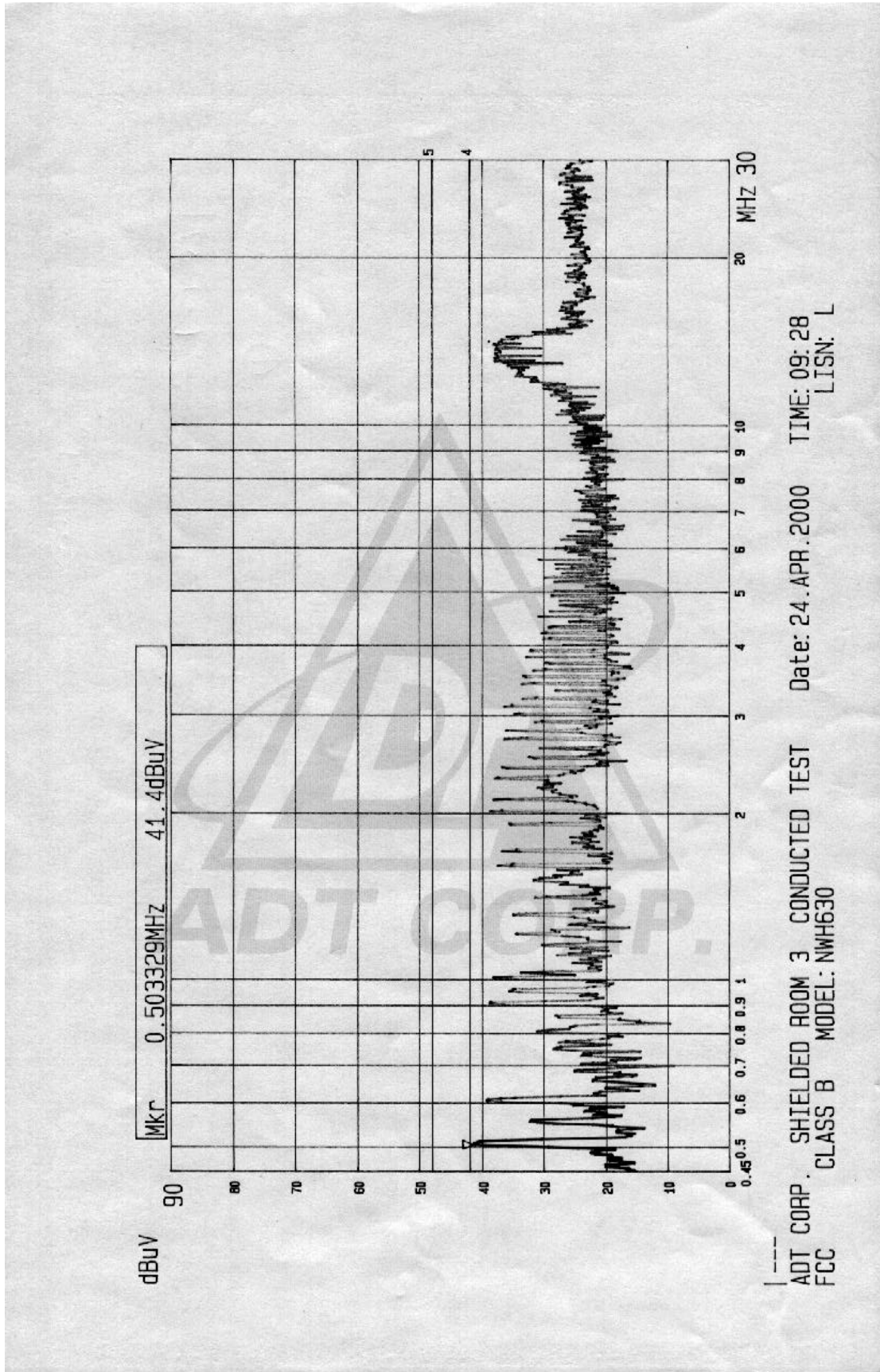
The temperature and related humidity: 23 and 63% RH

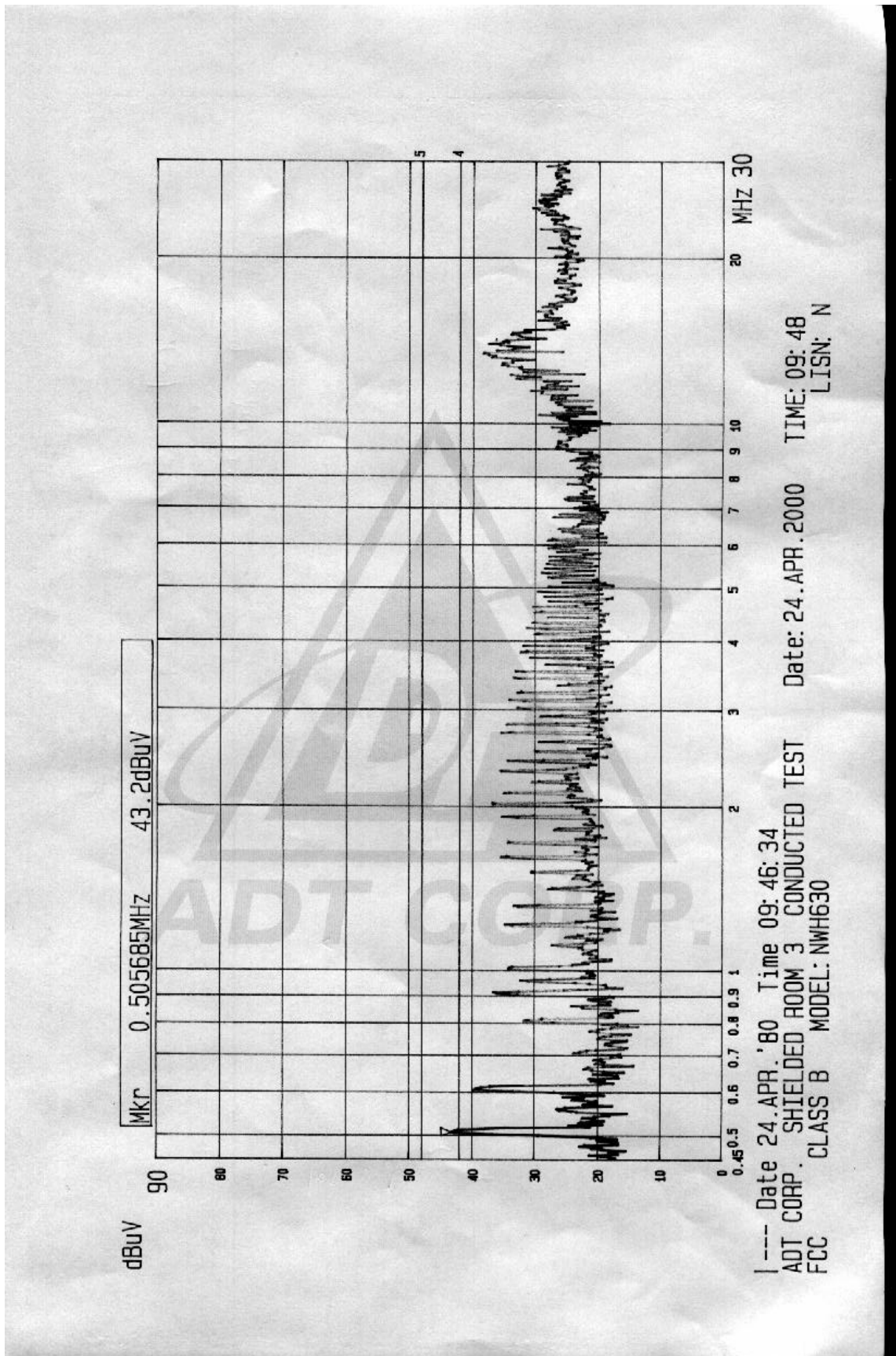
**5.1.7 Test Results**

MODE: CH 1		6 dB Bandwidth: 10 kHz				PHASE: LINE (L)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.51	0.2	40.5	-	40.7	-	48	-	-7.3	-
0.60	0.3	39.8	-	40.1	-	48	-	-7.9	-
2.00	0.3	37.2	-	37.5	-	48	-	-10.5	-
3.11	0.5	33.1	-	33.6	-	48	-	-14.4	-
13.20	1.0	37.3	-	38.3	-	48	-	-9.7	-
23.98	1.4	30.1	-	31.5	-	48	-	-16.5	-

MODE: CH1		6 dB Bandwidth: 10 kHz				PHASE: Neutral(N)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.51	0.2	42.1	-	42.3	-	48	-	-5.7	-
0.60	0.3	39.2	-	39.5	-	48	-	-8.5	-
2.00	0.3	35.1	-	35.4	-	48	-	-12.6	-
3.11	0.4	31.9	-	32.3	-	48	-	-15.7	-
13.20	0.7	37.1	-	37.8	-	48	-	-10.2	-
23.98	1.1	30.1	-	31.2	-	48	-	-16.8	-

- Remarks:
1. "": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.







## 5.2 6 dB Bandwidth Measurement

### 5.2.1 Test Instruments

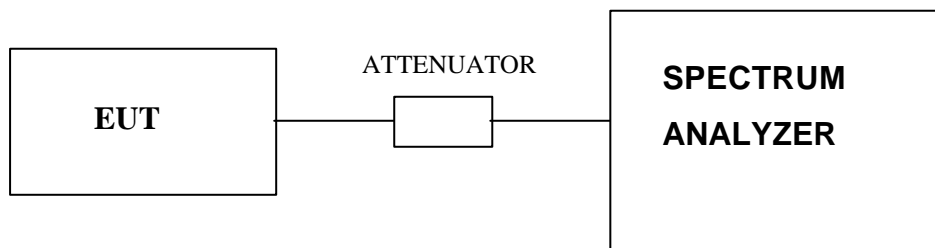
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	846839/018 848926/005	Dec. 03, 2000
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

