

MEASUREMENT AND TECHNICAL REPORT

SONIK TECHNOLOGIES CORPORATION
 VYTEK WIRELESS
 2310 Cousteau Court
 Vista, CA 92024

DATE: 02 May 2002

This Report Concerns:	Original Grant: X	Class II Change:
Equipment Type:	NPCS Transmitter, Model G2BT	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: Defer until:	No: X
Company Name agrees to notify the Commission by:	N/A	
of the intended date of announcement of the product so that the grant can be issued on that date.		
Transition Rules Request per 15.37?	Yes:	*No: X
(*) FCC Part 2, Paragraphs 2.1046; 2.1049; 2.1051; 2.1053; 2.1055 and Part 24, Paragraphs 24.131; 24.132(c); 24.133(a)(ii); 24.133(1)(ii); 24.135(a)		
Report Prepared by: TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 546 3999 Fax: 858 546 0364		

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1 GENERAL INFORMATION

1.1 Product Description

NPCS Transmitter, Model G2BT

Power Requirements

Voltage: 208-240 Vac

of Phases: 1

Current (Amps/phase(max)): 17.4a

Current (Amps/phase(nominal)): 17.4a

Typical Installation and/or Operating Environment

Controlled access/radio room/vault

EUT Power Cable

X Permanent OR

EUT Software.

Revision Level: C6

EUT Operating Modes to be Tested -

1. 4 carriers transmission, 100 w/carrier
2. 3 carriers transmission, 1300 w/carrier
3. 2 carriers transmission, 200 w/carrier
4. 1 carriers transmission, 400 w/carrier

EUT System Components -

Description

Control Chassis
 Power amplifier Array
 Power Supply
 Power Distribution
 Combiner and filter

Support Equipment

Description

Computer
 GPS Antenna

Oscillator Frequencies

Frequency MHz

10
 18.432
 20
 16.8

Power Supply

Manufacturer

Magnetek

1 GENERAL INFORMATION (continued)

1.2 Related Submittal/Grant

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

TEST	FCC CFR 47 #	PASS/FAIL
RF Power Output	Part 2, Para. 2.1046; Part 24; Para. 24.132(c)	Pass
Modulation	Part 2, Para. 2.1047; Part 24; Para. 24.133(1)(i)	Pass
Occupied Bandwidth	Part 2, Para. 2.1049; Part 24; Para. 24.131	Pass
Spurious Emissions at Antenna Terminals	Part 2, Para. 2.1051; Part 24; Para. 24.133	Pass
Radiated Spurious	Part 2, Para. 2.1053; Part 24; Para. 24.133(a)(ii)	Pass
Frequency Stability	Part 2, Para. 2.1055; Part 24; Para. 24.135(a)	Pass

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 25 GHz).

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE
 10040 Mesa Rim Road
 San Diego, CA 92121-2912
 Phone: 858 546 3999
 Fax: 858 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emission in the following configuration:

See Block Diagram.

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Modification

None

2.5 Configuration of Tested System

See Block Diagram.

3 RF POWER OUTPUT (CHANNELS 1-4)

Test Specifications: FCC Part 24 NPCS

Report No. SC202170Photos taken? ☒ Yes

Test Method:

FCC Part 2.1046 RF Power Output
FCC Part 24.132 (c) RF Power Limits

Date: Apr. 17, 2002

Temperature: 22 degrees C

Air Pressure: 100.9 kPa

Relative Humidity: 41 %

Test Area:

SR 2, Shielded Room, 12' x 24' x 10', Metal Chamber

EUT Description: G2BT Radio Transmitter NPCS

EUT POWER: 208 Vac 60 Hz

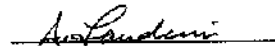
Limited to 3500 Watts e.r.p.

Frequency Band	Frequency under Test -- Modulation	Measured Watts	Complies
930 --- 931 MHz	930.5 MHz		
	1 Channel Carrier	410	Yes
	2 Channel Carrier	402	Yes
	3 Channel Carrier	410	Yes
	4 Channel Carrier	410	Yes
940 --- 941 MHz	940.5 MHz		
	1 Channel Carrier	397	Yes
	2 Channel Carrier	399	Yes
	3 Channel Carrier	406	Yes
	4 Channel Carrier	401	Yes

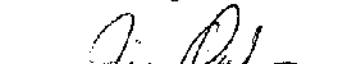
NOTES:

The directional coupler provided 47.7 dB attenuation and was entered into the power meter as an offset.

Tested By: A. Laudani


 Signature

Reviewed by: Jim Owen


 Signature

Test Equipment Used:

Prop. #	Model Number	Description	Manufacturer	Serial No.	Cal. Dates
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Customer's Test Equipment Used:

437B	Power Meter	Hewlett Packard	31250U13310	6/1/01
8481H	Power Sensor	Hewlett Packard	3318A16294	6/1/01
5882568W03	Directional Coupler	CellWave	195029-296	Verified 4-4-02

**4 MODULATION CHARACTERISTICS (CHANNELS 1, 2, 3 and 4, 930.500MHz and
(CHANNELS 1, 2, 3 and 4, 940.500 MHz)**

Report No. SC202170**Test Specifications: FCC Part 24 NPCS****FCC Part 2.1047 Modulation Characteristics****FCC Part 2.1051 Spurious Emissions at Antenna Terminals****FCC Part 24.131 (1)(i) Emission Limits****FCC Part 24.131 (1)(ii) Emission Limits****Notes:**

To prevent overloading the Spectrum Analyzer, a notch filter was inserted between the antenna port and the SA with an insertion loss of 6.8 to 7 dB for measured ranges between 30 to 3000 MHz

The emission mask was presented as the second of five pages within the Spurious Emission plots to show the near frequency emissions as the plots for Spurious Emissions have a large span which makes it difficult to discriminate near the intended radio emission.

Environmental room conditions: 22--24 degrees C, 100.9 Kpa pressure, 40-44 % rel. hum.

Photos of the Setup were taken, Data presented as Plots

Test Equipment Used:

Prop. #	Model Number	Description	Manufacturer	Serial No.	Cal. Dates
6495	hp8566B	Spectrum Analyzer	Hewlett Packard	2311A02209	11/13/02

Customer's Test Equipment Used:

588256B1J03	Directional Coupler	CellWave	192079-007	Verified 4-4-04
930.5 MHz	Notch Filter	WACOM Products, Inc.	37043-66	Verified 4-17-2002
940.5 MHz	Notch Filter	WACOM Products, Inc.	37043-67	Verified 4-17-2002
Notch Cavities of the WP-4941-7941-2 dual cavity dual channel filter set retuned for use on 930.5 & 940.5MHz				
Performance 48.0dB at 930.5MHz; 7.0dB Insertion Loss -- 30 to 3000 MHz				
41.0dB at 940.5MHz; 6.8dB Insertion Loss -- 30 to 3000 MHz				

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G2BT RADIO TRANSMITTER

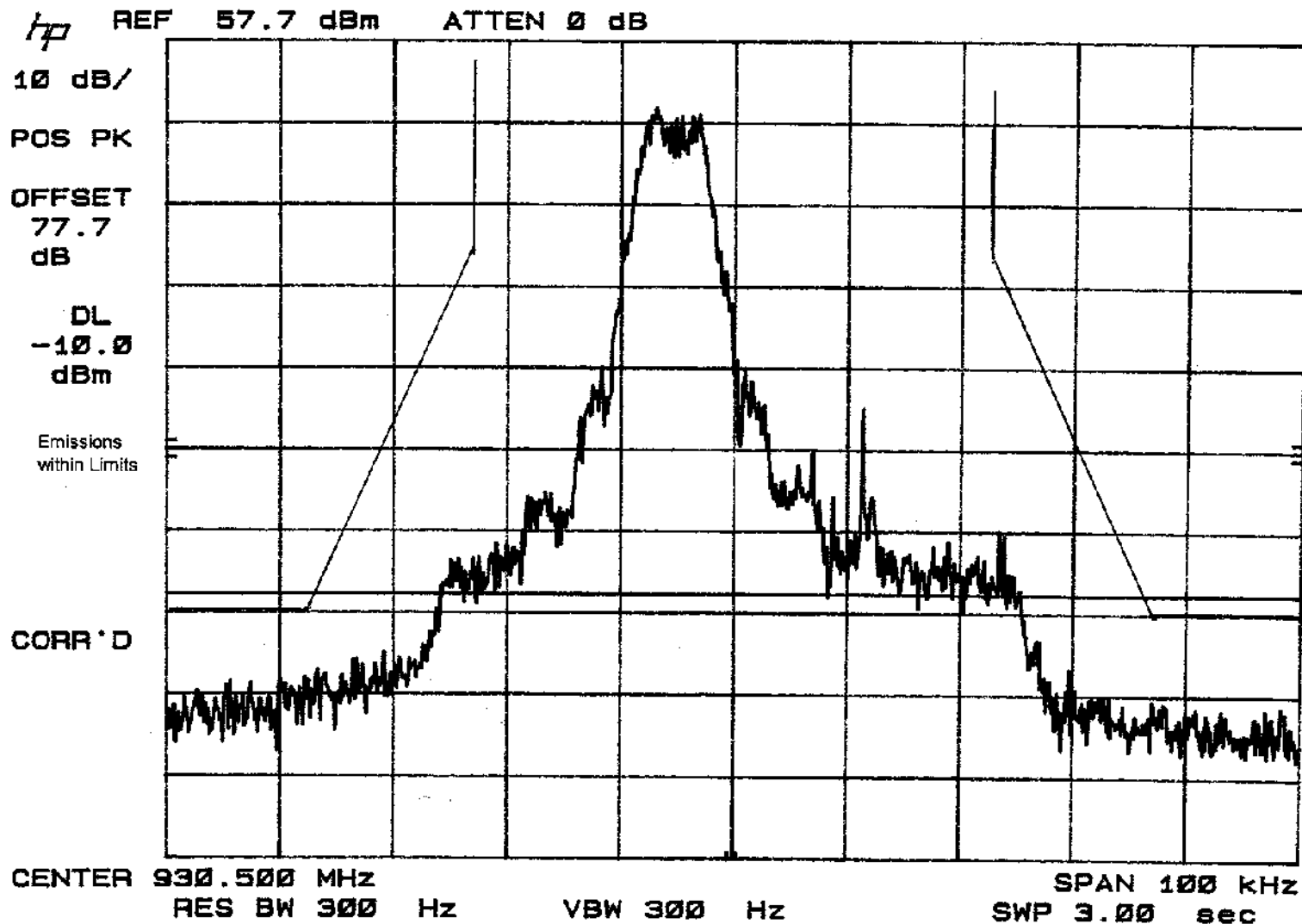
APR. 17, 2002
TECH/ENGR: AAL

FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS

FCC CFR 47 PART 24.133 (1)(i)

930.5 MHz 1 CHANNEL CARRIER

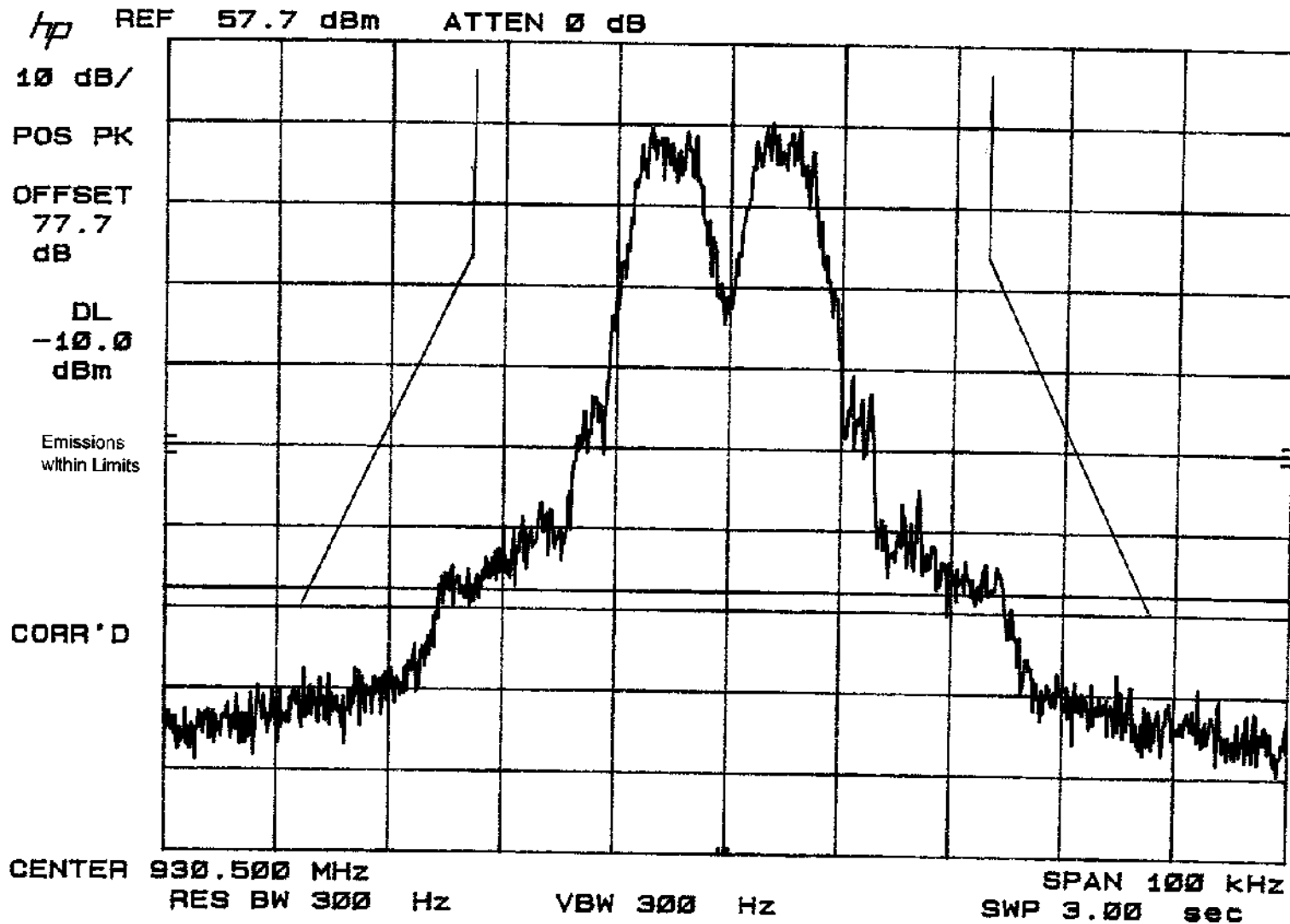
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FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
FCC CFR 47 PART 24.133 (1)(i) 930.5 MHz 2 CHANNEL CARRIER

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TECH/ENGR: AAL

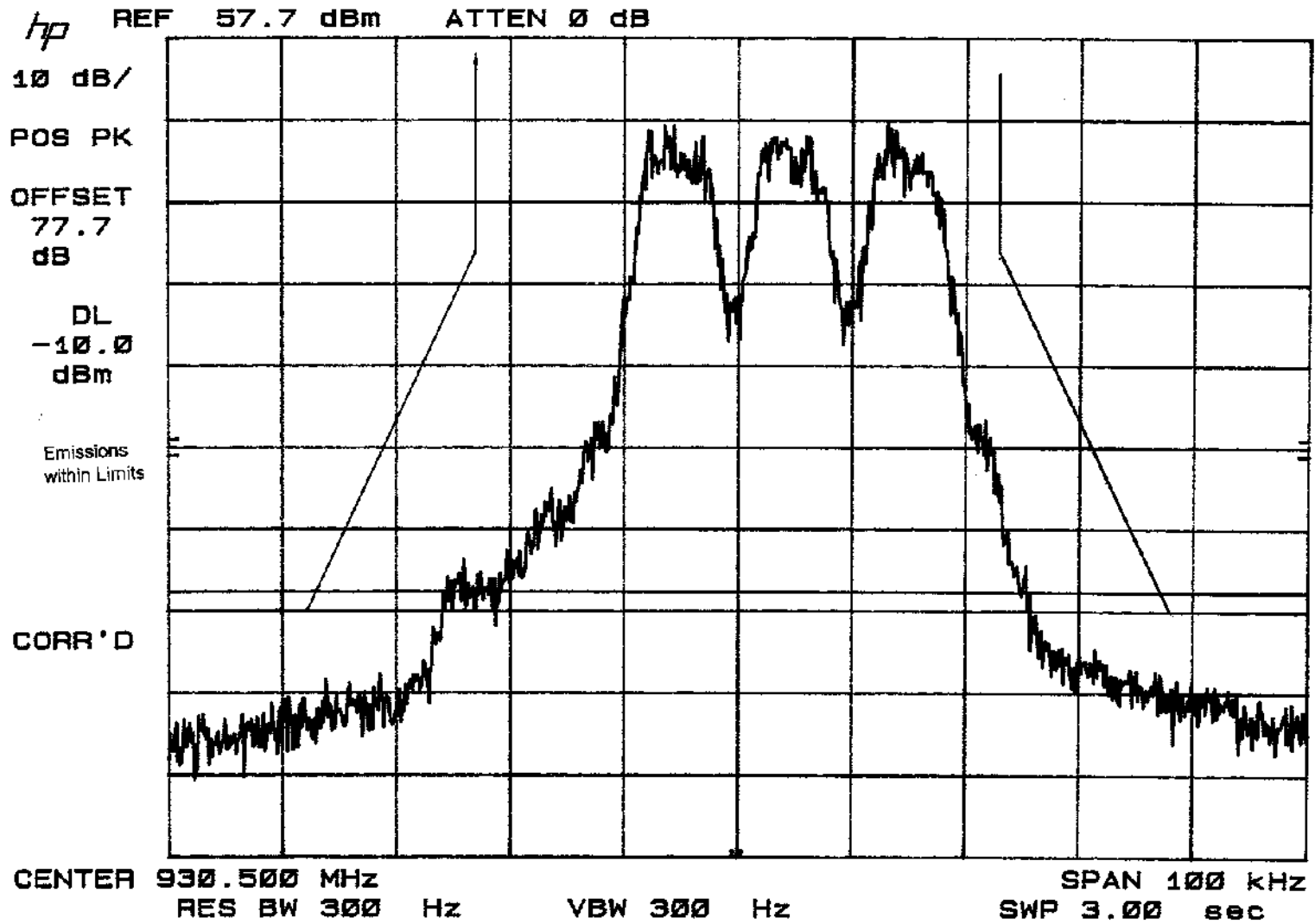
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FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
FCC CFR 47 PART 24.133 (1)(i) 930.5 MHz 3 CHANNEL CARRIER

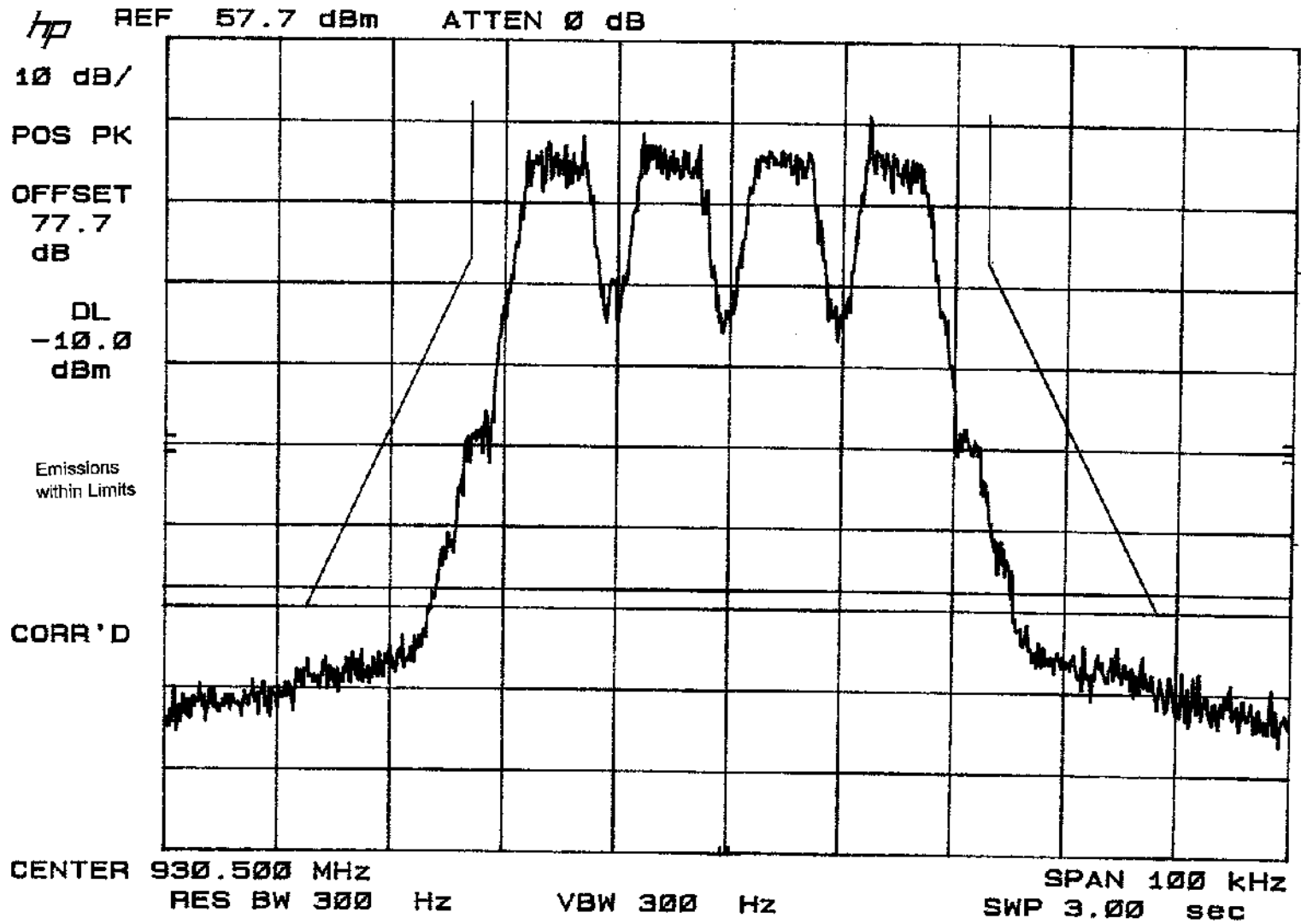
APR. 17, 2002
TECH/ENGR: AAL

FSK DATA



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 FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
 FCC CFR 47 PART 24.133 (1)(i) 930.5 MHz 4 CHANNEL CARRIER

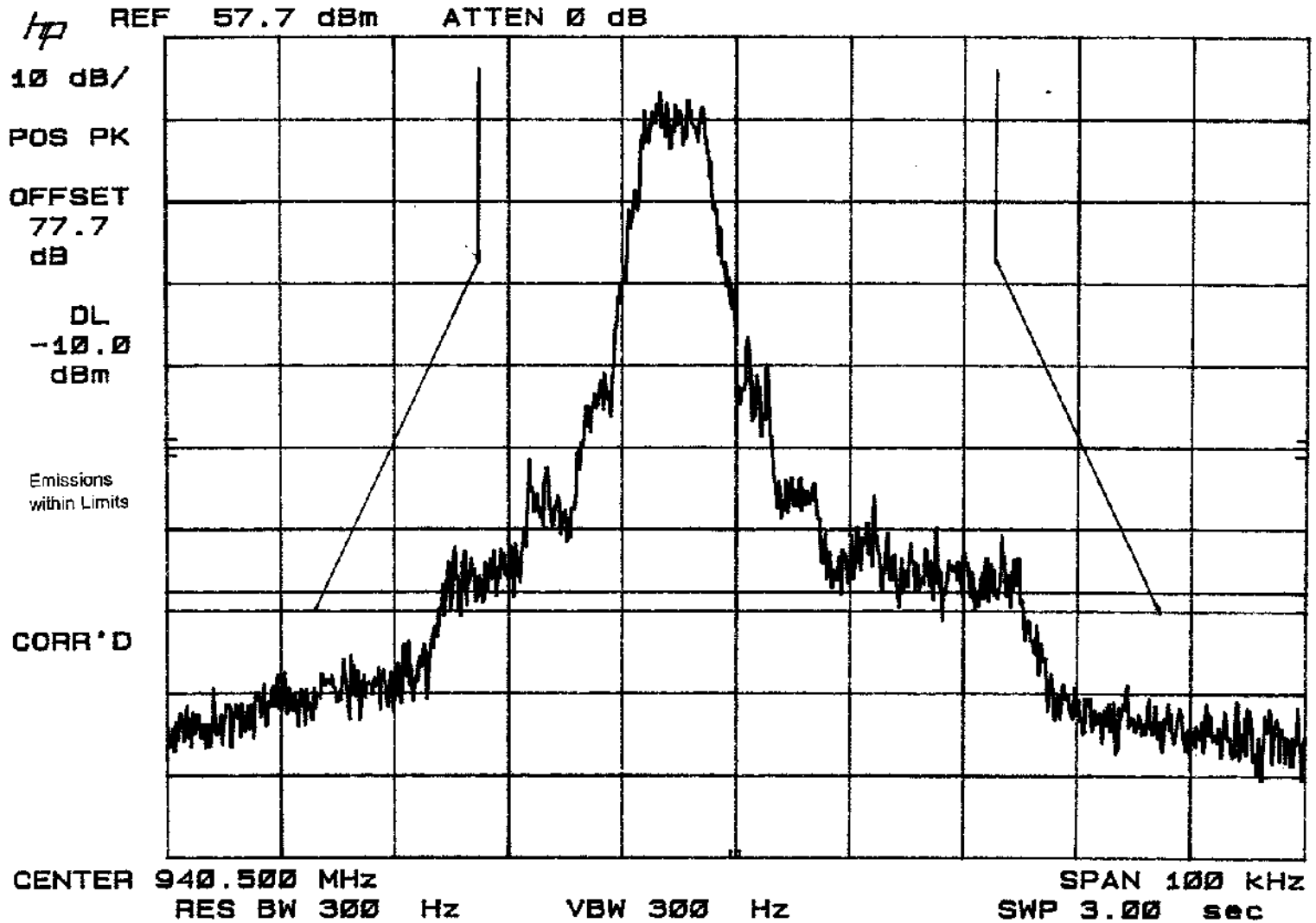
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 TECH/ENGR: AAL
 FSK DATA



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 FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
 FCC CFR 47 PART 24.133 (1)(i) 940.5 MHz 1 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

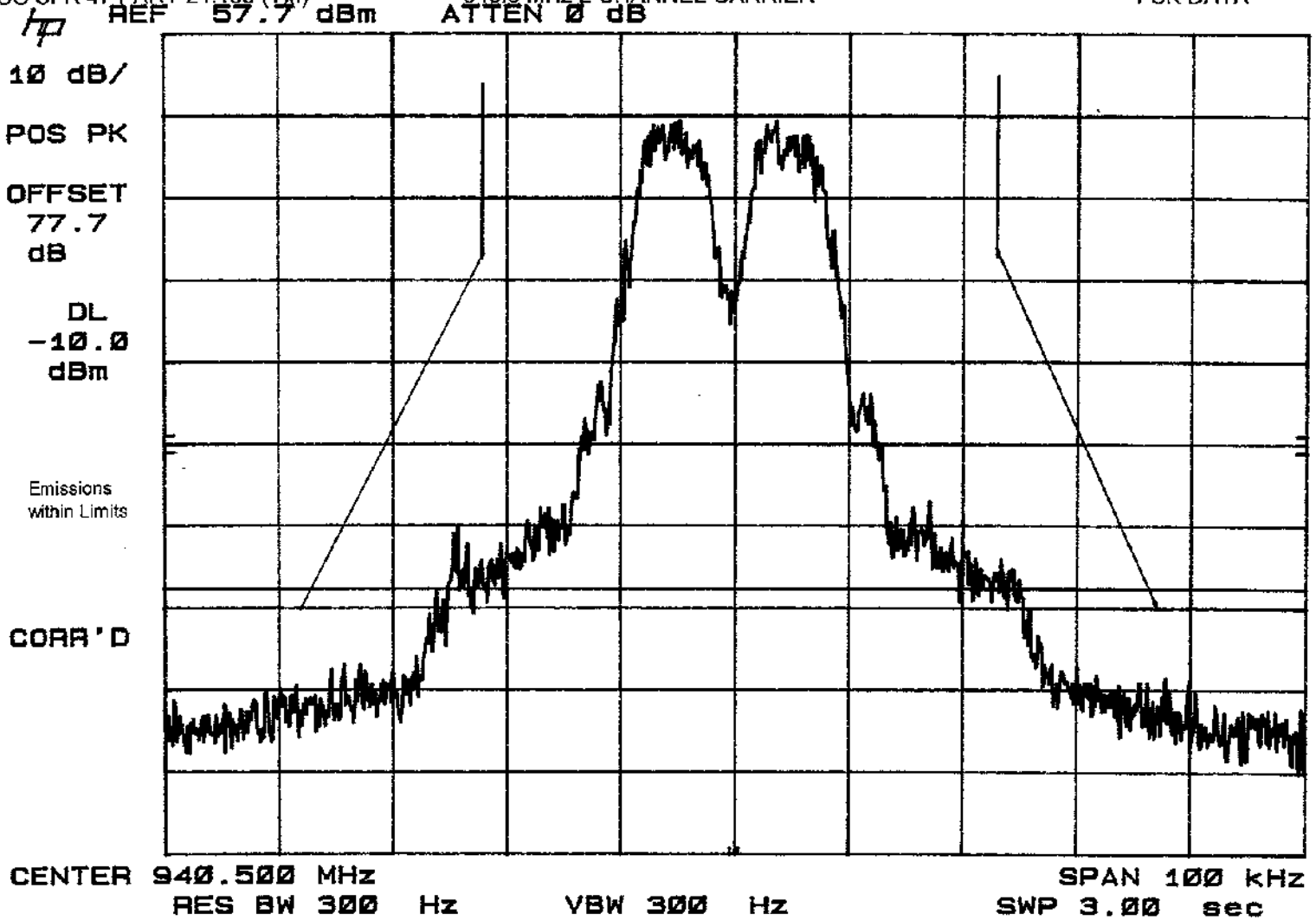
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TECH/ENGR: AAL

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FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
FCC CFR 47 PART 24.133 (1)(i) 940.5 MHz 2 CHANNEL CARRIER

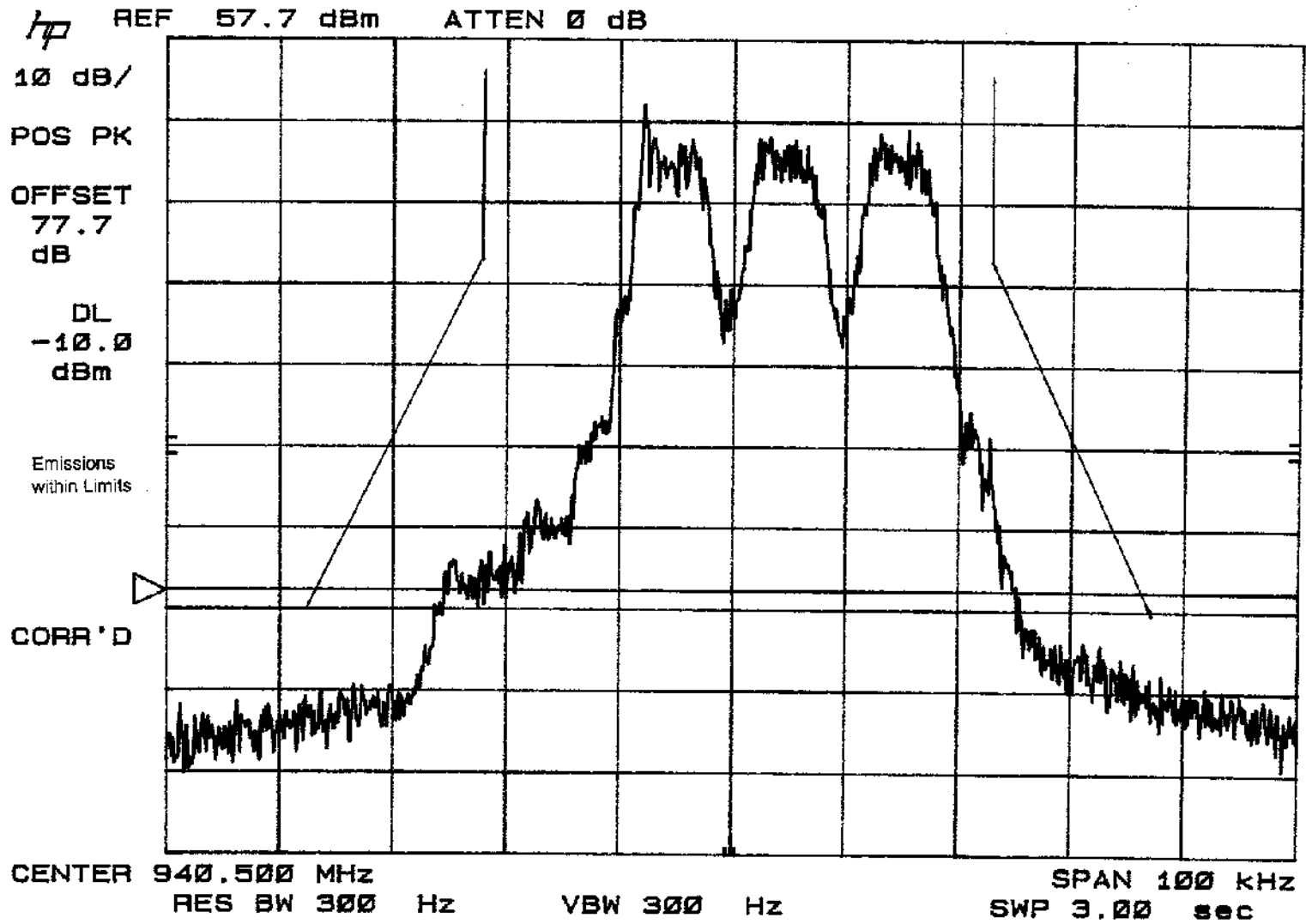
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 FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
 FCC CFR 47 PART 24.133 (1)(i) 940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

