The University of Michigan
Radiation Laboratory
3228 EECS Building
Ann Arbor, MI 48109-2122
Tel: (734) 764-0500

Measured Radio Frequency Emissions
From

HyperLink/Lucent Extended Range Radio
Class II Permissive Change
Model WL2401

Report No. 415031-101
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For:
Hyperlink Technologies Inc.
1200 Clint Moore Rd., Suite 14
Boca Raton, FL 33487

Contact:
Peter Roth
Tel: (561) 995-2256
Fax: (561) 995-2432
PO: verbal

Measurements made by: Joseph Brunett

Tests supervised by:
Report approved by: ____________________
Valdis V. Liepa
Research Scientist

Summary

Tests for compliance with FCC Regulations, according to Part 15 (15.247), and with Industry Canada Regulations, RSS-210 (Issue 5, Draft 1, Section 6.2.2 (o)) were performed on HyperLink spread spectrum RF Extended Range LAN System. These tests are in support of a Class II Permissive Change/Reassessment. AGC modified amplifiers were tested to replace the NON-AGC amplifiers already approved for the system.

In testing performed September 04, 2001 through October 18, 2001, the worst-case radiated emissions in restricted bands were met by 0.2 dB (see p. 12).

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1. Introduction

HyperLink/Lucent Extended Range Radio, Model WL2401, was tested for compliance with FCC Regulations, Part 15, adopted under Docket 87-389, April 18, 1989, and with Industry Canada RSS-210, Issue 5, Draft 1, Section 6.2.2 (t1), dated December 2000. The tests were performed at the University of Michigan Radiation Laboratory Willow Run Test Range following the procedures described in ANSI C63.4-1992 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The Site description and attenuation characteristics of the Open Site facility are on file with FCC Laboratory, Columbia, Maryland (FCC Reg. No: 91050) and with Industry Canada, Ottawa, ON (File Ref. No: IC 2057).

2. Test Procedure and Equipment Used

The test equipment commonly used in our facility is listed in Table 2.1 below. The second column identifies the specific equipment used in these tests. The HP 8593E spectrum analyzer is used for primary amplitude and frequency reference.

Table 2.1 Test Equipment

Test Instrument	Equipment Used	Manufacturer/Model	Cal. Date/By
Spectrum Analyzer (9kHz-22GHz)	X	Hewlett-Packard 8593A SN: 3107A01358	December 2000/UM
Spectrum Analyzer (9kHz-26GHz)	X	Hewlett-Packard 8593E SN: 3107A01131	December 2000/HP
Spectrum Analyzer (0.1-1500 MHz)		Hewlett-Packard 182T/8558B SN: 1529A01114/543592	December 2000/UM
Preamplifier (5-1000MHz)		Watkins-Johnson A11 -1 plus A25-1S	December 2000/UM
Preamplifier (5-4000 MHz)		Avantek	Oct. 1999/ U of M Rad Lab
Power Meter w/ Thermistor	X	Hewlett-Packard 432A Hewlett-Packard 478A	Dec. 2000/U of M Rad Lab
Peak Power Meter w/ Sensor	X	Pacific Instruments 1018B	Dec. 2000/U of M Rad Lab
Broadband Bicone (20-200 MHz)		University of Michigan	June 1999/U of M Rad Lab
Broadband Bicone (200-1000 MHz)		University of Michigan	June 1999/U of M Rad Lab
Dipole Antenna Set (25-1000 MHz)		University of Michigan	June 2000/UM
Dipole Antenna Set (30-1000 MHz)		EMCO 3121C	June 2000/UM
S-Band Std. Gain Horn	X	S/A, Model SGH-2.6	Manufacturer, NRL design
C-Band Std. Gain Horn	X	University of Michigan	Manufacturer, NRL design
XN-Band Std. Gain Horn	X	University of Michigan	Manufacturer, NRL design
X-Band Std. Gain Horn	X	S/A, Model 12-8.2	Manufacturer, NRL design
Ku-Band Std. Gain Horn	X	University of Michigan	Manufacturer, NRL design
K-Band Std. Gain Horn	X	University of Michigan	Manufacturer, NRL design
Ridge-horn Antenna (0.5-5 GHz)		University of Michigan	February 1991/U of M Rad Lab
LISN Box		University of Michigan	Dec. 2000/U of M Rad Lab
Signal Generator (0.1-2060 MHz)		Hewlett-Packard 8657B	January 2000/Uof M Rad Lab
Printer	X	Hewlett-Packard 2225A	August 1989/HP

3. Configuration and Identification of Device Under Test

The DUT is a spread spectrum RF wireless link operating in 2400 - 2483.5 MHz band. The system tested consisted of a laptop computer, Lucent radio, 50-foot coax cable, an amplifier (AGC), and (choice of) an antenna. Figure 3.1 shows the block diagram of the basic system. The system has been designed to operate from 2422 to 2452 MHz.

The DUT was designed and manufactured by Hyperlink Technologies Inc., 1200 Clint Moore Rd., Suite 14, Boca Raton, FL 33687. It is identified as:

HyperLink/Lucent Extended Range Radio
Model: WL2401
SN: Proto8
FCC ID: MYF-WL2401

The system for which authorization is persued will have additional amplifiers and antennas beyond those tested. These amplifiers are described in applications documents. Here we tested and report on the results of the extreme components: minumum and maxiumum power amplifier with minimum and maximum gain antenna.

<u>With components evaluated:</u>

Lucent RF Card	SN: 994T12466095
WaveLan	FCC ID: IMRWLPCE24H
IBM Laptop	SN: 23-RYY74
Model: IBM Thinkpad 710C	FCC ID: ANO263OCS
Amplifier, HyperAmp	
Model: HA2401-AGC016	SN: 10998
Model: HA2401-AGC250	SN: 250-051501
DC Injector, HyperLink	SN: N/A
Model 2404	
Power Supply for HyperLink Amplifier	
Model: ACSM-26	FCC: Class A
Pigtail Cable from Radio to DC Injector	