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

### 5.2.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth was measured and recorded.

### 5.2.3 Test Setup



### 5.2.4 EUT Operating condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

### 5.2.5 Climate Condition

The temperature and related humidity: 18 and 78%RH

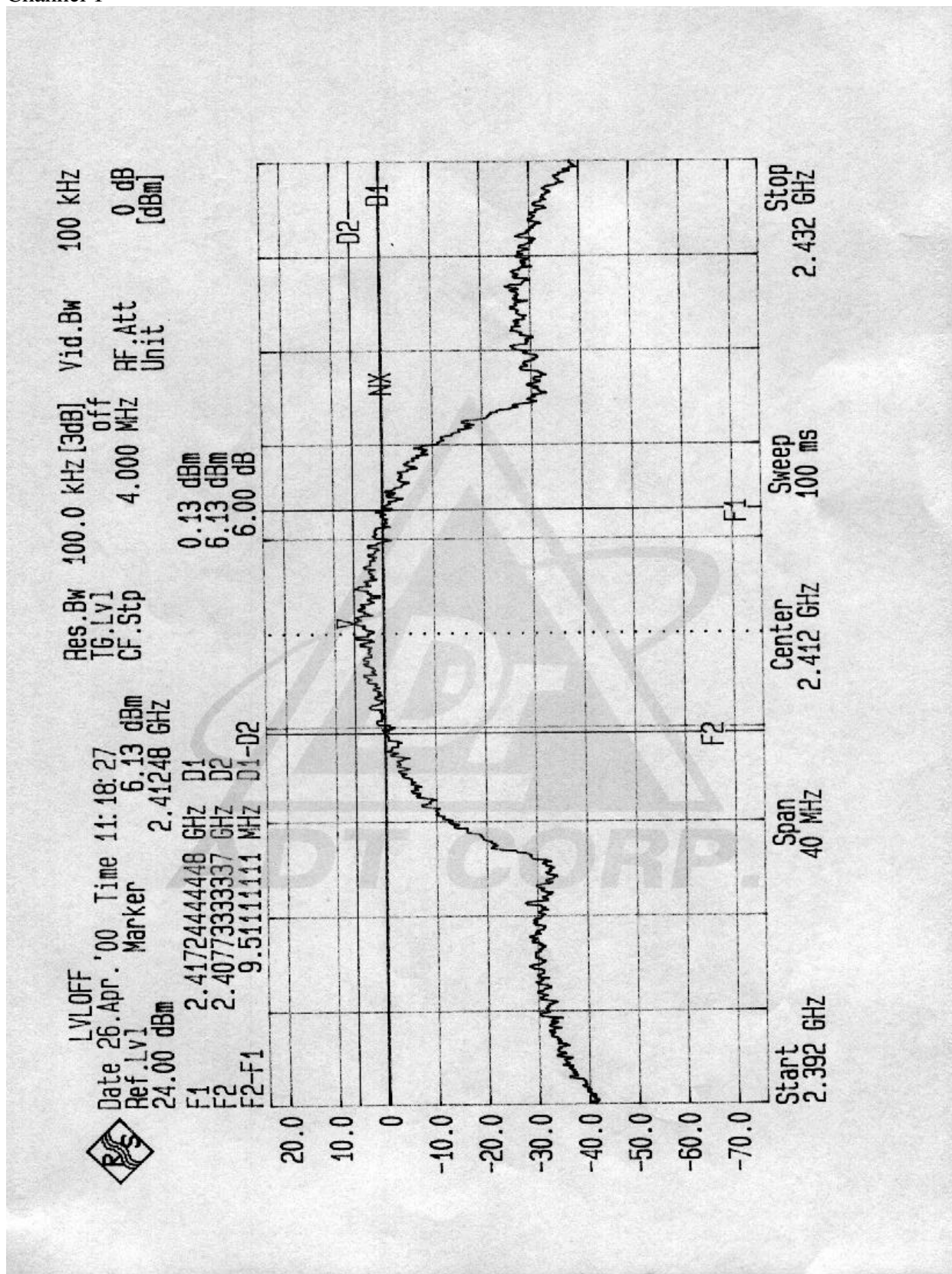


**5.2.6 Test Results**

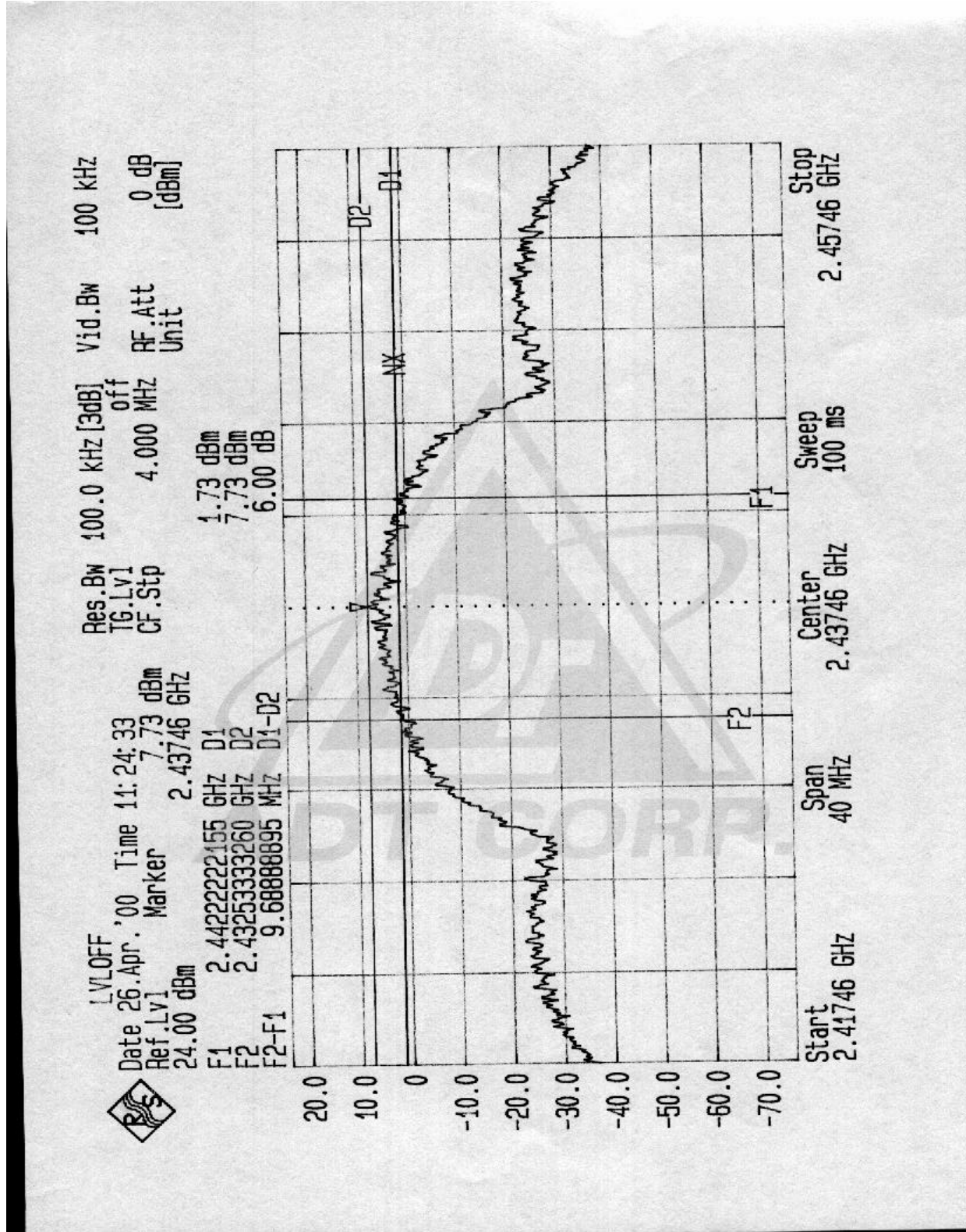
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	9.51	0.5	PASS
6	2437	9.69	0.5	PASS
11	2462	10.27	0.5	PASS

The plots of test result on the spectrum analyzer are attached below.

Channel 1

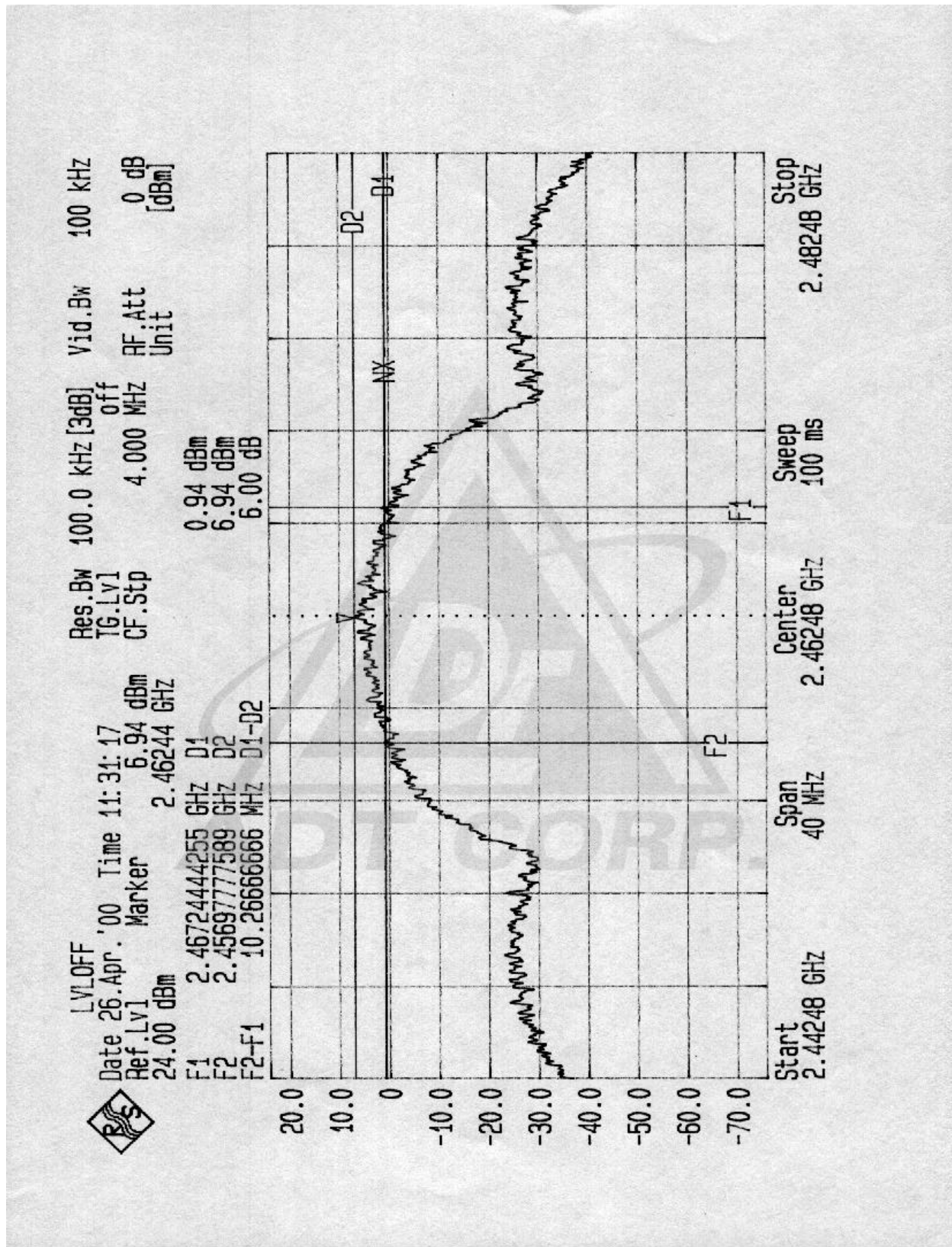


Channel 6





Channel 11





### 5.3 Maximum Peak Output Power and RF Exposure Limit Measurement

#### 5.3.1 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	846839/018 848926/005	Dec. 03, 2000
FULL ANECHOIC CHAMBER	N/A	N/A	N/A
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

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

#### 5.6.2 Test Procedure

##### 5.6.2.1 Maximum Peak Output Power

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured by the spectrum analyzer with 1 MHz RBW and 1 MHz VBW. The peak power was measured and recorded.

##### 5.6.2.2 RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
<b>(A)Limits For Occupational / Control Exposures</b>				
300-1500	...	...	F/300	6
1500-100,000	...	...	5	6
<b>(B)Limits For General Population / Uncontrolled Exposure</b>				
300-1500	...	...	F/1500	6
1500-100,000	...	...	1.0	30

F = Frequency in MHz

The 20cm separation requirement listed in section 2.1091 is met because the output power and the antenna gain is very low. Please see the calculation below.

Friis transmission formula :  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

where

$P_d$  = power density in  $mW/cm^2$

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

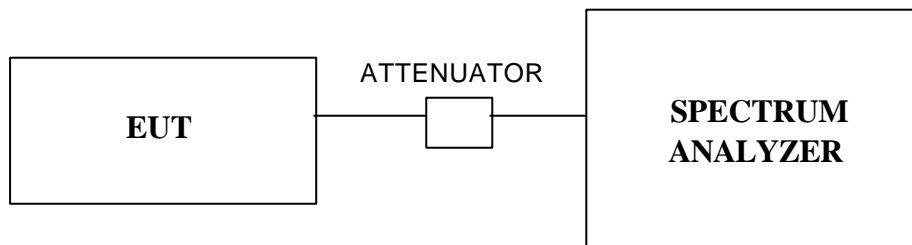
$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

Through the calculation, we will know the distance  $r$  where the MPE limit is reached.

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition,  
Page 640, Eq. (11-133).

### 5.6.3 Test Setup



### 5.6.4 EUT Operating condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 5.6.5 Climate Condition

The temperature and related humidity: 18 and 78% RH



### 5.6.6 Test Results

#### 5.6.6.1 Output Power Into Antenna:

Antenna Gain: -4 dBi or 0.4 (numeric)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	12.68	30	PASS
6	2437	13.34	30	PASS
11	2462	13.16	30	PASS

The plots of the result on the spectrum analyzer are attached below.

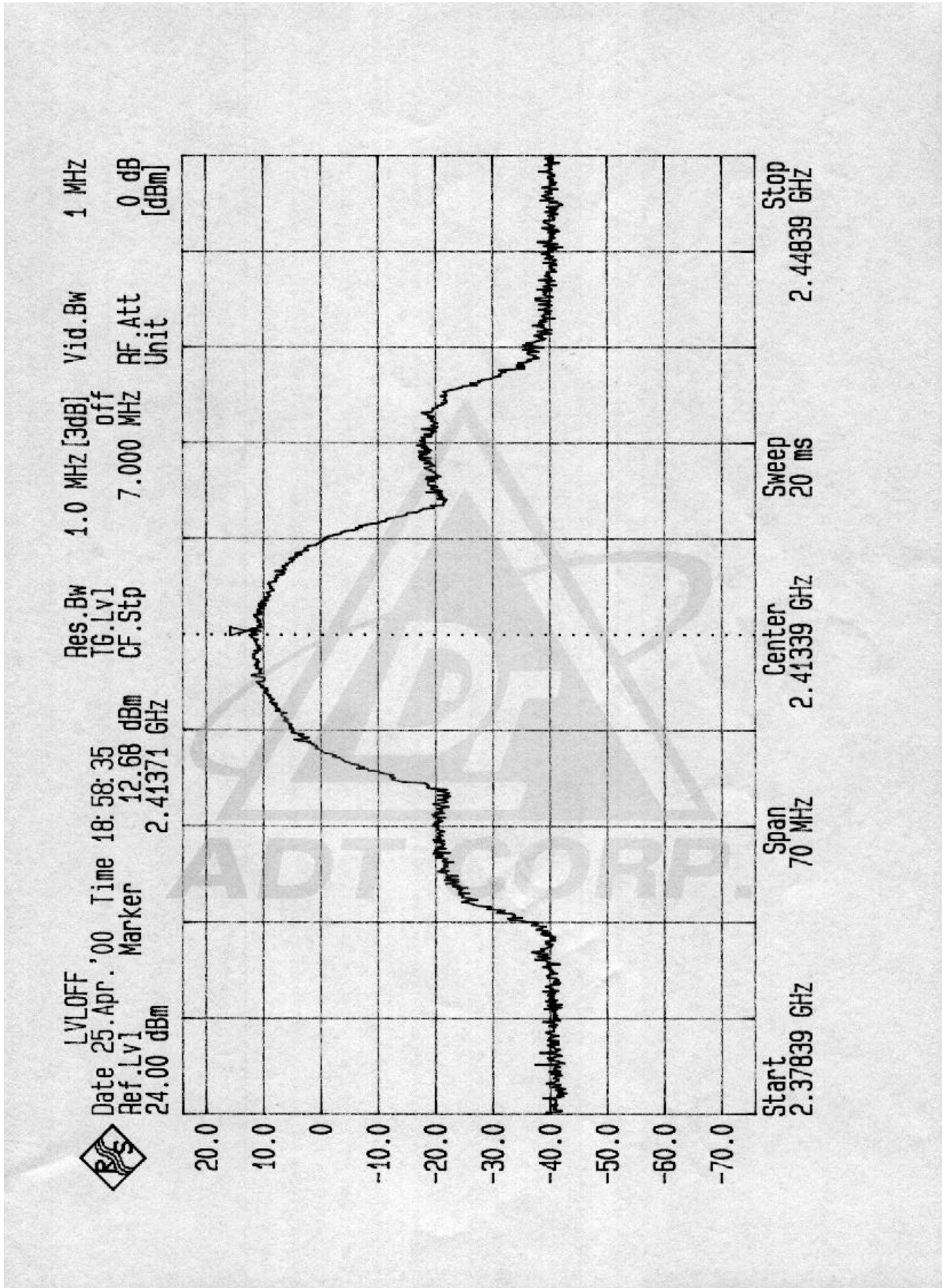
#### 5.6.6.2 RF Exposure Distance Limits :

CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER TO ANTENNA (mW)	MINIMUM ALLOWABLE DISTANCE ( r ) FROM SKIN (Centi-Meter)
1	2412	18.54	0.77
6	2437	21.58	0.83
11	2462	20.70	0.81