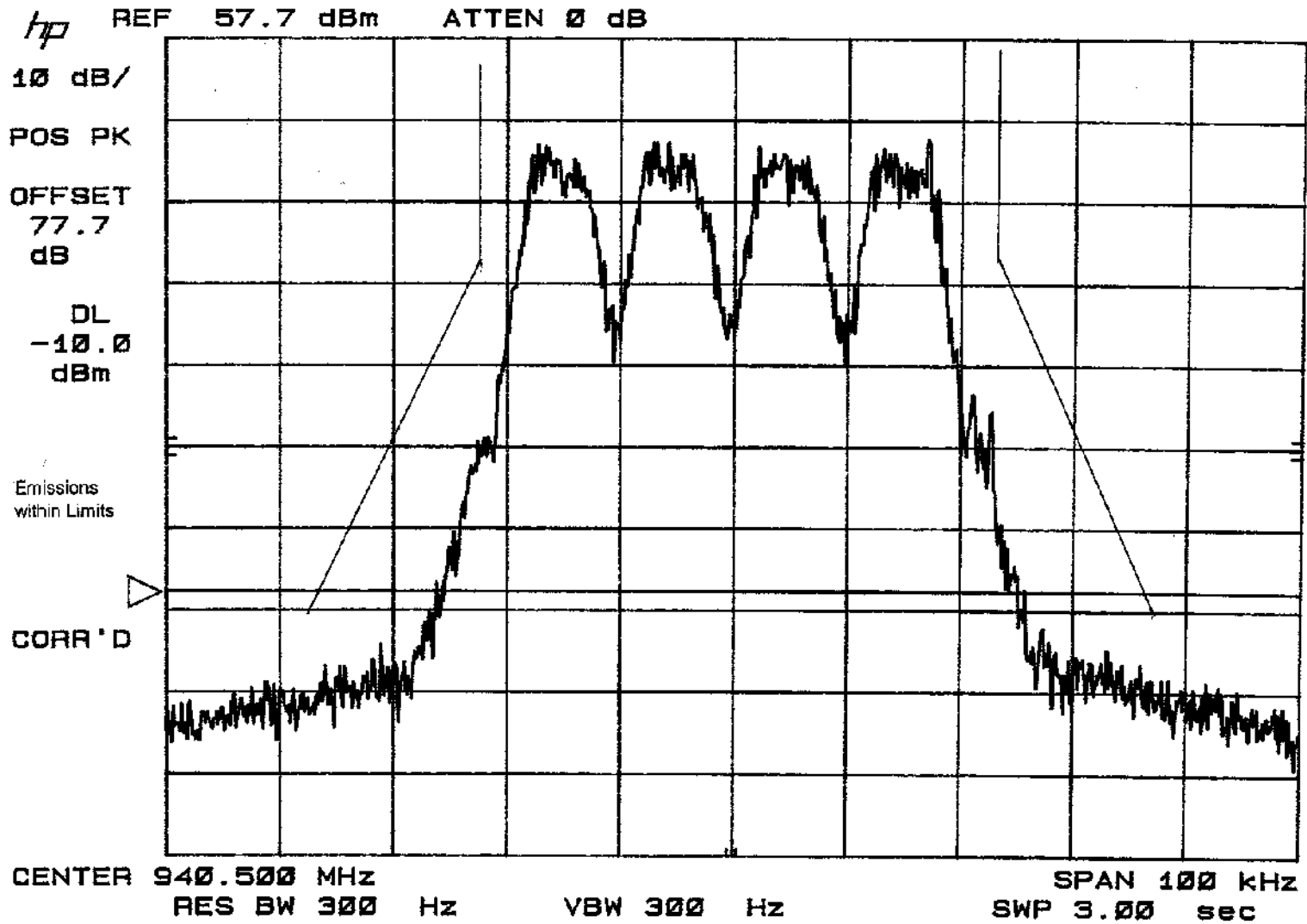
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 FCC CFR 47 PART 2.1047 MODULATION CHARACTERISTICS
 FCC CFR 47 PART 24.133 (1)(i) 940.5 MHz 4 CHANNEL CARRIER

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FSK DATA



5 OCCUPIED BANDWIDTH (CHANNELS 1-4; 930.500 and 940.500 MHz)

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G2BT RADIO TRANSMITTER

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TECH/ENGR: AAL

FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH

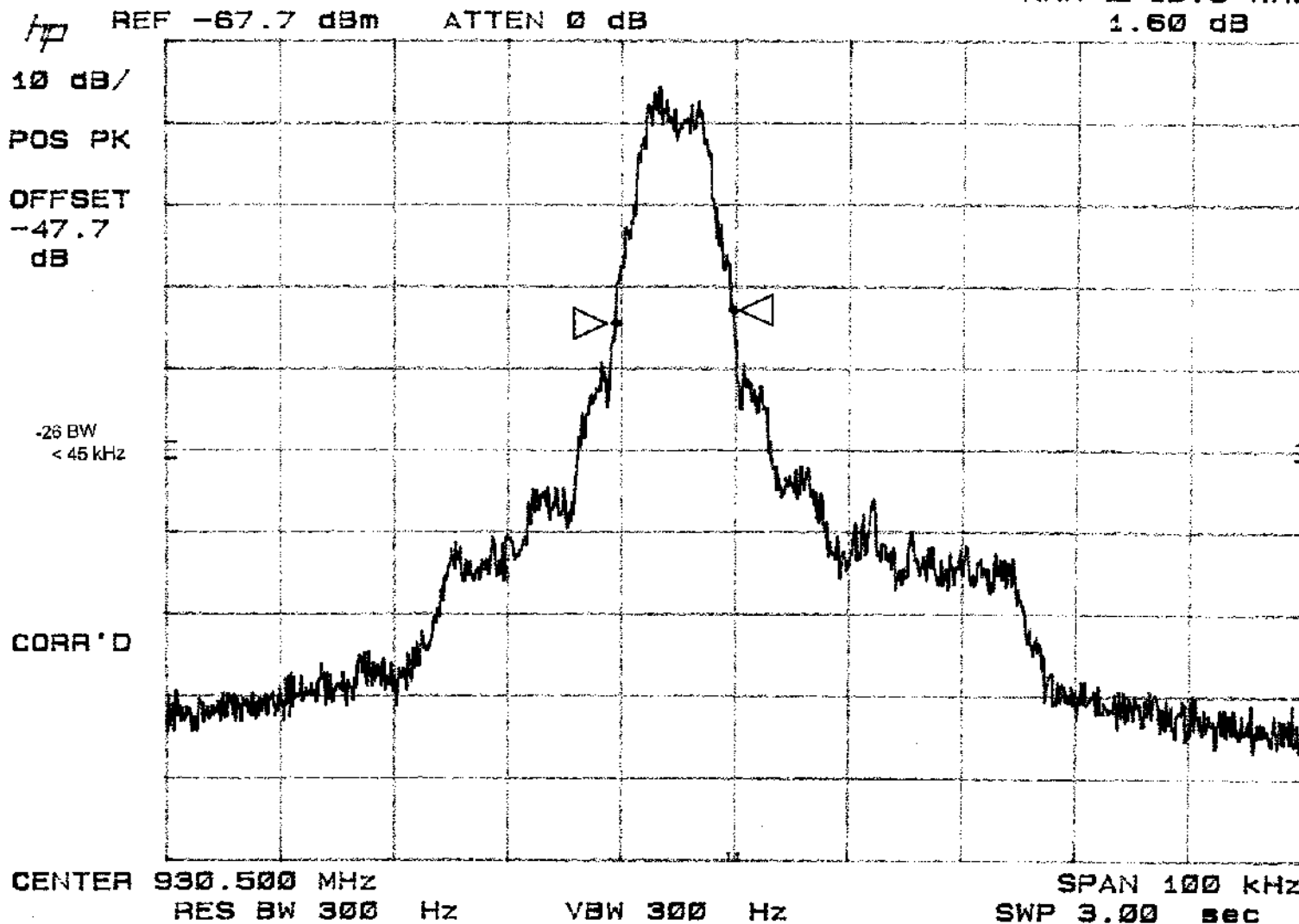
FCC CFR 47 PART 24.131

930.5 MHz 1 CHANNEL CARRIER

FSK DATA

MKR Δ 10.3 kHz

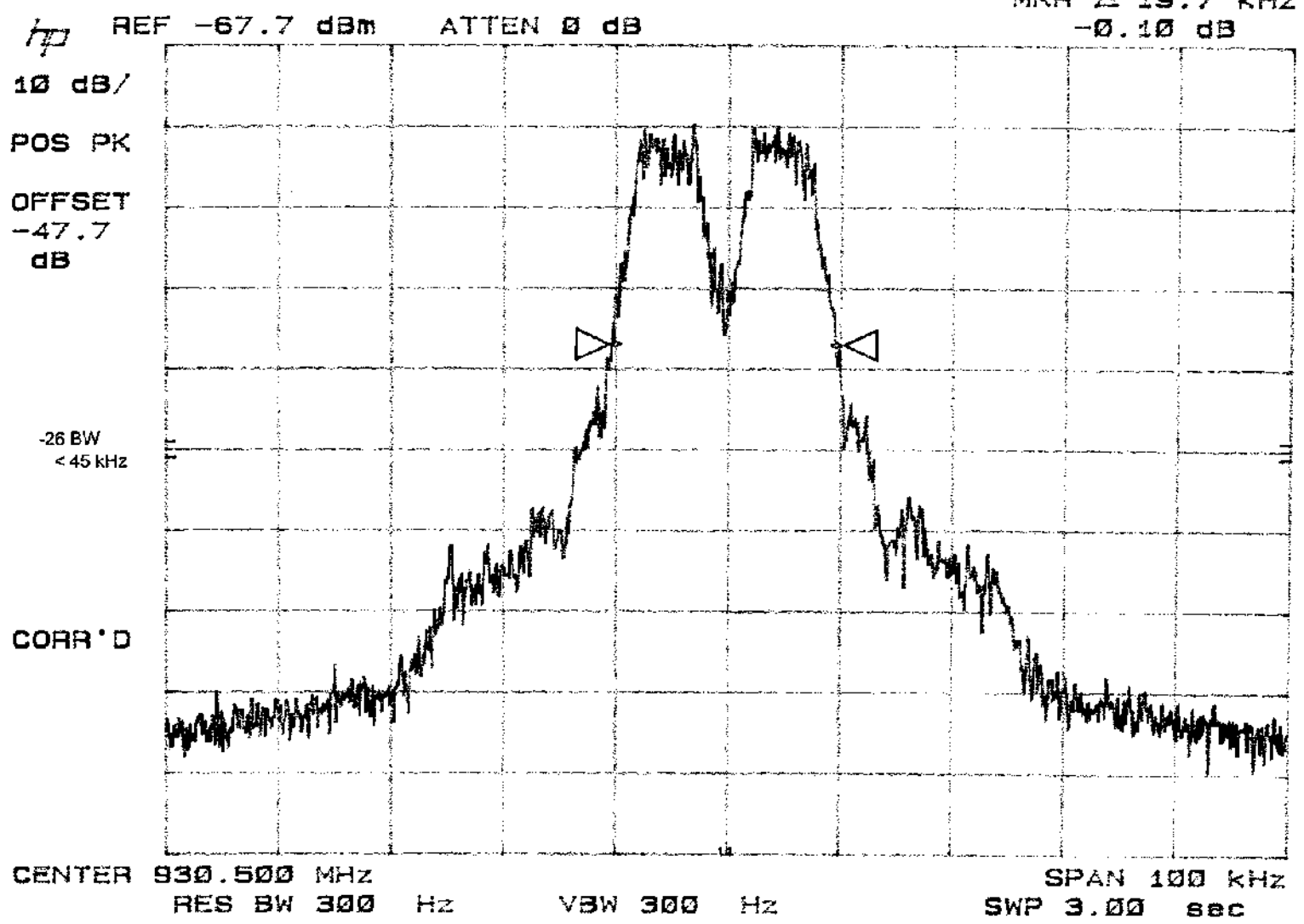
1.60 dB

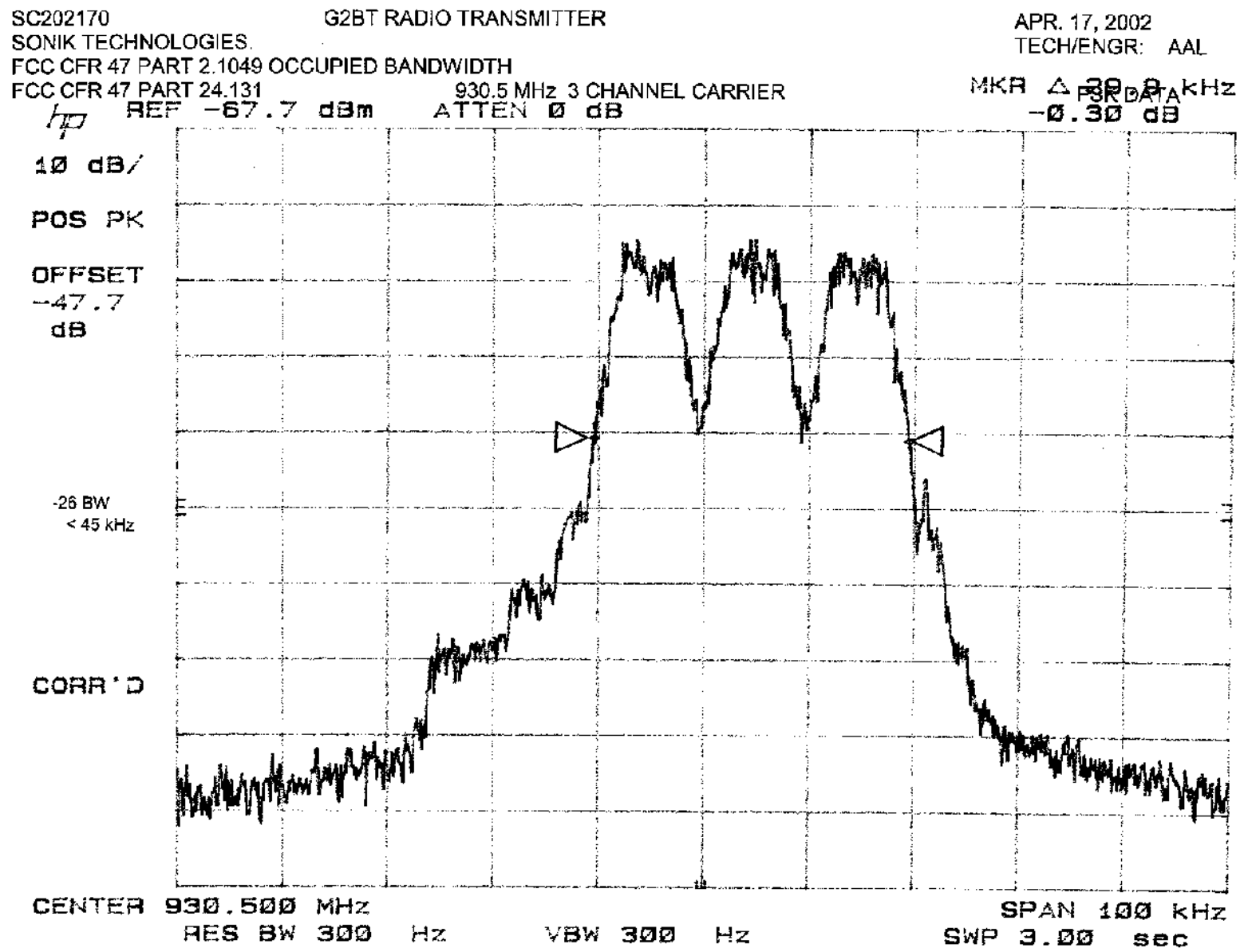


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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131
G2BT RADIO TRANSMITTER
930.5 MHz 2 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

FSK DATA
MKR Δ 19.7 kHz
-0.10 dB

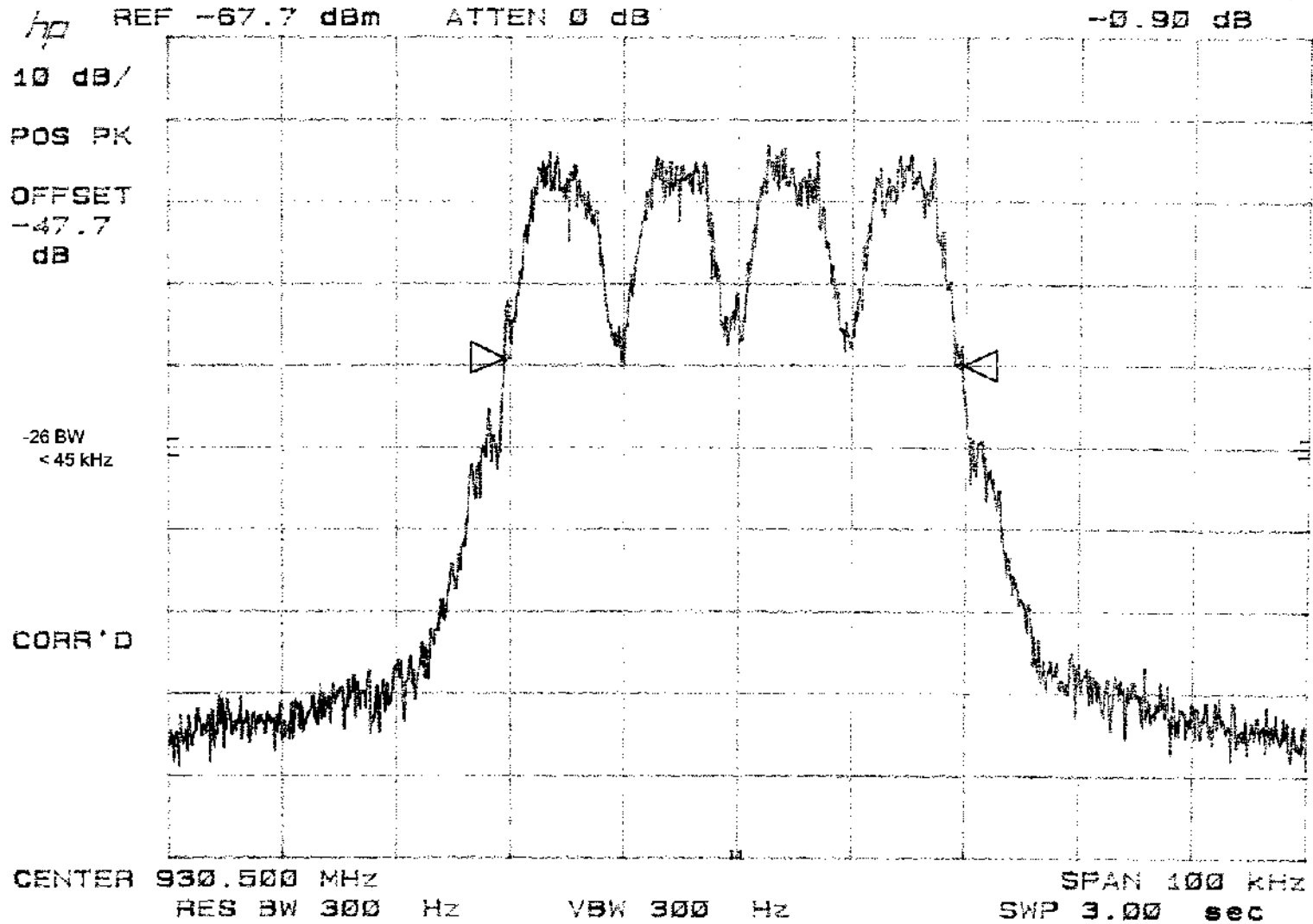




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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131
G2BT RADIO TRANSMITTER
930.5 MHz 4 CHANNEL CARRIER

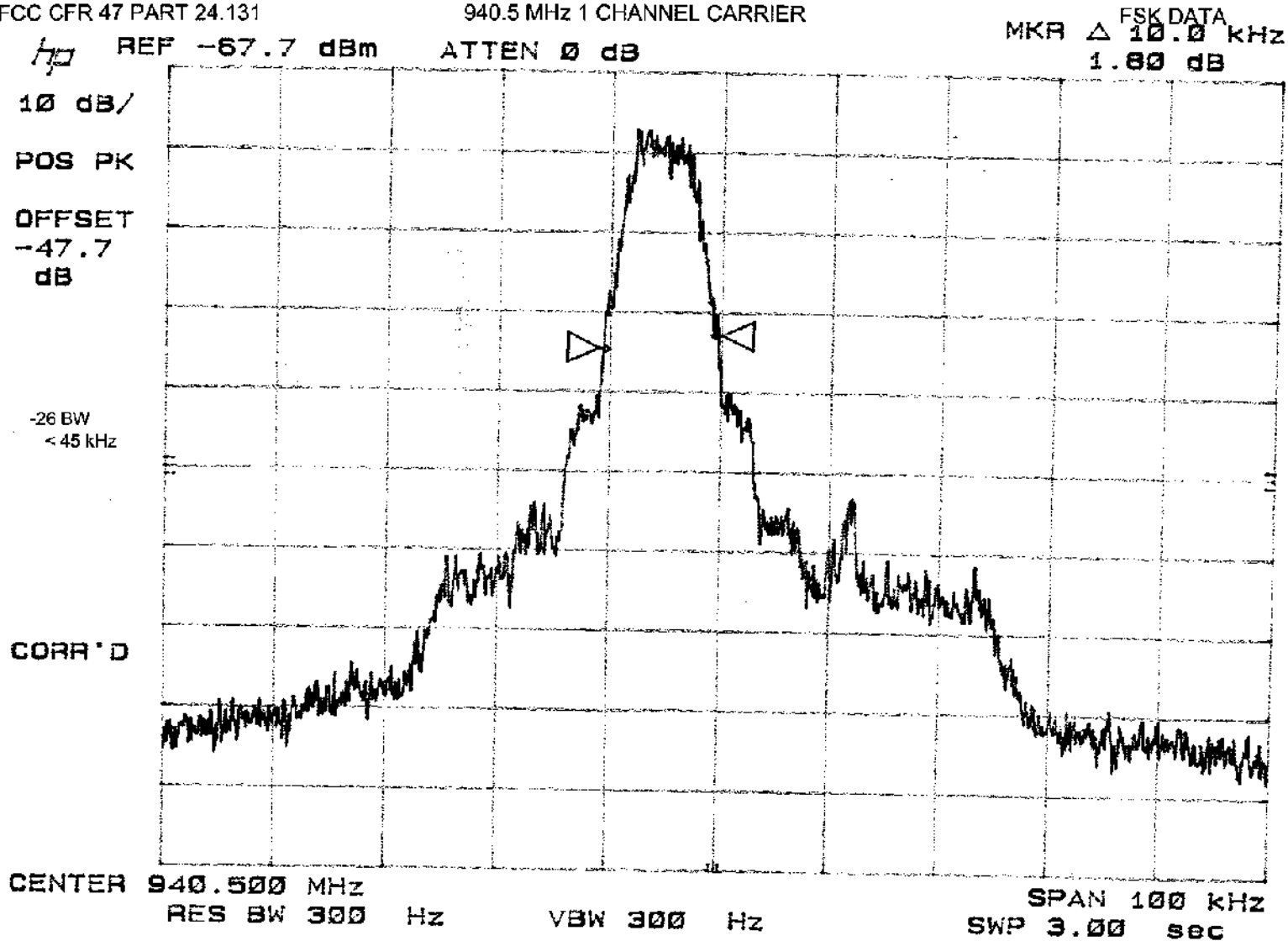
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FSK DATA
MKR Δ 40.0 kHz
-0.90 dB



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TECH/ENGR: AAL

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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131
940.5 MHz 1 CHANNEL CARRIER



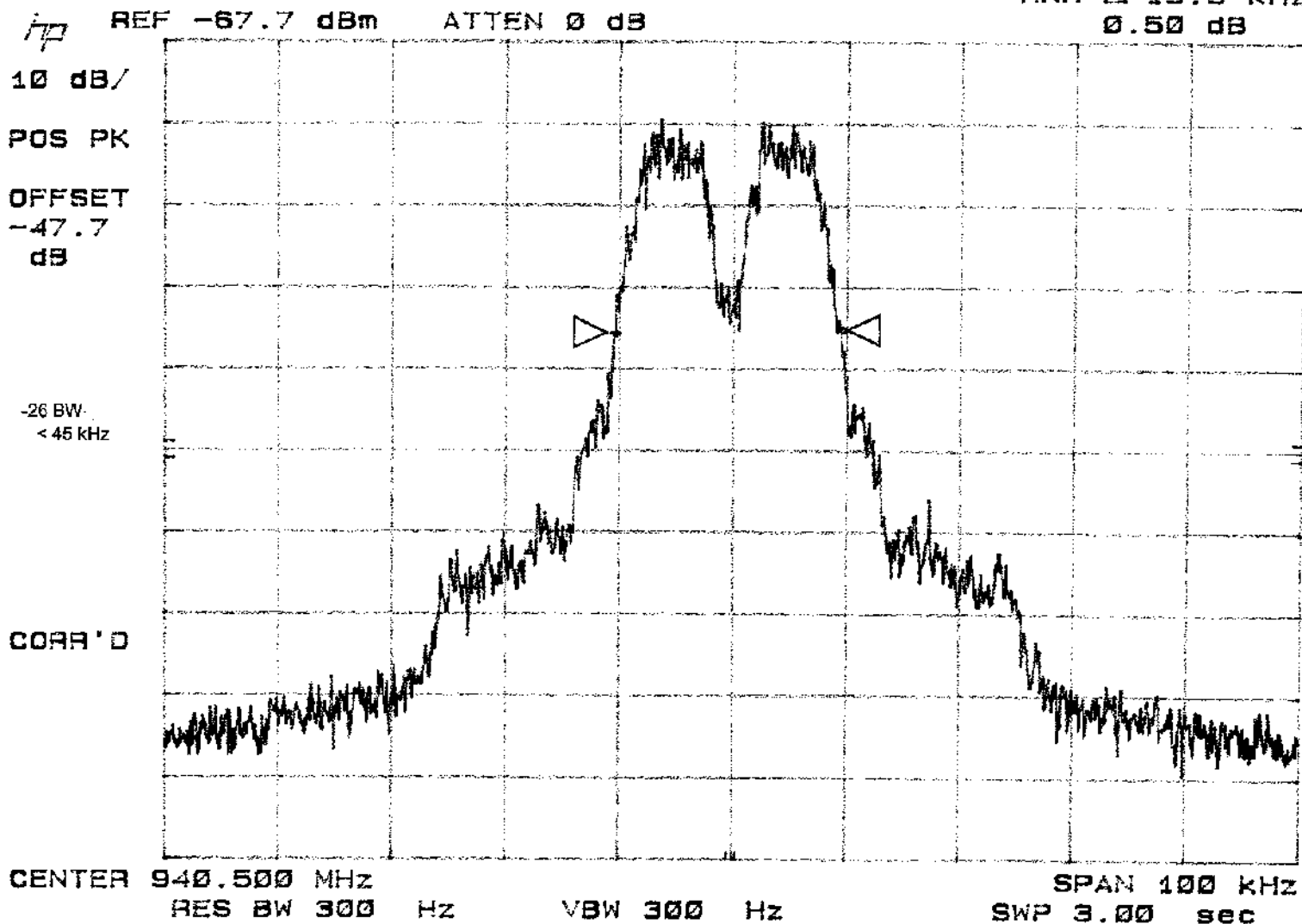
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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131

G2BT RADIO TRANSMITTER

APR. 17, 2002
TECH/ENGR: AAL

940.5 MHz 2 CHANNEL CARRIER

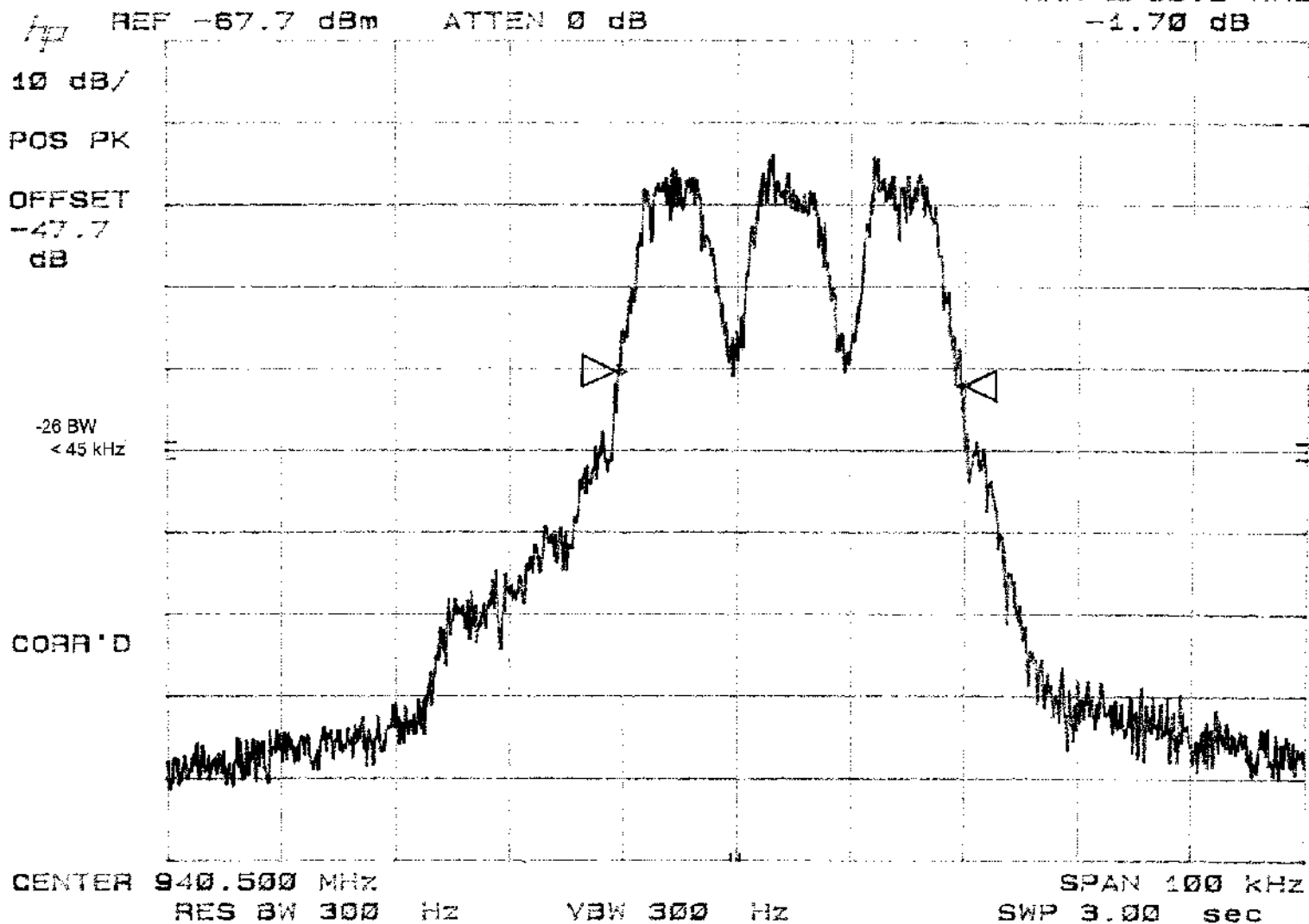
FSK DATA
MKR Δ 19.9 kHz
0.50 dB



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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131
G2BT RADIO TRANSMITTER
940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