<u>Antennas</u>

Antenna, Omni, V-pol
Model: HG 2403MU, 3.0 dBi

Antenna, Directional, H-pol
Model: HG 2424G, 24.0 dBi

3.1 EMI Relevant Modifications
None

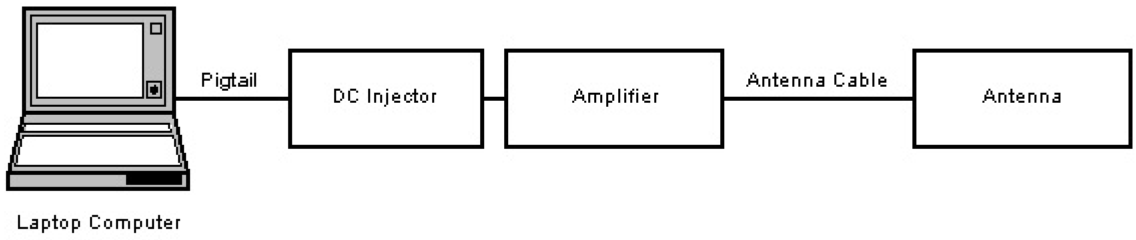


Figure 3.1 Diagram of System

4. Emission Limits

4.1 Radiated Emission Limits
Since the DUT is a spread spectrum device (15.247, 2.4 GHz), the radiated emissions are subject to emissions in restricted bands only (15.205). The applicable frequencies, through ten harmonics, are given below in Table 4.1. Emission limits from digital circuitry are specified in Table 4.2.

Table 4.1 Radiated Emission Limits (FCC:15.205; IC:RSS-210, 6.3) - Transmitter

Frequency	Fundamental Ave. E_{lim} (3m)		Spurious* Ave. E_{lim} (3m)	
(MHz)	(µV/m)	dB (µV/m)	(µV/m)	dB (µV/m)
2400-2483.5	---		---	
2310-2390 2483.5-2500 4500-5250	Restricted Bands Bands		500	54.0
7250-7750 14470-14500 17700-21400 22010-23120 23600-24000	Restricted Bands		500	54.0

* Measure up to tenth harmonic; 1 MHz res. BW, 100 Hz video BW (for average detection)

Table 4.2 Radiated Emission Limits (FCC:15.109;IC: RSS-210, 7.3) - Digital device.

Frequency	Class A ds = 10 m		Class B ds = 3 m	
(MHz)	(µV/m)	dB (µV/m)	(µV/m)	dB (µV/m)
30-88	90	39.0	100	40.0
88-216	150	43.5	150	43.5
219-960	210	46.4	200	46.0
960-	300	49.5	500	54.0

120 kHz BW up to 1 GHz, 1 MHz BW above 1 GHz

5. Radiated Emission Tests and Results

5.1 Anechoic Chamber Measurements

In our chamber, there is a set-up similar to that of an outdoor 3-meter site, with a turntable, and a ground plane. Instrumentation includes spectrum analyzers and other equipment as needed. For these tests the receiver (horn) antennas were placed on a Styrofoam block, at about 1.2 m height, and the DUT on a turntable at 3 meter distance, then moved to 1 m distance, if needed.

Standard gain horn antennas were used for the measurements. Up to 4 GHz the horns were connected directly to a spectrum analyzer via RG-214 coaxial cable, and above 4 GHz a pre-amp was added. The cables and the pre-amplifier used were specially calibrated for these tests using a network analyzer.

The DUT antenna was rotated in all possible ways and the maximum emission recorded. A photograph in Appendix (last page of the report) shows the measurement set-up.

5.2 Outdoor Measurements

None made

5.3 Computations and Results

To convert the dBm measured on the spectrum analyzer to dB(µV/m), we use expression

$$E_3(dB\mu V/m) = 107 + P_R + K_A - K_G + K_E$$

where
P_R = power recorded on spectrum analyzer, dB, measured at 3m
K_A = antenna factor, dB/m
K_G = pre-amplifier gain, including cable loss, dB
K_E = pulse operation correction factor, dB

When presenting the data, the dominant measured emissions at each frequency, under all of the possible orientations, are given. Computations and results are given in Tables 5.1 through 5.3. There we see that in the worst case the DUT meets the limit by 0.2 dB at 2483.5 MHz in Table 5.3.

Note, that besides the emission measurements, each table contains the frequency range of operation (in upper section of the table).

6. Other Measurements and Computations

6.1 Peak-to-Average Ratio (15.35(b))

For the measurements presented here for emissions in restricted bands, the DUT was programmed to transmit continuous, and such was verified with spectrum analyzer set to zero-span mode. See Figure 6.1. The average measurements were made using 1 MHz RBW and 100 Hz VBW (sometimes to 300 Hz – the measurements go faster). The peak measurements were made using 1 MHz RBW and 3 MHz VBW. Typically the difference between peak and average was 12 to 13 dB, and never exceeded the 20 dB limit.

6.2 Potential Health Hazard EM Radiation Level

The following table summarizes the minimum separation distance for each antenna/amplifier system tested, as calculated following FCC OET Bulletin 65.

Table 6.1 Potential Health Hazard Radiation Level

Ant.	Ant. Gain (dB)	Po(mW)	EIRP(dBm)	R (cm)
03MU	3	250	27.0	6.30
03MU	3	16	14.0	1.41
24G	24	16	35.1	16.0

6.3 Peak and Average Output Power (15.247(b))

For this measurement, the DUT was set in a test mode for continuous data transmission. A peak (diode detector) power meter and a bolometer type (average) microwave power meter were connected where the antenna attaches to the system. The power was measured for the 250 mW amplifier. No cable was used in measurement, as the cable is attached to the antenna. Since the DUT transmits in continuous mode, there is no adjustment needed to the readings. Table 6.2, below, presents the results. The Limit is 30dBm.

Table 6.2 Peak and Average Output Power (Antenna Conducted)

Freq (MHz)	Avg. P(dBm)	Peak P(dBm)	Comment
2422	23.2	25.0	(250 mW Amp)
2437	23.5	25.2	
2452	24.1	25.5	
2422	10.9	11.1	(16 mW Amp)
2437	10.8	11.1	
2452	10.8	11.0	

6.4 Bandwidth (15.247(a)(2))

For this test, the DUT was put in a test mode for continuous data transmission. The spectrum analyzer was connected where the antenna attaches to the system. The analyzer was set for RBW=VBW=100 kHz, SPAN= 100 MHz. 6-dB bandwidth was measured for lowest, mid, and highest channels that would be used in each configuration. Plots are shown in Figure 6.3 and Figure 6.4.