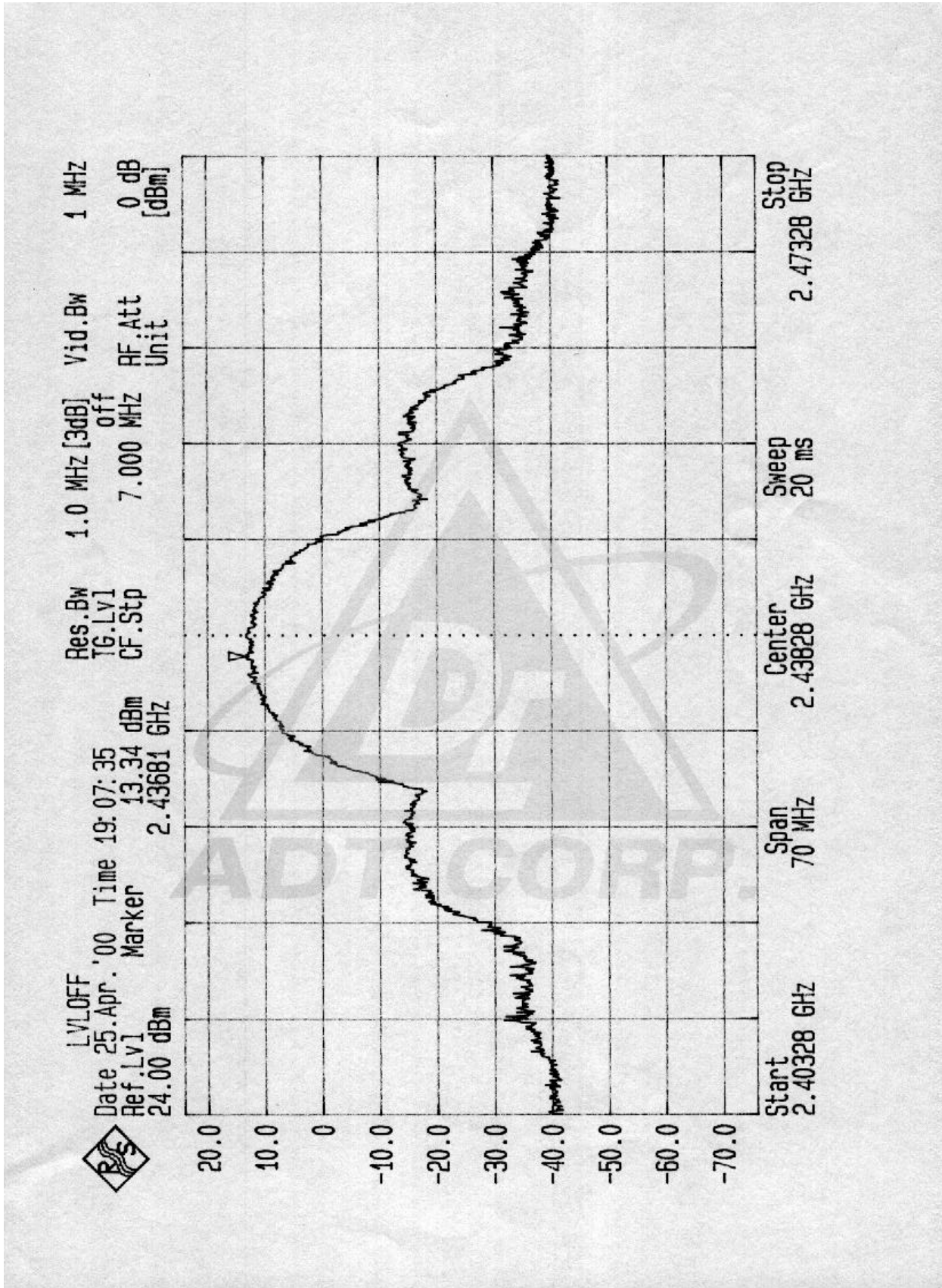
The distance r (4<sup>th</sup> column) calculated from the Friis transmission formula is far more shorter than 20 cm separation requirement. So, RF exposure limit warning or SAR test are not required.



Channel 1

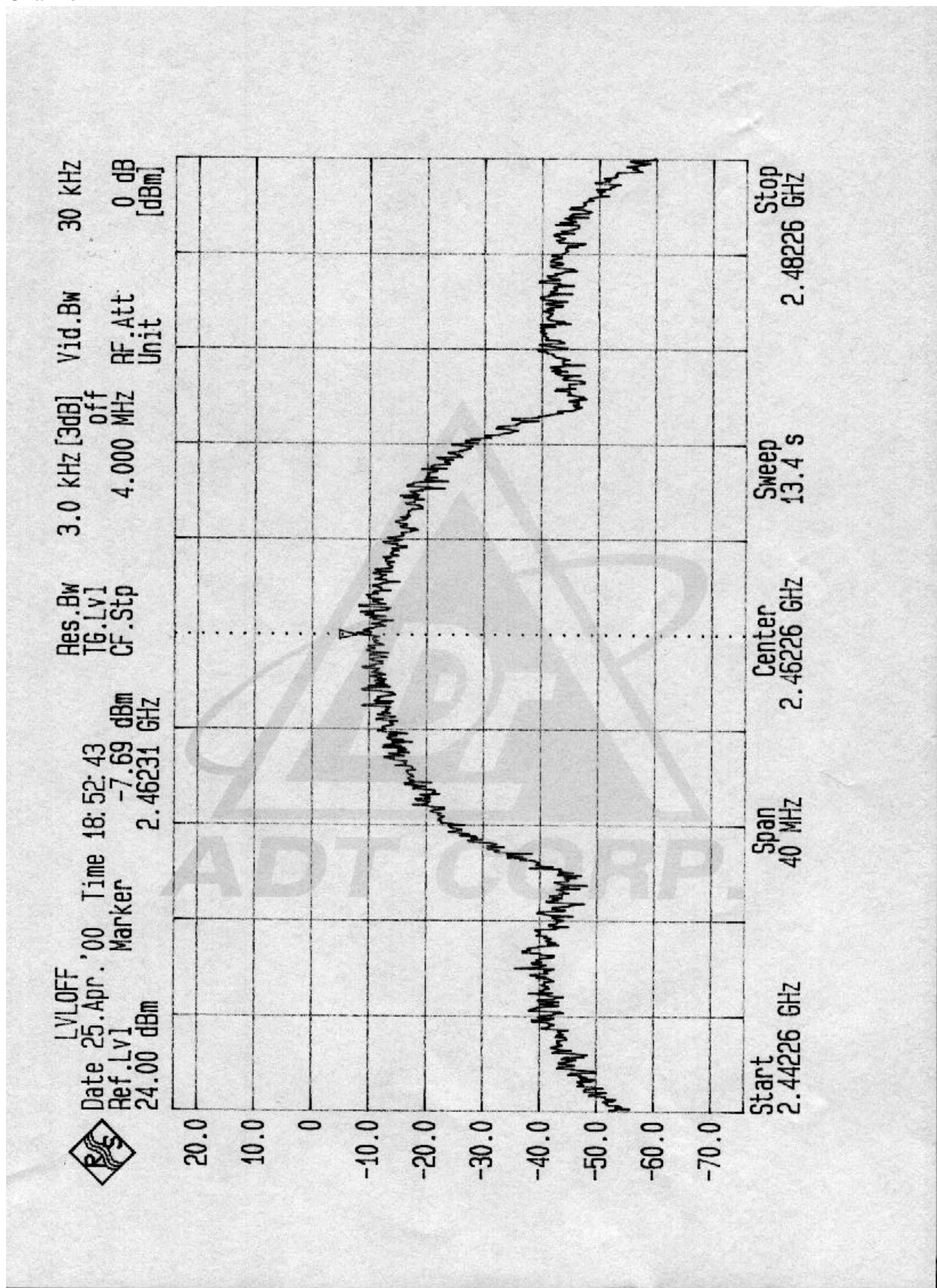


Channel 6





Channel 11





### 5.4 Radiated Emission Measurement

#### 5.4.1 Test instruments

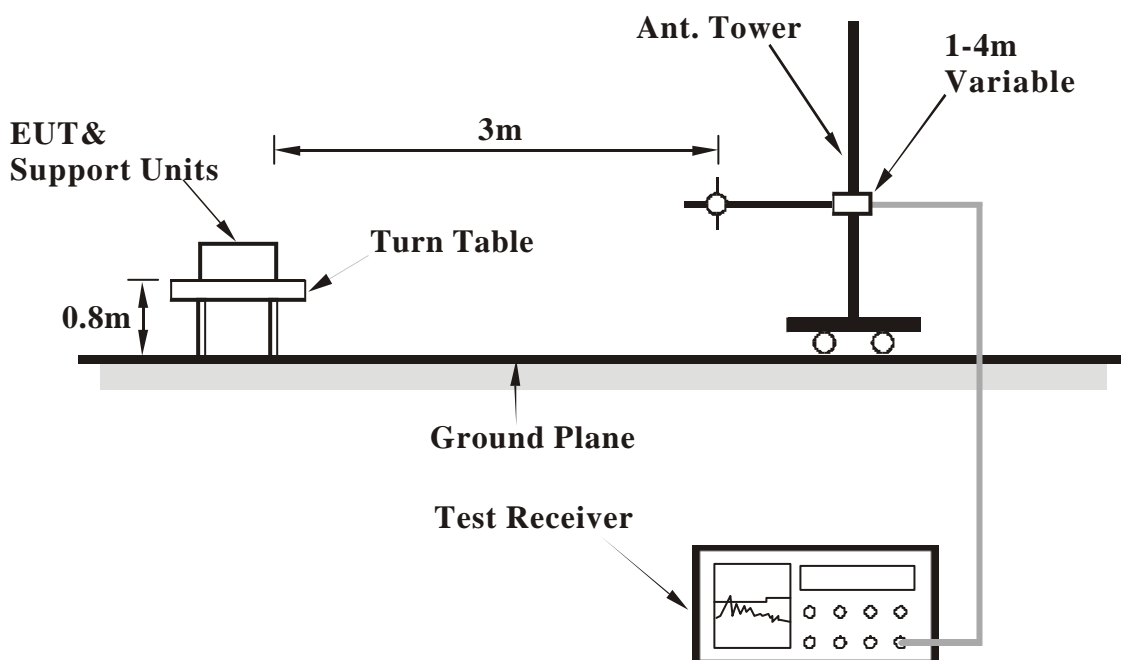
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	Apr 28, 2000
HP Preamplifier	8447D	2944A08485	May 01, 2000
HP Preamplifier	8347A	3307A01088	Sep. 09, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 27, 2000
SCHWARZBECK Tunable Dipole 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.

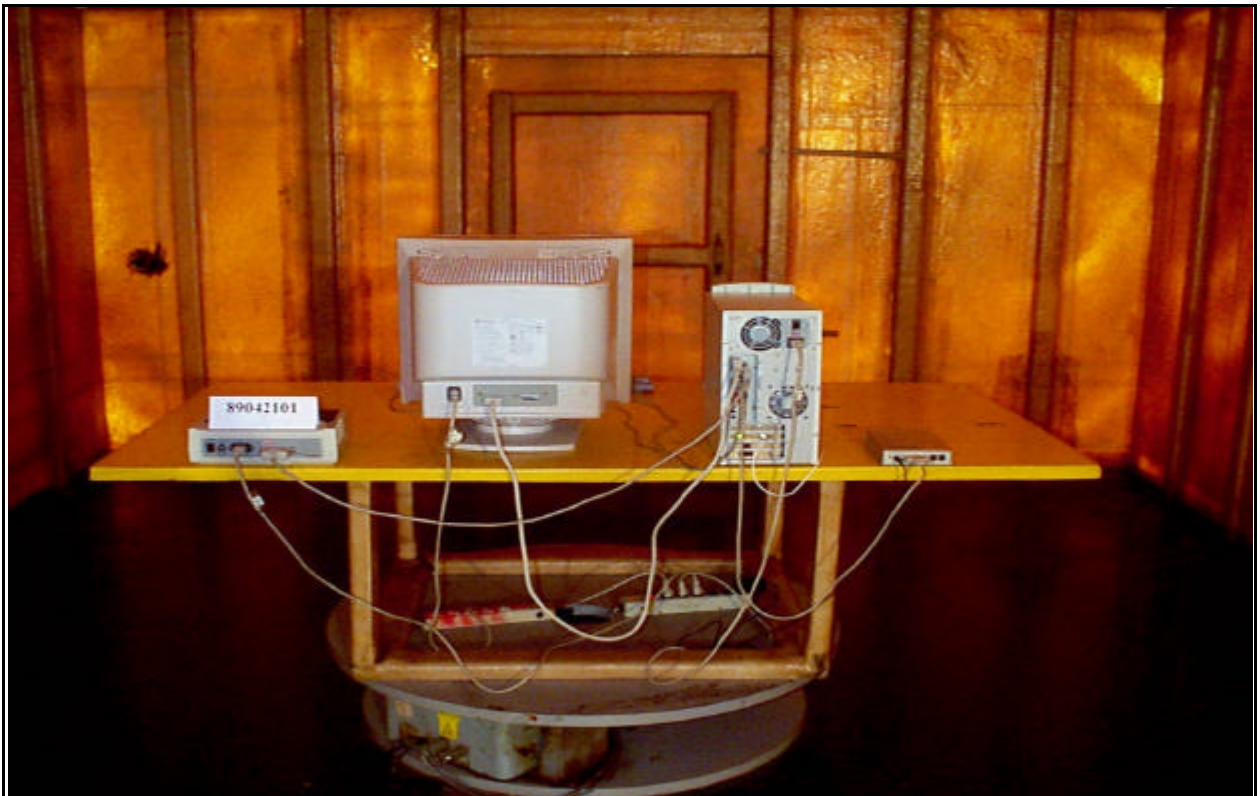
### 5.4.2 Test Procedure

- a. The EUT was placed on the top of a turn table and 0.8 meter above ground at an open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was arranged 3 meters away from the interference-receiving antenna mounted on the top of a variable height antenna tower.
- c. The interference-receiving antenna is a broadband antenna and its position 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.

### 5.4.3 Test Setup



#### 5.4.4 Photograph of Test Setup





#### **5.4.5 EUT Operating condition**

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually. "H" patterns and other messages were sent to support units and be displayed on the screen of Notebook PC.