FSK DATA
MKF Δ 30.0 KHz
-1.70 dB



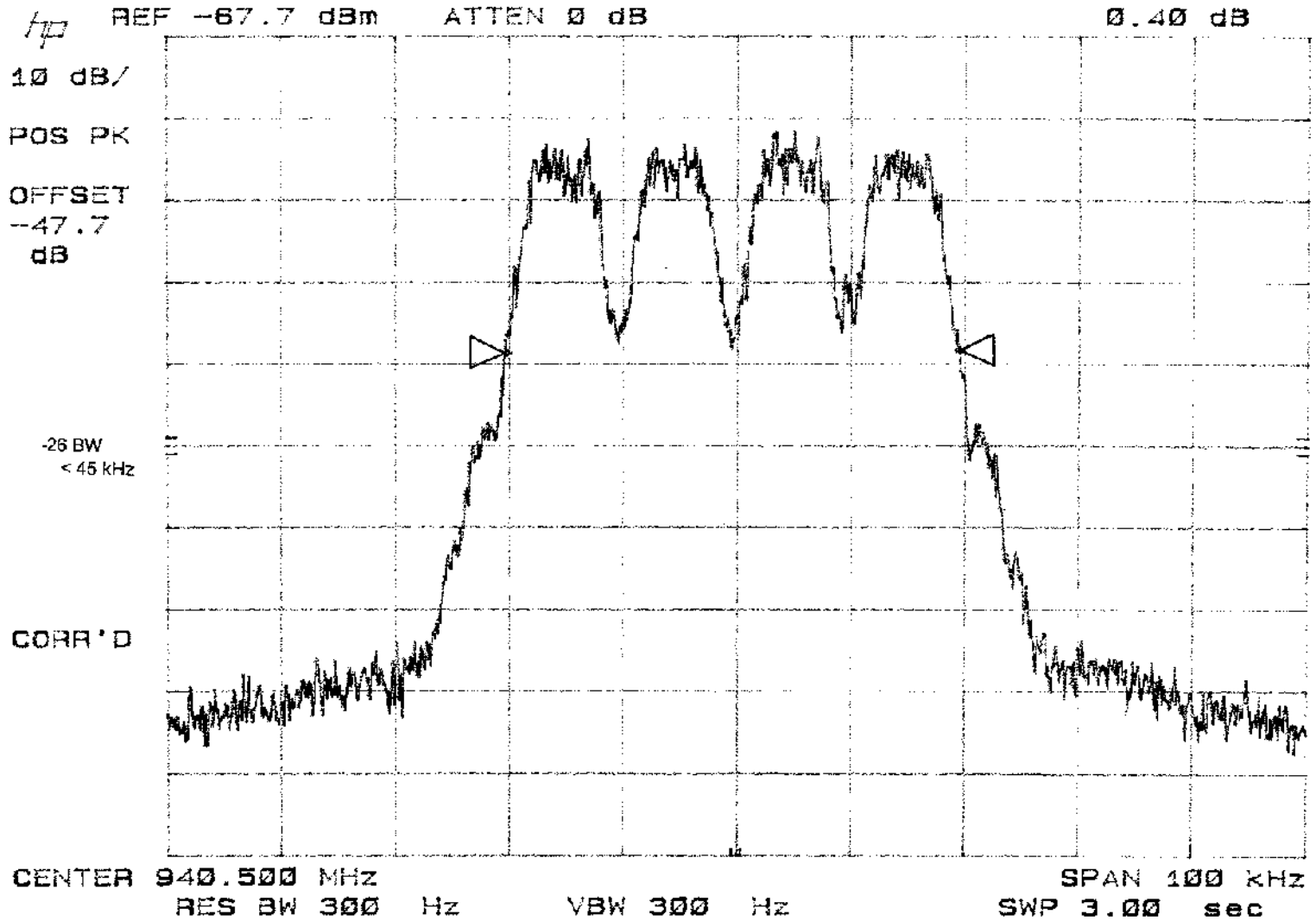
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FCC CFR 47 PART 2.1049 OCCUPIED BANDWIDTH
FCC CFR 47 PART 24.131

G2BT RADIO TRANSMITTER

940.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

FSK DATA
MKR Δ 39.8 kHz
0.40 dB



6 SPURIOUS EMISSION AT ANTENNA TERMINALS EQUIPMENT/DATA

Report No. SC202170**Test Specifications: FCC Part 24 NPCS****FCC Part 2.1047 Modulation Characteristics****FCC Part 2.1051 Spurious Emissions at Antenna Terminals****FCC Part 24.131 (1)(i) Emission Limits****FCC Part 24.131 (1)(ii) Emission Limits****Notes:**

To prevent overloading the Spectrum Analyzer, a notch filter was inserted between the antenna port and the SA with an insertion loss of 6.8 to 7 dB for measured ranges between 30 to 3000 MHz

The emission mask was presented as the second of five pages within the Spurious Emission plots to show the near frequency emissions as the plots for Spurious Emissions have a large span which makes it difficult to discriminate near the intended radio emission.

Environmental room conditions: 22--24 degrees C, 100.9 Kpa pressure, 40-44 % rel. hum.

Photos of the Setup were taken, Data presented as Plots

Test Equipment Used:

Prop. #	Model Number	Description	Manufacturer	Serial No.	Cal. Dates
6495	hp8566B	Spectrum Analyzer	Hewlett Packard	2311A02209	11/13/02

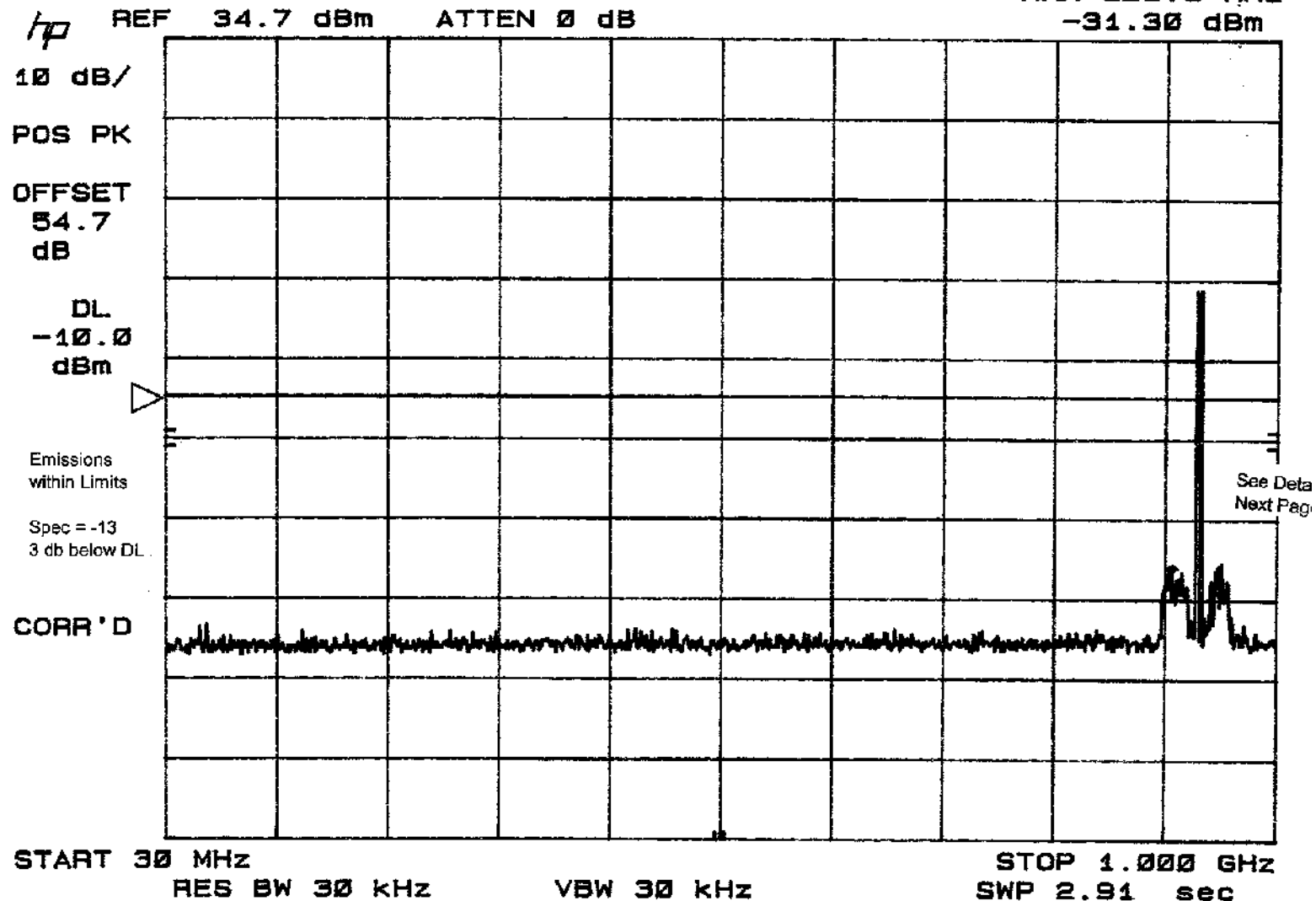
Customer's Test Equipment Used:

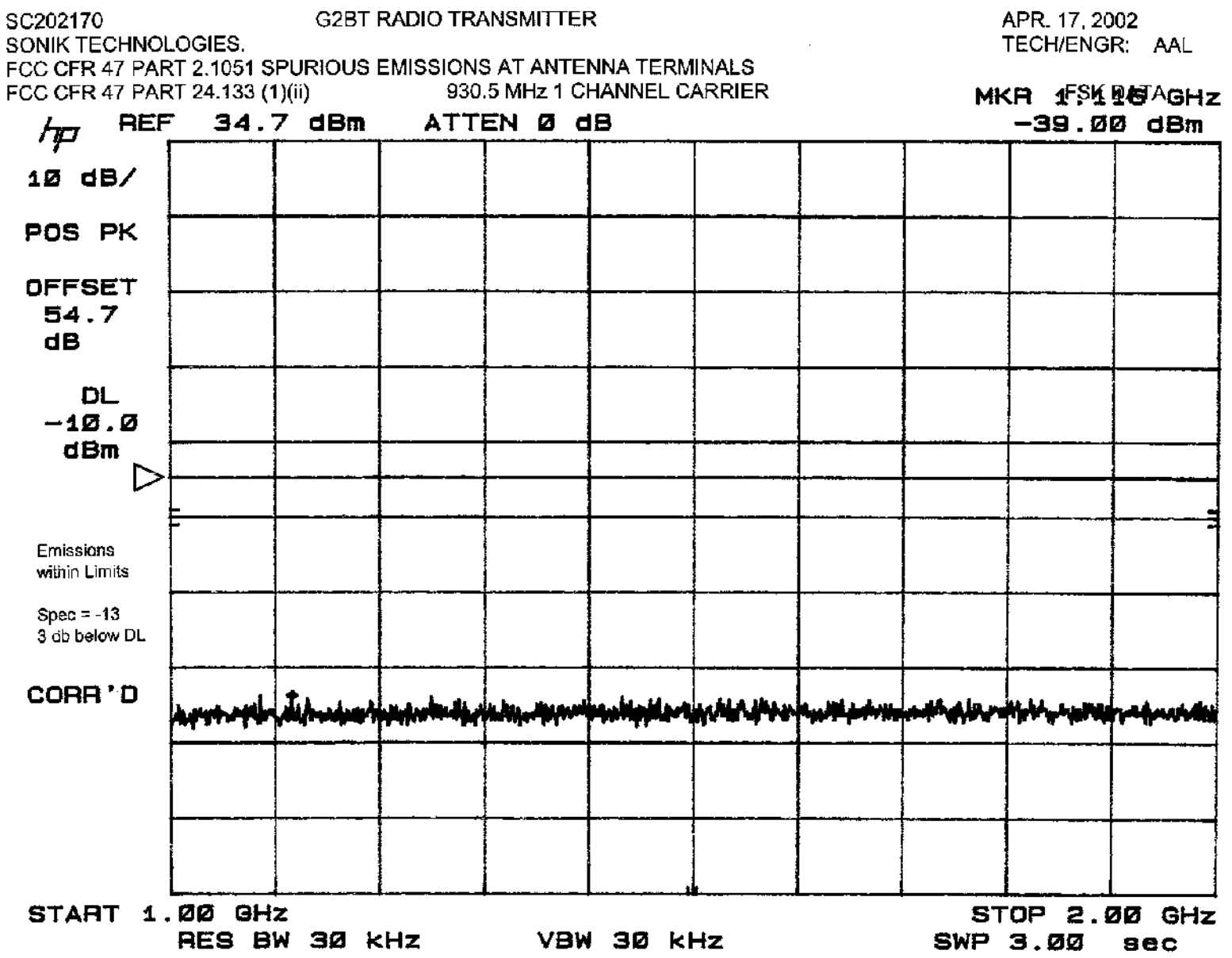
588256B1J03	Directional Coupler	CellWave	192079-007	Verified 4-4-04
930.5 MHz	Notch Filter	WACOM Products, Inc.	37043-66	Verified 4-17-2002
940.5 MHz	Notch Filter	WACOM Products, Inc.	37043-67	Verified 4-17-2002
Notch Cavities of the WP-4941-7941-2 dual cavity dual channel filter set retuned for use on 930.5 & 940.5MHz				
Performance 48.0dB at 930.5MHz; 7.0dB Insertion Loss -- 30 to 3000 MHz				
41.0dB at 940.5MHz; 6.8dB Insertion Loss -- 30 to 3000 MHz				

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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 1 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

FSK DATA
 MKR 908.8 MHz
 -31.30 dBm

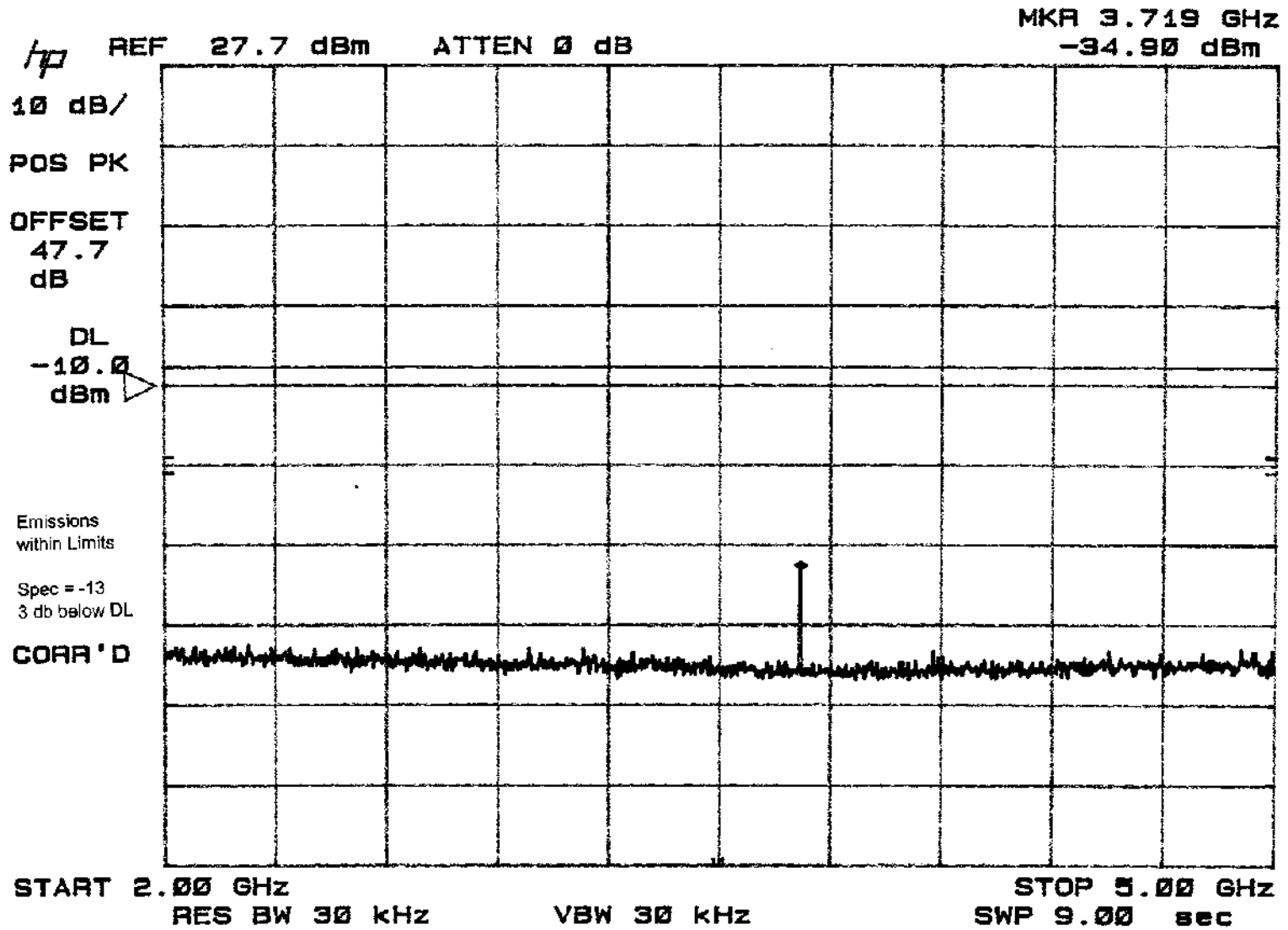




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 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 1 CHANNEL CARRIER

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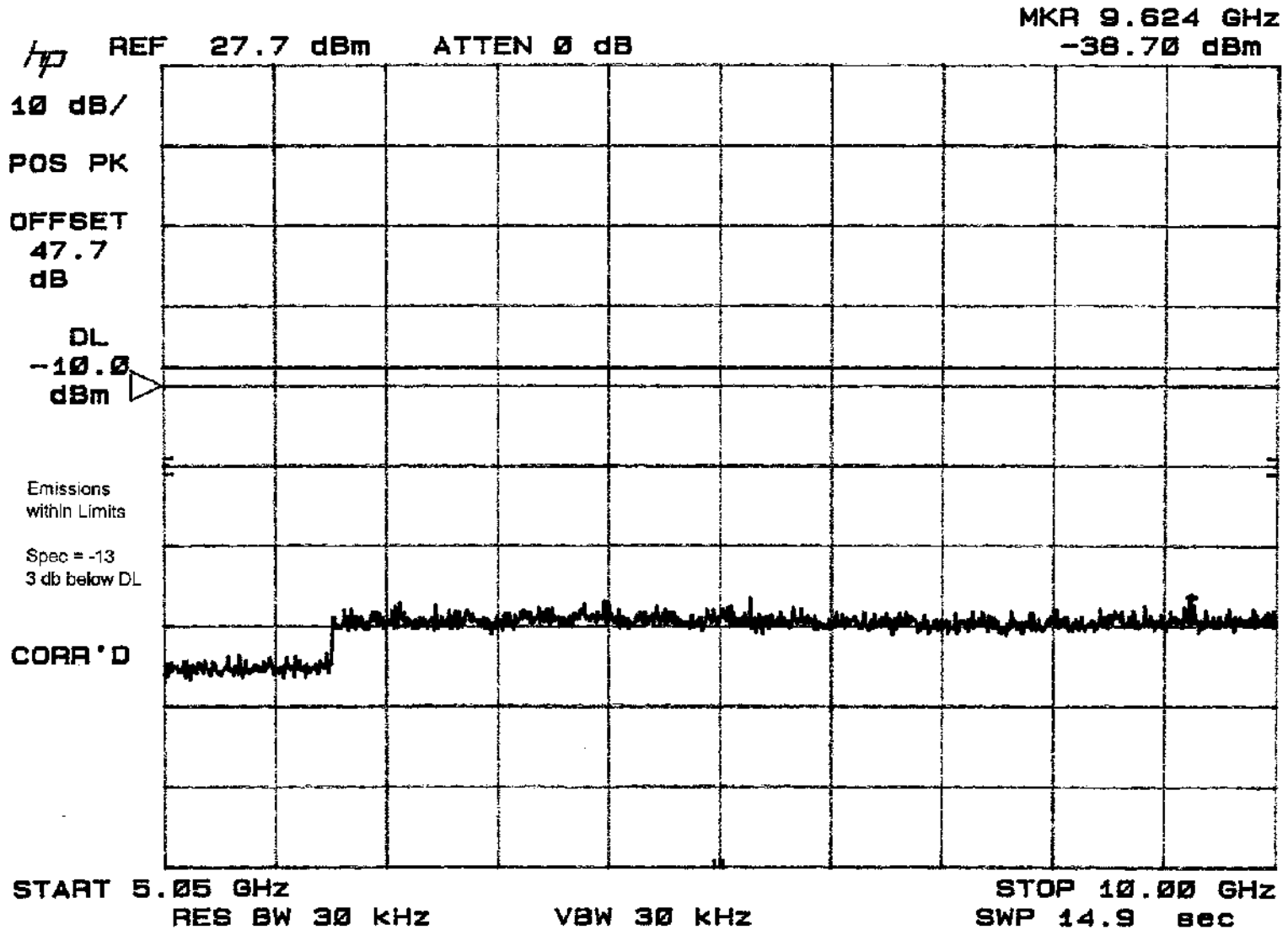
FSK DATA



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 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 1 CHANNEL CARRIER

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FSK DATA

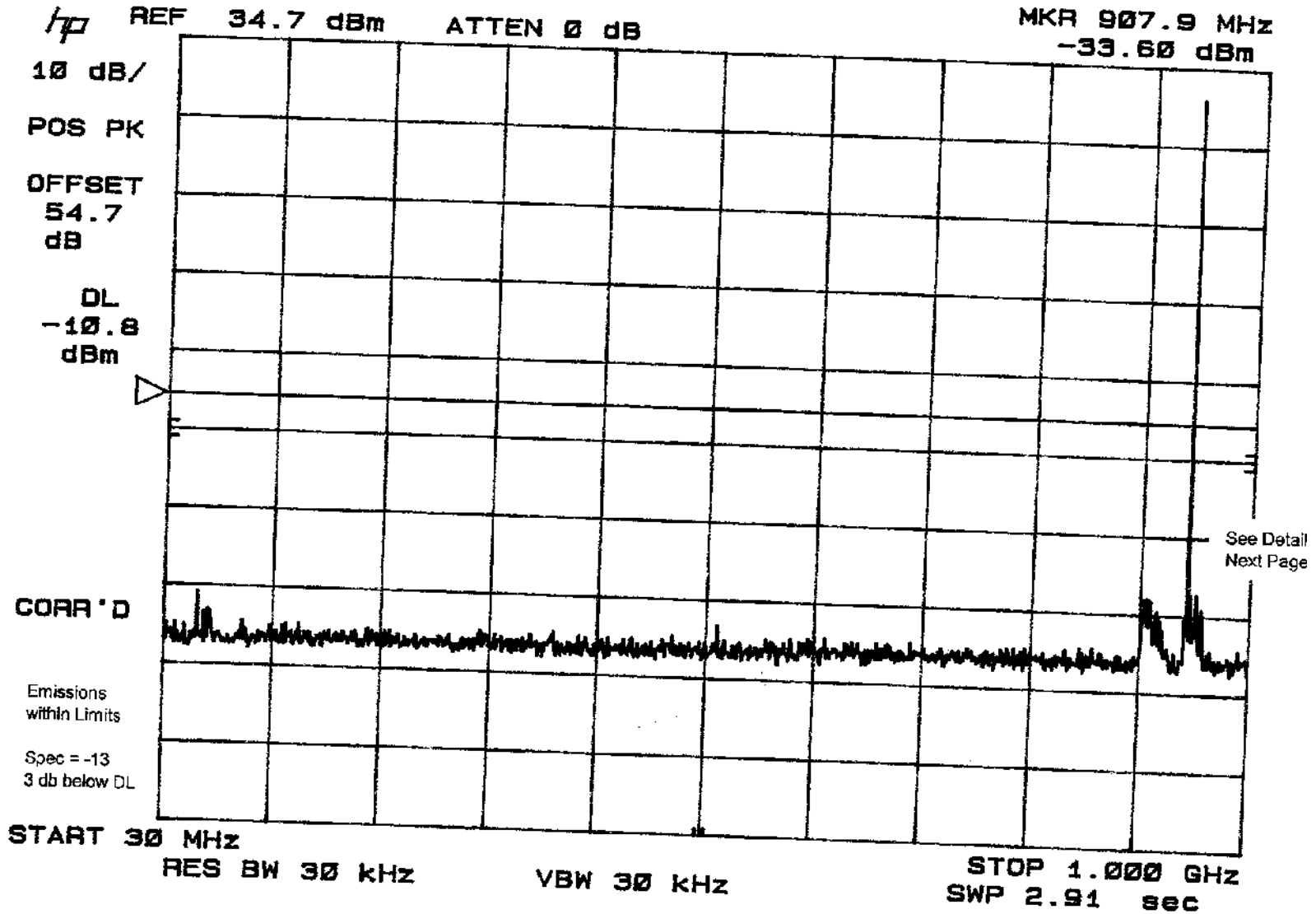


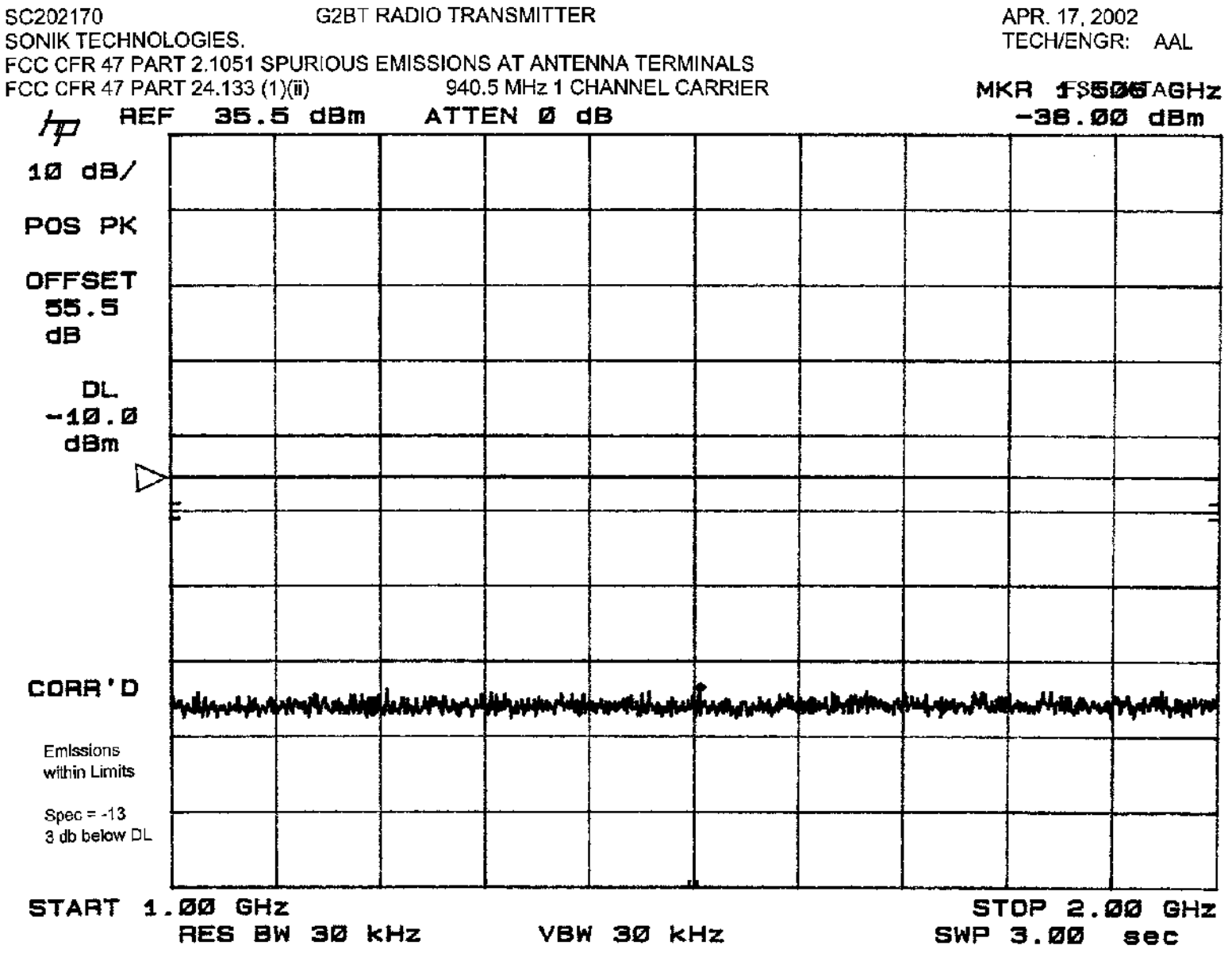
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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 1 CHANNEL CARRIER

FSK DATA

MR 907.9 MHz
-33.60 dBm



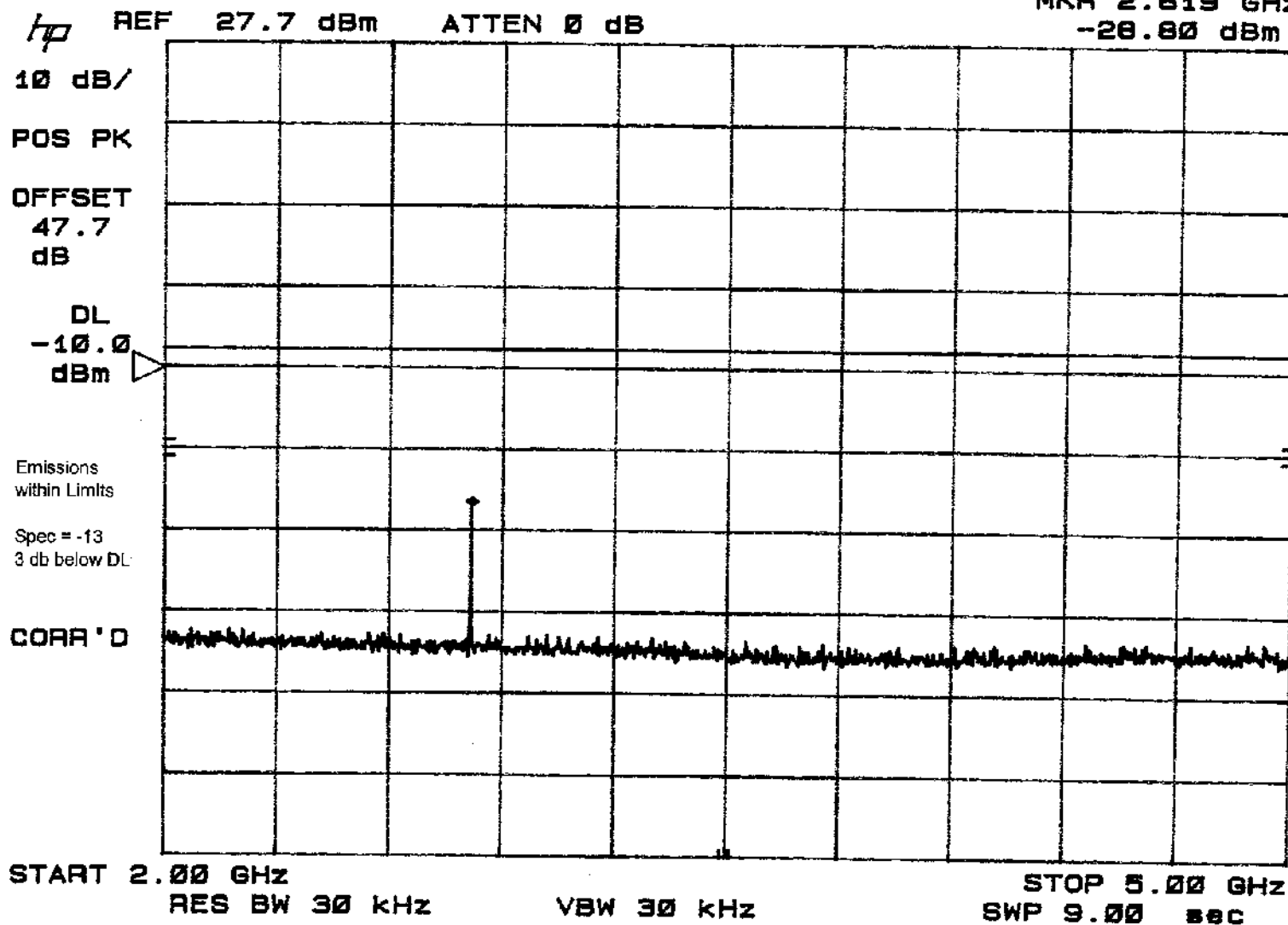


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 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 1 CHANNEL CARRIER