16 mW AGC Amplifier

Frequency	6 dB Bandwidth
2.422 GHz	10.1 MHz
2.437 GHz	10.2 MHz
2.452 GHz	10.2 MHz

250 mW AGC Amplifier

Frequency	6 dB Bandwidth
2.422 GHz	10.3 MHz
2.437 GHz	10.1 MHz
2.452 GHz	10.2 MHz

6.5 RF Antenna Conducted Spurious Emissions (15.247(c))

For this test, the DUT was put in a test mode for continuous data transmission. The spectrum analyzer was connected where the antenna attaches to the system. The analyzer was set for RBW=VBW=100 kHz, the frequency was swept from 0 to 25 GHz. Emissions were measured for lowest, mid, and highest channels used in the system. See Figures 6.5 through 6.10. In the plots, only the fundamental is seen, the rest is noise. In all cases, the noise is at least 35 dB below the carrier. (Limit -20.0 dB below carrier). The Figure 6.11 and 6.12 shows the band-edge scans at lower and upper edges.

6.6 Power Spectral Density and Line Spacing (15.247(d))

For this measurement, the DUT was put in a test mode for continuous data transmission. The spectrum analyzer was connected where the antenna attaches to the system. Configured was the "worst case" system, (i.e., with 50-foot cable, high power amp 250 mW AGC), and the minimal system, (i.e., with 16 mW AGC amplifier). These systems were measured for lowest and highest channels that would be used in the system. The spectrum was first scanned for the maximum spectrum peaks and then at these peaks the sweep was repeated with RBW=3 kHz, VBW=100 kHz, SPAN=300 kHz, and SWEEP TIME=100s. See Figures 6.13 through 6.16 for 250mW AGC and Figures 6.17 through 6.19 for 16mW AGC. The readings obtained are:

250 mW AGC Amplifier

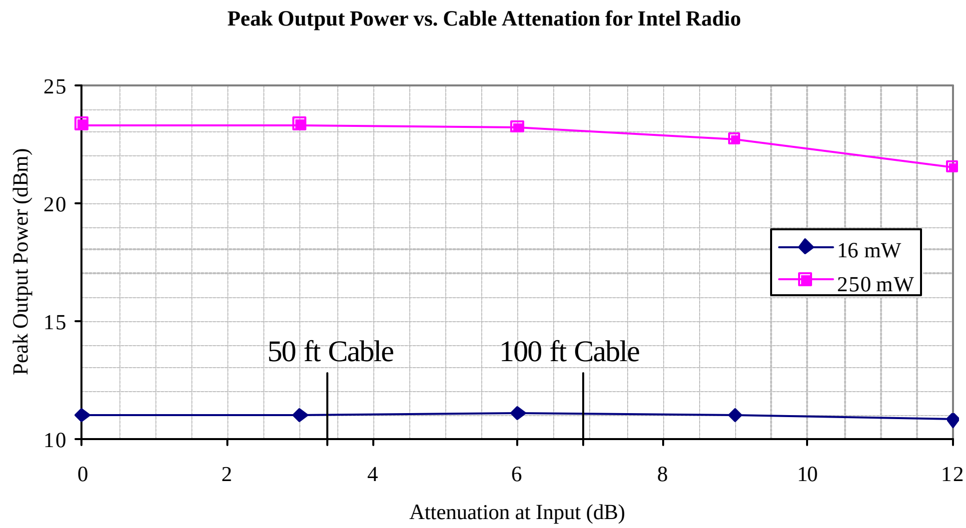
Frequency	Analyzer Reading	Line Spacing
2.42135 GHz	-16.0 dBm (Limit 8.0 dBm)	4.5 kHz
2.45135 GHz	-18.0 dBm (Limit 8.0 dBm)	4.5 kHz

16 mW AGC Amplifier

Frequency	Analyzer Reading	Line Spacing
2.42035 GHz	-5.2 dBm (Limit 8.0 dBm)	4.5 kHz
2.45035 GHz	-5.5 dBm (Limit 8.0 dBm)	4.5 kHz

6.7 AGC Performance of the RF Amplifier

Below we show from measurements that the output power of the amplifier is independent of the input signal for up to 9 dB of attenuation at the input. This demonstrates that when using the AGC amplifiers, the system performance is cable length independent from up to 120 ft.



(It should be noted that the 250 mW AGC amplifier requires 50 ft of cable minimum to pass antenna conducted emissions at band edges. All other amplifiers do not require a minimum length of cable.)

The University of Michigan
Radiation Laboratory
3228 EECS Building
Ann Arbor, Michigan 48109-2122
(734) 764-0500

Table 5.1 Highest Emissions Measured

	Radiated Emissions									L/Lucent;2403MU 16mWAGC
#	Freq. MHz	Ant. Used	Ant. Pol.	Ave dBm	Ka dB/m	Kg dB	E3 dBµV/m	E3lim dBµV/m	Pass dB	Comments
1										
2	2422.0									Low channel
3	2437.0									Mid channel
4	2452.0									High channel
5										
6	2390.0	HornS	H/V	-79.8	21.5	- 0.6	49.3	54.0	4.7	Low
7	2390.0	HornS	H/V	-79.8	21.5	- 0.6	49.3	54.0	4.7	Mid
8	2390.0	HornS	H/V	-79.8	21.5	- 0.6	49.3	54.0	4.7	High
9	2483.5	HornS	H/V	-79.6	21.5	- 0.6	49.5	54.0	4.5	Low
10	2483.5	HornS	H/V	-79.6	21.5	- 0.6	49.5	54.0	4.5	Mid
11	2483.5	HornS	H/V	-79.5	21.5	- 0.6	49.6	54.0	4.4	High
12	4844.0	HornC	H/V	-42.4	25.5	37.0	53.1	54.0	0.9	Low
13	4874.0	HornC	H/V	-42.3	25.5	37.0	53.2	54.0	**0.8**	Mid
14	4904.0	HornC	H/V	-44.7	25.5	37.0	50.8	54.0	3.2	High
15	7266.0	HornXN	H/V	-62.8	25.5	36.0	33.7	54.0	20.3	Low
16	7311.0	HornXN	H/V	-62.9	25.5	36.0	33.6	54.0	20.4	Mid
17	7356.0	HornXN	H/V	-60.8	25.5	36.0	35.7	54.0	18.3	High
18	12110.0	HornX	H/V	-67.3	25.5	34.0	31.2	54.0	22.8	Low
19	12185.0	HornX	H/V	-67.6	25.5	34.0	30.9	54.0	23.1	Mid
20	12260.0	HornX	H/V	-67.6	25.5	34.0	30.9	54.0	23.1	High
21	14532.0	HornKu	H/V	-66.5	32.3	32.0	40.8	54.0	13.2	Low, noise
22	19376.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Low, noise
23	19496.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Mid, noise
24	19616.0	HornK	H/V	-72.3	32.3	32.0	35.0	54.0	19.0	High, noise
25	22041.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Low, noise
26										
27										
28										
29										
30										
31										
32	**Configuration:**									
33	Pwr supp	Pwr feed	Coax	Amp	Ant		* Ave: measured with 1 MHz RBW and 100 Hz VBW			
34	ACSM-26	No	10 ft	16 mW	03MU		* Peak: measured with 1 MHz RBW and 3 MHz VBW			
35										
36										
37										
38										