#### **5.4.6 Climate Condition**

The temperature and related humidity: 25 and 65% RH



**5.4.7 Test Results**

**5.4.7.1 Frequency range of measurement: 30 ~ 1000MHz**

Mode: Channel 1 Antenna Polarity: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
132.76	12.7	23.4	36.1	43.5	-7.4	100	266
165.92	11.4	10.1	21.5	43.5	-22.0	100	90
176.26	10.9	11.0	21.9	43.5	-21.6	100	310
199.87	10.2	14.8	25.0	43.5	-18.5	100	17
210.66	10.9	10.2	21.1	43.5	-22.4	100	352
233.17	12.5	6.9	19.4	46.0	-26.6	100	26
748.01	22.4	0.6	23.0	46.0	-23.0	152	359

Channel 1 Antenna Polarity: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
44.01	11.0	13.7	24.7	40.0	-15.3	297	359
132.76	12.7	21.8	34.5	43.5	-9.0	234	115
166.52	11.4	15.4	26.8	43.5	-16.7	234	271
176.01	10.9	10.8	21.7	43.5	-21.8	216	78
199.85	10.2	14.7	24.9	43.5	-18.6	216	113
264.01	14.6	4.5	19.1	46.0	-26.9	130	70
528.05	20.4	2.8	23.2	46.0	-22.8	181	121

- 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. The limit value is defined as per 15.247(c),





Channel 6 Antenna Polarity: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
132.76	12.7	21.7	34.4	43.5	-9.1	100	267
165.92	11.4	9.9	21.3	43.5	-22.2	100	91
176.00	10.9	9.8	20.7	43.5	-22.8	100	333
199.85	10.2	15.5	25.7	43.5	-17.8	100	26
264.00	14.6	2.3	16.9	46.0	-29.1	100	77
374.01	17.1	2.6	19.7	46.0	-26.3	100	254
748.01	22.4	0.5	22.9	46.0	-23.1	158	305

Channel 6 Antenna Polarity: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
132.73	12.7	21.5	34.2	43.5	-9.3	233	279
165.90	11.4	11.8	23.2	43.5	-20.3	190	255
176.00	10.9	12.6	23.5	43.5	-20.0	177	70
199.85	10.2	14.3	24.5	43.5	-19.0	130	145
264.00	14.6	5.6	20.2	46.0	-25.8	126	246
315.99	15.4	15.5	30.9	46.0	-15.1	114	249
528.00	20.4	3.7	24.1	46.0	-21.9	102	176

- 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. The limit value is defined as per 15.247(c),



Channel 11 Antenna Polarity: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
110.00	12.3	9.9	22.2	43.5	-21.3	100	296
132.77	12.7	23.5	36.2	43.5	-7.3	100	276
199.84	10.2	14.3	24.5	43.5	-19.0	100	360
233.20	12.5	8.6	21.1	46.0	-24.9	100	332
264.00	14.6	1.7	16.3	46.0	-29.7	100	78
449.73	18.6	8.7	27.3	46.0	-18.7	100	176
528.05	20.4	2.0	22.4	46.0	-23.6	178	120
748.01	22.4	0.9	23.3	46.0	-22.7	148	307

Channel 11 Antenna Polarity: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Freq. 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)
132.73	12.7	20.4	33.1	43.5	-10.4	223	256
176.01	10.9	11.9	22.8	43.5	-20.7	229	87
199.84	10.2	13.7	23.9	43.5	-19.6	139	131
264.00	14.6	7.2	21.8	46.0	-24.2	115	181
528.02	20.4	3.0	23.4	46.0	-22.6	256	244
566.36	20.9	6.7	27.6	46.0	-18.4	129	236

- 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. The limit value is defined as per 15.247(c),



5.4.8.2 Frequency range of measurement: Above 1000 MHz

Channel 1 Antenna Polarity: Vertical		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2038.00	33.6	16.9	-	50.5	-	74	54	-23.5	-	100	168
*2413.04	34.0	68.1	60.8	102.1	94.7	-	-	-	-	100	87
4823.94	41.5	28.2	8.6	69.7	50.1	74	54	-4.3	-3.9	104	238
7236.31	39.6	12.1	-	51.7	-	74	54	-22.3	-	105	50
9648.08	42.2	11.1	-	53.3	-	74	54	-20.7	-	100	100
12060.00	44.0	-	-	-	-	74	54	-	-	-	-

Channel 1 Antenna Polarity: Horizontal		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2037.92	33.6	16.0	-	49.6	-	74	54	-24.4	-	100	298
*2412.97	34.0	70.2	62.3	104.2	96.3	-	-	-	-	100	265
4823.88	41.5	29.4	10.6	70.09	52.1	74	54	-	-	100	265
7236.31	39.6	22.8	8.3	62.4	47.9	74	54	-11.6	-6.1	100	61
9648.08	42.2	12.4	7.9	54.6	50.1	74	54	-19.4	-3.9	100	58
12060.00	44.0	-	-	-	-	74	54	-	-	-	-

- 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. The limit value is defined as per 15.247(c),
  6. “ \* “ : Fundamental Frequency



Channel 6 Antenna Polarity: Vertical		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2063.15	33.6	14.6	-	48.2	-	74	54	-25.8	-	100	267
*2435.95	34.0	64.4	56.6	98.4	90.6	-	-	-	-	100	267
4873.94	41.5	23.1	8.6	64.6	50.1	74	54	-9.4	-3.9	100	240
7311.00	39.7	11.5	-	51.2	-	74	54	-22.8	-	100	288
9748.10	42.3	11.1	-	53.4	-	74	54	-20.6	-	100	271
12185.00	44.0	-	-	-	-	74	54	-	-	-	-

Channel 6 Antenna Polarity: Horizontal		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2063.00	33.6	14.1	-	47.7	-	74	54	-26.3	-	100	321
*2435.93	34.0	69.5	62.5	103.5	96.5	74	54	-	-	127	324
4873.91	41.5	29.6	11.1	71.1	52.6	74	54	-2.9	-1.4	100	325
7311.30	39.7	23.3	8.2	63.0	47.9	74	54	-11.0	-6.1	100	50
9748.10	42.3	14.9	8.1	57.2	50.4	74	54	-16.8	-3.6	101	58
12185.00	44.0	-	-	-	-	74	54	-	-	-	-

- 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. The limit value is defined as per 15.247(c),
  6. “ \* “ : Fundamental Frequency



Channel 11 Antenna Polarity: Vertical		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2088.00	33.7	13.7	-	47.7	-	74	54	-26.6	-	100	162
*2460.86	34.1	65.5	57.7	99.6	91.8	-	-	-	-	100	234
4924.22	41.6	23.5	7.6	65.1	49.2	74	54	-8.9	-4.8	100	267
7386.30	39.8	12.5	-	52.3	-	74	54	-21.7	-	102	180
9847.70	42.3	12.6	7.9	54.9	50.2	74	54	-19.1	-3.8	103	198
12310.00	44.5	-	-	-	-	74	54	-	-	-	-

Channel 11 Antenna Polarity: Horizontal		Detector Function : Peak, Average				6dB Bandwidth : 1 MHz				Distance : 3 M Freq. 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.		
2087.96	33.7	14.0	-	47.7	-	74	54	-26.3	-	100	192
*2460.89	34.1	70.0	63.1	104.1	97.2	-	-	-	-	100	310
4923.95	41.6	30.0	9.5	71.6	51.1	74	54	-2.4	-2.9	100	308
7386.80	39.8	25.1	8.9	64.9	48.7	74	54	-9.1	-5.3	102	180
9847.70	42.3	15.9	8.3	58.2	50.6	74	54	-15.8	-3.4	103	198
12310.00	44.5	-	-	-	-	74	54	-	-	-	-

- 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. The limit value is defined as per 15.247(c),
  6. " \* " : Fundamental Frequency

## 5.5 Power Spectral Density Measurement

### 5.5.1 Test Instruments

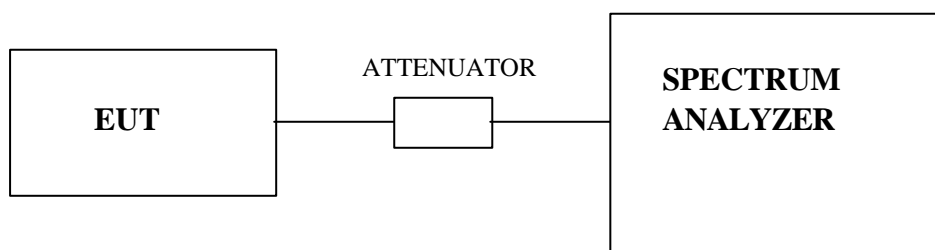
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	846839/018 848926/005	Dec. 03, 2000
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

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

### 5.5.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured by the spectrum analyzer with 3 kHz RBW and 30 kHz VBW. The power spectral density was measured and recorded.

### 5.5.3 Test Setup



### 5.5.4 EUT Operating condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 5.5.5 Climate Condition

The temperature and related humidity: 18 and 78% RH

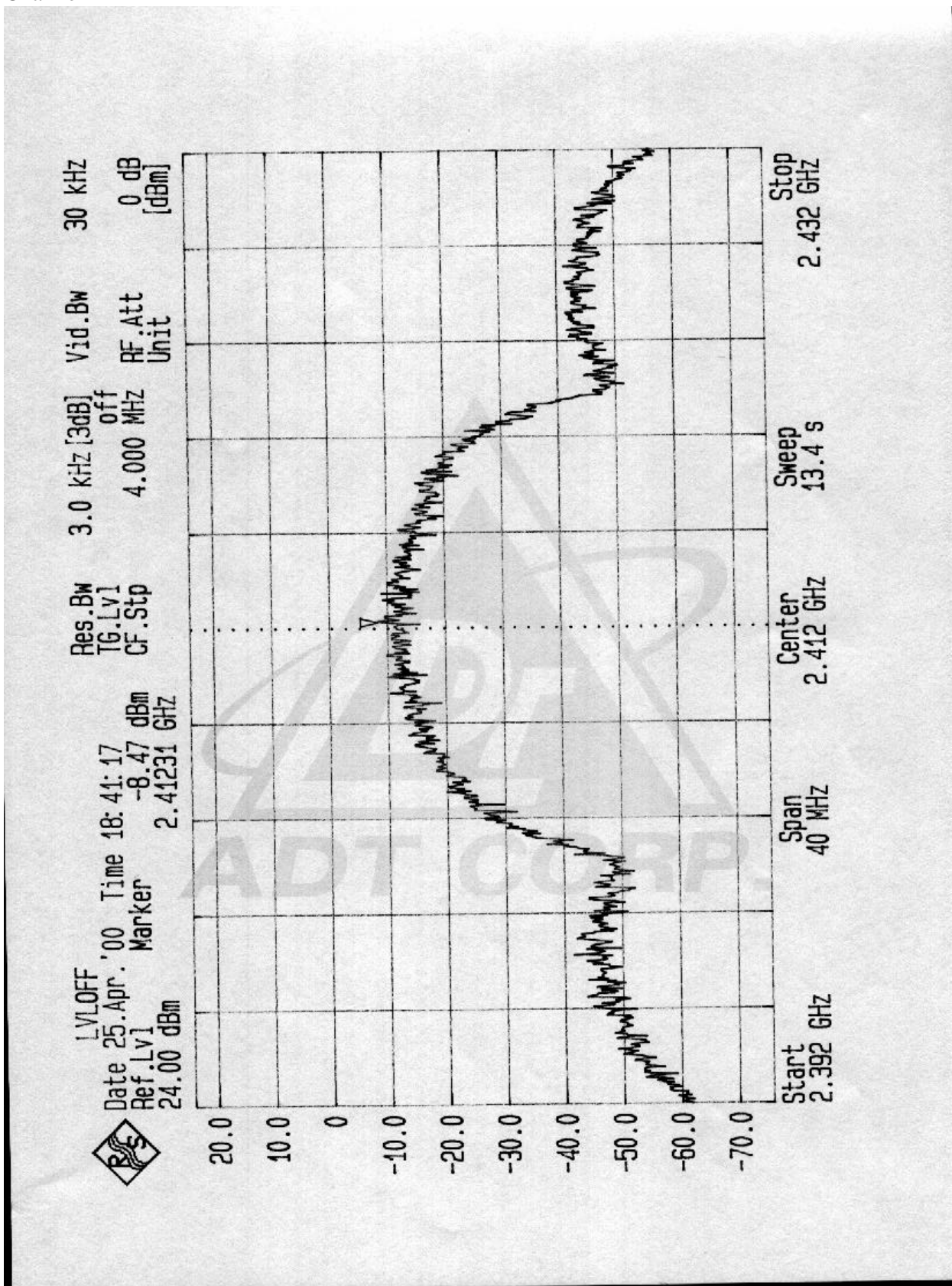


**5.5.6 Test Results**

<b>CHANNEL NUMBER</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>RF POWER LEVEL IN 3 KHz BW</b>	<b>MAXIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	-5.63dBm	8dBm	PASS
6	2437	-6.03dBm	8dBm	PASS
11	2462	-4.79dBm	8dBm	PASS

The plots of test result on the spectrum analyzer are attached below.