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FSK DATA

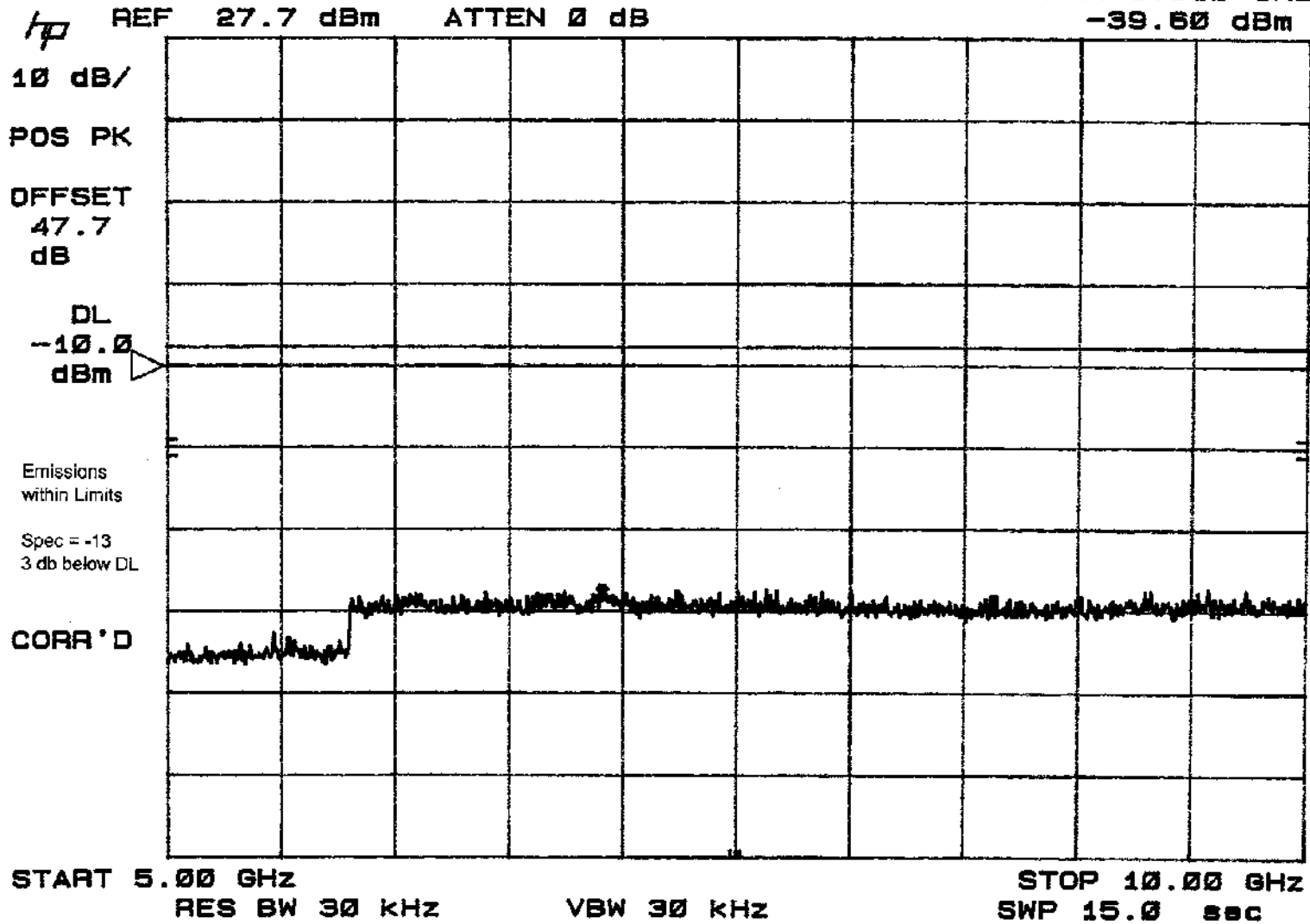
MKR 2.819 GHz
 -28.80 dBm



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FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 1 CHANNEL CARRIER

APR. 17, 2002
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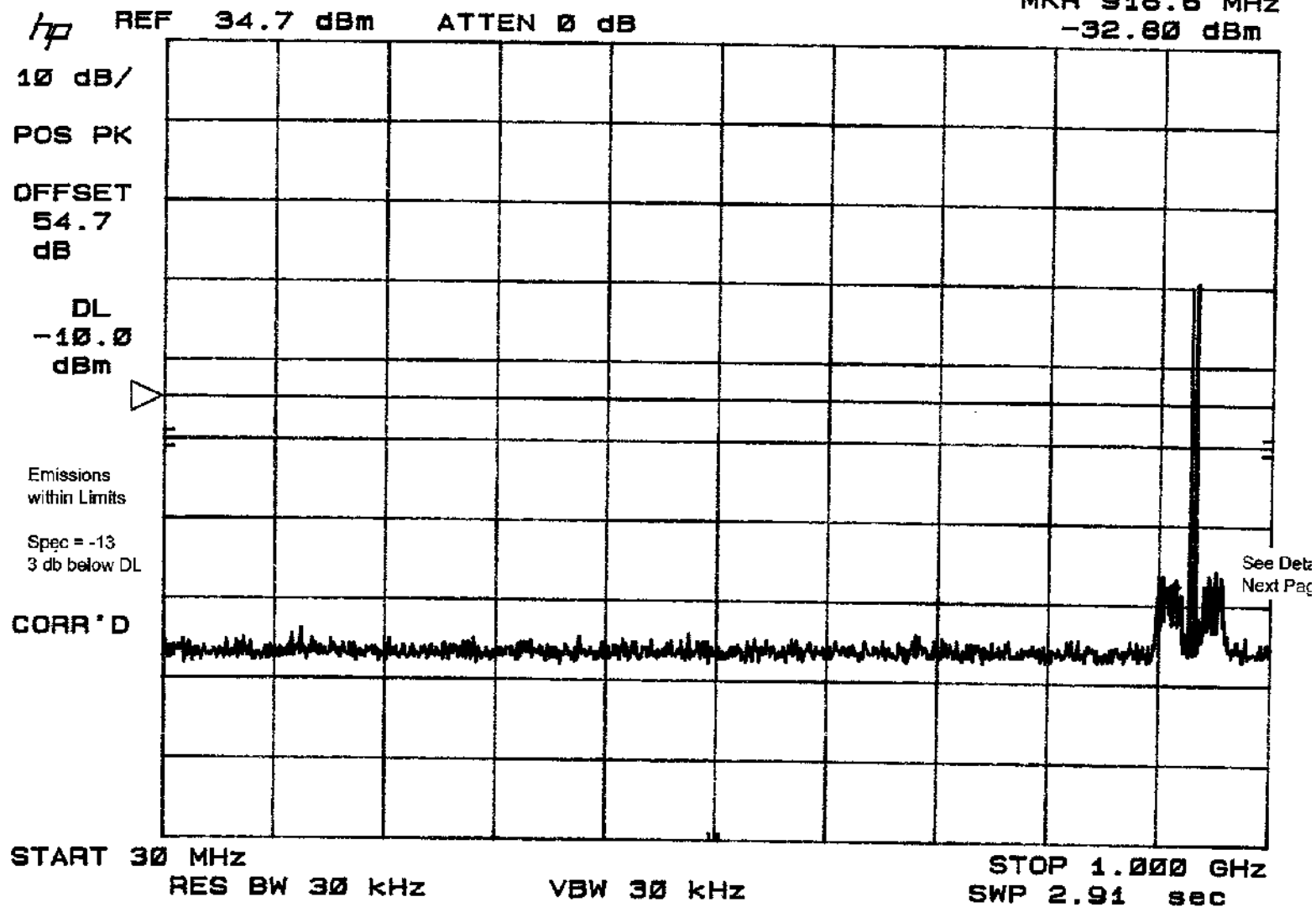
FSK DATA
MKR 6.910 GHz
-39.60 dBm



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FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 2 CHANNEL CARRIER

APR. 17, 2002
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FSK DATA
MKR 916.6 MHz
-32.80 dBm



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 2 CHANNEL CARRIER

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MKR ± 6.65 GHz
-36.80 dBm

hp REF 34.7 dBm

ATTEN 0 dB

10 dB/

POS PK

OFFSET
54.7
dB

DL
-10.0
dBm

Emissions
within Limits

Spec = -13
3 db below DL

CORR'D

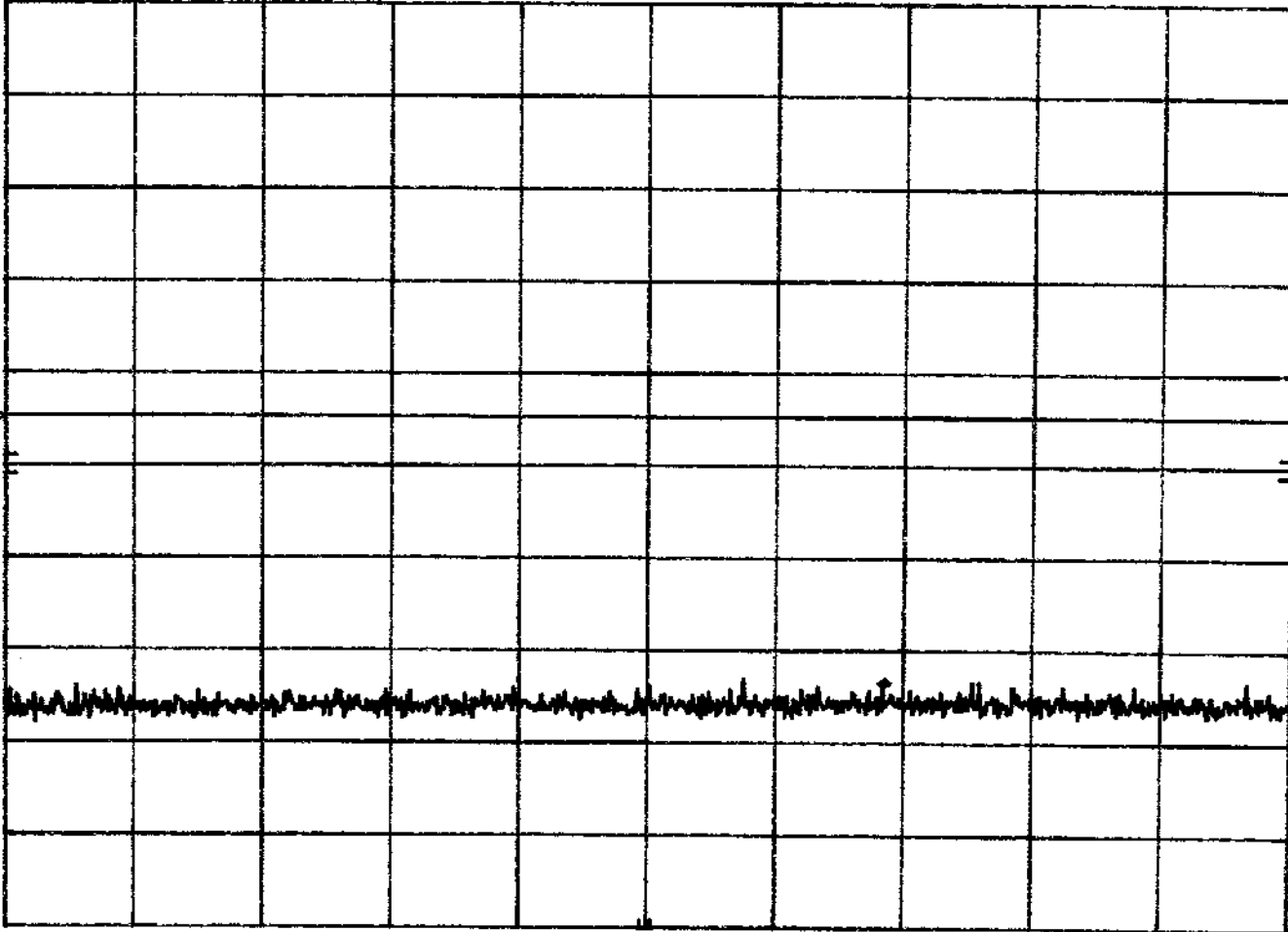
START 1.00 GHz

RES BW 30 KHz

VBW 30 KHz

STOP 2.00 GHz

SWP 3.00 sec

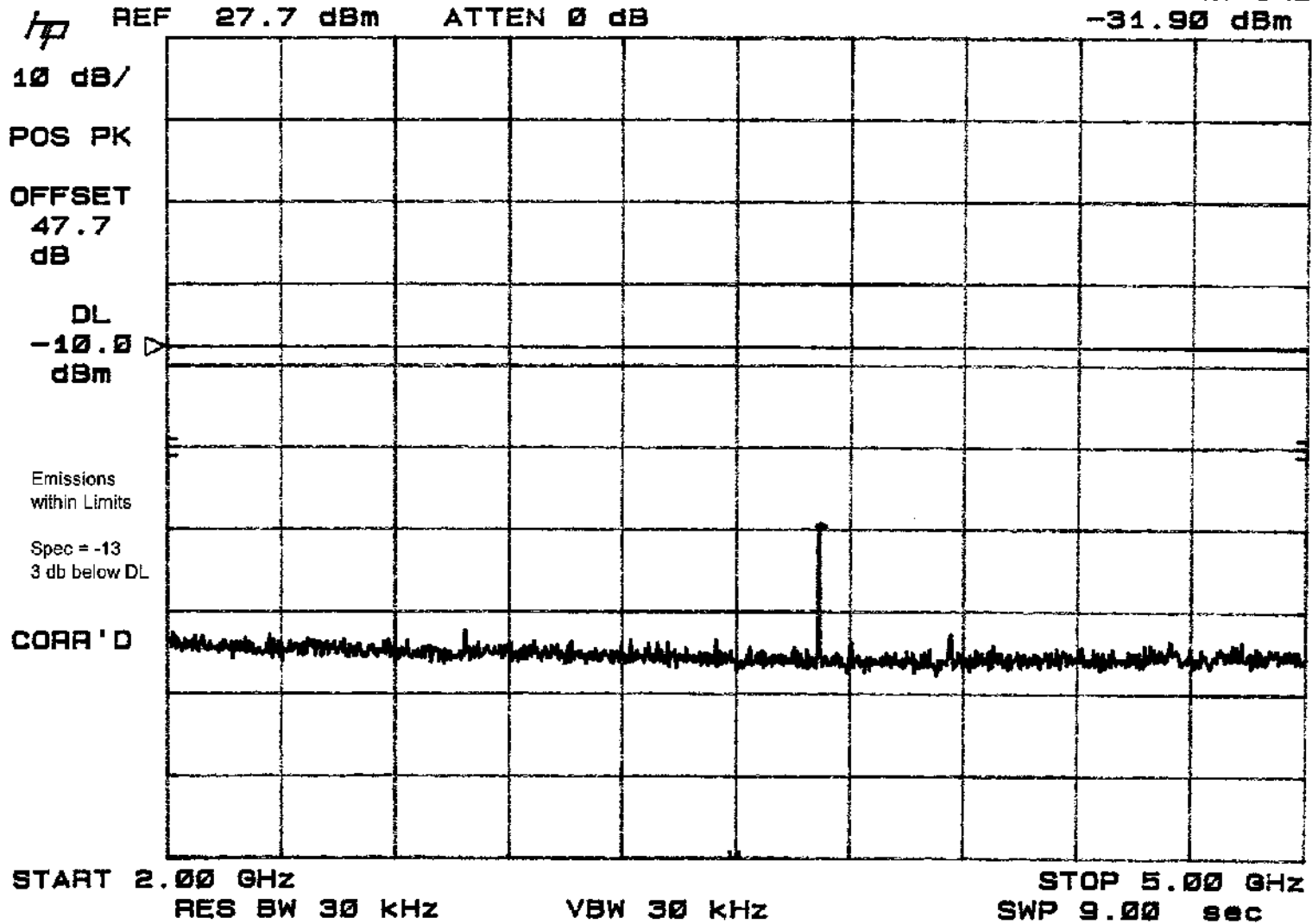


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 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 2 CHANNEL CARRIER

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FSK DATA

MKR 3.722 GHz
 -31.90 dBm

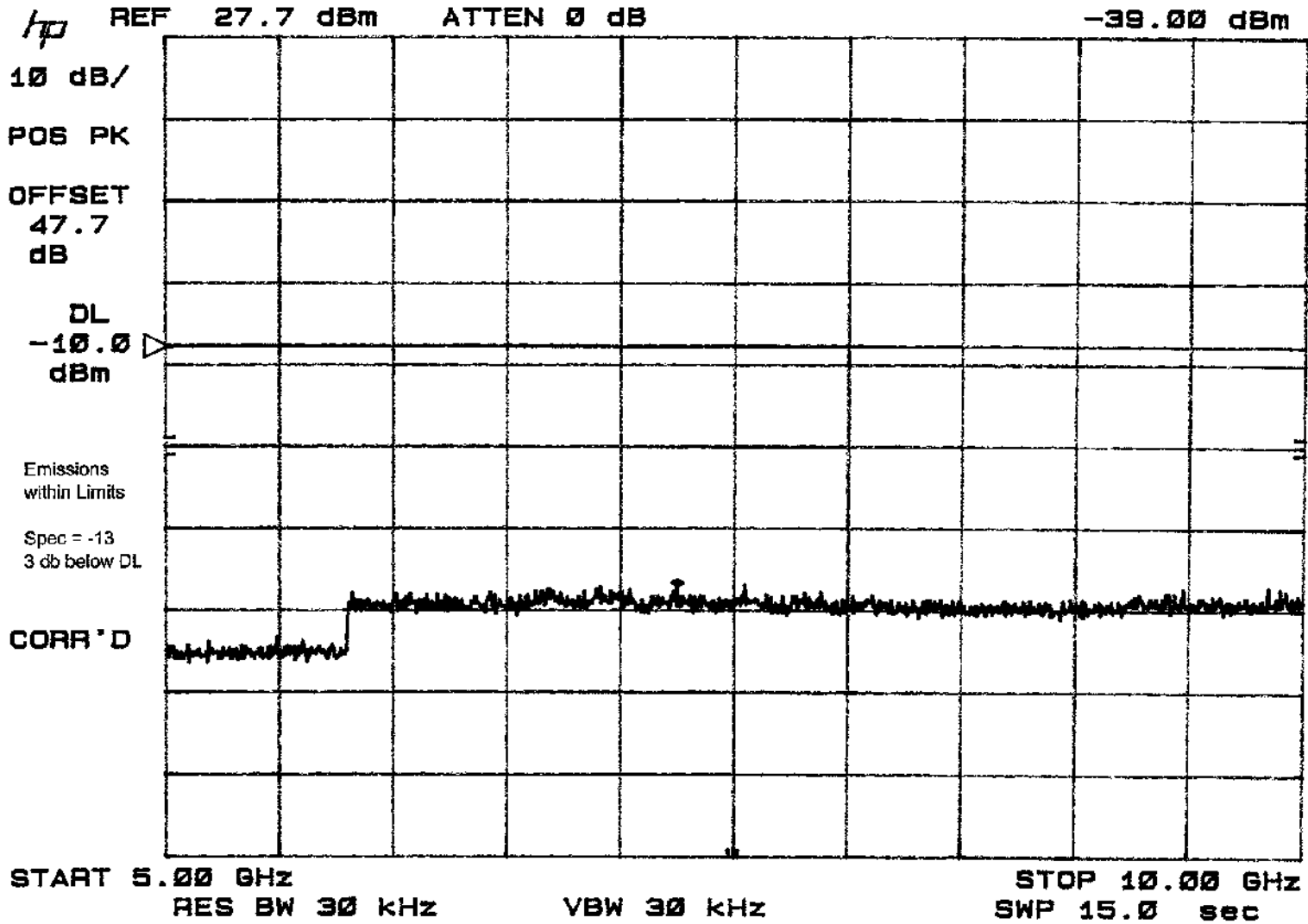


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 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 2 CHANNEL CARRIER

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FSK DATA

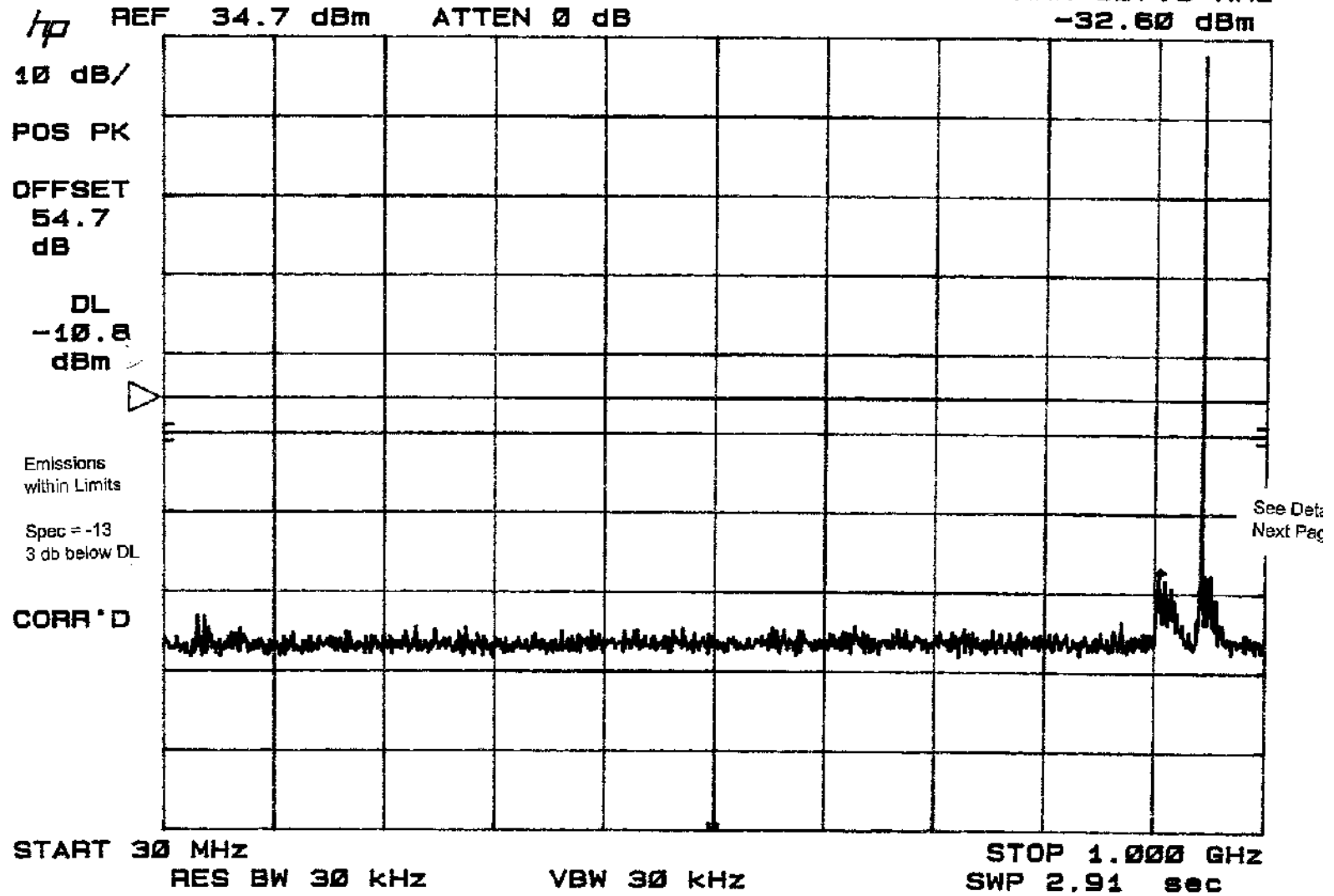
MKR 7.250 GHz
 -39.00 dBm



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 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 2 CHANNEL CARRIER

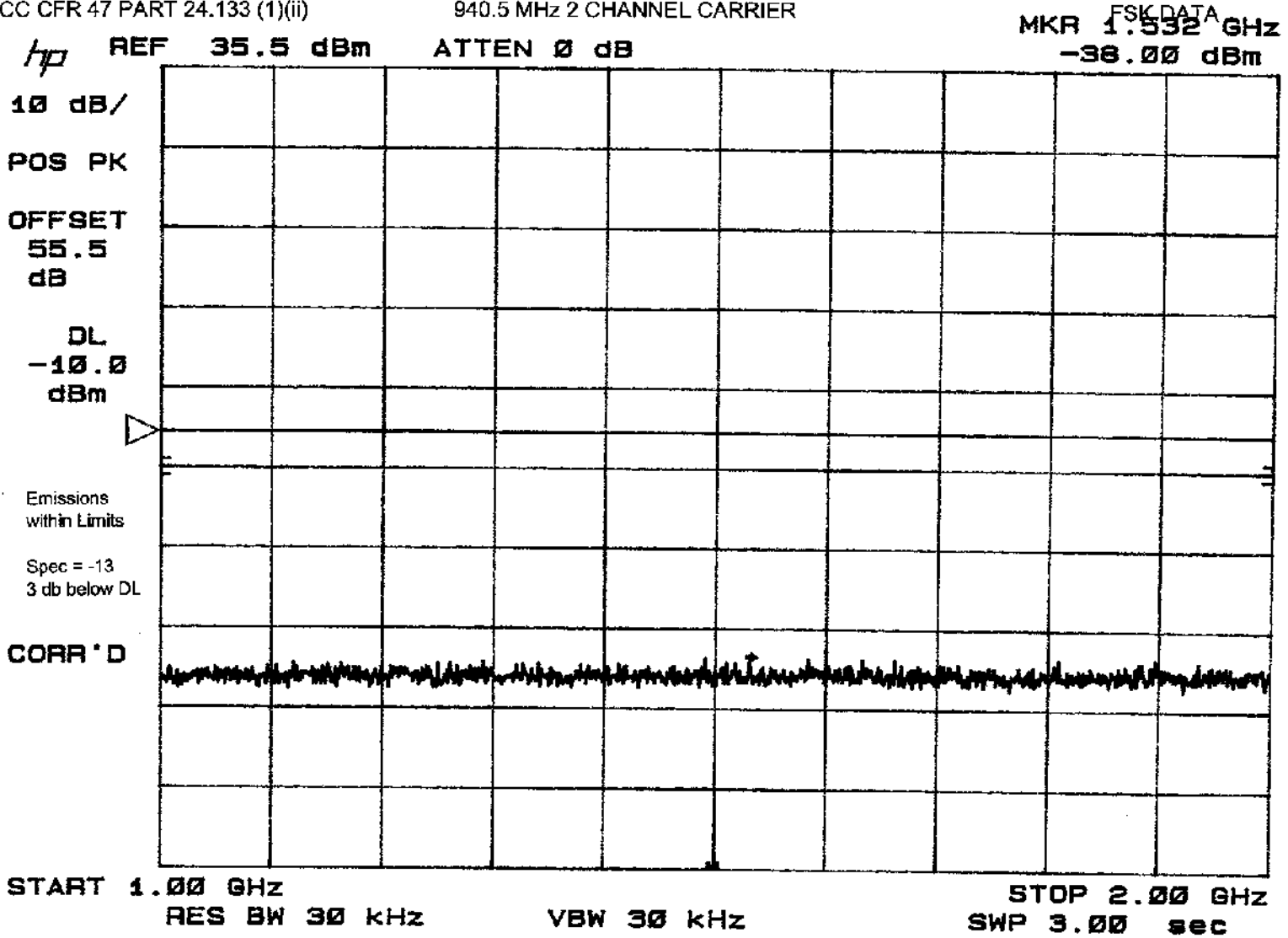
APR. 17, 2002
 TECH/ENGR: AAL

FSK DATA
 MKR 907.9 MHz
 -32.60 dBm



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SONIK TECHNOLOGIES.
FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 2 CHANNEL CARRIER

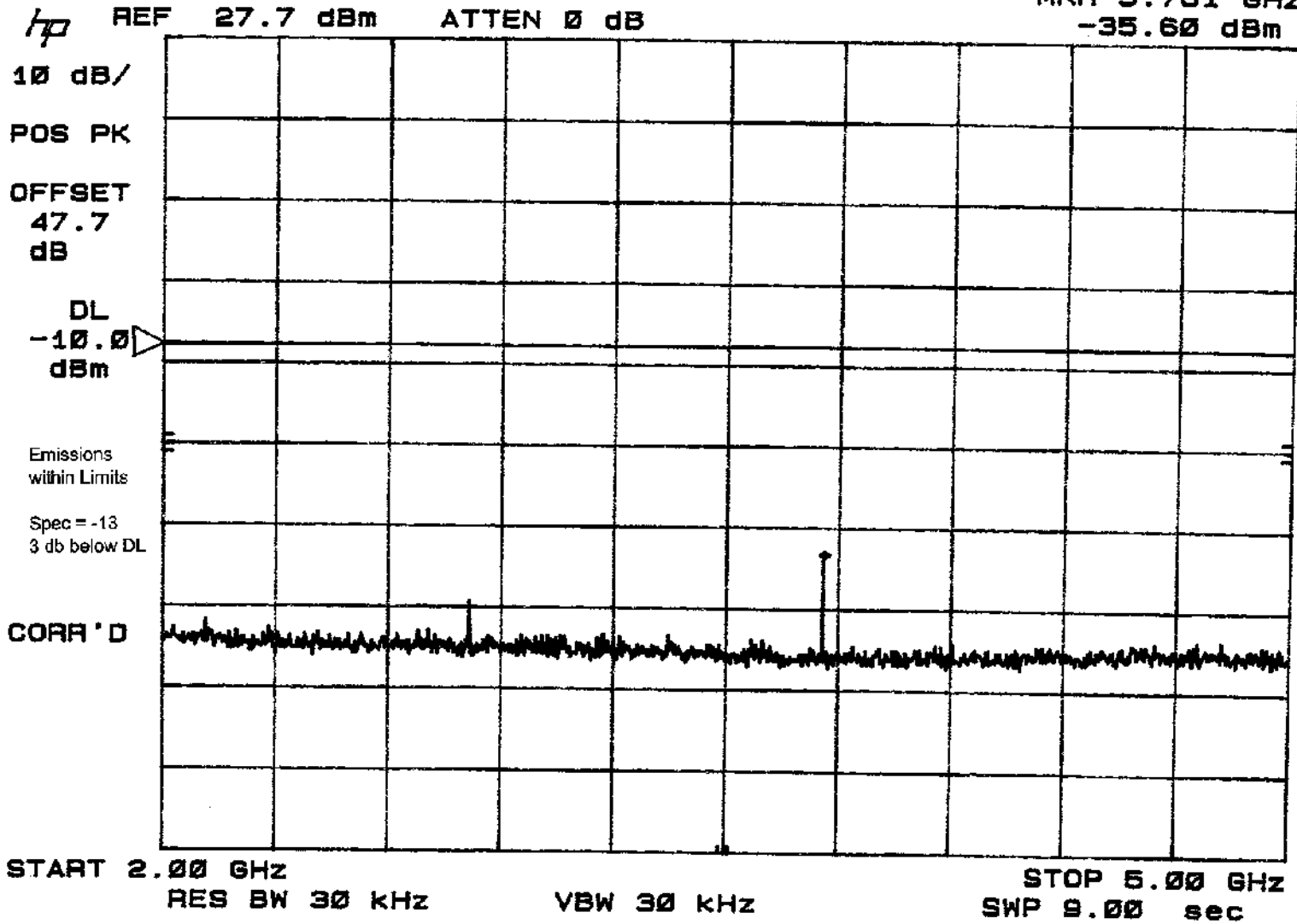
APR. 17, 2002
TECH/ENGR: AAL



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 2 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