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Table 5.2 Highest Emissions Measured

	Radiated Emissions									HL/Lucent;2403MU 250mWAGC
#	Freq. MHz	Ant. Used	Ant. Pol.	Ave dBm	Ka dB/m	Kg dB	E3 dBμV/m	E3lim dBμV/m	Pass dB	Comments
1										
2	2422.0									Low channel
3	2437.0									Mid channel
4	2452.0									High channel
5										
6	2390.0	HornS	H/V	-76.3	21.5	- 0.6	52.8	54.0	1.2	Low
7	2390.0	HornS	H/V	-77.3	21.5	- 0.6	51.8	54.0	2.2	Mid
8	2390.0	HornS	H/V	-79.0	21.5	- 0.6	50.1	54.0	3.9	High
9	2483.5	HornS	H/V	-79.5	21.5	- 0.6	49.6	54.0	4.4	Low
10	2483.5	HornS	H/V	-78.6	21.5	- 0.6	50.5	54.0	3.5	Mid
11	2483.5	HornS	H/V	-75.4	21.5	- 0.6	53.7	54.0	**0.3**	High
12	4844.0	HornC	H/V	-48.1	25.5	37.0	47.4	54.0	6.6	Low
13	4874.0	HornC	H/V	-48.9	25.5	37.0	46.6	54.0	7.4	Mid
14	4904.0	HornC	H/V	-48.8	25.5	37.0	46.7	54.0	7.3	High
15	7266.0	HornXN	H/V	-61.7	25.5	36.0	34.8	54.0	19.2	Low
16	7311.0	HornXN	H/V	-64.4	25.5	36.0	32.1	54.0	21.9	Mid
17	7356.0	HornXN	H/V	-66.4	25.5	36.0	30.1	54.0	23.9	High
18	12110.0	HornX	H/V	-62.1	25.5	34.0	36.4	54.0	17.6	Low
19	12185.0	HornX	H/V	-67.3	25.5	34.0	31.2	54.0	22.8	Mid
20	12260.0	HornX	H/V	-67.5	25.5	34.0	31.0	54.0	23.0	High
21	14532.0	HornKu	H/V	-67.6	32.3	32.0	39.7	54.0	14.3	Low, noise
22	19376.0	HornK	H/V	-72.3	32.3	32.0	35.0	54.0	19.0	Low, noise
23	19496.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Mid, noise
24	19616.0	HornK	H/V	-72.3	32.3	32.0	35.0	54.0	19.0	High, noise
25	22041.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Low, noise
26										
27										
28										
29										
30										
31										
32	**Configuration:**									
33	Pwr supp	Pwr feed	Coax	Amp	Ant		* Ave: measured with 1 MHz RBW and 100 Hz VBW			
34	ACSM-26	No	10 ft	250 mW	03MU		* Peak: measured with 1 MHz RBW and 3 MHz VBW			
35										
36	For conducted emissions									
37	ACSM-26	No	50 ft	250 mW	03MU					
38										

Meas. 09/04/01 - 10/18/01; U of Mich

Table 5.3 Highest Emissions Measured

Radiated Emissions										HL/Lucent; 2424G 16mWAGC
#	Freq. MHz	Ant. Used	Ant. Pol.	Ave dBm	Ka dB/m	Kg dB	E3 dBμV/m	E3lim dBμV/m	Pass dB	Comments
1										
2	2422.0									Low channel
3	2437.0									Mid channel
4	2452.0									High channel
5										
6	2390.0	HornS	H/V	-77.1	21.5	- 0.6	52.0	54.0	2.0	Low
7	2390.0	HornS	H/V	-77.0	21.5	- 0.6	52.1	54.0	1.9	Mid
8	2390.0	HornS	H/V	-76.7	21.5	- 0.6	52.4	54.0	1.6	High
9	2483.5	HornS	H/V	-76.2	21.5	- 0.6	52.9	54.0	1.1	Low
10	2483.5	HornS	H/V	-76.9	21.5	- 0.6	52.2	54.0	1.8	Mid
11	2483.5	HornS	H/V	-75.3	21.5	- 0.6	53.8	54.0	**0.2**	High
12	4844.0	HornC	H/V	-47.1	25.5	37.0	48.4	54.0	5.6	Low
13	4874.0	HornC	H/V	-49.3	25.5	37.0	46.2	54.0	7.8	Mid
14	4904.0	HornC	H/V	-42.7	25.5	37.0	52.8	54.0	1.2	High
15	7266.0	HornXN	H/V	-61.6	25.5	36.0	34.9	54.0	19.1	Low
16	7311.0	HornXN	H/V	-63.5	25.5	36.0	33.0	54.0	21.0	Mid
17	7356.0	HornXN	H/V	-62.3	25.5	36.0	34.2	54.0	19.8	High
18	12110.0	HornX	H/V	-67.4	25.5	34.0	31.1	54.0	22.9	Low
19	12185.0	HornX	H/V	-67.6	25.5	34.0	30.9	54.0	23.1	Mid
20	12260.0	HornX	H/V	-67.6	25.5	34.0	30.9	54.0	23.1	High
21	14532.0	HornKu	H/V	-66.5	32.3	32.0	40.8	54.0	13.2	Low, noise
22	19376.0	HornK	H/V	-72.3	32.3	32.0	35.0	54.0	19.0	Low, noise
23	19496.0	HornK	H/V	-72.2	32.3	32.0	35.1	54.0	18.9	Mid, noise
24	19616.0	HornK	H/V	-72.3	32.3	32.0	35.0	54.0	19.0	High, noise
25	21798.0	HornK	H/V	-72.4	32.3	32.0	34.9	54.0	19.1	Low, noise
26	21933.0	HornK	H/V	-72.3	32.3	32.0	35.0	55.0	20.0	Low, noise
27	22068.0	HornK	H/V	-72.4	32.3	32.0	34.9	56.0	21.1	Low, noise
28										
29										
30										
31										
32	**Configuration:**									
33	Pwr supp	Pwr feed	Coax	Amp	Ant		* Ave: measured with 1 MHz RBW and 100 Hz VBW			
34	ACSM-26	No	50 ft	250 mW	24G		* Peak: measured with 1 MHz RBW and 3 MHz VBW			
35										
36										
37										
38										