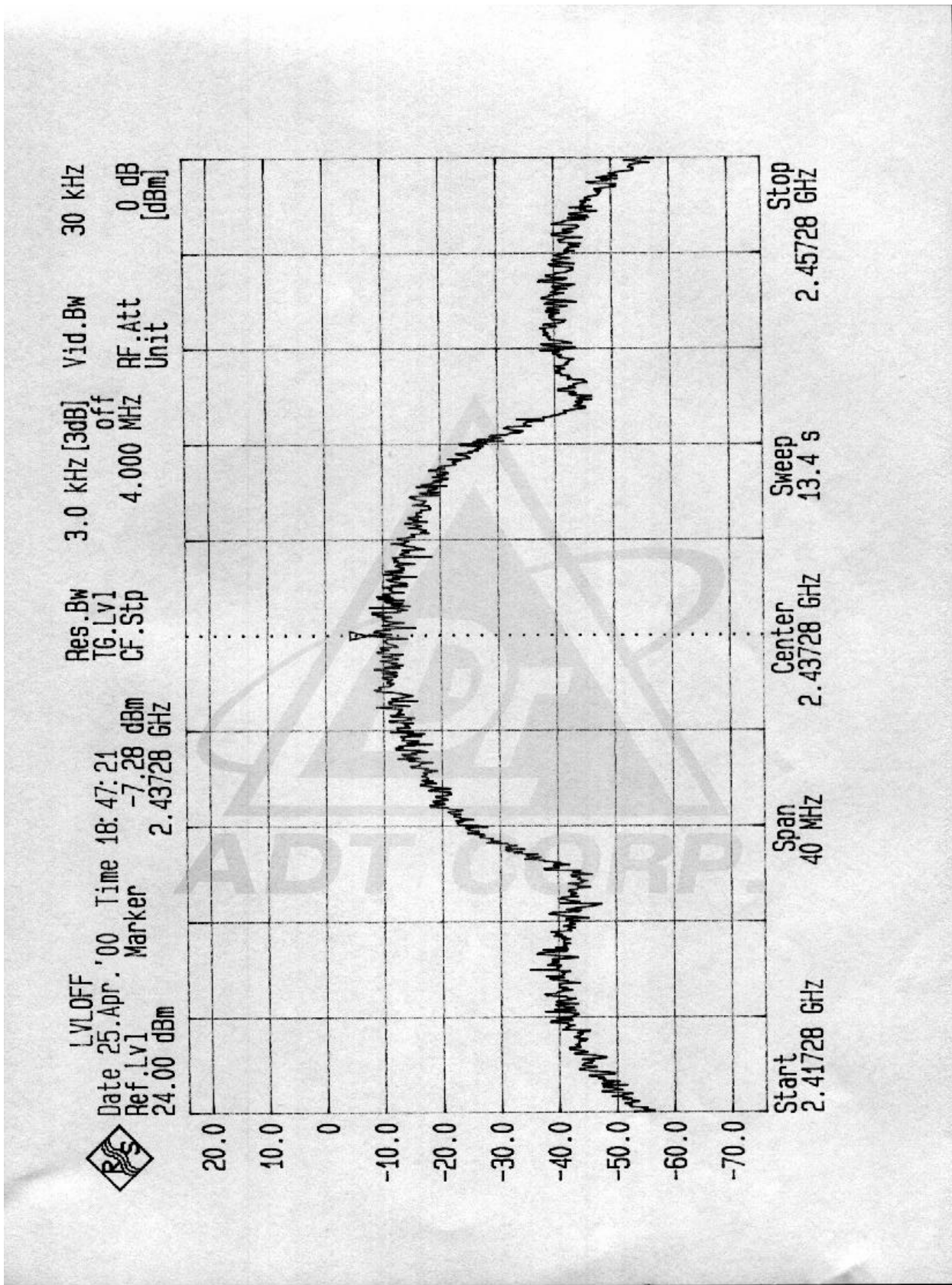
Channel 1





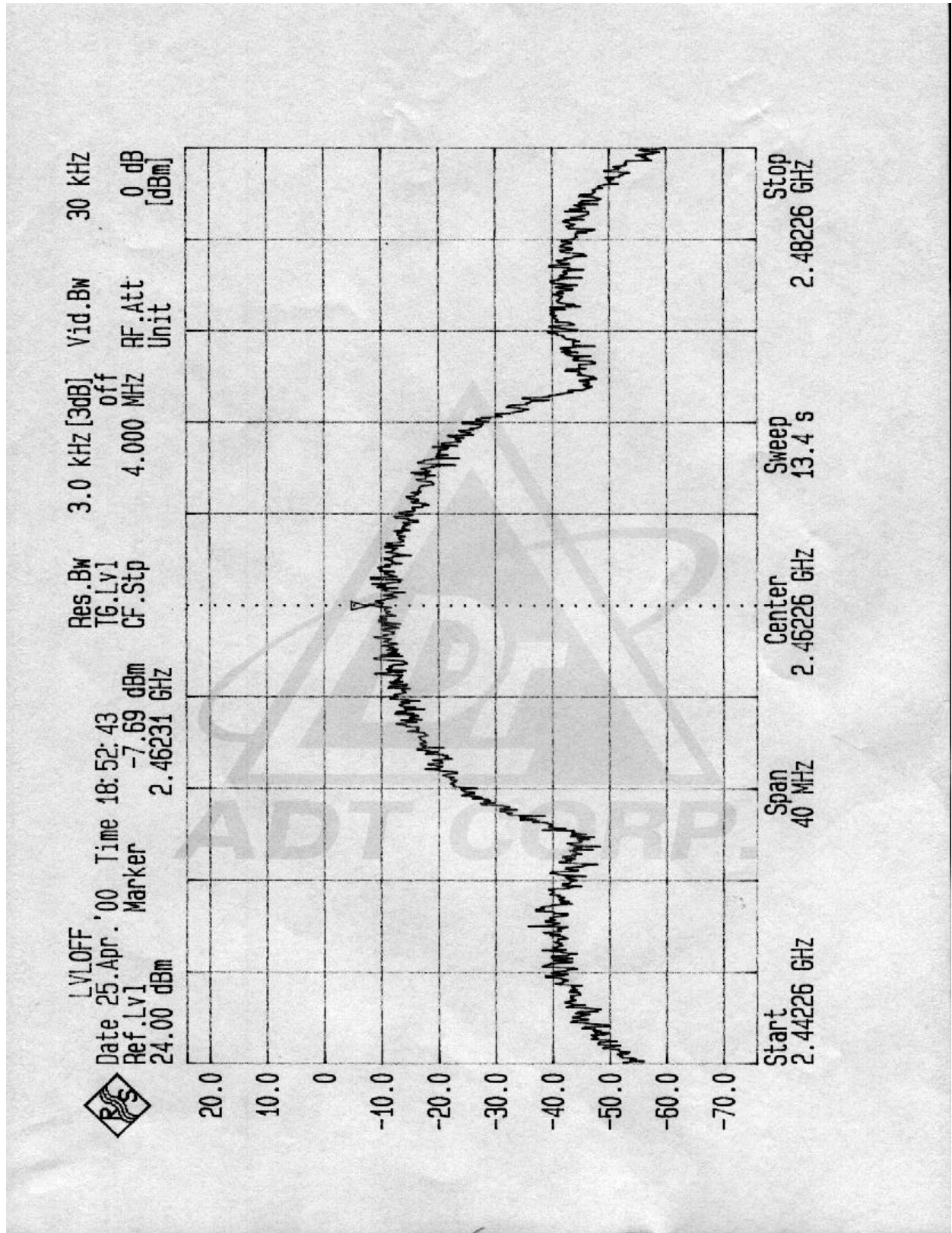


Channel 6





Channel 11





## 5.6 Processing Gain of a Direct Sequence Spread Spectrum Measurement

### 5.6.1 Test Instruments and Support Units

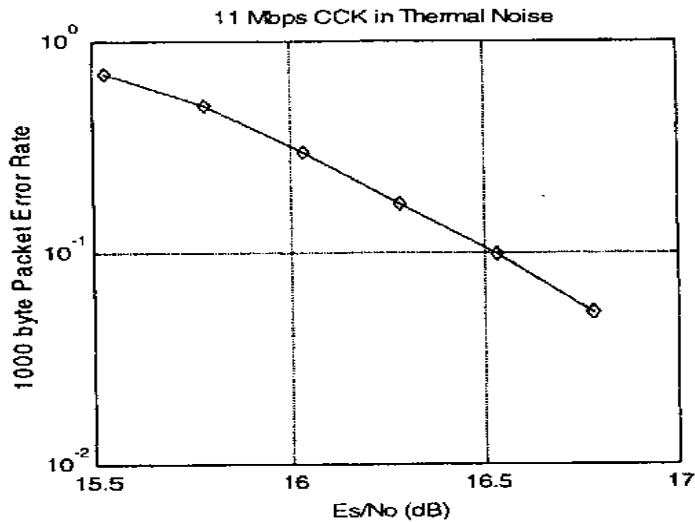
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
Hewlett Packard Spectrum Analyzer, 9kHz to 22GHz	HP8593E	S942848	15 Jun 2000
Marconi Signal Generator, 10kHz to 2.7GHz	2031	953426	06 Aug 2000
Hewlett Packard Power Meter,	HP438A	S952633	06 Jan 2000
Hewlett Packard Power Sensor, -20 to -70dBm	HP8481D	SCD15369	24 Feb 2000
Hewlett Packard Attenuator, 6dB to 10 dB	HP8493A	NA	NA
Hewlett Packard Step Attenuator, 1dB steps	HP8494A	NA	NA
Hewlett Packard Step Attenuator, 10dB steps	HP8495D	NA	NA
Hewlett Packard Power Splitter,	HP11667B	04390	NA
Cmpaq Laptop Computer (Qty 2),	Armada 1700	NA	NA

### 5.6.2 Method of Measurement

The processing gain may be measured using the CW jamming margin method. Figure 1 shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system. At each point, the generator level required to produce the recommended Bit Error Rate (BER) is recorded. This level is jammer level. The output power of the transmitting unit is measured at the same point. The jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data points. The lowest remaining J/S ratio is used when calculating the Process Gain.

The reference PER is specified as 8%. The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The curve is attached as below.

**1.1 1000 byte PER vs. Es/No**



This value and the measured J/S ratio are used in the following equation to calculate the Process Gain (Gp) of the system.

$$G_p = (S/N)_o + M_j + L_{sys}$$

Where:

(S/N)<sub>o</sub>: Signal to noise ratio for the chosen BER.

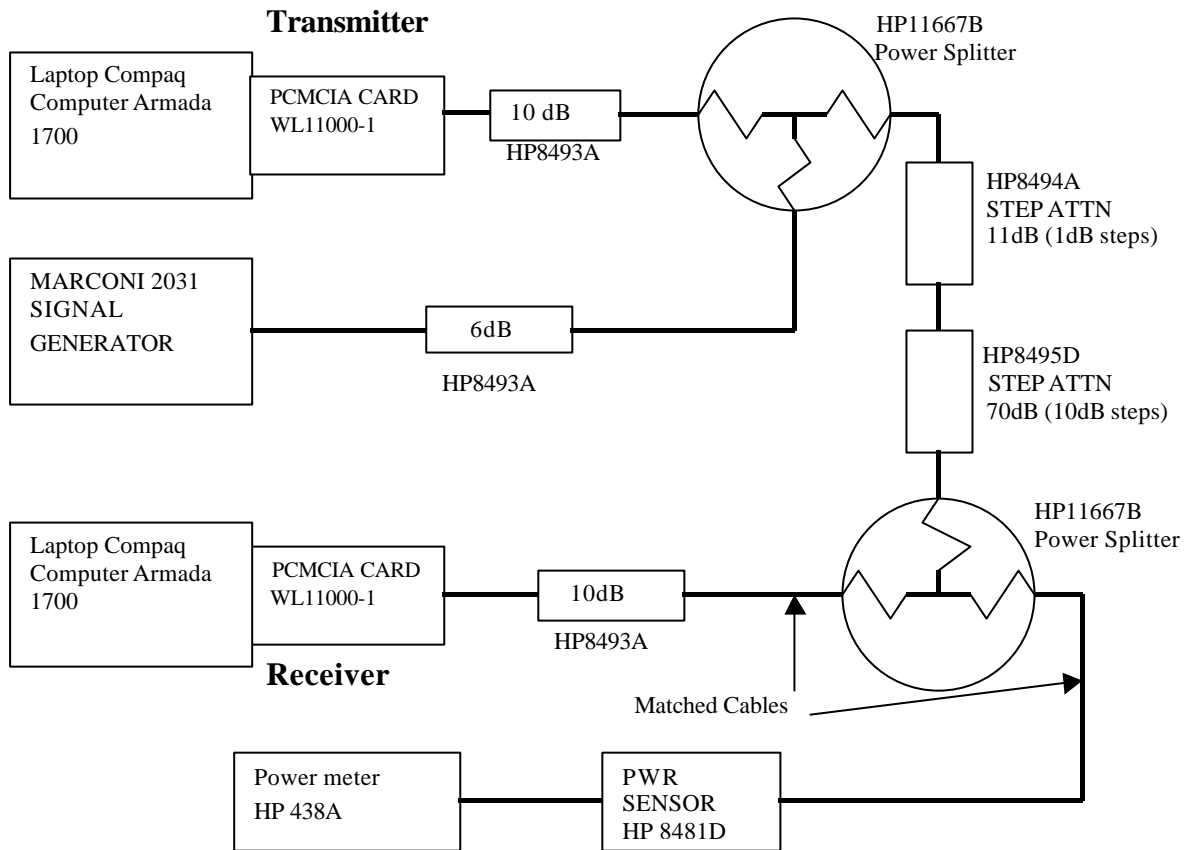
M<sub>j</sub> : Maximum jammer to Signal Ratio recorded at the detected BER.

L<sub>sys</sub> : System losses . For the purpose of this processing gain calculation, we assume L<sub>sys</sub> at its minimum value of 2 dB.

Applicable Reference Documents.

1. "HFA3861A Direct Sequence Spread Spectrum Baseband Processor" Harris Corporation Semiconductor Sector Preliminary Data Sheet, Melbourne FL, July 1999.
2. "M-ary Orthogonal Keying BER Curve" .

### 5.6.3 Test Setup



### 5.6.4 Test Procedure

Obtain the simplex link shown. Perform all independent instrumentation calibrations prior to this procedure. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. Signal Power at receiver approximately  $-60\text{dBm}$  (above thermal sensitivity such that thermal noise does not cause bit errors).
2. Signal Power at power meter between  $-20$  and  $-30\text{dBm}$  for optimal linearity.
3. Use spectrum analyzer to monitor test.
4. Ensure that CW Jammer generator RF output is disabled and measure the power at the power meter port using the power meter. This is the relative signal power,  $S_r$ .
5. Disable Transmitter, and set CW Jammer generator RF output frequency equal to the carrier frequency and enable generator output. Set reference CW Jammer power level at power meter port  $8.4\text{dB}$  below  $S_r$  (minimum J/S, or  $10\text{dB}$  processing gain reference



level). Note the power level setting on the generator, this is the reference CW Jammer power setting, Jr.

6. Disable CW Jammer, re-establish link. PER test should be operating essentially error-free.
7. Enable CW Jammer at the reference power level and verify that the PER test indicates a PER of less than 8%.
8. Alternatively, adjust the CW Jammer level to that which causes 8% PER and verify that the S/J is less than 8.4dB.
9. Repeat step 7 for uniform steps in frequency increments of 50 kHz across the receiver passband with the CW Jammer. In this case the receiver passband is +/- 8.5 MHz.