FSK DATA
 MKR 3.761 GHz
 -35.60 dBm

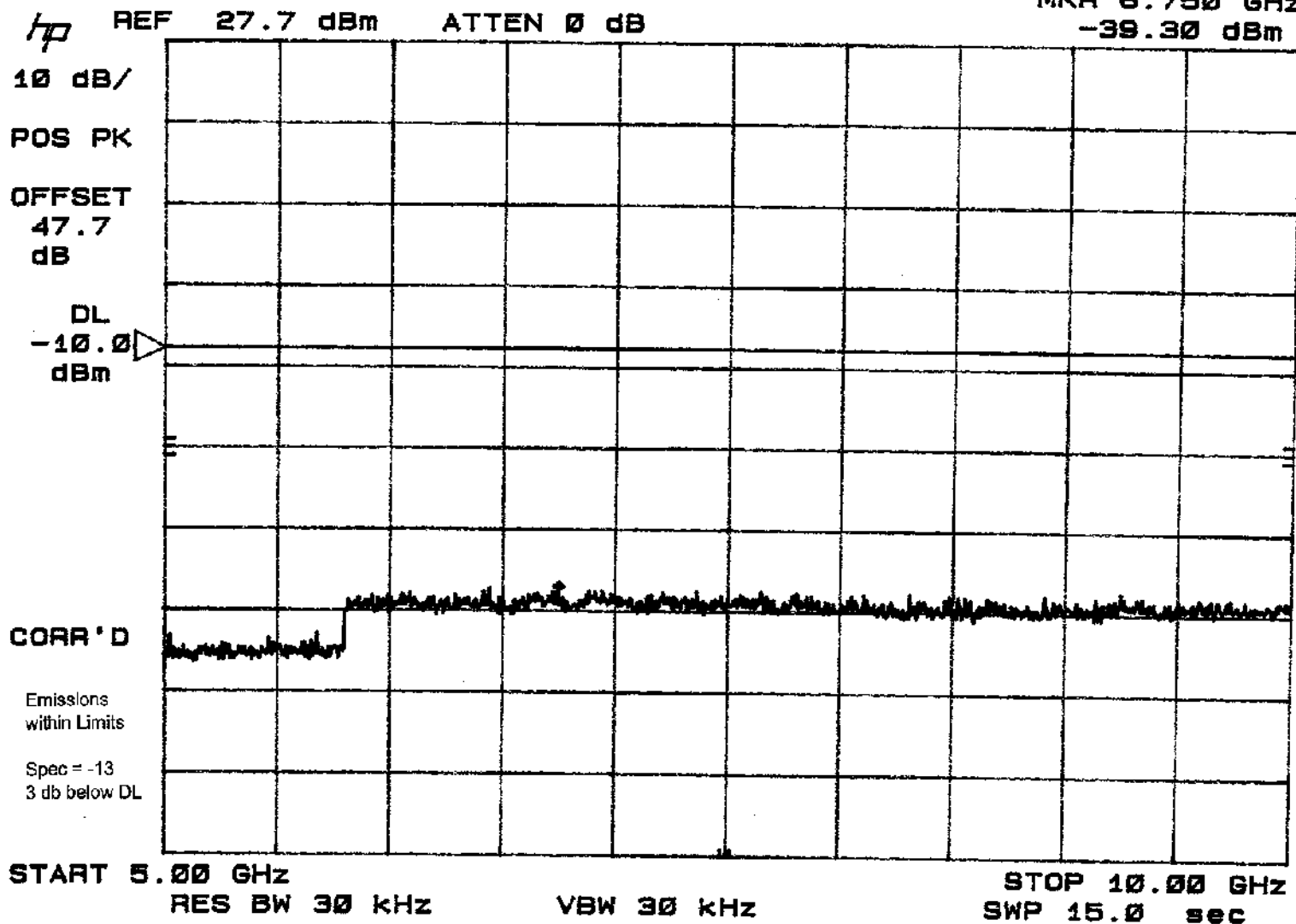


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 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 2 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

FSK DATA

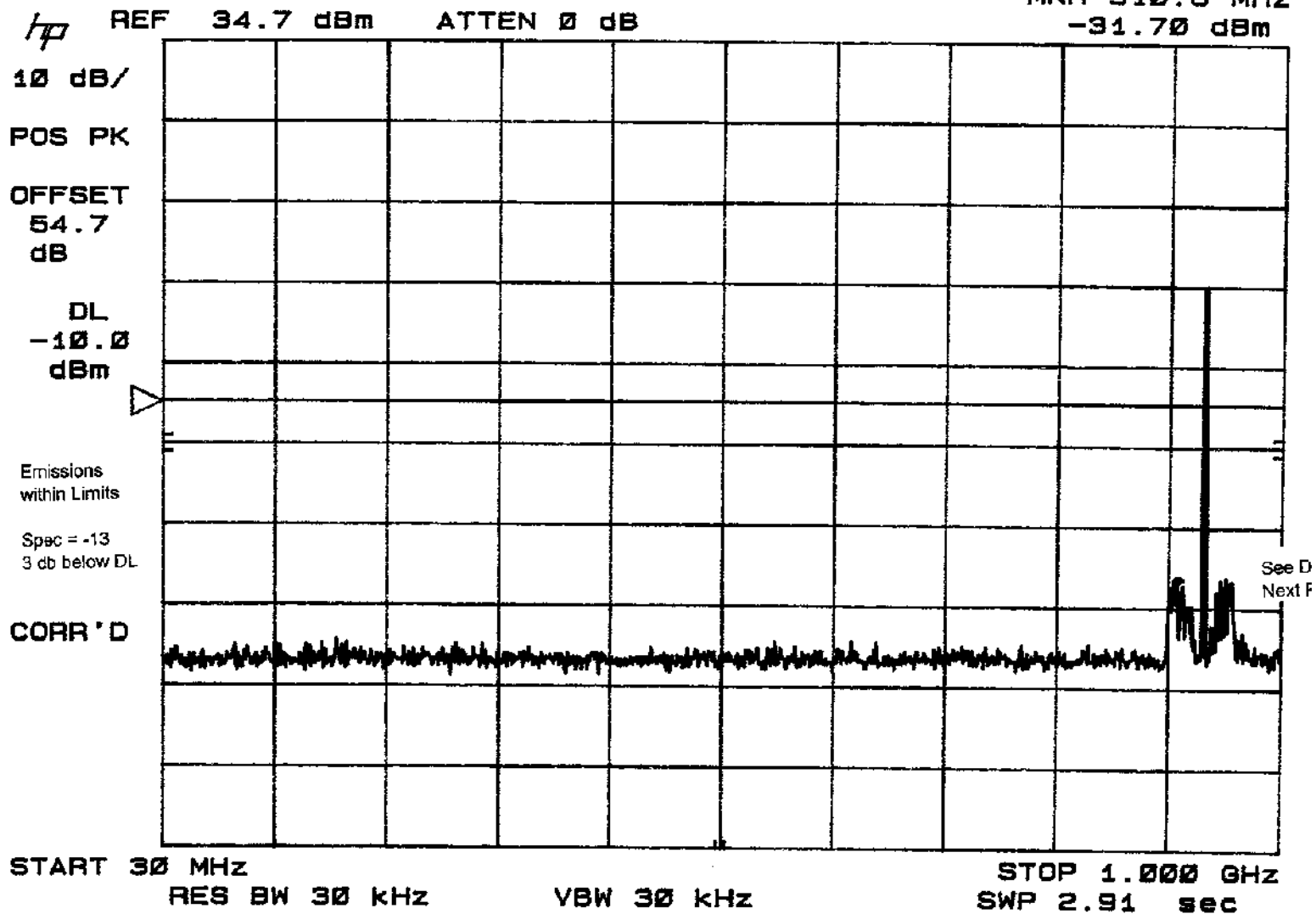
MKR 6.750 GHz
 -39.30 dBm



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

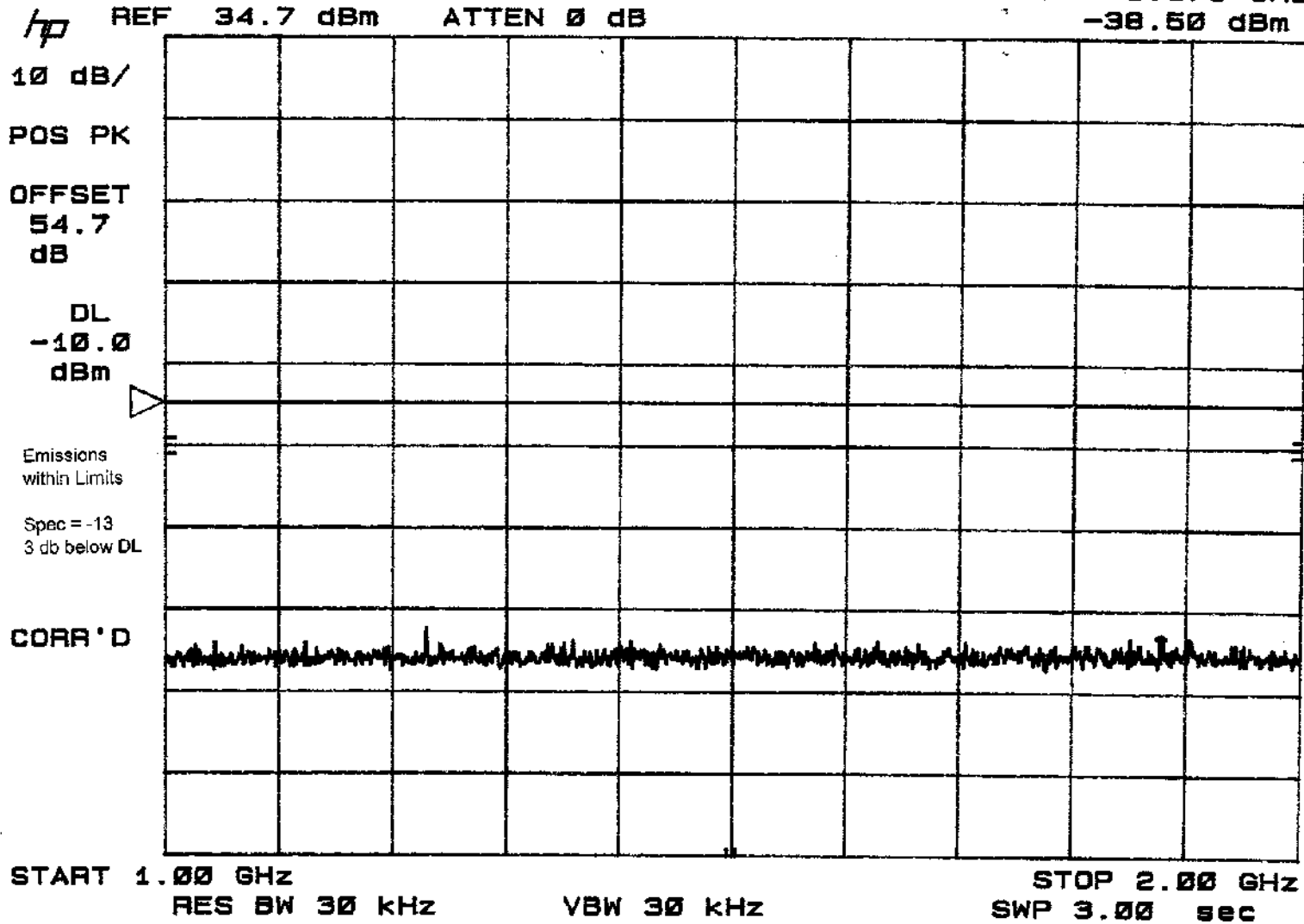
FSK DATA
 MKR 910.0 MHz
 -31.70 dBm



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

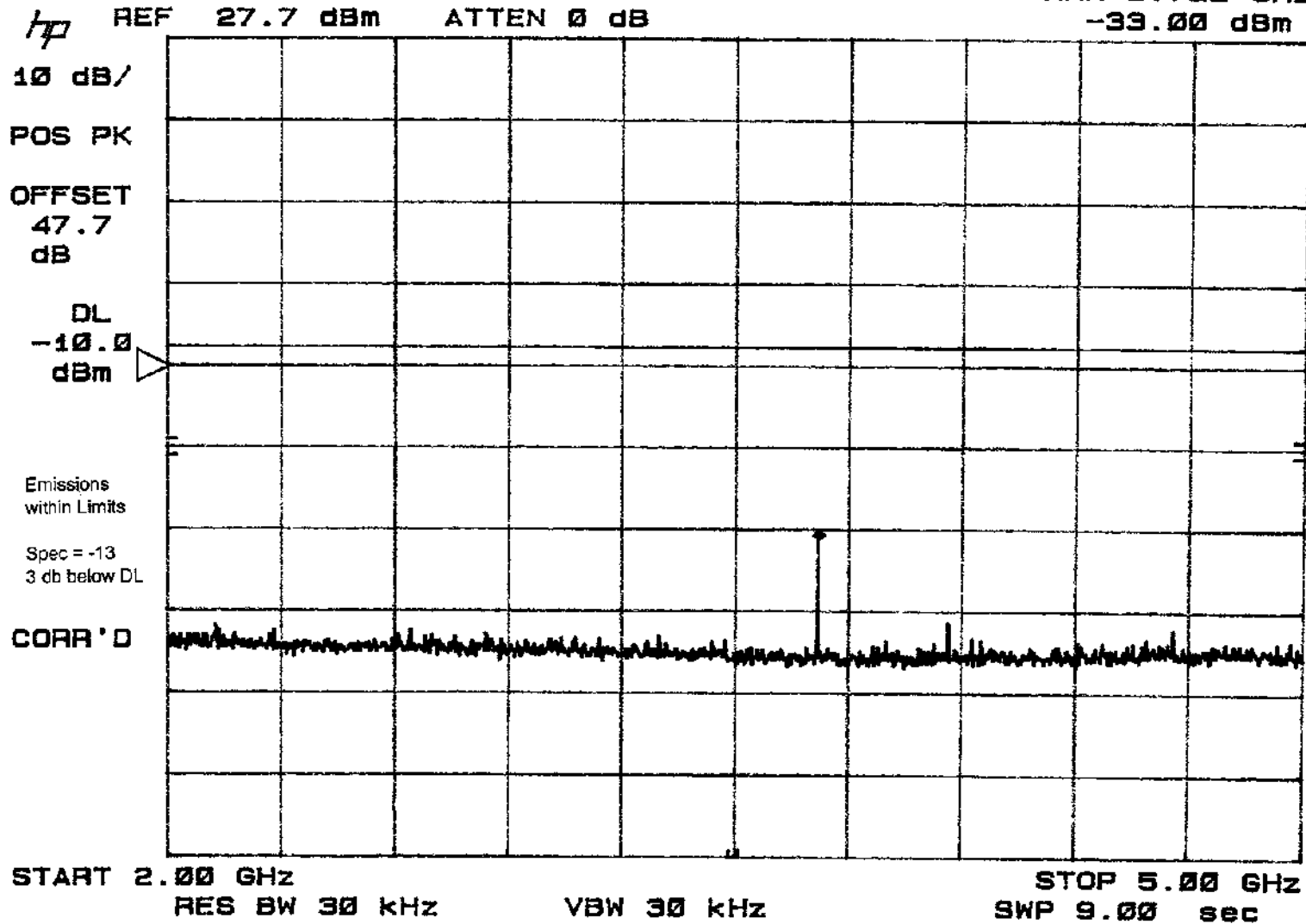
FSK DATA
MKR 1.878 GHz
-38.50 dBm



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FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 3 CHANNEL CARRIER

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FSK DATA
MKR 3.722 GHz
-39.00 dBm



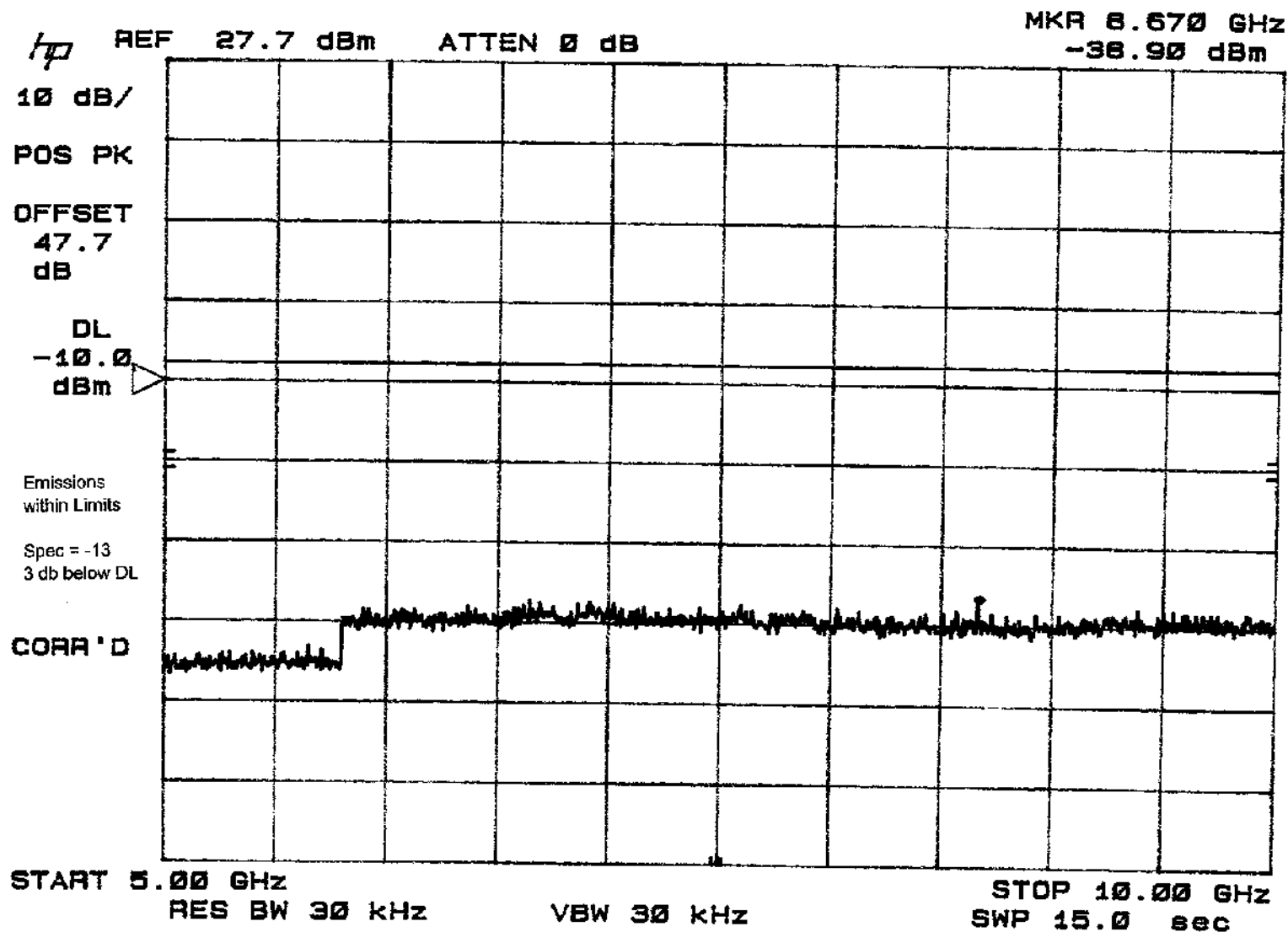
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G2BT RADIO TRANSMITTER

FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

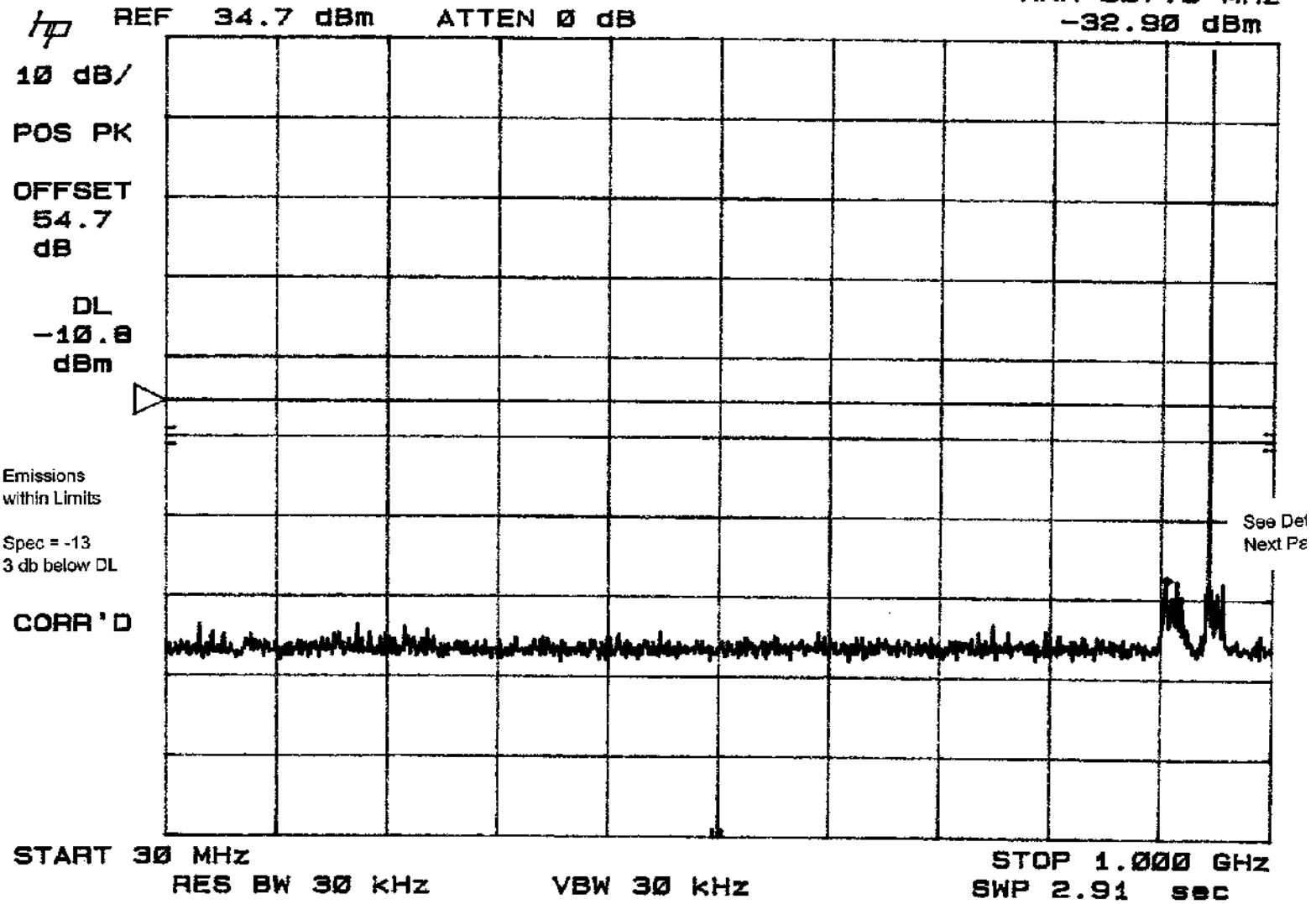
FSK DATA



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
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FSK DATA
 MKR 907.9 MHz
 -32.90 dBm



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

MKR 1.648 GHz
 -37.80 dBm

hp REF 35.5 dBm ATTN 0 dB

10 dB/

POS PK

OFFSET
 55.5
 dB

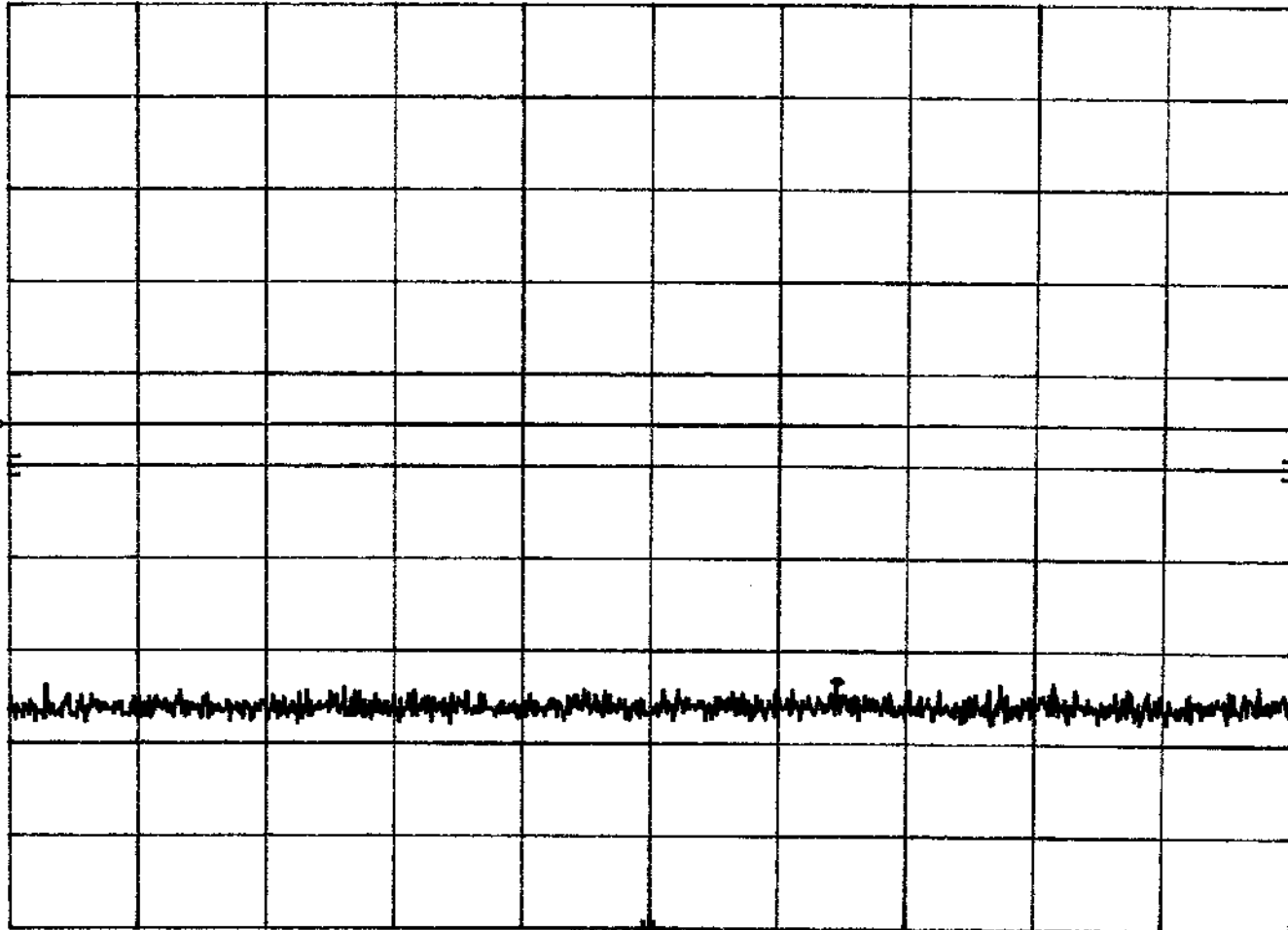
DL
 -10.0
 dBm



Emissions
 within Limits

Spec = -13
 3 db below DL

CORR'D



START 1.00 GHz

RES BW 30 KHz

VBW 30 KHz

STOP 2.00 GHz

SWP 3.00 sec

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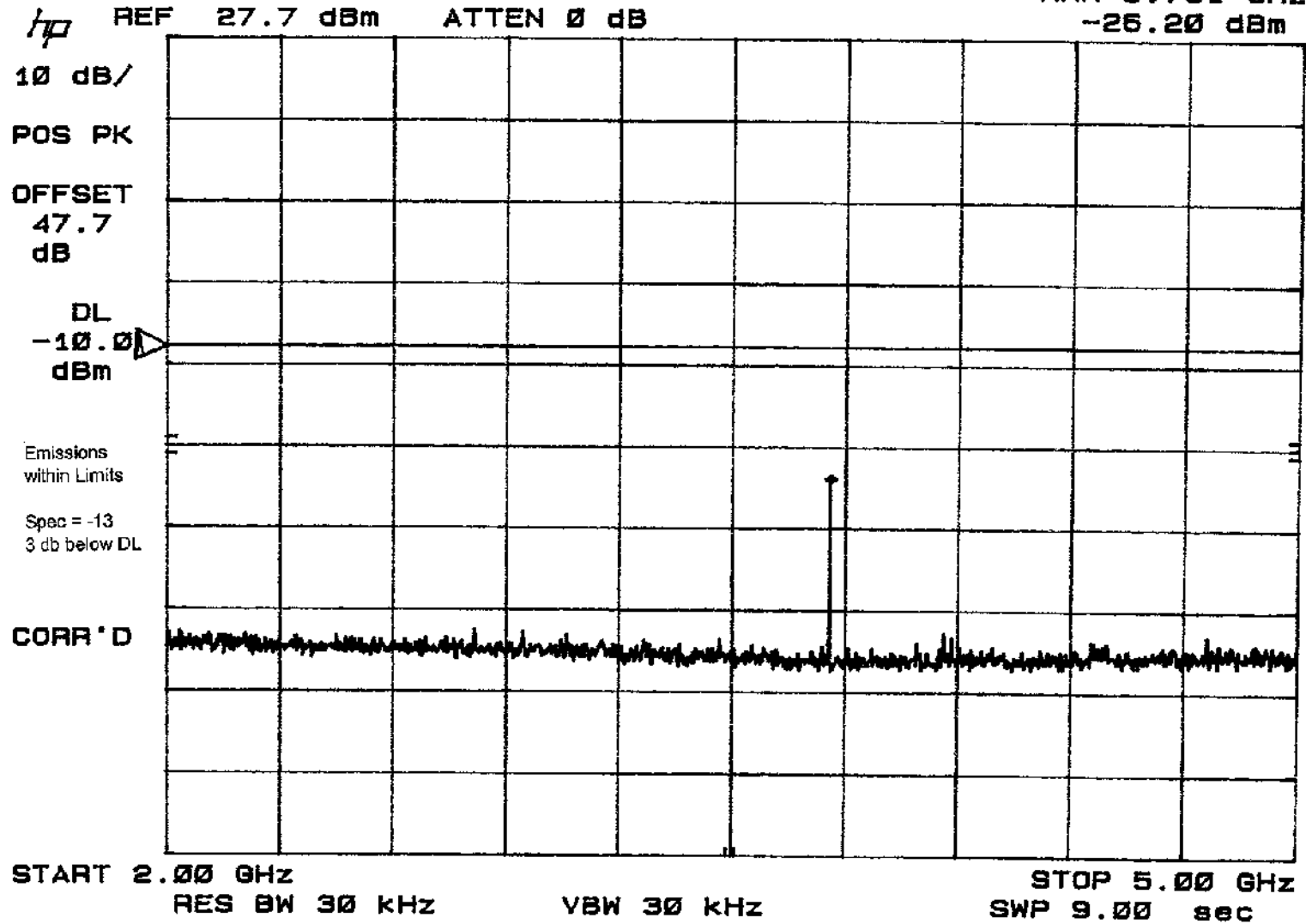
G2BT RADIO TRANSMITTER