Meas. 09/04/01 - 10/18/01; U of Mich

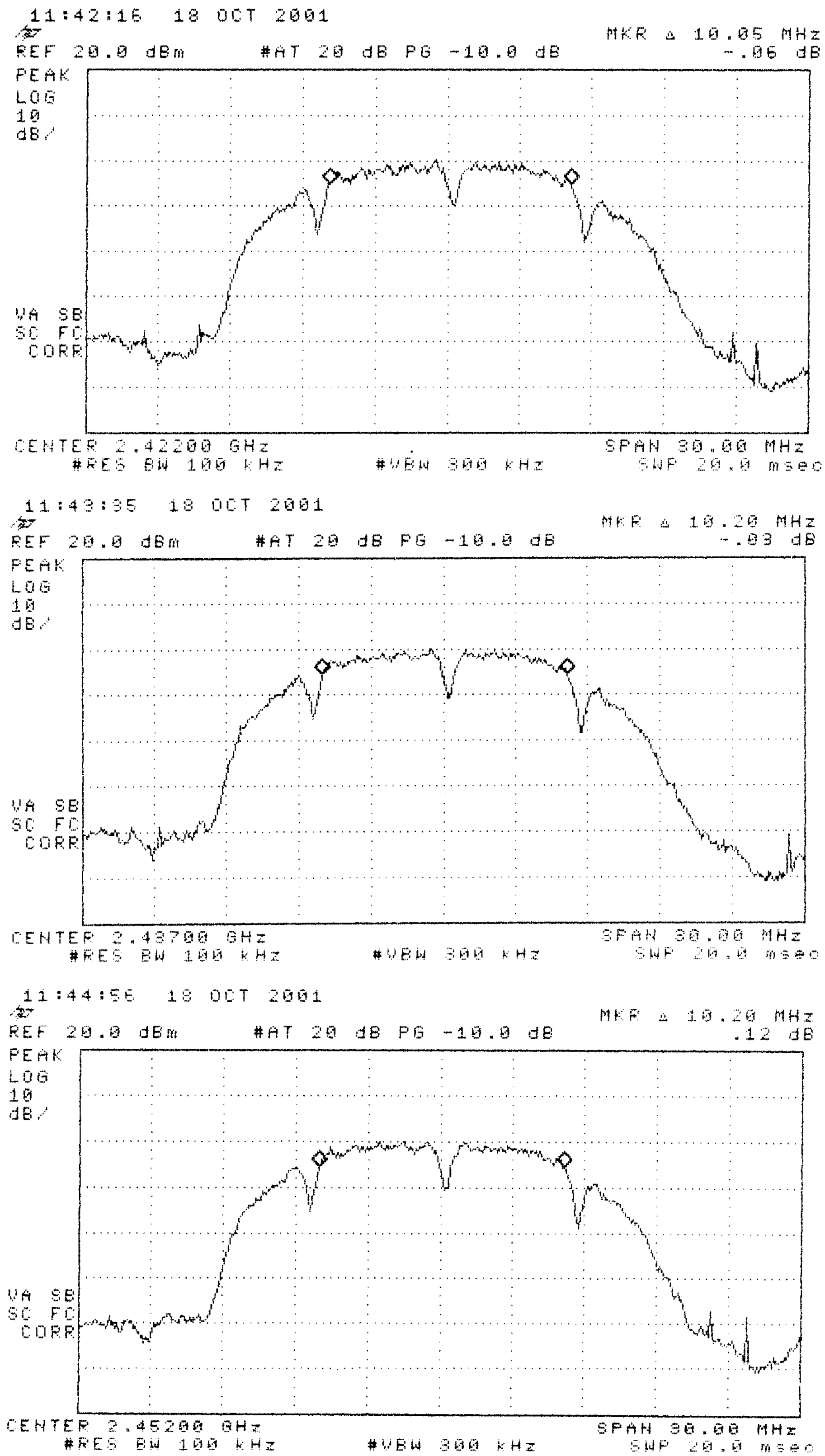
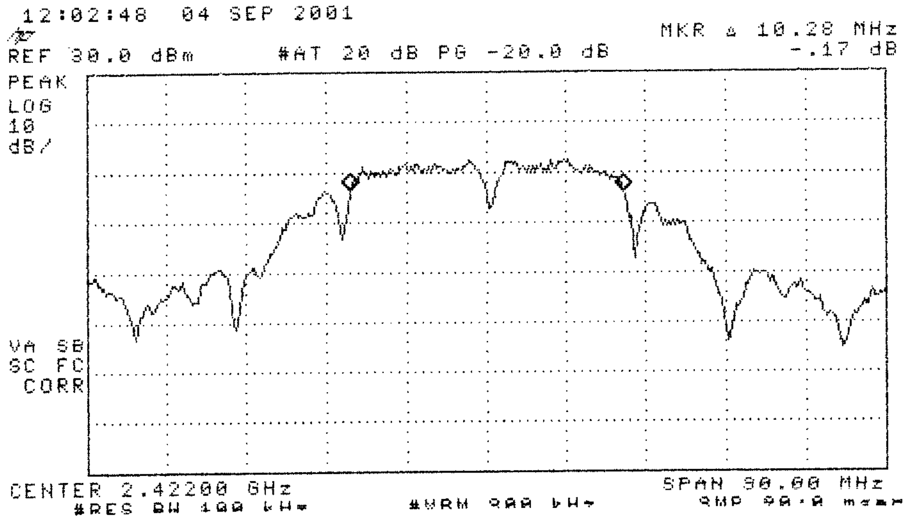
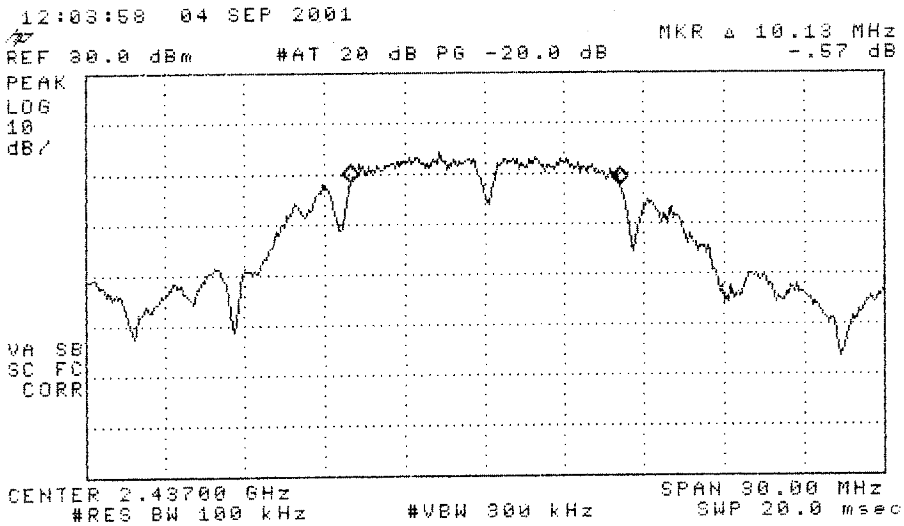