The numerical data associated with the following radio channel is tabulated and presented for :

Channel 1	:2412 MHz
Channel 6	:2437 MHz
Channel 11	:2462 MHz

### 5.6.5 EUT Operating condition

Software provided by client to set the EUT to transmit at lowest, middle and highest channel.

### 5.6.6 Climate Condition

The temperature and related humidity: 25°C and 50%RH



5.6.7 Test Results

11Mbps CHANNEL 1 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq.	$G_p$	$(S/N)_o$	$M_j = J/S$	$L_{sys}$	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4095	11.3	16.4	-7.1	2	-47.1	-0.7
2.40955	11.4	16.4	-7	2	-47	-0.6
2.4096	11.4	16.4	-7	2	-47	-0.6
2.40965	11.4	16.4	-7	2	-47	-0.6
2.4097	11.3	16.4	-7.1	2	-47.1	-0.7
2.40975	11.3	16.4	-7.1	2	-47.1	-0.7
2.4098	11.1	16.4	-7.3	2	-47.3	-0.9
2.40985	11.1	16.4	-7.3	2	-47.3	0.9
2.4099	11	16.4	-7.4	2	-47.4	-1
2.40995	11	16.4	-7.4	2	-47.4	-1
2.41	10.9	16.4	-7.5	2	-47.5	-1.1
2.41005	11	16.4	-7.4	2	-47.4	-1
2.4101	11	16.4	-7.4	2	-47.4	-1
2.41015	11.1	16.4	-7.3	2	-47.3	-0.9
2.4102	11.2	16.4	-7.2	2	-47.2	-0.8
2.41025	11.3	16.4	-7.1	2	-47.1	-0.7
2.4103	11.3	16.4	-7.1	2	-47.1	-0.7
2.41035	11.4	16.4	-7	2	-47	-0.6
2.4104	11.3	16.4	-7.1	2	-47.1	-0.7
2.41045	11.3	16.4	-7.1	2	-47.1	-0.7
2.4105	11.3	16.4	-7.1	2	-47.1	-0.7
2.41055	11.2	16.4	-7.2	2	-47.2	-0.8
2.4106	11.2	16.4	-7.2	2	-47.2	-0.8
2.41065	11.3	16.4	-7.1	2	-47.1	-0.7
2.4107	11.3	16.4	-7.1	2	-47.1	-0.7
2.41075	11.3	16.4	-7.1	2	-47.1	-0.7
2.4108	11.4	16.4	-7	2	-47	-0.6
2.41085	11.5	16.4	-6.9	2	-46.9	-0.5
2.4109	11.6	16.4	-6.8	2	-46.8	-0.4
2.41095	11.6	16.4	-6.8	2	-46.8	-0.4
2.411	11.6	16.4	-6.8	2	-46.8	-0.4
2.41105	11.4	16.4	-7	2	-47	-0.6
2.4111	11.5	16.4	-6.9	2	-46.9	-0.5
2.41115	11.6	16.4	-6.8	2	-46.8	-0.4

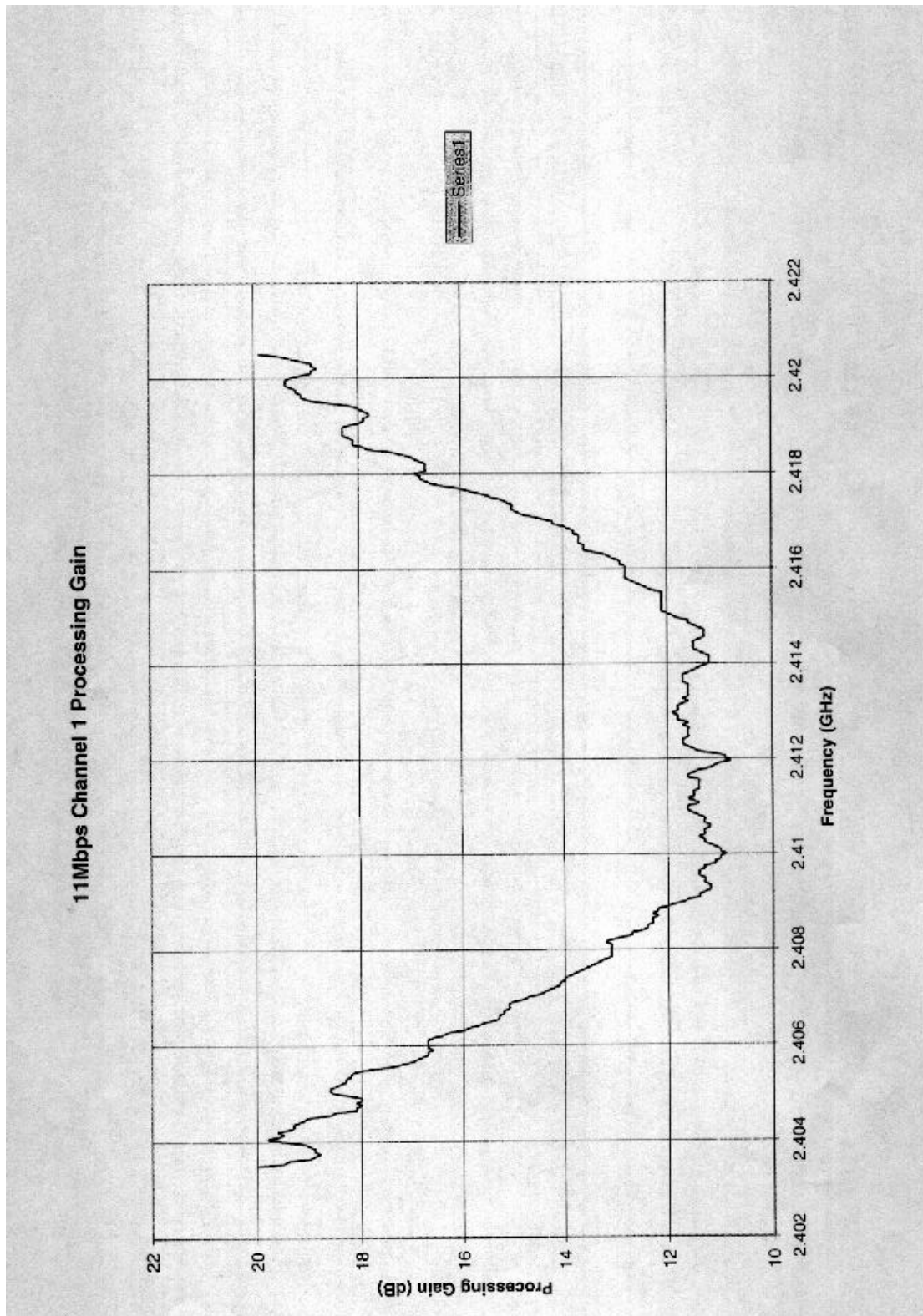


11Mbps CHANNEL 1 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	M <sub>j</sub> = J/S (dB)	L <sub>sys</sub> (dB)	Jammer (dBm)	LVL (dBm)
2.4112	11.5	16.4	-6.9	2	-46.9	-0.5
2.41125	11.5	16.4	-6.9	2	-46.9	-0.5
2.4113	11.5	16.4	-6.9	2	-46.9	-0.5
2.41135	11.4	16.4	-7	2	-47	-0.6
2.4114	11.4	16.4	-7	2	-47	-0.6
2.41145	11.4	16.4	-7	2	-47	-0.6
2.4115	11.4	16.4	-7	2	-47	-0.6
2.41155	11.4	16.4	-7	2	-47	-0.6
2.4116	11.6	16.4	-6.8	2	-46.8	-0.4
2.41165	11.6	16.4	-6.8	2	-46.8	-0.4
2.4117	11.5	16.4	-6.9	2	-46.9	-0.5
2.41175	11.4	16.4	-7	2	-47	-0.6
2.4118	11.2	16.4	-7.2	2	-47.2	-0.8
2.41185	11.1	16.4	-7.3	2	-47.3	-0.9
2.4119	11	16.4	-7.4	2	-47.4	-1
2.41195	10.8	16.4	-7.6	2	-47.6	-1.2
2.412	10.9	16.4	-7.5	2	-47.5	-1.1
2.41205	10.9	16.4	-7.5	2	-47.5	-1.1
2.4121	11.1	16.4	-7.3	2	-47.3	-0.9
2.41215	11.4	16.4	-7	2	-47	-0.6
2.4122	11.5	16.4	-6.9	2	-46.9	-0.5
2.41225	11.6	16.4	-6.8	2	-46.8	-0.4
2.4123	11.7	16.4	-6.7	2	-46.7	-0.3
2.41235	11.7	16.4	-6.7	2	-46.7	-0.3
2.4124	11.7	16.4	-6.7	2	-46.7	-0.3
2.41245	11.6	16.4	-6.8	2	-46.8	-0.4
2.4125	11.6	16.4	-6.8	2	-46.8	-0.4
2.41255	11.6	16.4	-6.8	2	-46.8	-0.4
2.4126	11.6	16.4	-6.8	2	-46.8	-0.4
2.41265	11.6	16.4	-6.8	2	-46.8	-0.4
2.4127	11.7	16.4	-6.7	2	-46.7	-0.3
2.41275	11.6	16.4	-6.8	2	-46.8	-0.4
2.4128	11.8	16.4	-6.6	2	-46.6	-0.2
2.41285	11.8	16.4	-6.6	2	-46.6	-0.2





11Mbps CHANNEL 1 Processing Gain						
Gp = (S/N) <sub>o</sub> + Mj + Lsys						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	Mj = J/S (dB)	Lsys (dB)	Jammer (dBm)	LVL (dBm)
2.4129	11.8	16.4	-6.6	2	-46.6	-0.2
2.41295	11.9	16.4	-6.5	2	-46.5	-0.1
2.413	11.8	16.4	-6.6	2	-46.6	-0.2
2.41305	11.8	16.4	-6.6	2	-46.6	-0.2
2.4131	11.8	16.4	-6.6	2	-46.6	-0.2
2.41315	11.7	16.4	-6.7	2	-46.7	-0.3
2.4132	11.6	16.4	-6.8	2	-46.8	-0.4
2.41325	11.7	16.4	-6.7	2	-46.7	-0.3
2.4133	11.6	16.4	-6.8	2	-46.8	-0.4
2.41335	11.6	16.4	-6.8	2	-46.8	-0.4
2.4134	11.6	16.4	-6.8	2	-46.8	-0.4
2.41345	11.6	16.4	-6.8	2	-46.8	-0.4
2.4135	11.6	16.4	-6.8	2	-46.8	-0.4
2.41355	11.7	16.4	-6.8	2	-46.8	-0.4
2.4136	11.6	16.4	-6.7	2	-46.7	-0.3
2.41365	11.7	16.4	-6.7	2	-46.7	-0.3
2.4137	11.7	16.4	-6.7	2	-46.7	-0.3
2.41375	11.7	16.4	-6.7	2	-46.7	-0.3
2.4138	11.6	16.4	-6.8	2	-46.8	-0.4
2.41385	11.5	16.4	-6.9	2	-46.9	-0.5
2.4139	11.4	16.4	-7	2	-47	-0.6
2.41395	11.3	16.4	-7.1	2	-47.1	-0.7
2.414	11.2	16.4	-7.2	2	-47.2	-0.8
2.41405	11.2	16.4	-7.2	2	-47.2	-0.8
2.4141	11.2	16.4	-7.2	2	-47.2	-0.8
2.41415	11.2	16.4	-7.2	2	-47.2	-0.8
2.4142	11.3	16.4	-7.1	2	-47.1	-0.7
2.41425	11.4	16.4	-7	2	-47	-0.6
2.4143	11.5	16.4	-6.9	2	-46.9	-0.5
2.41435	11.5	16.4	-6.9	2	-46.9	-0.5
2.4144	11.5	16.4	-6.9	2	-46.9	-0.5
2.41445	11.5	16.4	-6.9	2	-46.9	-0.5
2.4145	11.4	16.4	-7	2	-47	-0.6
Processing Gain : 11.5 dB						





11Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	M <sub>j</sub> = J/S (dB)	L <sub>sys</sub> (dB)	Jammer (dBm)	LVL (dBm)
2.4345	11.2	16.4	-7.2	2	-47.2	-3.1
2.43455	11.2	16.4	-7.2	2	-47.2	-3.1
2.4346	11.2	16.4	-7.2	2	-47.2	-3.1
2.43465	11.3	16.4	-7.1	2	-47.1	-3
2.4347	11.3	16.4	-7.1	2	-47.1	-3
2.43475	11.2	16.4	-7.2	2	-47.2	-3.1
2.4348	11.1	16.4	-7.3	2	-47.3	-3.2
2.43485	11.1	16.4	-7.3	2	-47.3	-3.2
2.4349	11	16.4	-7.4	2	-47.4	-3.3
2.43495	11	16.4	-7.4	2	-47.4	-3.3
2.435	11	16.4	-7.4	2	-47.4	-3.3
2.43505	11.1	16.4	-7.3	2	-47.3	-3.2
2.4351	11.1	16.4	-7.3	2	-47.3	-3.2
2.43515	11.2	16.4	-7.2	2	-47.2	-3.1
2.4352	11.3	16.4	-7.1	2	-47.1	-3
2.43525	11.3	16.4	-7.1	2	-47.1	-3
2.4353	11.4	16.4	-7	2	-47	-2.9
2.43535	11.4	16.4	-7	2	-47	-2.9
2.4354	11.3	16.4	-7.1	2	-47.1	-3
2.43545	11.3	16.4	-7.1	2	-47.1	-3
2.4355	11.2	16.4	-7.2	2	-47.2	-3.1
2.43555	11.2	16.4	-7.2	2	-47.2	-3.1
2.4356	11.2	16.4	-7.2	2	-47.2	-3.1
2.43565	11.2	16.4	-7.2	2	-47.2	-3.1
2.4357	11.2	16.4	-7.2	2	-47.2	-3.1
2.43575	11.3	16.4	-7.1	2	-47.1	-3
2.4358	11.4	16.4	-7	2	-47	-2.9
2.43585	11.5	16.4	-6.9	2	-46.9	-2.8
2.4359	11.5	16.4	-6.9	2	-46.9	-2.8
2.43595	11.5	16.4	-6.9	2	-46.9	-2.8
2.436	11.5	16.4	-6.9	2	-46.9	-2.8
2.43605	11.4	16.4	-7	2	-47	-2.9
2.4361	11.5	16.4	-6.9	2	-46.9	-2.8
2.43615	11.5	16.4	-6.9	2	-46.9	-2.8