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TECH/ENGR: AAL

FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 3 CHANNEL CARRIER

FSK DATA

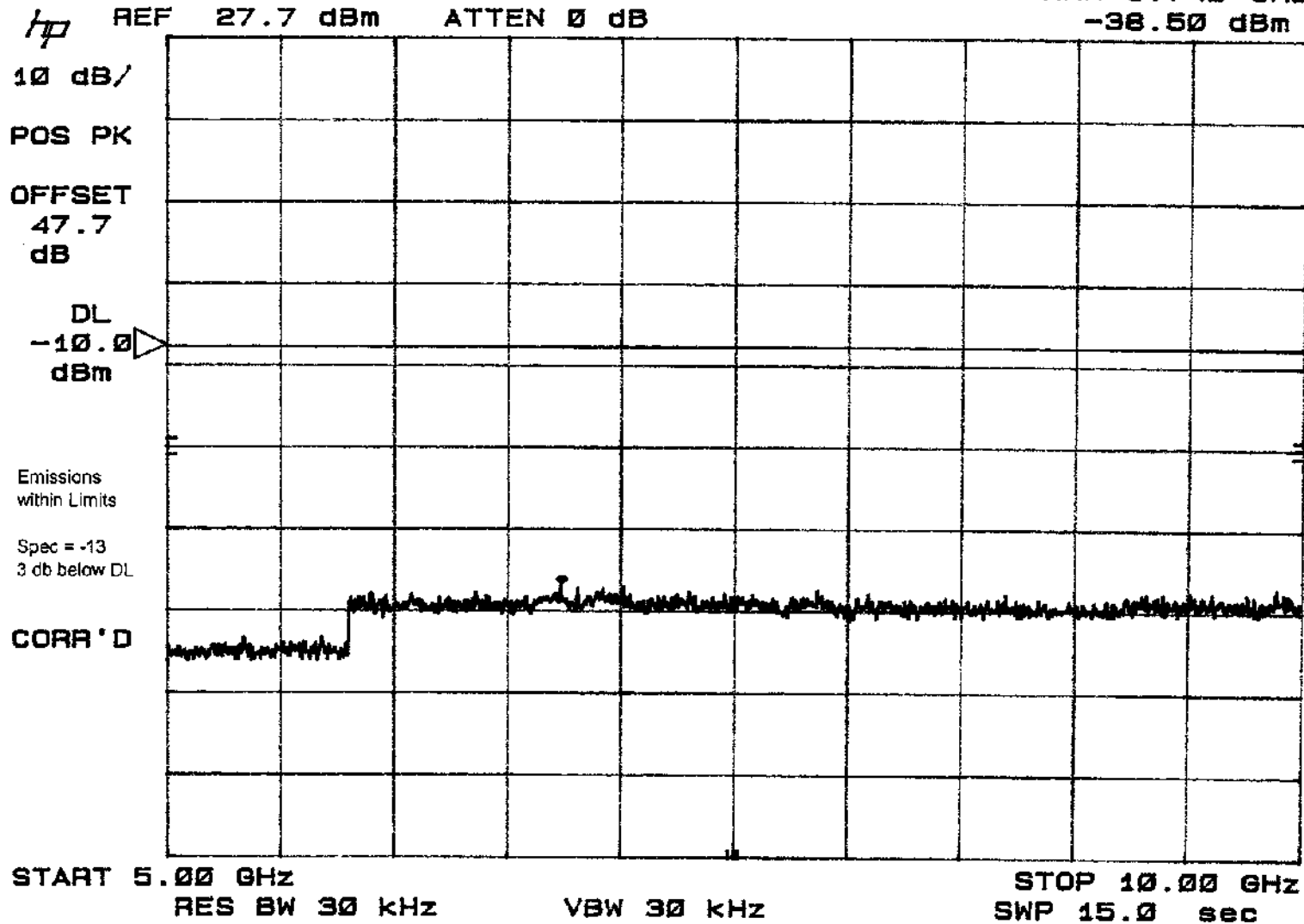
MKR 3.761 GHz
-26.20 dBm



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
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TECH/ENGR: AAL

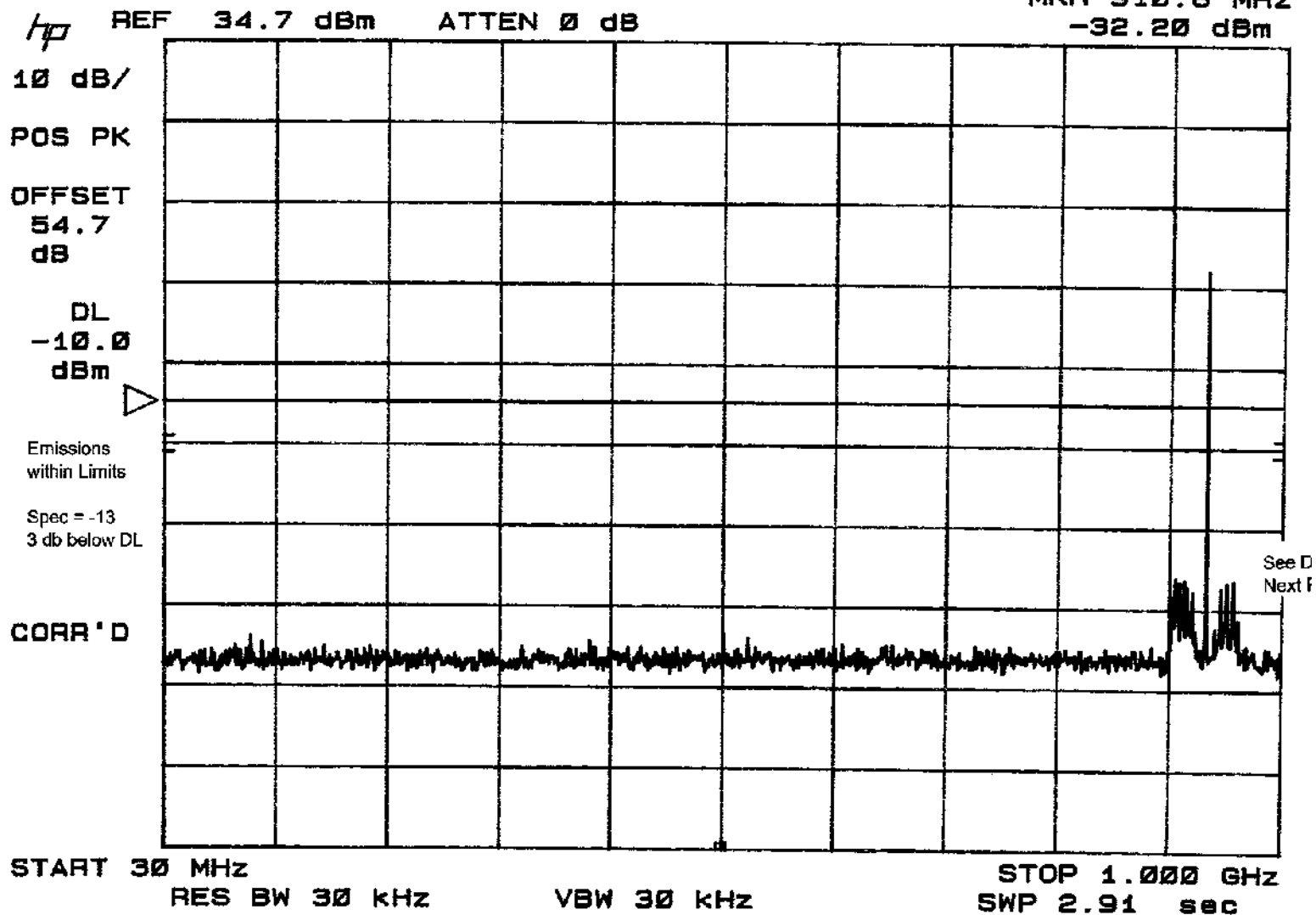
FSK DATA
MKR 6.740 GHz
-38.50 dBm



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

FSK DATA
 MKR 910.6 MHz
 -32.20 dBm



APR. 17, 2002
TECH/ENGR: AAL

FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 4 CHANNEL CARRIER

FSK DATA
MKR 1.884 GHz
-37.80 dBm

ho REF 34.7 dBm ATTEN 0 dB

10 dB/

POS PK

OFFSET
54.7
dB

DL
-10.0
dBm

Emissions within Limits

Spec = -13
3 db below DL

CORR'D

START 1.00 GHz

AES BW 30 kHz

VBW 30 kHz

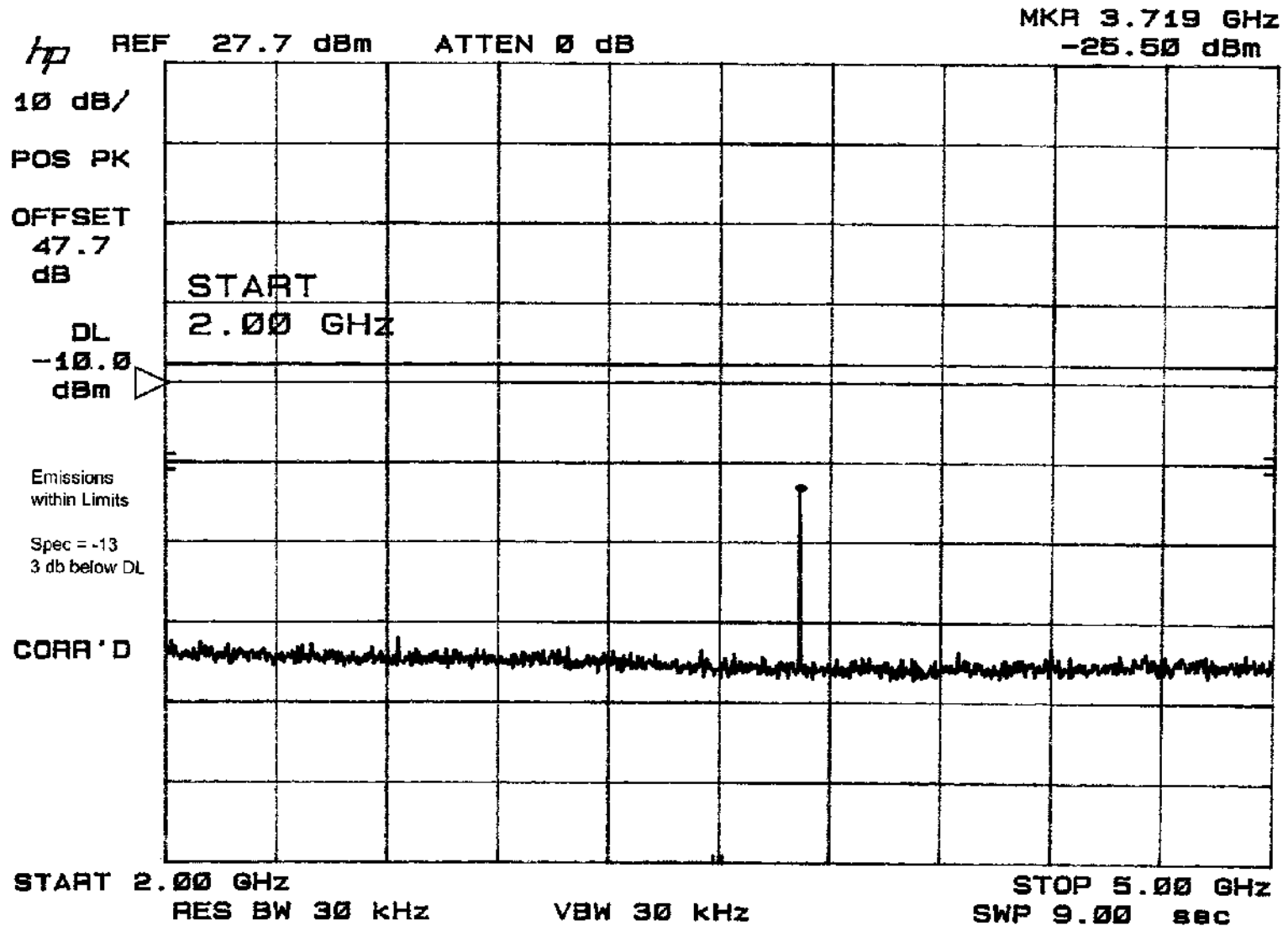
STOP 2.00 GHz

SWP 3.00 sec

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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

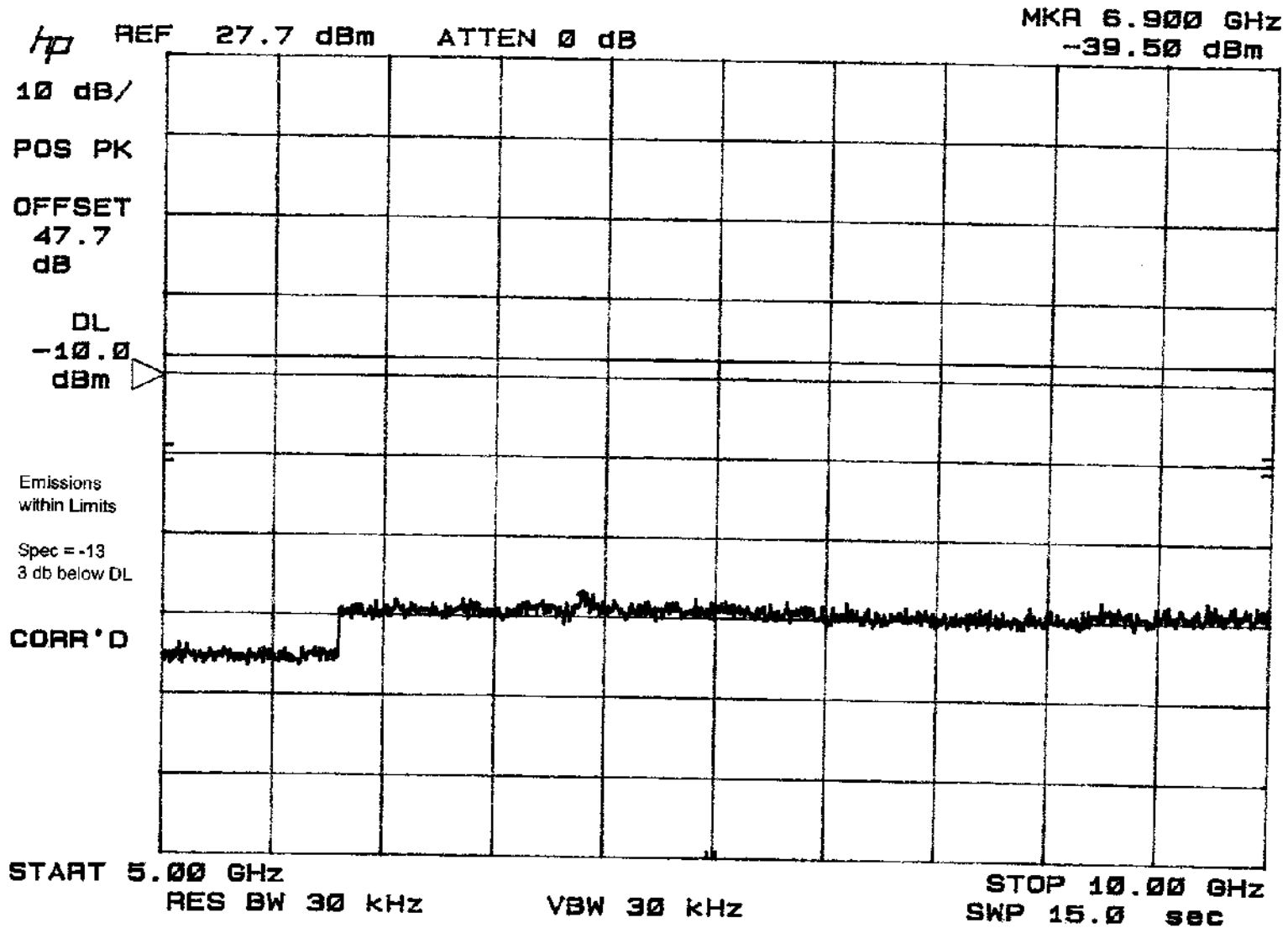
FSK DATA



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 930.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

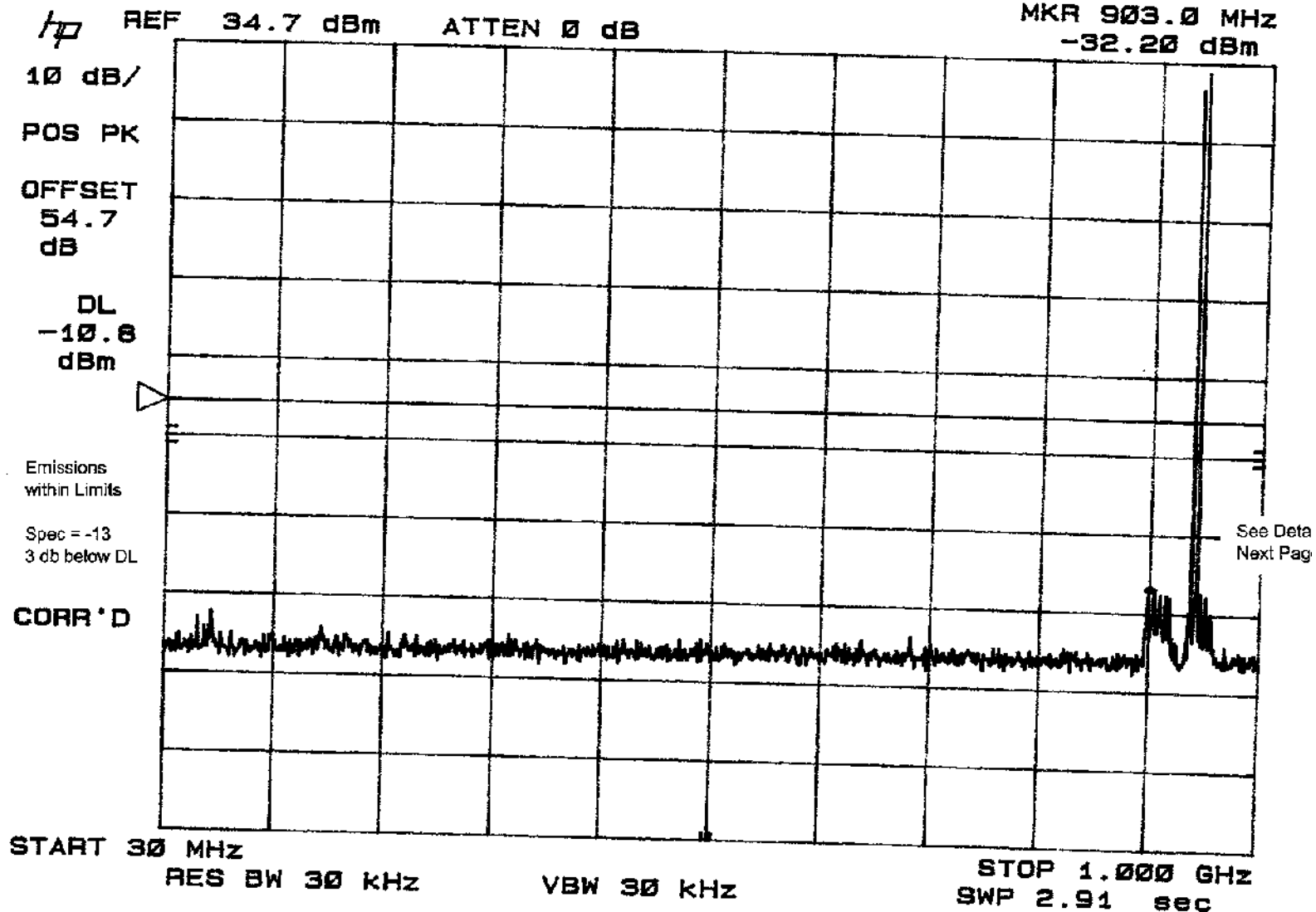
FSK DATA



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

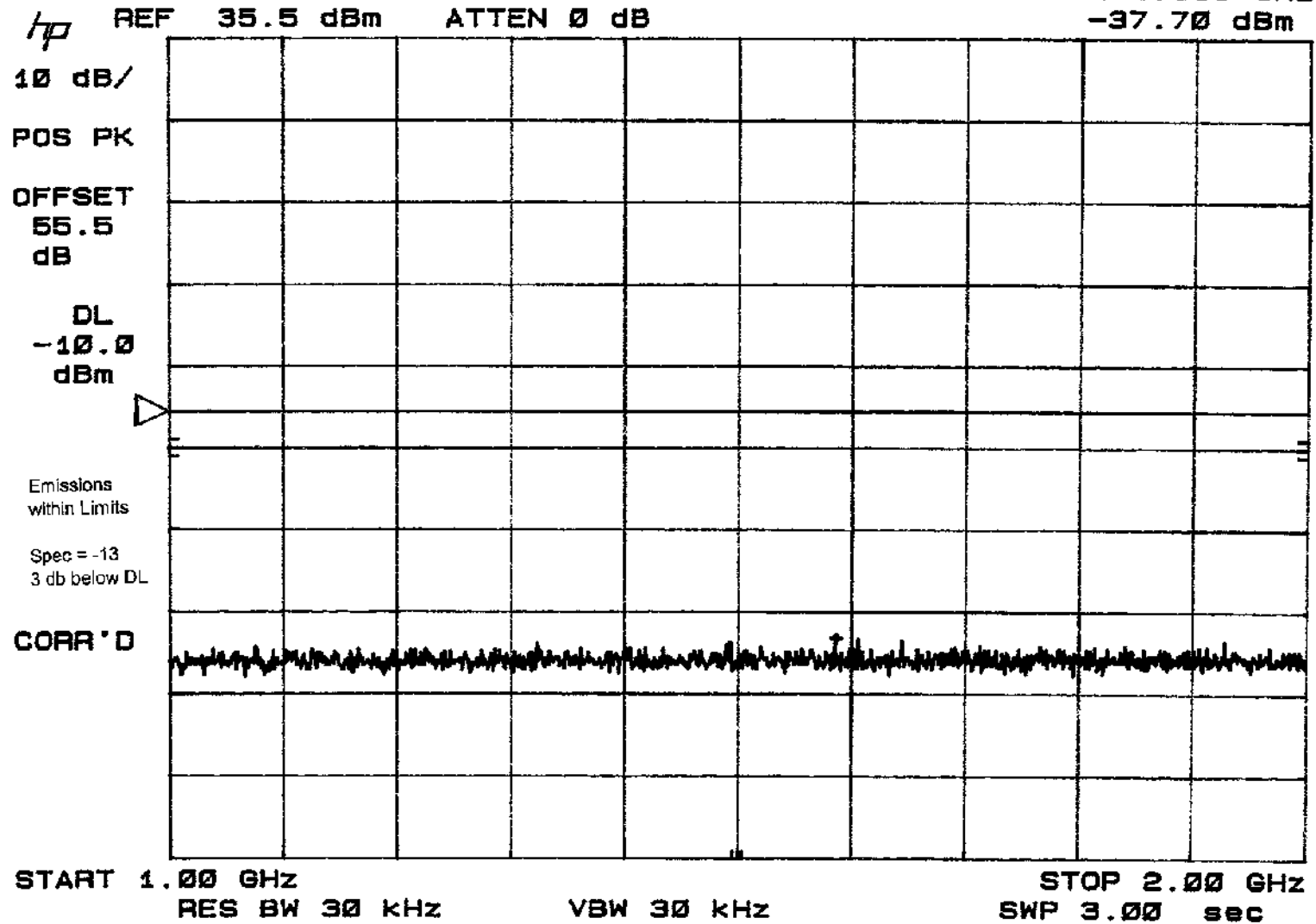
FSK DATA
MKR 903.0 MHz
-32.20 dBm



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii)
G2BT RADIO TRANSMITTER
940.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

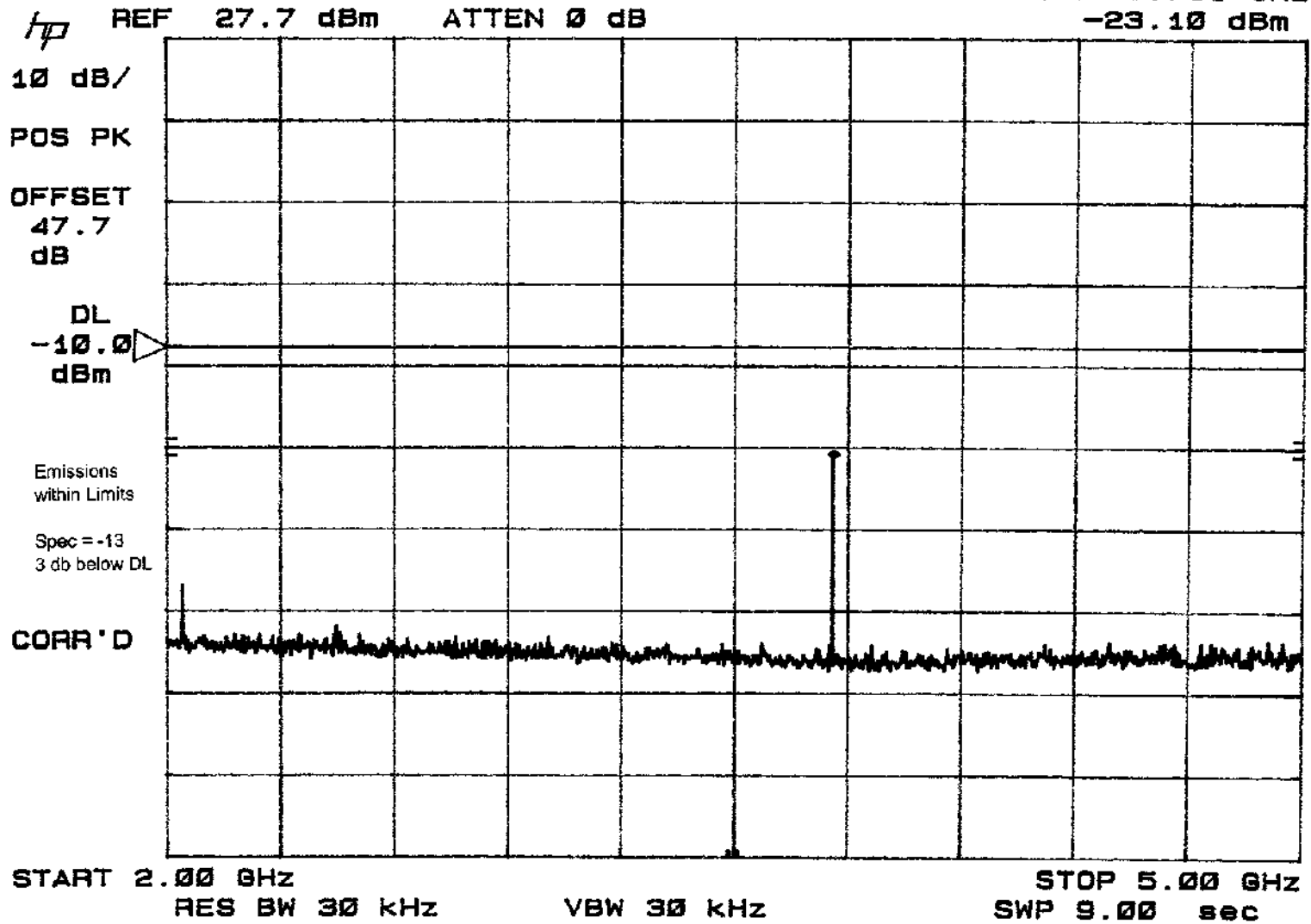
FSK DATA
MKR 1.586 GHz
-37.70 dBm



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 FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
 FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

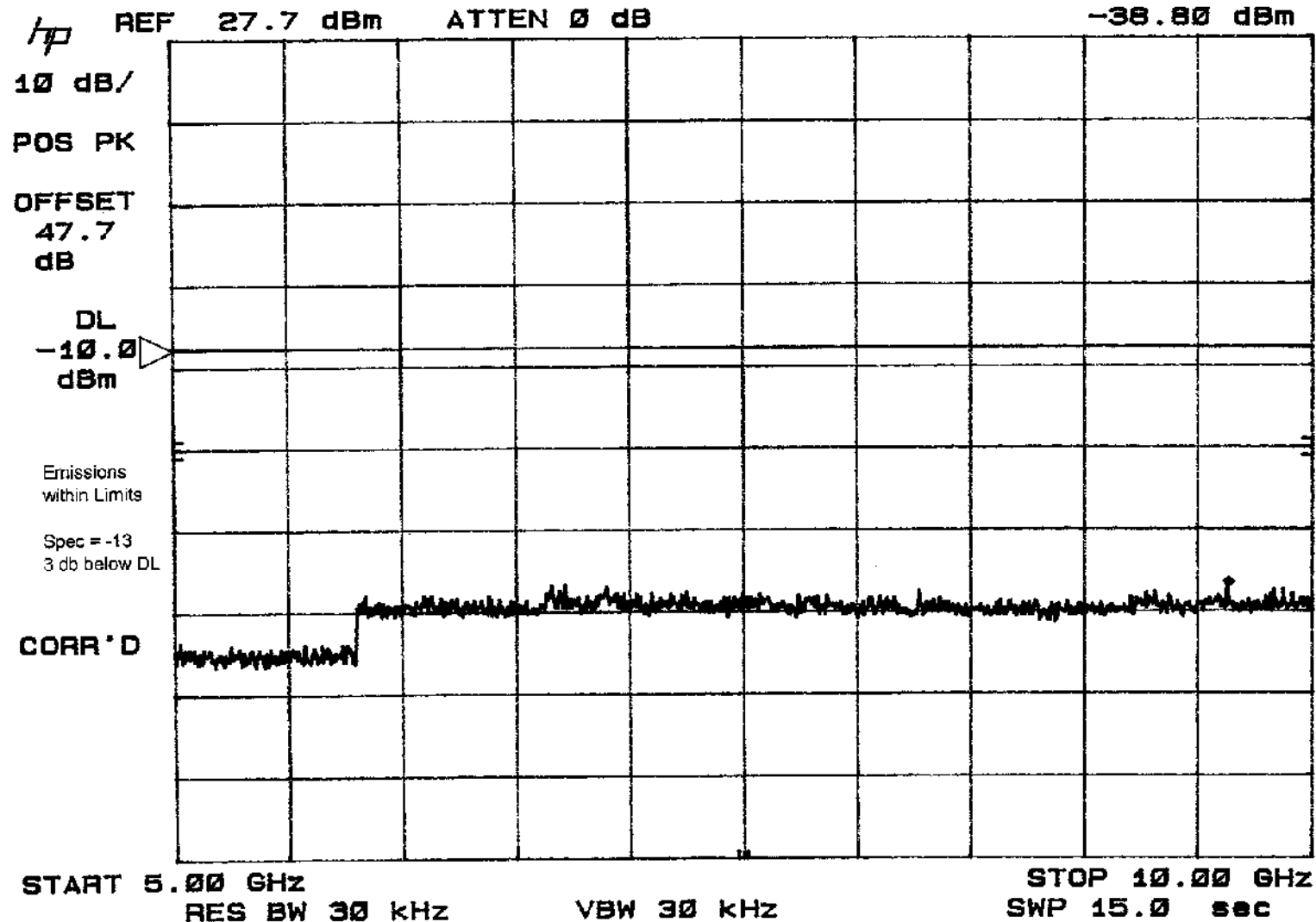
FSK DATA
 MKR 3.781 GHz
 -23.10 dBm



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FCC CFR 47 PART 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS
FCC CFR 47 PART 24.133 (1)(ii) 940.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
TECH/ENGR: AAL

FSK DATA
MKR 9.635 GHz
-38.80 dBm



7 RADIATED EMISSION EQUIPMENT/DATA

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for radiated emissions test setup.

y.bcta1a

[illegible]

Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna, cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

Where, SAR = Spectrum Analyzer Reading

AF = Antenna Factor

CL = Cable Loss

AG = Amplifier Gain (if any)

DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} - 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

This result is well below the FCC and CSA Class A limit of 29.5 dBuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

8 FREQUENCY STABILITY EQUIPMENT/DATA

See following page(s).

Test Specifications: FCC Part 24 NPCS

Report No. SC202170Photos taken? ☒ Yes

Test Method:
FCC Part 2.1055 Frequency Stability over
Voltage Variation at Room Temperature
FCC Part 24.135 (a) Frequency Stability

Date: Apr. 17, 2002
 Temperature: 22 degrees C
 Air Pressure: 100.9 kPa
 Relative Humidity: 41 %

Test Area:
 SR 2, Shielded Room, 12' x 24' x 10', Metal Chamber

EUT Description: G2BT Radio Transmitter NPCS

EUT POWER: 208 Vac 60 Hz

Limits = 0.0001 %

Frequency Band	Frequency under Test -- Modulation	85 % Power 102 Vac	115 % Power 138 Vac	delta	Complies
930 --- 931 MHz	930.5 MHz				
	1 Channel Carrier	930499528	930499526	0.0000002%	Yes
	2 Channel Carrier	930499528	930499518	0.0000011%	Yes
	3 Channel Carrier	930499524	930499526	-0.0000002%	Yes
940 --- 941 MHz	4 Channel Carrier	930499526	930499520	0.0000006%	Yes
	940.5 MHz				
	1 Channel Carrier	930499521	930499519	0.0000002%	Yes
	2 Channel Carrier	930499516	930499523	-0.0000008%	Yes
	3 Channel Carrier	930499526	930499525	0.0000001%	Yes
	4 Channel Carrier	930499522	930499520	0.0000002%	Yes

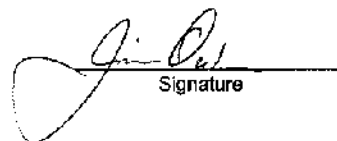
NOTES:

The directional coupler provided 47.7 dB attenuation and was entered into the Spectrum Analyzer as an offset. To provide variance of the power supply, the battery backup function was disconnected. The supply for control of the radio was isolated and provided with a separate 120 Vac line which was varied by plus and minus 15 % of 120 Vac.