Figure 6.3 6 dB-point bandwidth measurements; low, mid, and high channels.
(16 mW AGC)





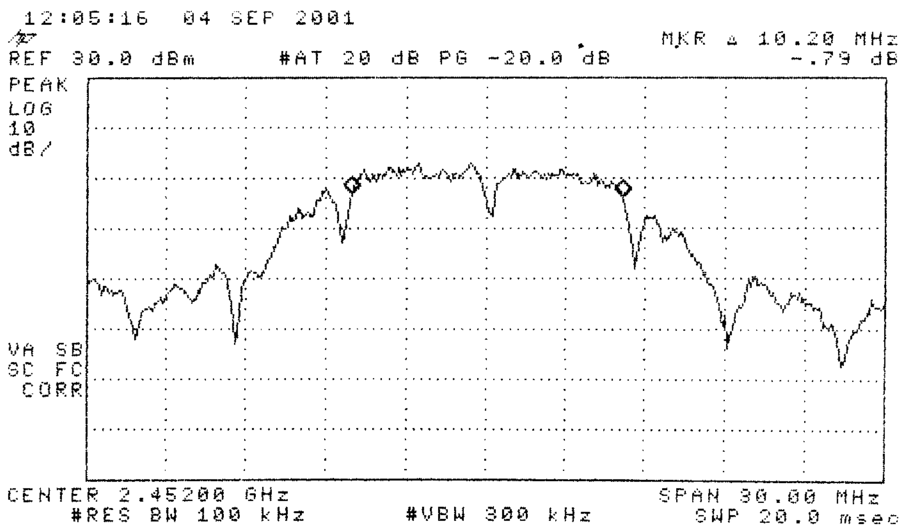


Figure 6.4 6 dB-point bandwidth measurements; low, mid, and high channels.
(250 mW AGC)

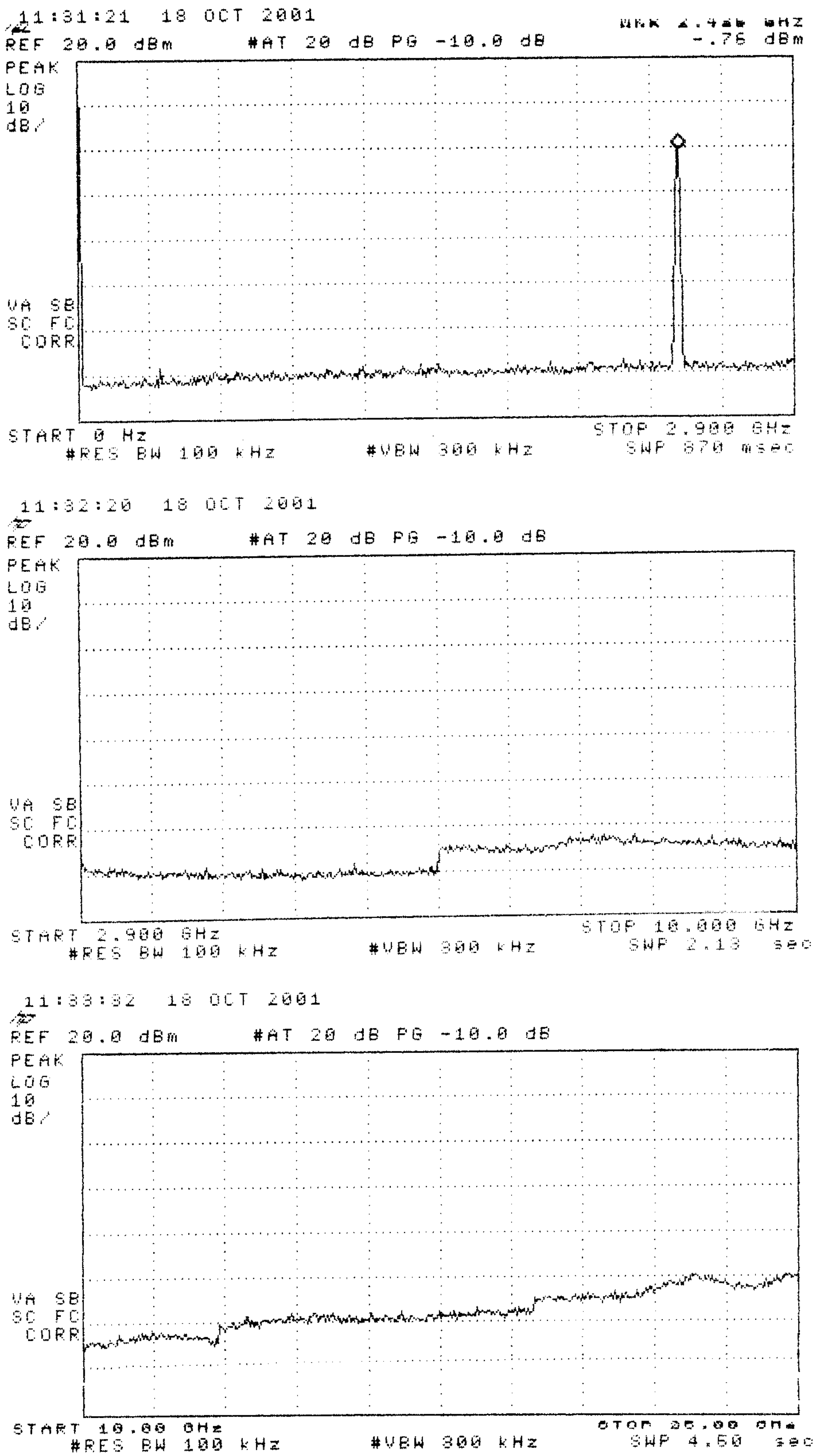


Figure 6.5 Antenna conducted spurious emissions, low channel.