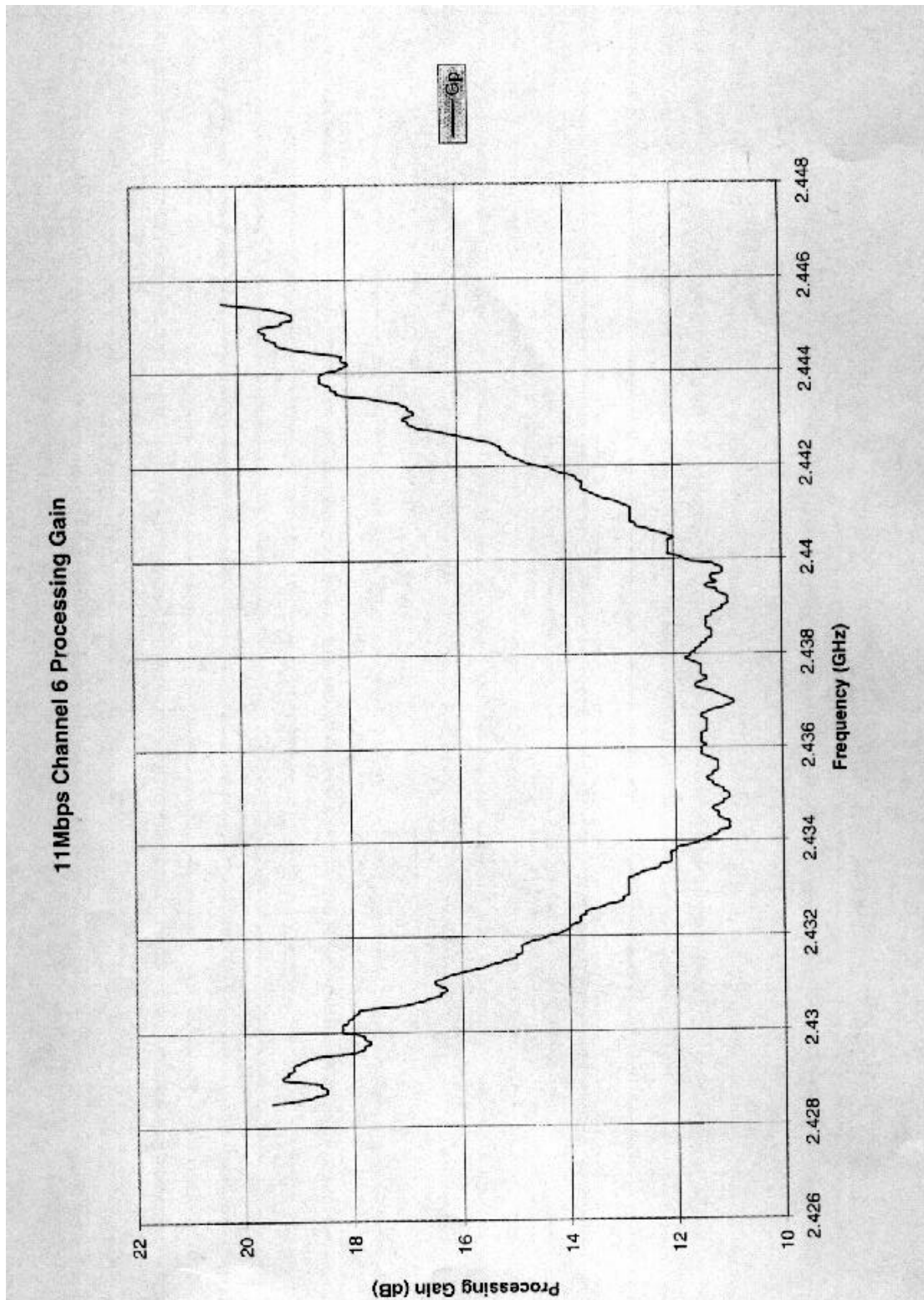


11Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	$G_p$ (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	$L_{sys}$ (dB)	Jammer (dBm)	LVL (dBm)
2.4362	11.5	16.4	-6.9	2	-46.9	-2.8
2.43625	11.5	16.4	-6.9	2	-46.9	-2.8
2.4363	11.5	16.4	-6.9	2	-46.9	-2.8
2.43635	11.4	16.4	-7	2	-47	-2.9
2.4364	11.4	16.4	-7	2	-47	-2.9
2.43645	11.4	16.4	-7	2	-47	-2.9
2.4365	11.4	16.4	-7	2	-47	-2.9
2.43655	11.4	16.4	-7	2	-47	-2.9
2.4366	11.4	16.4	-7	2	-47	-2.9
2.43665	11.5	16.4	-6.9	2	-46.9	-2.8
2.4367	11.5	16.4	-6.9	2	-46.9	-2.8
2.43675	11.4	16.4	-7	2	-47	-2.9
2.4368	11.3	16.4	-7.1	2	-47.1	-3
2.43685	11.1	16.4	-7.3	2	-47.3	-3.2
2.4369	11	16.4	-7.4	2	-47.4	-3.3
2.43695	10.9	16.4	-7.5	2	-47.5	-3.4
2.437	10.9	16.4	-7.5	2	-47.5	-3.4
2.43705	11	16.4	-7.4	2	-47.4	-3.3
2.4371	11.1	16.4	-7.3	2	-47.3	-3.2
2.43715	11.2	16.4	-7.2	2	-47.2	-3.1
2.4372	11.3	16.4	-7.1	2	-47.1	-3
2.43725	11.5	16.4	-6.9	2	-46.9	-2.8
2.4373	11.6	16.4	-6.8	2	-46.8	-2.7
2.43735	11.6	16.4	-6.8	2	-46.8	-2.7
2.4374	11.5	16.4	-6.9	2	-46.9	-2.8
2.43745	11.4	16.4	-7	2	-47	-2.9
2.4375	11.4	16.4	-7	2	-47	-2.9
2.43755	11.5	16.4	-6.9	2	-46.9	-2.8
2.4376	11.5	16.4	-6.9	2	-46.9	-2.8
2.43765	11.5	16.4	-6.9	2	-46.9	-2.8
2.4377	11.5	16.4	-6.9	2	-46.9	-2.8
2.43775	11.5	16.4	-6.9	2	-46.9	-2.8
2.4378	11.6	16.4	-6.8	2	-46.8	-2.7
2.43785	11.7	16.4	-6.7	2	-46.7	-2.6



11Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	M <sub>j</sub> = J/S (dB)	L <sub>sys</sub> (dB)	Jammer (dBm)	LVL (dBm)
2.4379	11.8	16.4	-6.6	2	-46.6	-2.5
2.43795	11.7	16.4	-6.7	2	-46.7	-2.6
2.438	11.7	16.4	-6.7	2	-46.7	-2.6
2.43805	11.6	16.4	-6.8	2	-46.8	-2.7
2.4381	11.6	16.4	-6.8	2	-46.8	-2.7
2.43815	11.5	16.4	-6.9	2	-46.9	-2.8
2.4382	11.5	16.4	-6.9	2	-46.9	-2.8
2.43825	11.4	16.4	-7	2	-47	-2.9
2.4383	11.4	16.4	-7	2	-47	-2.9
2.43835	11.3	16.4	-7.1	2	-47.1	-3
2.4384	11.3	16.4	-7.1	2	-47.1	-3
2.43845	11.3	16.4	-7.1	2	-47.1	-3
2.4385	11.3	16.4	-7.1	2	-47.1	-3
2.43855	11.4	16.4	-7	2	-47	-2.9
2.4386	11.4	16.4	-7	2	-47	-2.9
2.43865	11.4	16.4	-7	2	-47	-2.9
2.4387	11.4	16.4	-7	2	-47	-2.9
2.43875	11.4	16.4	-7	2	-47	-2.9
2.4388	11.3	16.4	-7.1	2	-47.1	-3
2.43885	11.3	16.4	-7.1	2	-47.1	-3
2.4389	11.2	16.4	-7.2	2	-47.2	-3.1
2.4895	11.1	16.4	-7.3	2	-47.3	-3.2
2.439	11.1	16.4	-7.3	2	-47.3	-3.2
2.43905	11	16.4	-7.4	2	-47.4	-3.3
2.4391	11	16.4	-7.4	2	-47.4	-3.3
2.43915	11	16.4	-7.4	2	-47.4	-3.3
2.4392	11	16.4	-7.4	2	-47.4	-3.3
2.43925	11.1	16.4	-7.3	2	-47.3	-3.2
2.4393	11.2	16.4	-7.2	2	-47.2	-3.1
2.43935	11.2	16.4	-7.2	2	-47.2	-3.1
2.4394	11.4	16.4	-7	2	-47	-2.9
2.43945	11.4	16.4	-7	2	-47	-2.9
2.4395	11.2	16.4	-7.2	2	-47.2	-3.1

Processing Gain : 11.4 dB





11Mbps CHANNEL 11 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	$G_p$ (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	$L_{sys}$ (dB)	Jammer (dBm)	LVL (dBm)
2.4595	11.7	16.4	-6.7	2	-46.7	-4.9
2.45955	11.8	16.4	-6.6	2	-46.6	-4.8
5.4596	11.8	16.4	-6.6	2	-46.6	-4.8
2.45965	11.7	16.4	-6.7	2	-46.7	-4.9
2.4597	11.7	16.4	-6.7	2	-46.7	-4.9
2.45975	11.6	16.4	-6.8	2	-46.8	-5
2.4598	11.5	16.4	-6.9	2	-46.9	-5.1
2.45985	11.4	16.4	-7	2	-47	-5.2
2.4599	11.4	16.4	-7	2	-47	-5.2
2.45995	11.3	16.4	-7.1	2	-47.1	-5.3
2.46	11.3	16.4	-7.1	2	-47.1	-5.3
2.46005	11.3	16.4	-7.1	2	-47.1	-5.3
2.4601	11.4	16.4	-7	2	-47	-5.2
2.46015	11.5	16.4	-6.9	2	-46.9	-5.1
2.4602	11.5	16.4	-6.9	2	-46.9	-5.1
2.46025	11.6	16.4	-6.8	2	-46.8	-5
2.4603	11.6	16.4	-6.8	2	-46.8	-5
2.46035	11.6	16.4	-6.8	2	-46.8	-5
2.4604	11.6	16.4	-6.8	2	-46.8	-5
2.46045	11.5	16.4	-6.9	2	-46.9	-5.1
2.4605	11.5	16.4	-6.9	2	-46.9	-5.1
2.46055	11.4	16.4	-7	2	-47	-5.2
2.4606	11.4	16.4	-7	2	-47	-5.2
2.46065	11.5	16.4	-6.9	2	-46.9	-5.1
2.4607	11.5	16.4	-6.9	2	-46.9	-5.1
2.46075	11.6	16.4	-6.8	2	-46.8	-5
2.4608	11.6	16.4	-6.8	2	-46.8	-5
2.46085	11.8	16.4	-6.6	2	-46.6	-4.8
2.4609	11.9	16.4	-6.5	2	-46.5	-4.7
2.46095	12	16.4	-6.4	2	-46.4	-4.6
2.461	12	16.4	-6.4	2	-46.4	-4.6
2.46105	11.9	16.4	-6.5	2	-46.5	-4.7
2.4611	12	16.4	-6.4	2	-46.4	-4.6
2.46115	12.1	16.4	-6.3	2	-46.3	-4.5