Tested By: A. Laudani


 Signature

Reviewed by: Jim Owen


 Signature

Test Equipment Used:
 Prop. # Model Number
 6495 hp8566B

Description
 Spectrum Analyzer

Manufacturer
 Hewlett Packard

Serial No. 2311A02209
Cal. Dates 11/13/02

Customer's Test Equipment Used:

588256B1J03

Directional Coupler

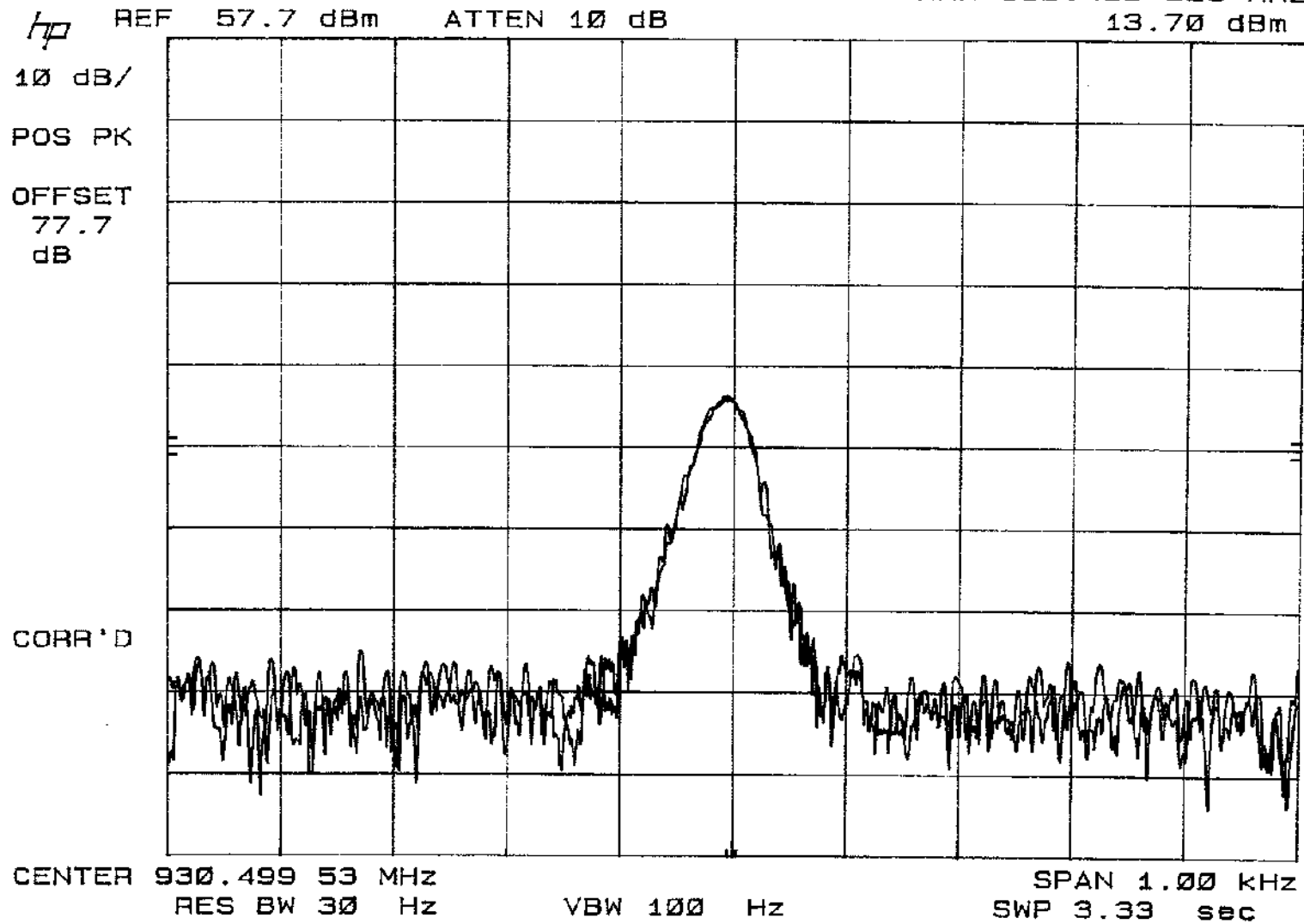
CellWave

192079-007 Verified 4-4-04

SC202170
 SONIK TECHNOLOGIES.
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
 FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 930.5 MHz 1 CHANNEL CARRIER

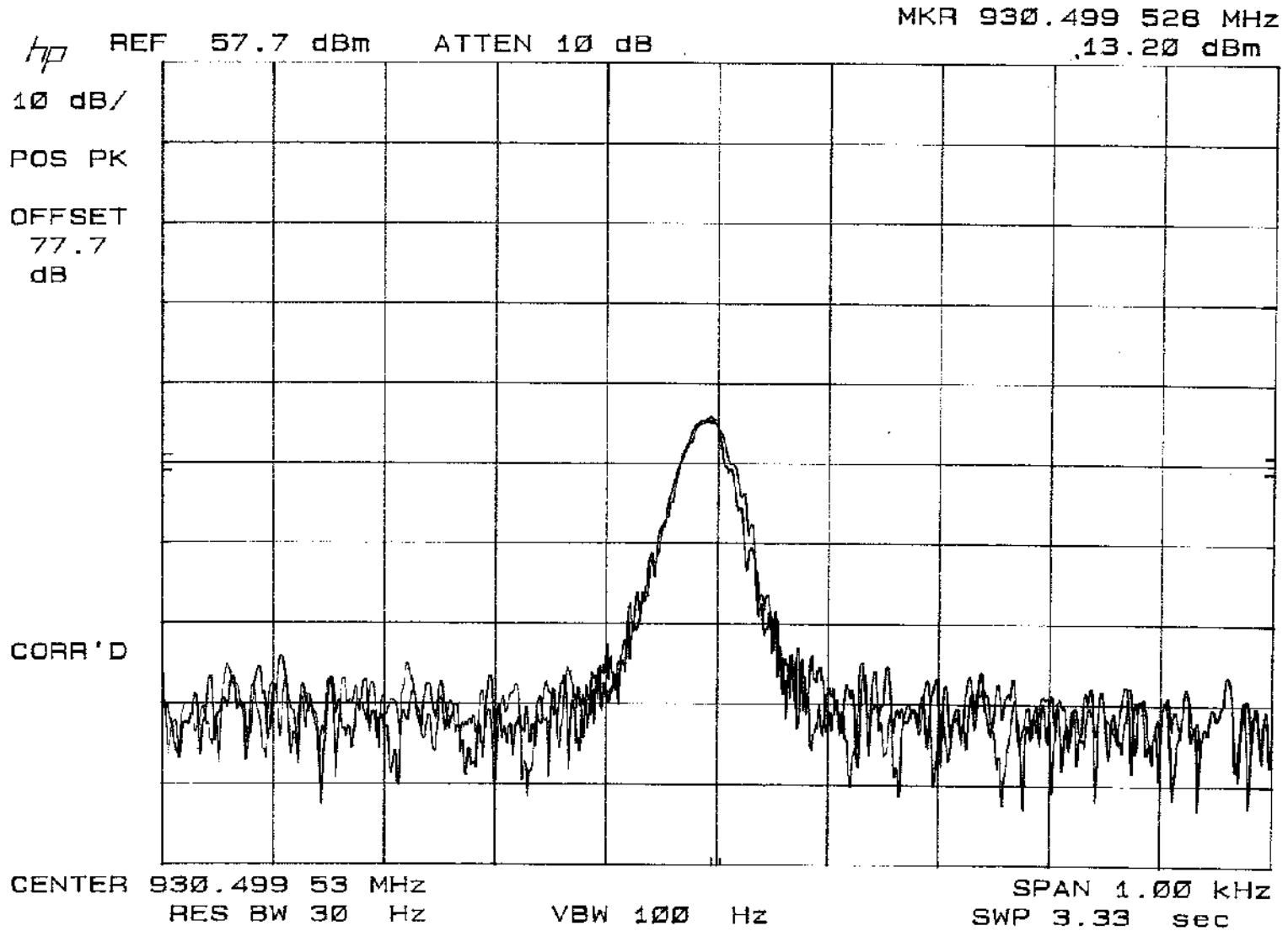
APR. 17, 2002
 TECH/ENGR: AAL

MKR 930.499 528 MHz
 13.70 dBm



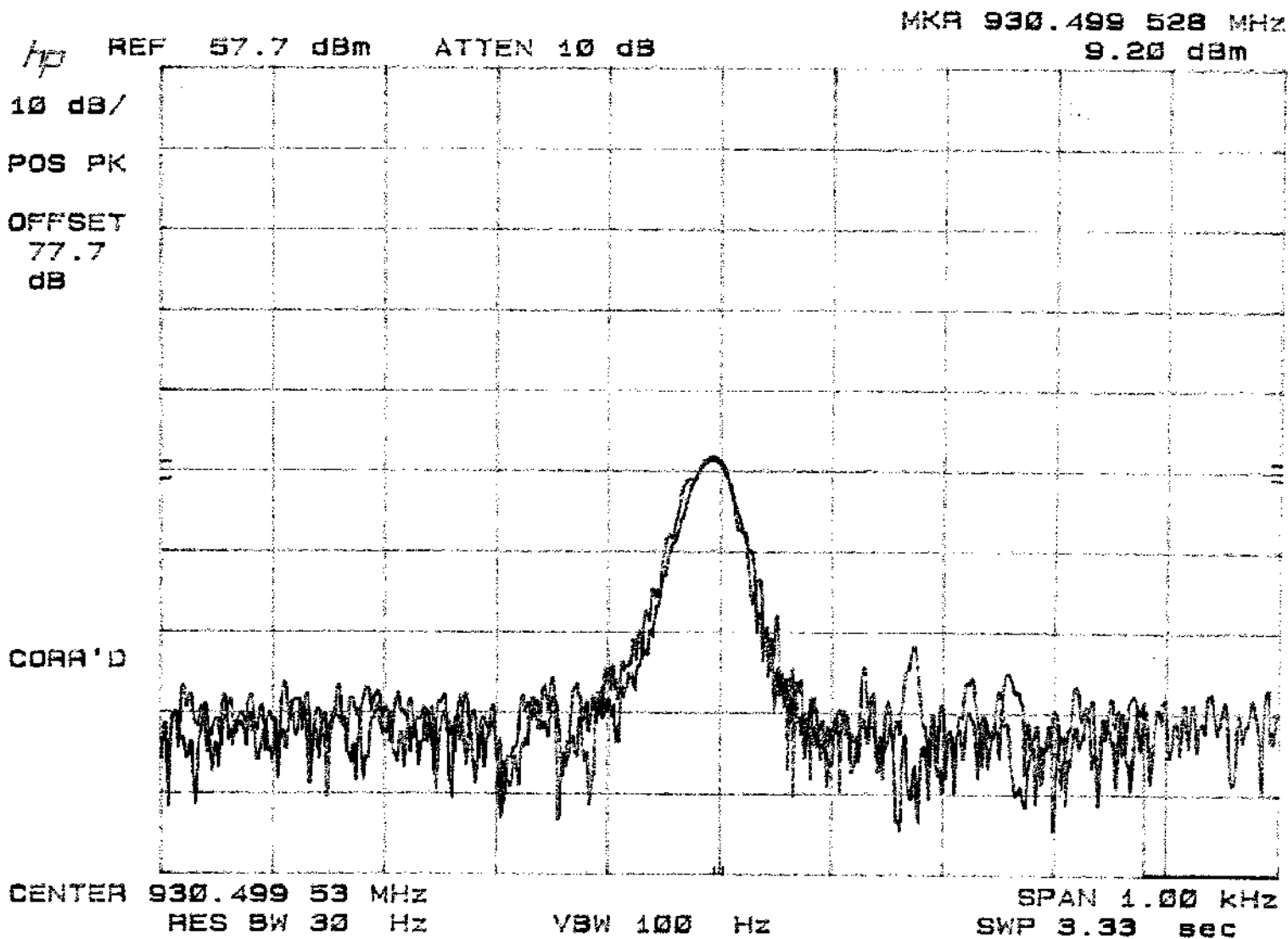
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 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE
 FCC CFR 47 PART 24.135 (A) 115% NOMINAL SUPPLY VOLTAGE 930.5 MHz 1 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL
 FSK DATA

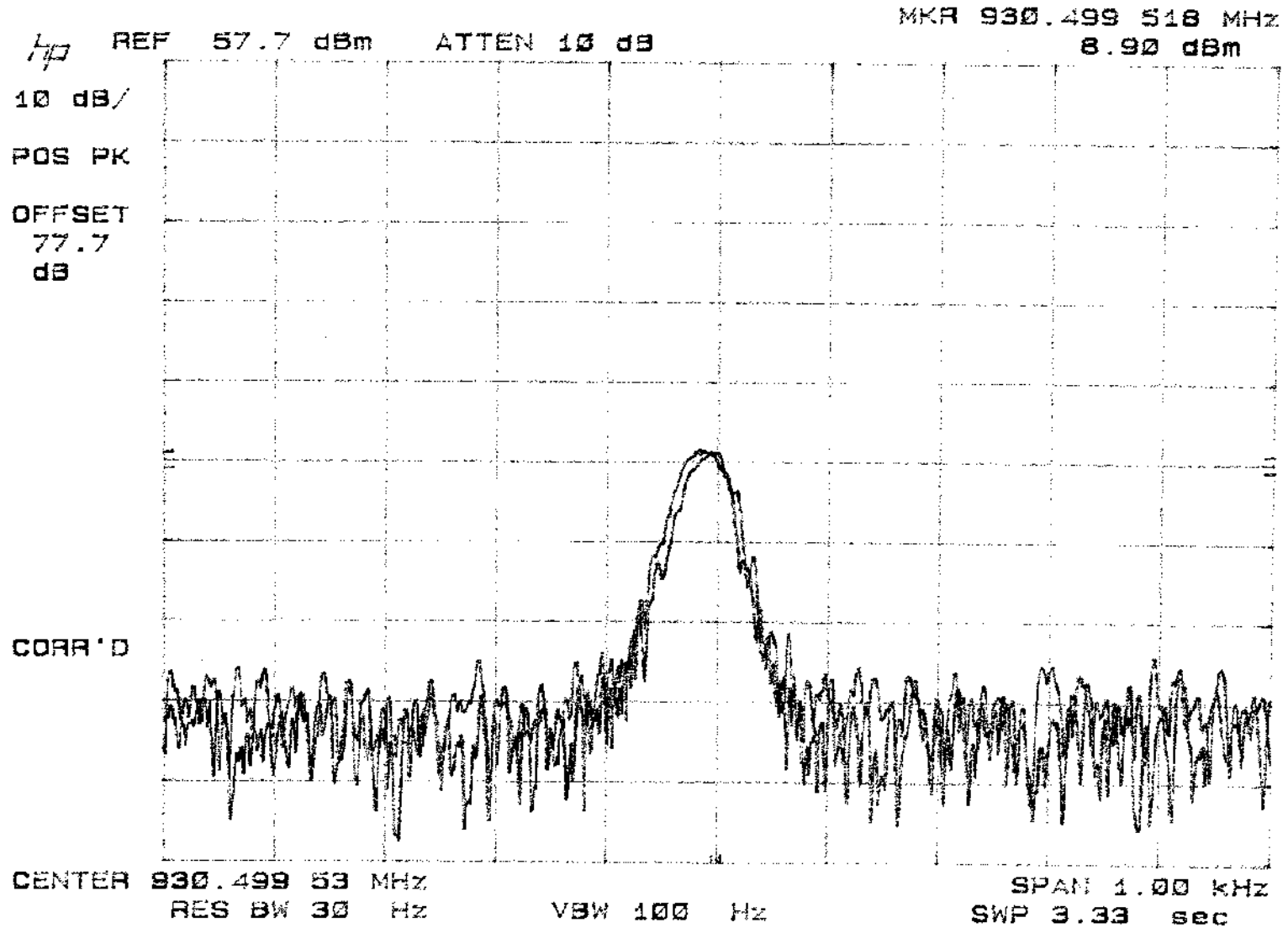


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FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 930.5 MHz 2 CHANNEL CARRIER

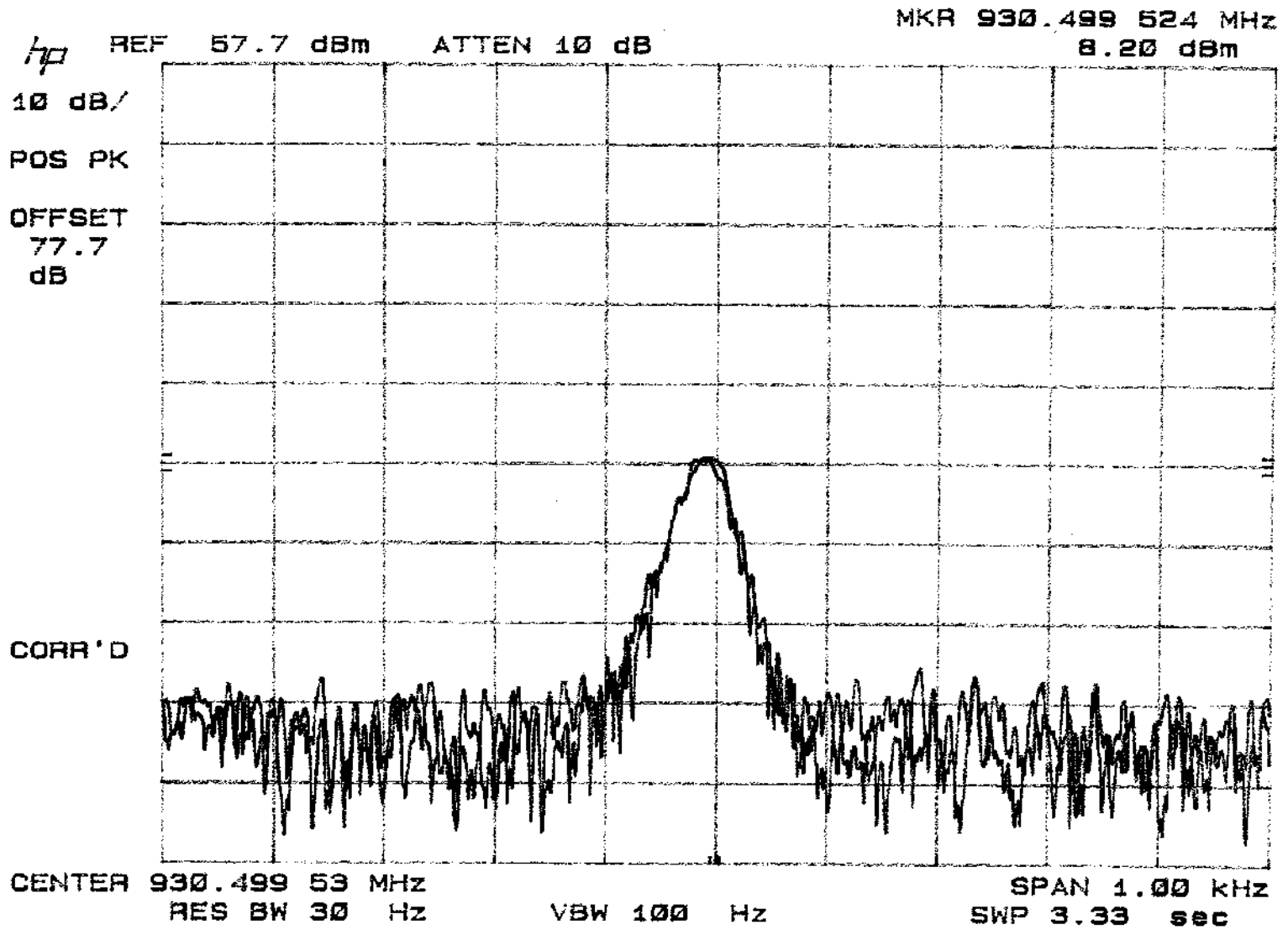
APR. 17, 2002
TECH/ENGR: AAL



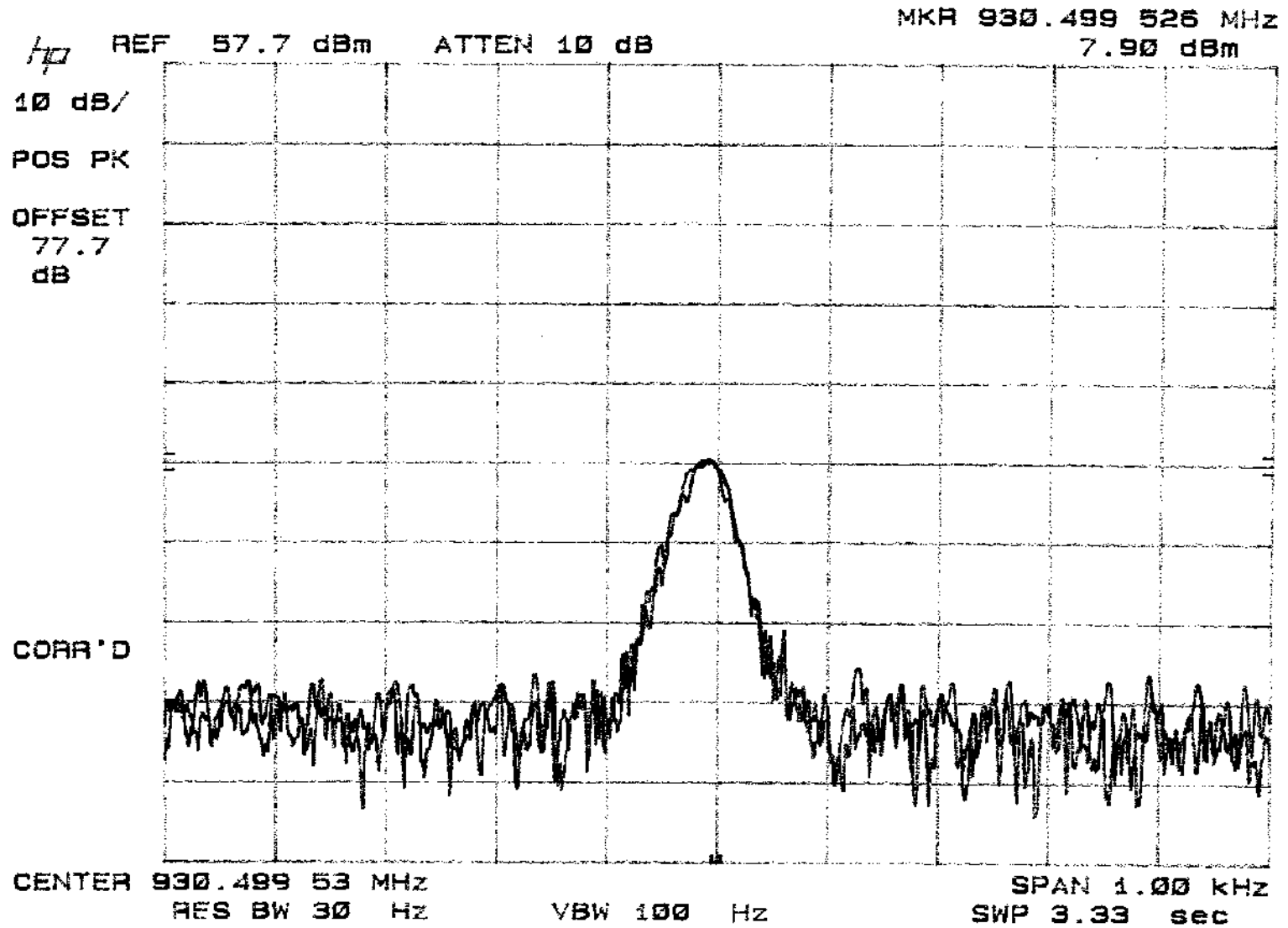
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 SONIK TECHNOLOGIES.
 APR. 17, 2002
 TECH/ENGR: AAL
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
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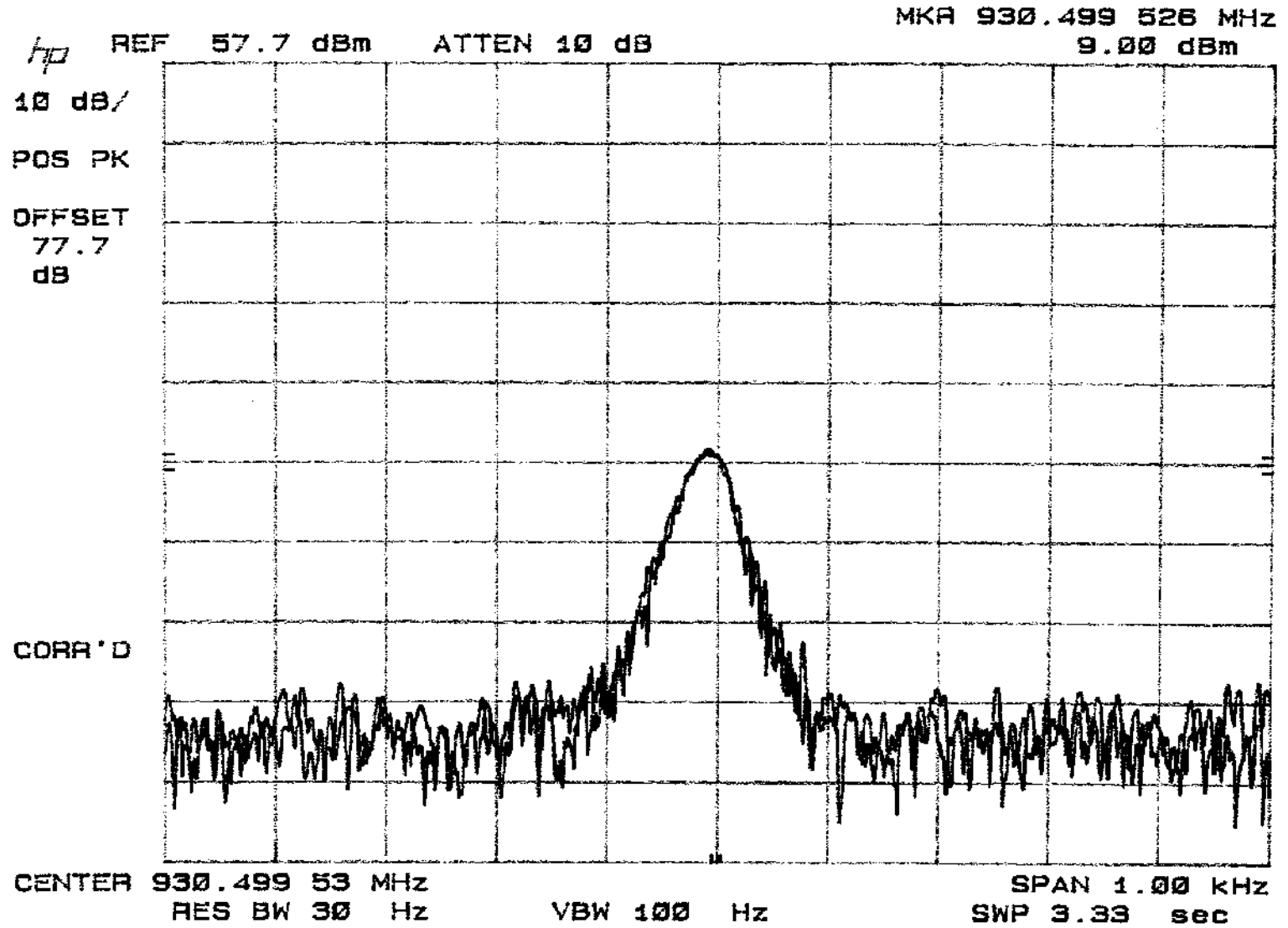


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 SONIK TECHNOLOGIES. TECH/ENGR: AAL
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
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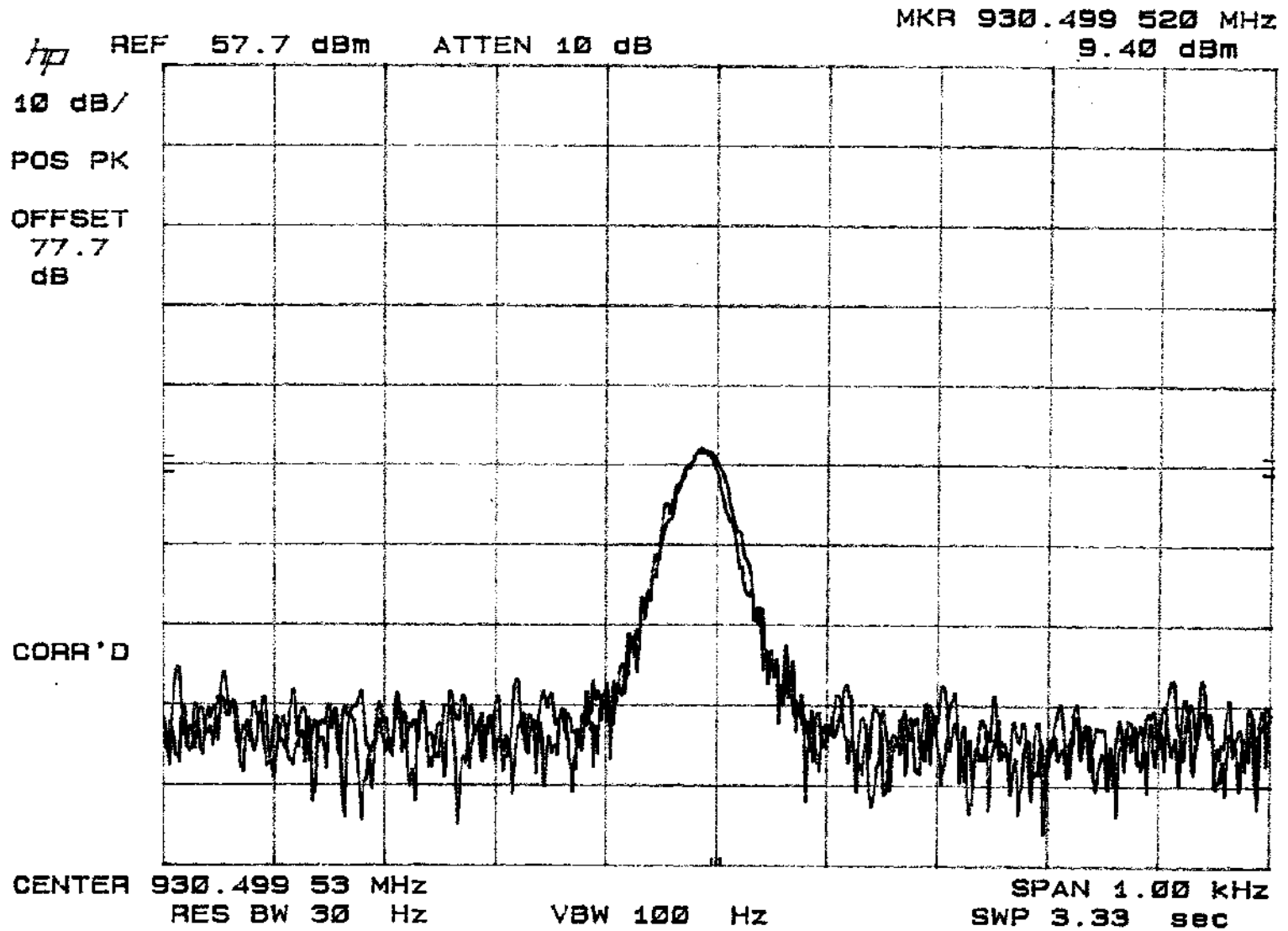
SC202170
 SONIK TECHNOLOGIES.
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
 FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 930.5 MHz 4 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