(16 mW AGC)

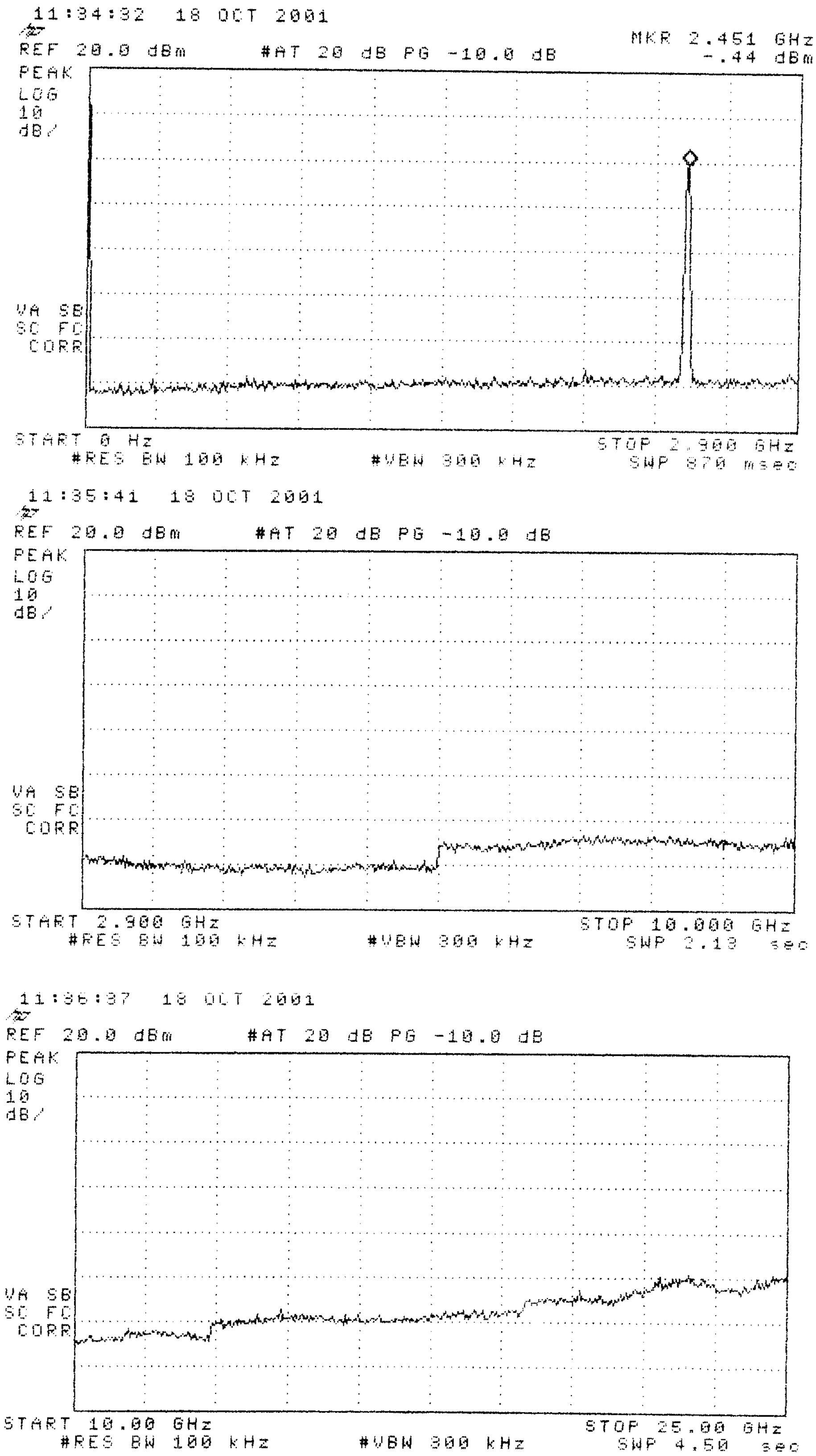


Figure 6.6 Antenna conducted spurious emissions, mid channel.

(16 mW AGC)