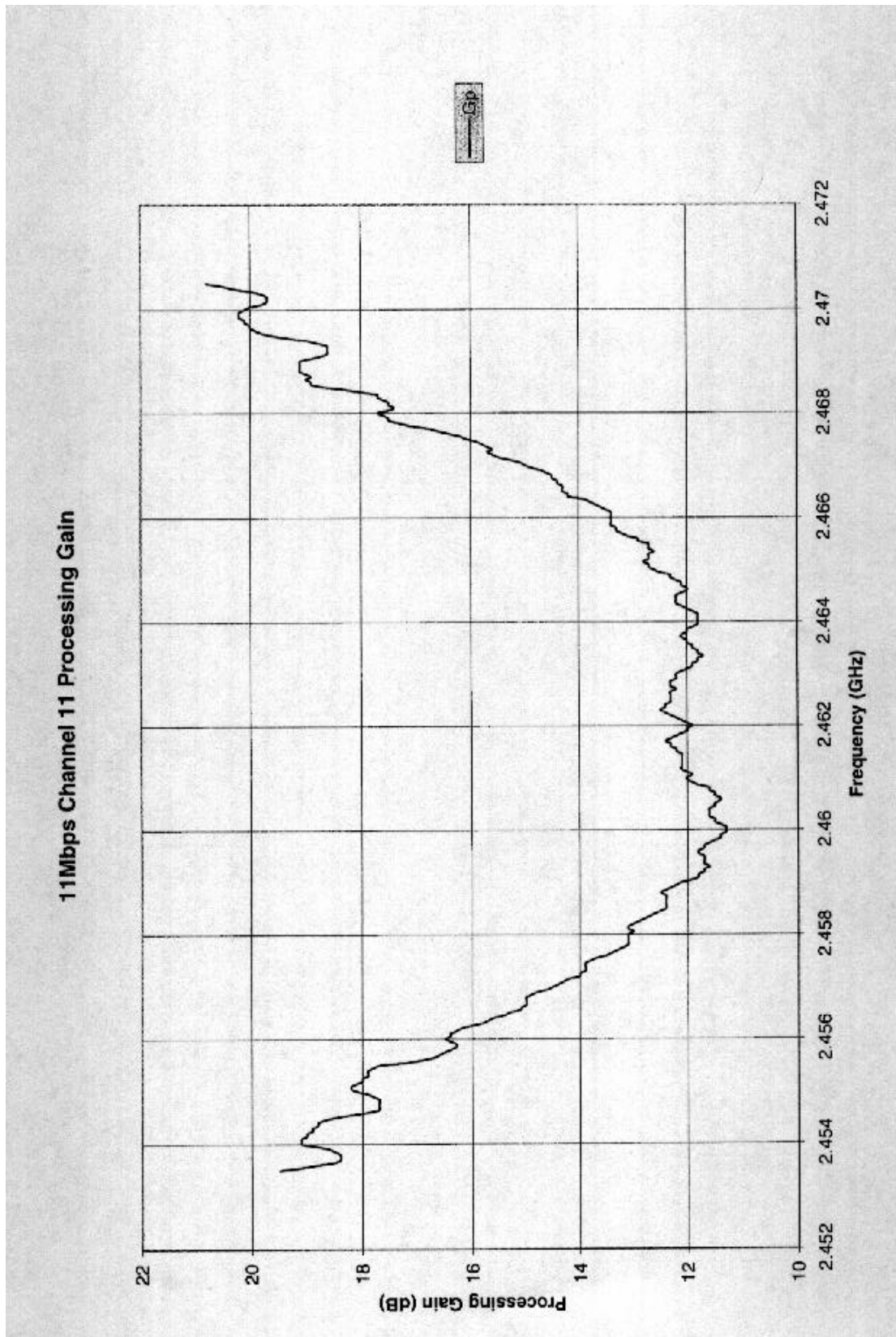


11Mbps CHANNEL 11 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	$G_p$ (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	$L_{sys}$ (dB)	Jammer (dBm)	LVL (dBm)
2.4612	12.1	16.4	-6.3	2	-46.3	-4.5
2.46125	12.1	16.4	-6.3	2	-46.3	-4.5
2.4613	12.1	16.4	-6.3	2	-46.3	-4.5
2.46135	12.1	16.4	-6.3	2	-46.3	-4.5
2.4614	12.1	16.4	-6.3	2	-46.3	-4.5
2.46145	12.1	16.4	-6.3	2	-46.3	-4.5
2.4615	12.2	16.4	-6.2	2	-46.2	-4.4
2.46155	12.2	16.4	-6.2	2	-46.2	-4.4
2.4616	12.3	16.4	-6.1	2	-46.1	-4.3
2.46165	12.3	16.4	-6.1	2	-46.1	-4.3
2.4617	12.4	16.4	-6	2	-46	-4.2
2.46175	12.3	16.4	-6.1	2	-46.1	-4.3
2.4618	12.2	16.4	-6.2	2	-46.2	-4.4
2.46185	12.1	16.4	-6.3	2	-46.3	-4.5
2.4619	12	16.4	-6.4	2	-46.4	-4.6
2.46195	12	16.4	-6.4	2	-46.4	-4.6
2.462	11.9	16.4	-6.5	2	-46.5	-4.7
2.46205	12	16.4	-6.4	2	-46.4	-4.6
2.4621	12.1	16.4	-6.3	2	-46.3	-4.5
2.46215	12.2	16.4	-6.2	2	-46.2	-4.4
2.4622	12.3	16.4	-6.1	2	-46.1	-4.3
2.46225	12.4	16.4	-6	2	-46	-4.2
2.4623	12.5	16.4	-5.9	2	-45.9	-4.1
2.46235	12.4	16.4	-6	2	-46	-4.2
2.4624	12.4	16.4	-6	2	-46	-4.2
2.46245	12.3	16.4	-6.1	2	-46.1	-4.3
2.4625	12.3	16.4	-6.1	2	-46.1	-4.3
2.46255	12.3	16.4	-6.1	2	-46.1	-4.3
2.4626	12.3	16.4	-6.1	2	-46.1	-4.3
2.46265	12.3	16.4	-6.1	2	-46.1	-4.3
2.4627	12.2	16.4	-6.2	2	-46.2	-4.4
2.46275	12.3	16.4	-6.1	2	-46.1	-4.3
2.4628	12.3	16.4	-6.1	2	-46.1	-4.3
2.46285	12.3	16.4	-6.1	2	-46.1	-4.3





11Mbps CHANNEL 11 Processing Gain						
Gp = (S/N) <sub>o</sub> + Mj + Lsys						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	Mj = J/S (dB)	Lsys (dB)	Jammer (dBm)	LVL (dBm)
2.4629	12.2	16.4	-6.2	2	-46.2	-4.4
2.46295	12.2	16.4	-6.2	2	-46.2	-4.4
2.463	12.2	16.4	-6.2	2	-46.2	-4.4
2.46305	12.1	16.4	-6.3	2	-46.3	-4.5
2.4631	12	16.4	-6.4	2	-46.4	-4.6
2.46315	11.9	16.4	-6.5	2	-46.5	-4.7
2.4632	11.9	16.4	-6.5	2	-46.5	-4.7
2.46325	11.8	16.4	-6.6	2	-46.6	-4.8
2.4633	11.8	16.4	-6.6	2	-46.6	-4.8
2.46335	11.7	16.4	-6.7	2	-46.7	-4.9
2.4634	11.8	16.4	-6.6	2	-46.6	-4.8
2.46345	11.8	16.4	-6.6	2	-46.6	-4.8
2.4635	11.9	16.4	-6.5	2	-46.5	-4.7
2.46355	11.9	16.4	-6.5	2	-46.5	-4.7
2.4636	12	16.4	-6.4	2	-46.4	-4.6
2.46365	12	16.4	-6.4	2	-46.4	-4.6
2.4637	12.1	16.4	-6.3	2	-46.3	-4.5
2.46375	12.1	16.4	-6.3	2	-46.3	-4.5
2.4638	12	16.4	-6.4	2	-46.4	-4.6
2.46385	12	16.4	-6.4	2	-46.4	-4.6
2.4639	11.9	16.4	-6.5	2	-46.5	-4.7
2.46395	11.8	16.4	-6.6	2	-46.6	-4.8
2.464	11.8	16.4	-6.6	2	-46.6	-4.8
2.46405	11.8	16.4	-6.6	2	-46.6	-4.8
2.4641	11.8	16.4	-6.6	2	-46.6	-4.8
2.46415	11.8	16.4	-6.6	2	-46.6	-4.8
2.4642	11.9	16.4	-6.5	2	-46.5	-4.7
2.46425	12	16.4	-6.4	2	-46.4	-4.6
2.4643	12.1	16.4	-6.3	2	-46.3	-4.5
2.46435	12.2	16.4	-6.2	2	-46.2	-4.4
4.4644	12.2	16.4	-6.2	2	-46.2	-4.4
2.46445	12.2	16.4	-6.2	2	-46.2	-4.4
2.4645	12.2	16.4	-6.2	2	-46.2	-4.4
Processing Gain : 12 dB						





2Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	$G_p$ (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	$L_{sys}$ (dB)	Jammer (dBm)	LVL (dBm)
2.4345	12.1	13.3	-3.2	2	-43.2	0.5
2.43455	12.7	13.3	-2.6	2	-42.6	1.1
2.4346	12.9	13.3	-2.4	2	-42.4	1.3
2.43465	13	13.3	-2.3	2	-42.3	1.4
2.4347	13	13.3	-2.3	2	-42.3	1.4
2.43475	12.9	13.3	-2.4	2	-42.4	1.3
2.4348	13.1	13.3	-2.2	2	-42.2	1.5
2.43485	12.4	13.3	-2.9	2	-42.9	0.8
2.4349	12.1	13.3	-3.2	2	-43.2	0.5
2.43495	12.6	13.3	-2.7	2	-42.7	1
2.435	12.6	13.3	-2.7	2	-42.7	1
2.43505	12.5	13.3	-2.8	2	-42.8	0.9
2.4351	12.4	13.3	-2.9	2	-42.9	0.8
2.43515	12.4	13.3	-2.9	2	-42.9	0.8
2.4352	12.2	13.3	-3.1	2	-43.1	0.6
2.43525	12.2	13.3	-3.1	2	-43.7	0.6
2.4353	12.3	13.3	-3	2	-43	0.7
2.43535	11.9	13.3	-3.4	2	-43.4	0.3
2.4354	11.5	13.3	-3.8	2	-43.8	-0.1
2.43545	12.1	13.3	-3.2	2	-43.2	0.5
2.4355	11.5	13.3	-3.8	2	-43.8	-0.1
2.43555	12.4	13.3	-2.9	2	-42.9	0.8
2.4356	12.7	13.3	-2.6	2	-42.6	1.1
2.43565	12.9	13.3	-2.4	2	-42.4	1.3
2.4357	12.8	13.3	-2.5	2	-42.5	1.2
5.43575	12.8	13.3	-2.5	2	-42.5	1.2
2.4358	12.9	13.3	-2.4	2	-42.4	1.3
2.43585	12.1	13.3	-3.2	2	-43.2	0.5
2.4359	11.7	13.3	-3.6	2	-43.6	0.1
2.43595	12.4	13.3	-2.9	2	-42.9	0.8
2.436	12.5	13.3	-2.8	2	-42.8	0.9
2.43605	12.5	13.3	-2.8	2	-42.8	0.9
2.4361	12.4	13.3	-2.9	2	-42.9	0.8
2.43615	12.4	13.3	-2.9	2	-42.9	0.8



2Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	$G_p$ (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	$L_{sys}$ (dB)	Jammer (dBm)	LVL (dBm)
2.4362	12.1	13.3	-3.2	2	-43.2	0.5
2.43625	12.1	13.3	-3.2	2	-43.2	0.5
2.4363	12.1	13.3	-3.2	2	-43.2	0.5
2.43635	11.5	13.3	-3.8	2	-43.8	-0.1
2.4364	11.1	13.3	-4.2	2	-44.2	-0.5
2.43645	11.7	13.3	-3.6	2	-43.6	0.1
2.4365	11.2	13.3	-4.1	2	-44.1	-0.4
2.43655	12.6	13.3	-2.7	2	-42.7	1
2.4366	13.1	13.3	-2.2	2	-42.2	1.5
2.43665	13.7	13.3	-1.6	2	-41.6	2.1
2.4367	14.1	13.3	-1.2	2	-41.2	2.5
2.43675	15.1	13.3	-0.2	2	-40.2	3.5
2.4368	15.7	13.3	0.4	2	-39.6	4.1
2.43685	16.2	13.3	0.9	2	-39.1	4.6
2.4369	16.1	13.3	0.8	2	-39.2	4.5
2.43695	16.3	13.3	1	2	-39	4.7
2.437	16.6	13.3	1.3	2	-38.7	5
2.43705	16.3	13.3	1	2	-39	4.7
2.4371	16.3	13.3	1	2	-39	4.7
2.43715	16	13.3	0.7	2	-39.3	4.4
2.4372	15.5	13.3	0.2	2	-39.8	3.9
2.43725	14.8	13.3	-0.5	2	-40.5	3.2
2.4373	14	13.3	-1.3	2	-41.3	2.4
2.43735	13.5	13.3	-1.8	2	-41.8	1.9
2.4374	12.7	13.3	-2.6	2	-42.6	1.1
2.43745	12.6	13.3	-2.7	2	-42.7	1
2.4375	11.6	13.3	-3.7	2	-43.7	0
2.43755	12.1	13.3	-3.2	2	-43.2	0.5
2.4376	12.1	13.3	-3.2	2	-43.2	0.5
2.43765	12.1	13.3	-3.2	2	-43.2	0.5
2.4377	12	13.3	-3.3	2	-43.3	0.4
2.43775	11.7	13.3	-3.6	2	-43.6	0.1
2.4378	12	13.3	-3.3	2	43.3	0.4
2.43785	11.1	13.3	-4.2	2	-44.2	-0.5



2Mbps CHANNEL 6 Processing Gain						
$G_p = (S/N)_o + M_j + L_{sys}$						
Freq. (GHz)	Gp (dB)	(S/N) <sub>o</sub> (dB)	M <sub>j</sub> = J/S (dB)	L <sub>sys</sub> (dB)	Jammer (dBm)	LVL (dBm)
2.4379	11.2	13.3	-4.1	2	-44.1	-0.4
2.43795	12.1	13.3	-3.2	2	-43.2	0.5
2.438	12.5	13.3	-2.8	2	-42.8	0.9
2.43805	12.7	13.3	-2.6	2	-42.6	1.1
2.4381	12.8	13.3	-2.5	2	-42.5	1.2
2.43815	12.9	13.3	-2.4	2	-42.4	1.3
2.4382	12.9	13.3	-2.4	2	-42.4	1.3
2.43825	12.9	13.3	-2.4	2	-42.4	1.3
2.4383	12.8	13.3	-2.5	2	-42.5	1.2
2.43835	12.6	13.3	-2.7	2	-42.7	1
2.4384	12	13.3	-3.3	2	-43.3	0.4
2.43845	12.4	13.3	-2.9	2	-42.9	0.8
2.4385	11.7	13.3	-3.6	2	-43.6	0.1
2.43855	12.3	13.3	-3	2	-43	0.7
2.4386	12.3	13.3	-3	2	-43	0.7
2.43865	12.3	13.3	-3	2	-43	0.7
2.4387	12.2	13.3	-3.1	2	-43.1	0.6
2.43875	12	13.3	-3.3	2	-43.3	0.4
2.4388	12.3	13.3	-3	2	-43	0.7
2.43885	11.6	13.3	-3.7	2	-43.7	0
2.4389	11.6	13.3	-3.7	2	-43.7	0
2.43895	12.4	13.3	-2.9	2	-42.9	0.8
2.439	12.7	13.3	-2.6	2	-42.6	1.1
2.43905	12.7	13.3	-2.6	2	-42.6	1.1
2.4391	12.8	13.3	-2.5	2	-42.5	1.2
2.43915	12.9	13.3	-2.4	2	-42.4	1.3
2.4392	12.8	13.3	-2.5	2	-42.5	1.2
2.43925	12.9	13.3	-2.4	2	-42.4	1.3
2.4393	12.8	13.3	-2.5	2	-42.5	1.2
2.43935	12.6	13.3	-2.7	2	-42.7	1
2.4394	12.3	13.3	-3	2	-43	0.7
2.43945	12.5	13.3	-2.8	2	-42.8	0.9
2.4395	12	13.3	-3.3	2	-43.3	0.4
Processing Gain : 12.5 dB						