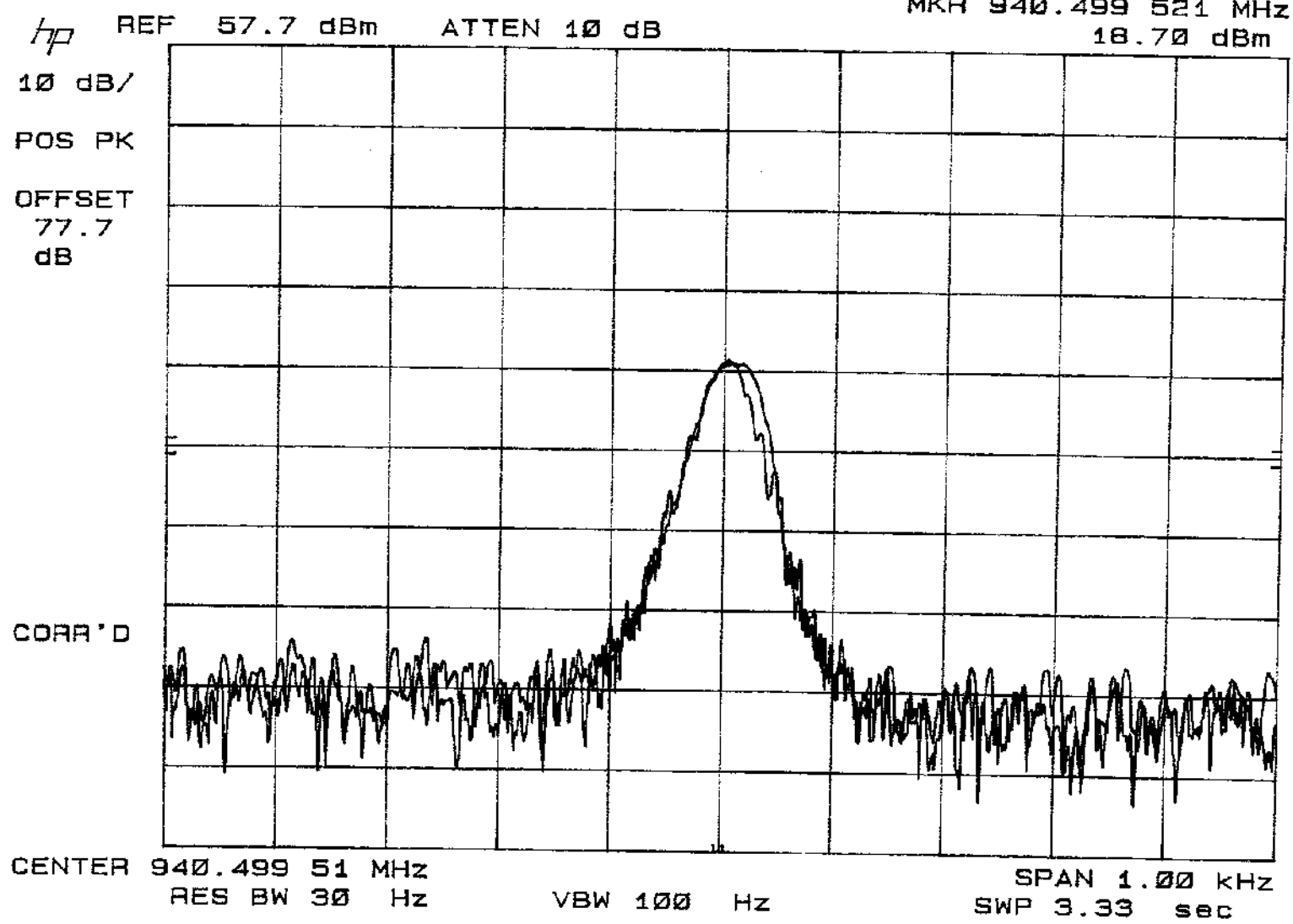


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 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
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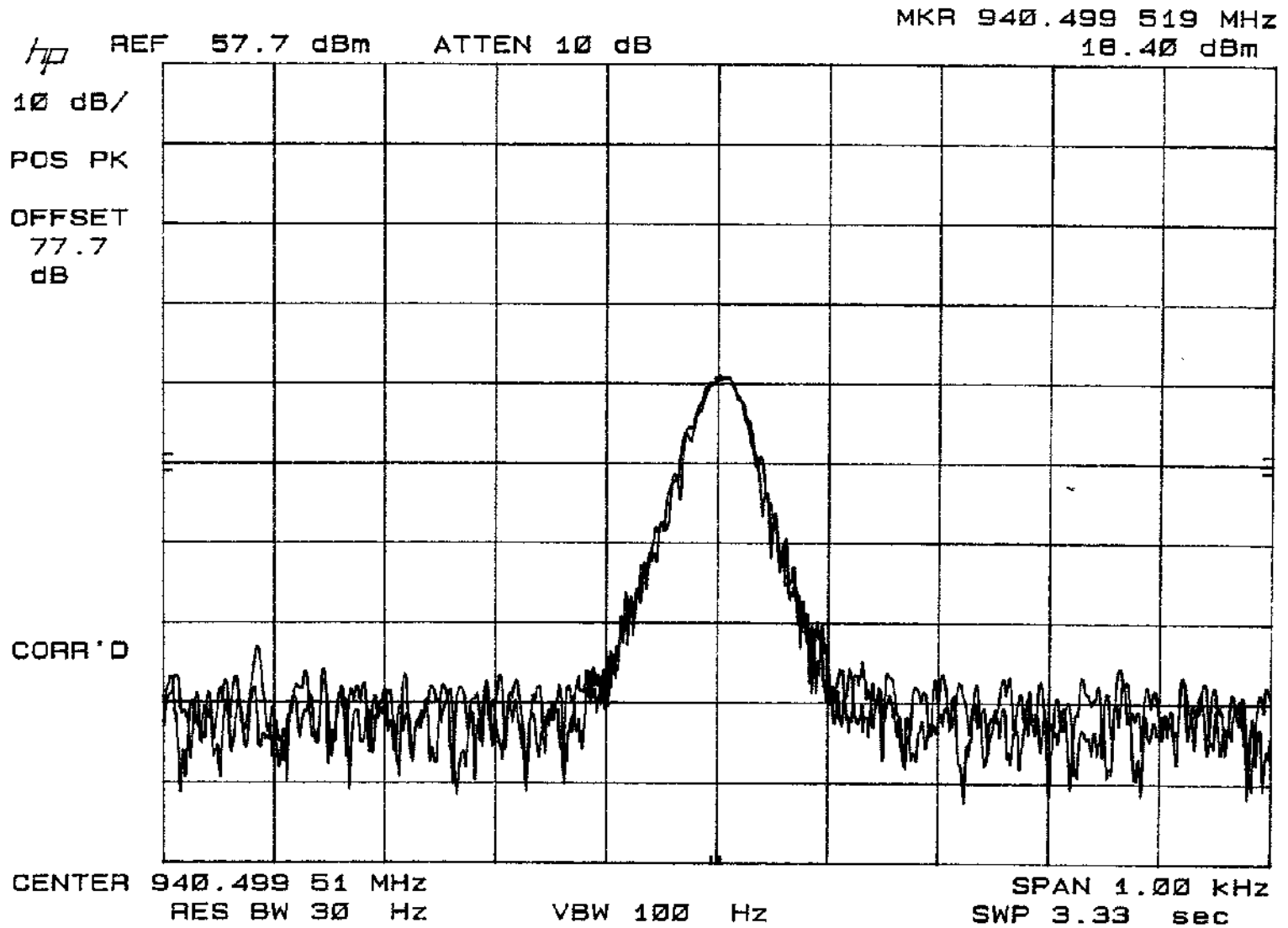
APR. 17, 2002
 TECH/ENGR: AAL



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 SONIK TECHNOLOGIES. TECH/ENGR: AAL
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
 FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 940.5 MHz 1 CHANNEL CARRIER
 MKR 940.499 521 MHz
 18.70 dBm



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 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
 FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 940.5 MHz 2 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL

MKR 940.499 516 MHz
 12.00 dBm

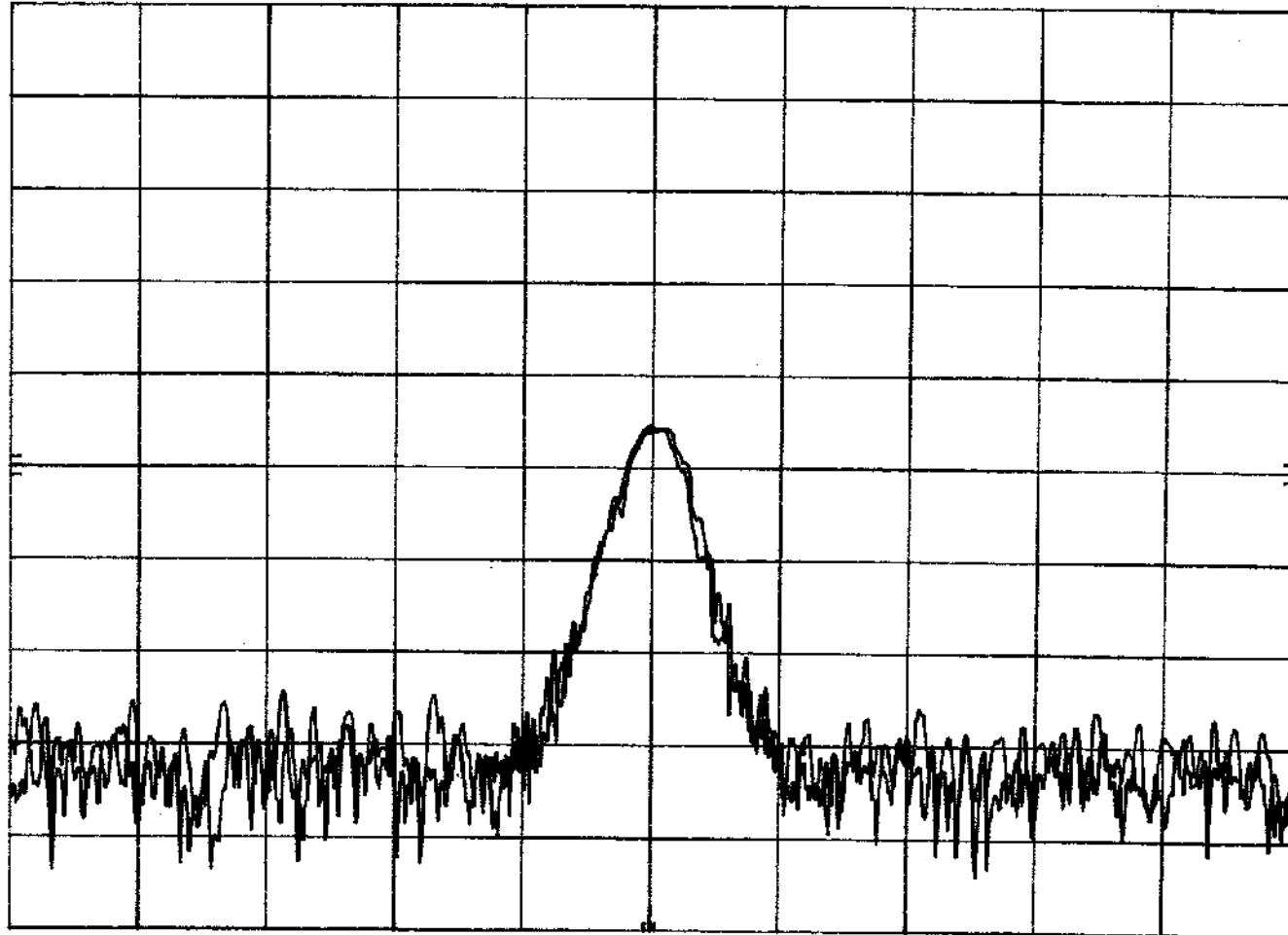
hp REF 57.7 dBm ATTEN 10 dB

10 dB/

POS PK

OFFSET
 77.7
 dB

CORR'D



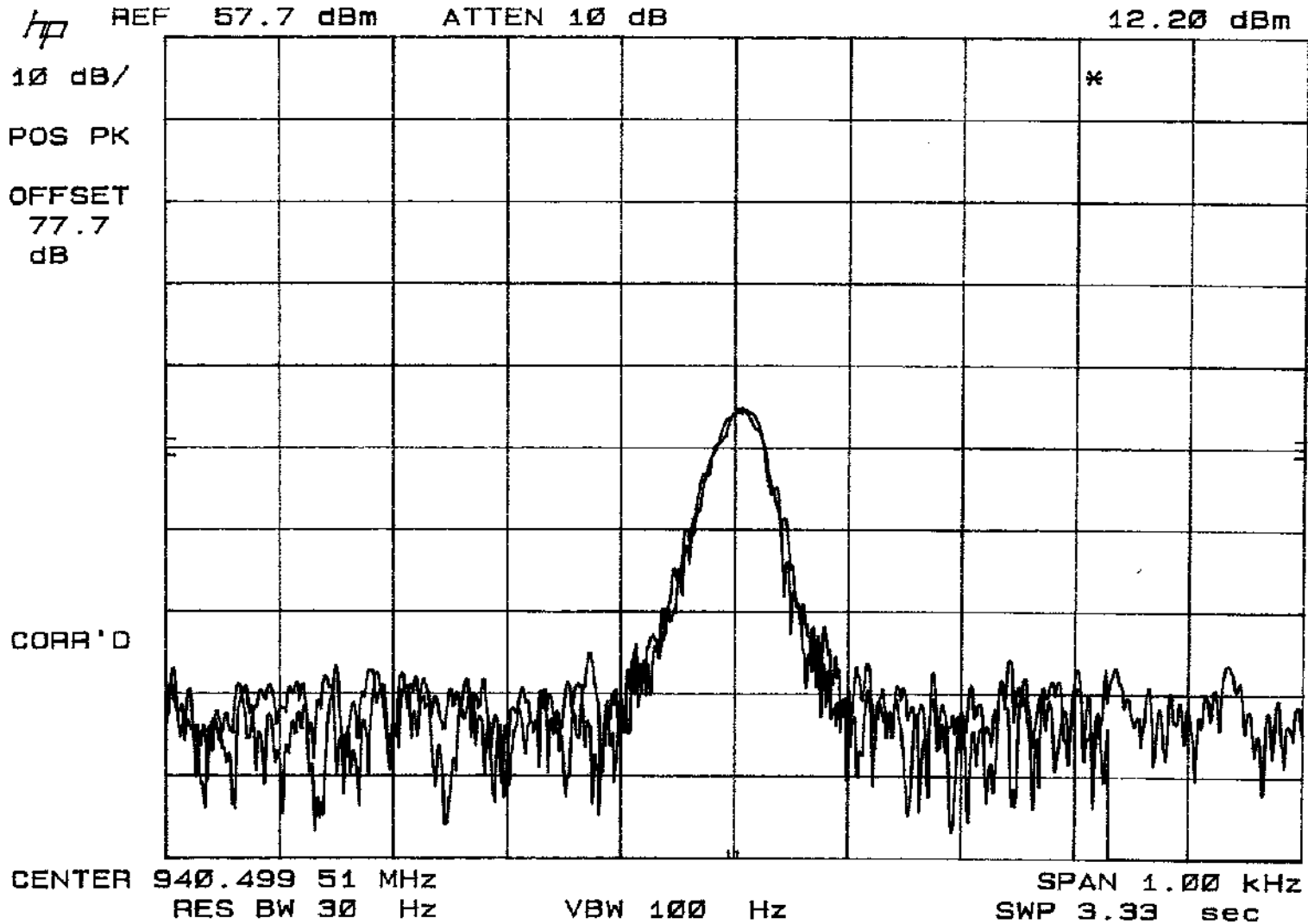
CENTER 940.499 51 MHz
 RES BW 30 Hz

VBW 100 Hz

SPAN 1.00 kHz
 SWP 3.33 sec

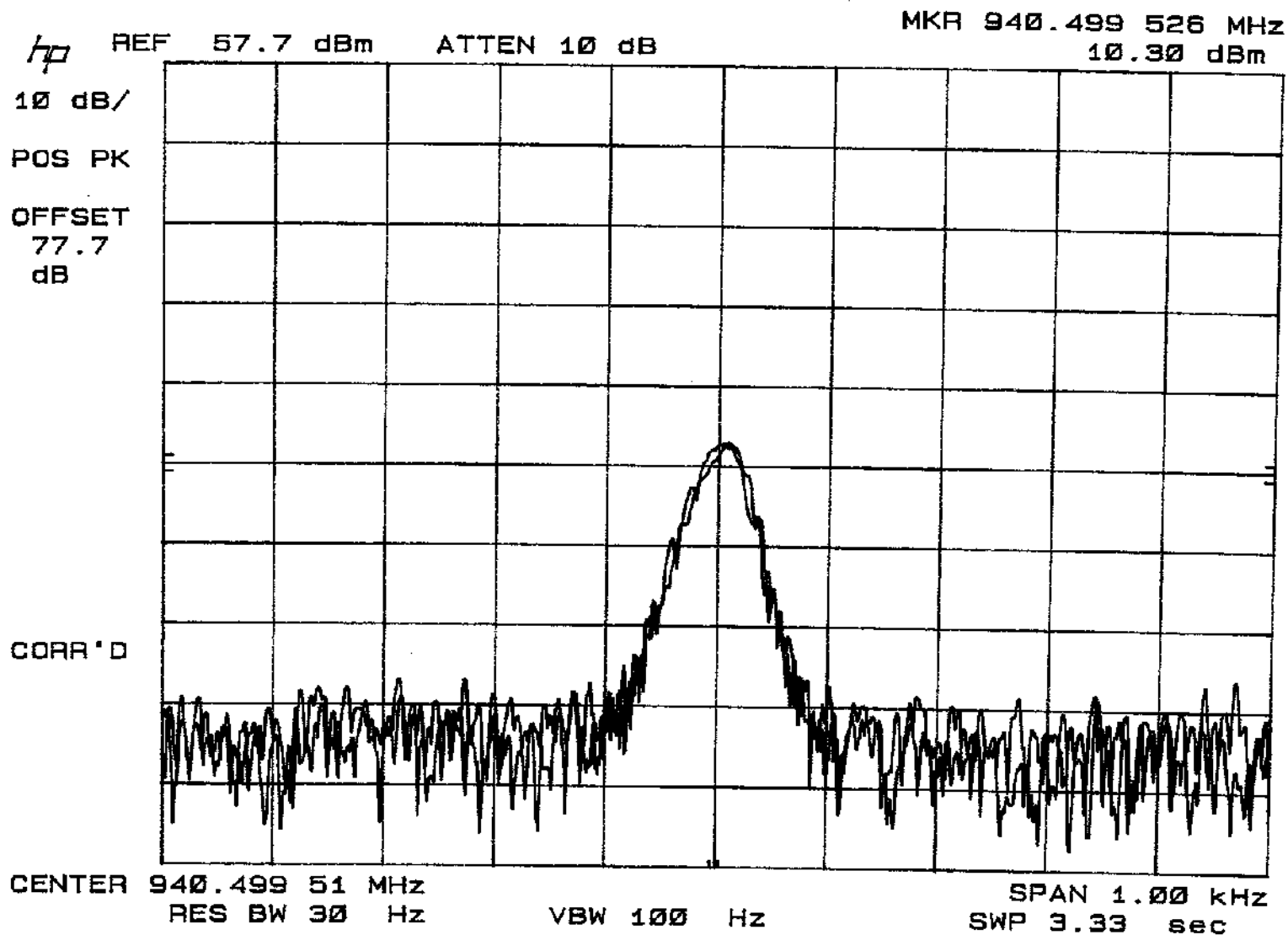
SC202170 G2BT RADIO TRANSMITTER APR. 17, 2002
 SONIK TECHNOLOGIES. TECH/ENGR: AAL
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA
 FCC CFR 47 PART 24.135 (A) 115% NOMINAL SUPPLY VOLTAGE 940.5 MHz 2 CHANNEL CARRIER

MKR 940.499 523 MHz
 12.20 dBm



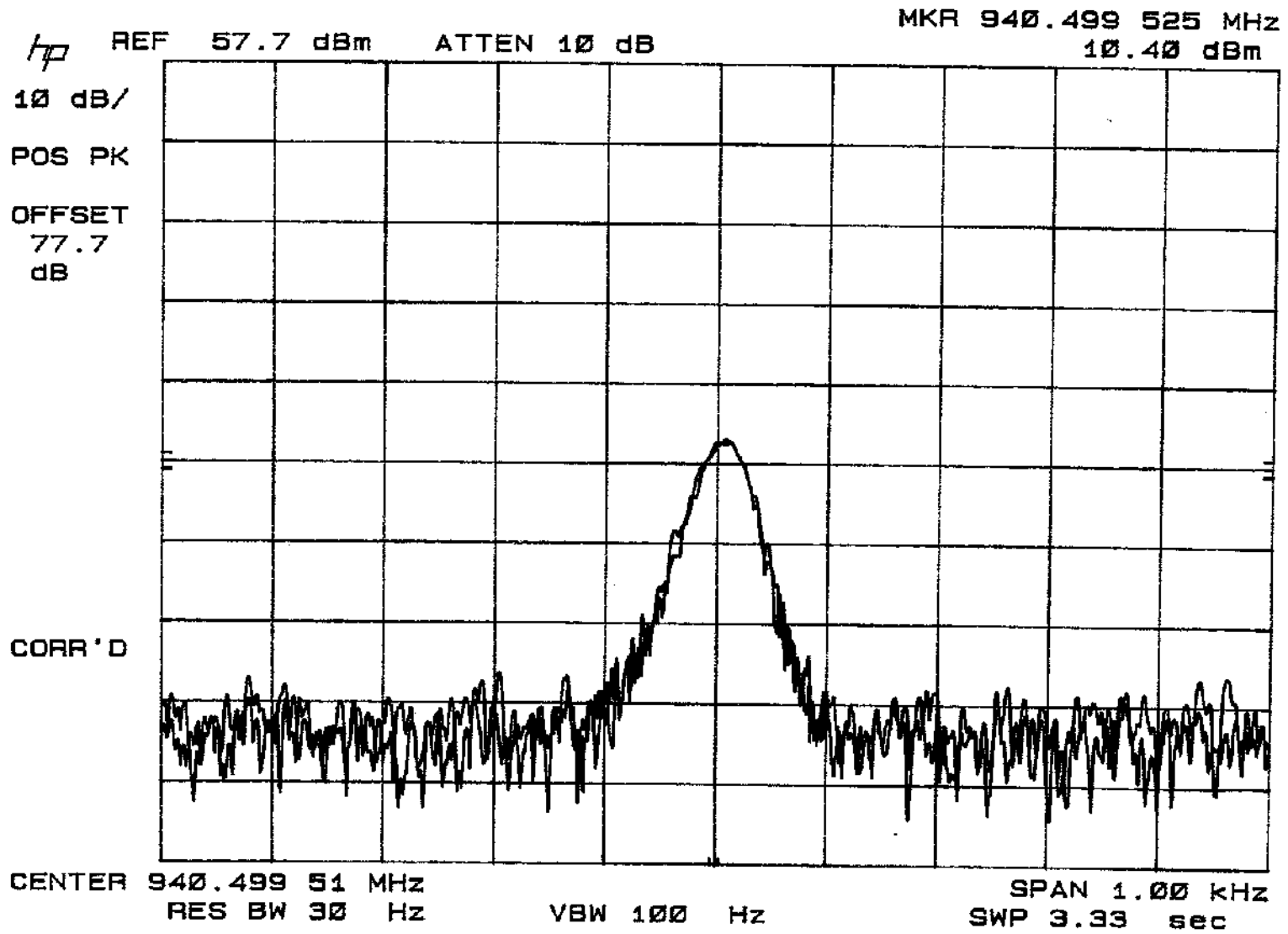
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 SONIK TECHNOLOGIES.
 FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE
 FCC CFR 47 PART 24.135 (A) 85% NOMINAL SUPPLY VOLTAGE 940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL
 FSK DATA

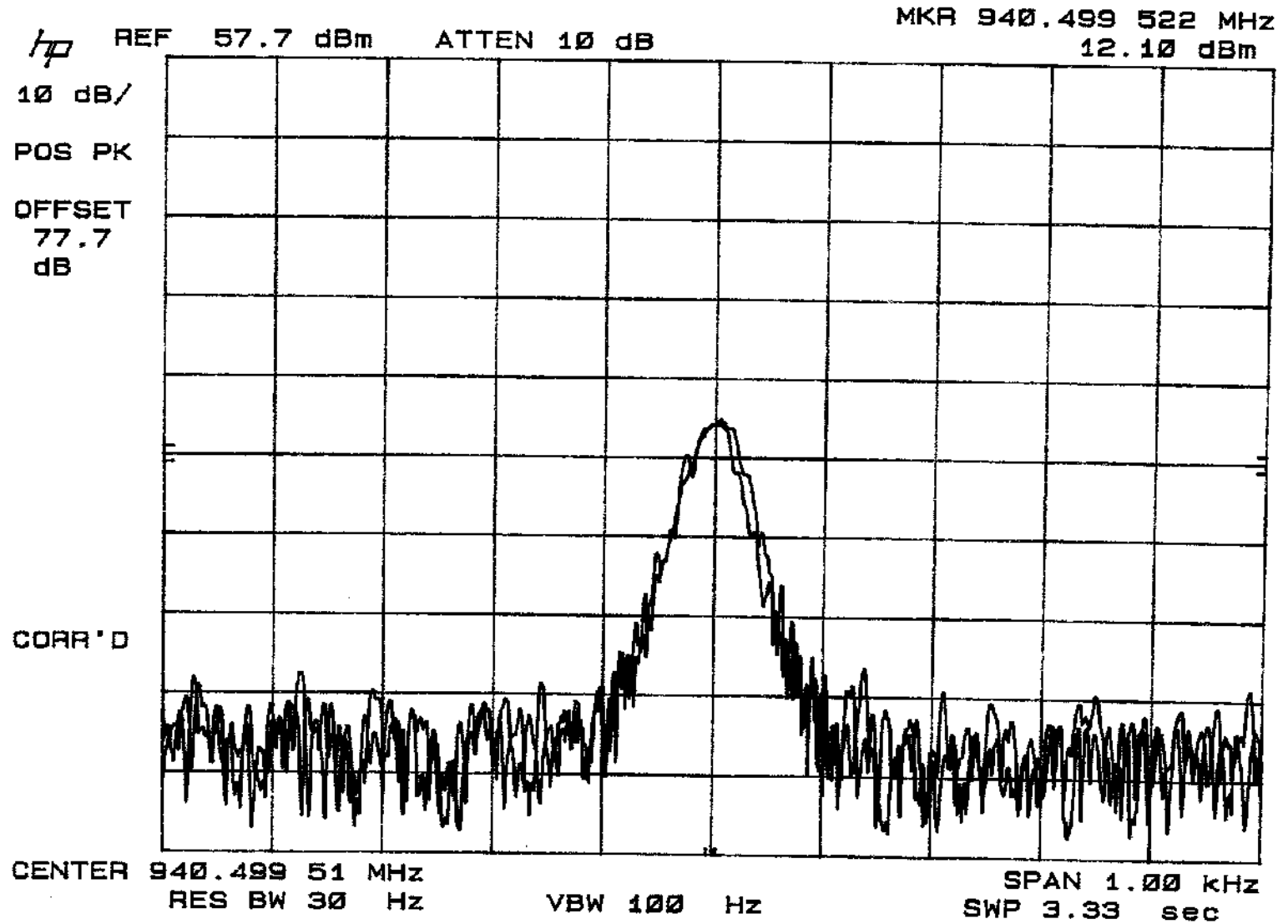


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 FCC CFR 47 PART 24.135 (A) 115% NOMINAL SUPPLY VOLTAGE 940.5 MHz 3 CHANNEL CARRIER

APR. 17, 2002
 TECH/ENGR: AAL



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 APR. 17, 2002
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APR. 17, 2002

TECH/ENGR: AAL

FCC CFR 47 PART 2.1055 FREQUENCY STABILITY OVER VOLTAGE VARIATION AT ROOM TEMPERATURE FSK DATA

FCC CFR 47 PART 24.135 (A) 115% NOMINAL SUPPLY VOLTAGE 940.5 MHz 4 CHANNEL CARRIER

MR 940.499 520 MHz

12.30 dBm

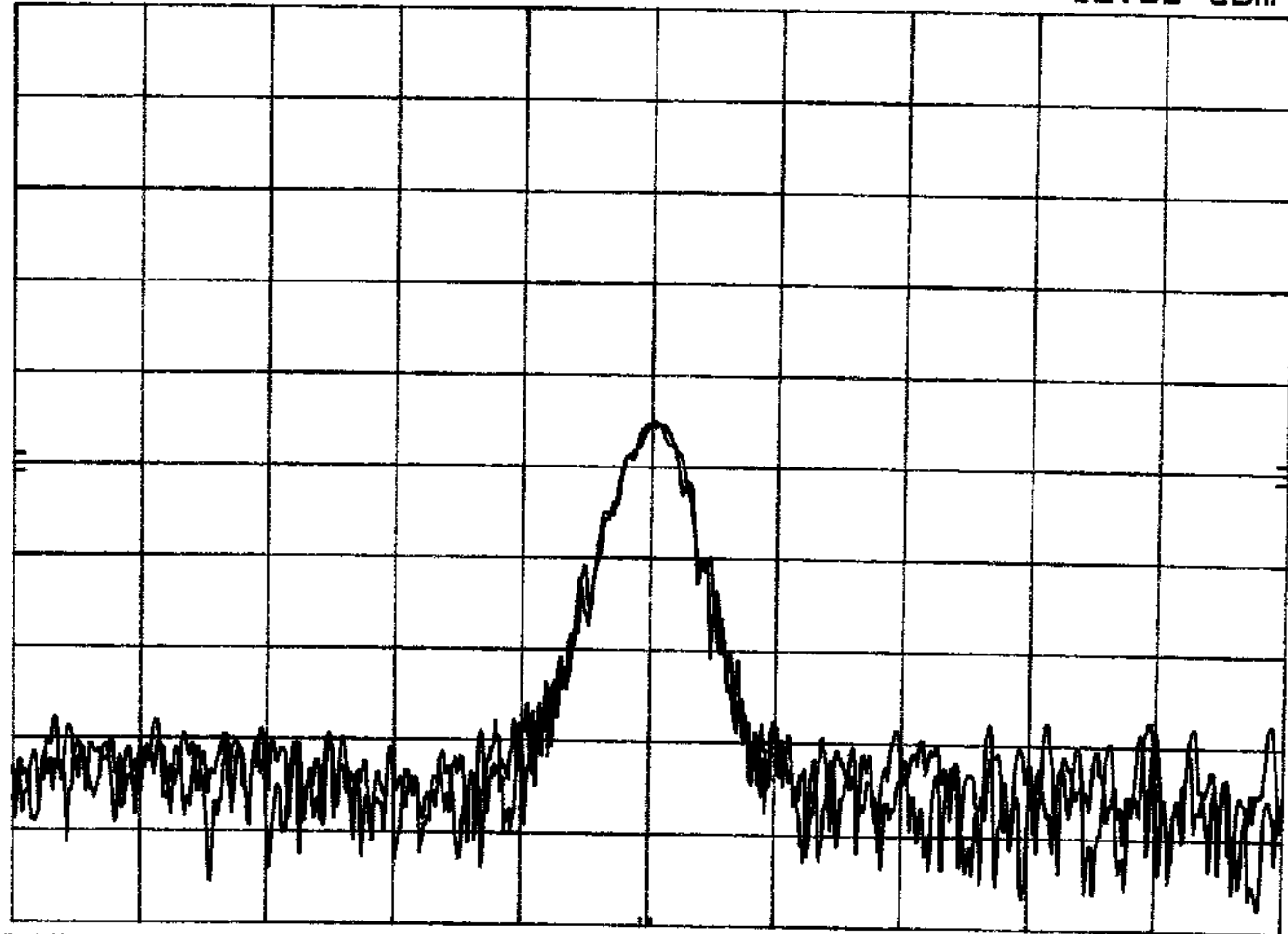
hp REF 57.7 dBm ATTEN 10 dB

10 dB/

POS PK

OFFSET
77.7
dB

CORR'D



CENTER 940.499 51 MHz

RES BW 30 Hz

VBW 100 Hz

SPAN 1.00 kHz
SWP 3.33 sec

ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per *FCC Part 2, Paragraphs 2.1046; 2.1049; 2.1051; 2.1053; 2.1055 and Part 24, Paragraphs 24.131; 24.132(c); 24.133(a)(ii); 24.133(1)(ii); 24.135(a).*

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of *FCC Part 2, Paragraphs 2.1046; 2.1049; 2.1051; 2.1053; 2.1055 and Part 24, Paragraphs 24.131; 24.132(c); 24.133(a)(ii); 24.133(1)(ii); 24.135(a).*

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Alan Laudani
(EMC Engineer)