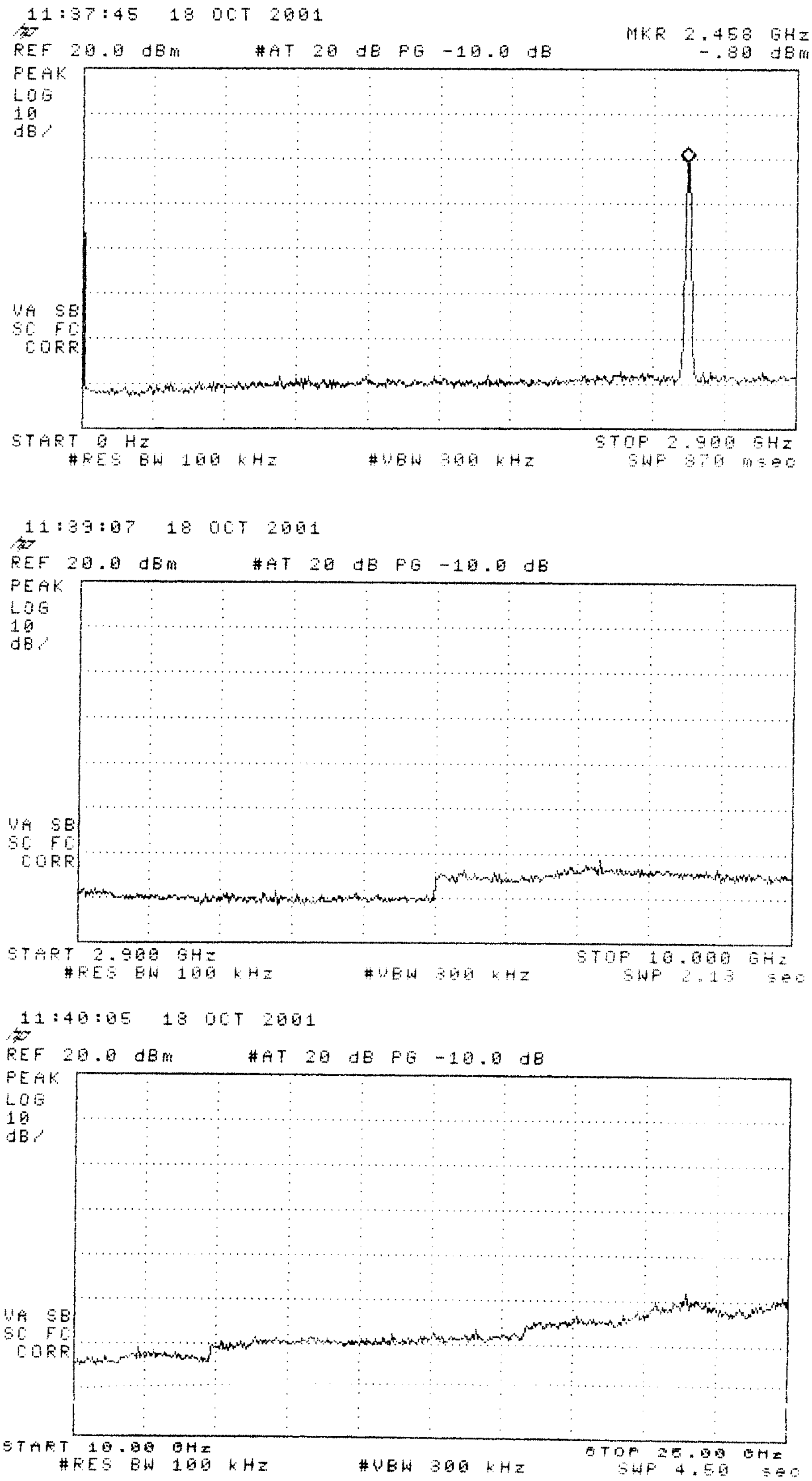


Figure 6.7 Antenna conducted spurious emissions, high channel.

(16 mW AGC)

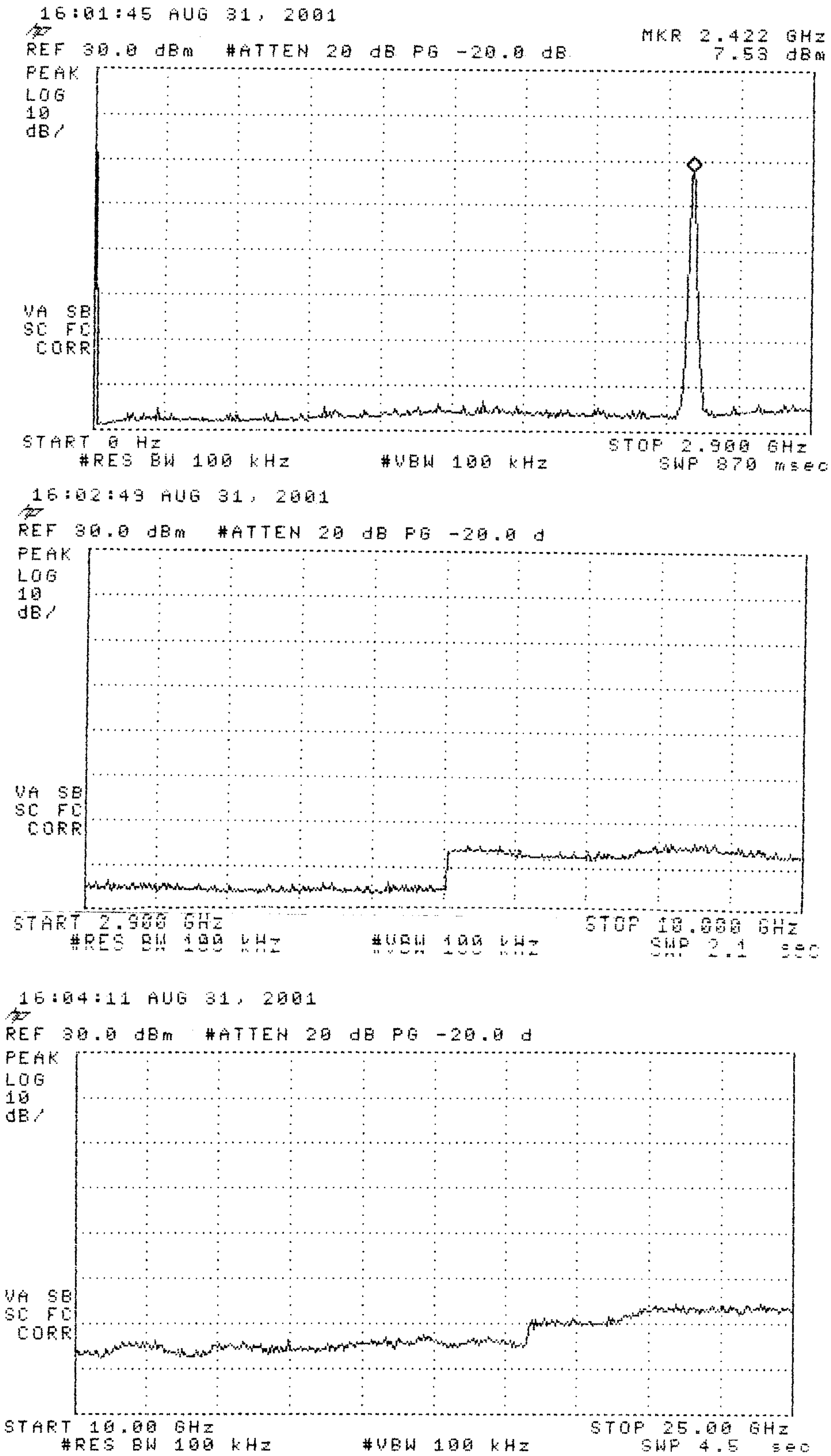


Figure 6.8 Antenna conducted spurious emissions, low channel.

(250 mW AGC)

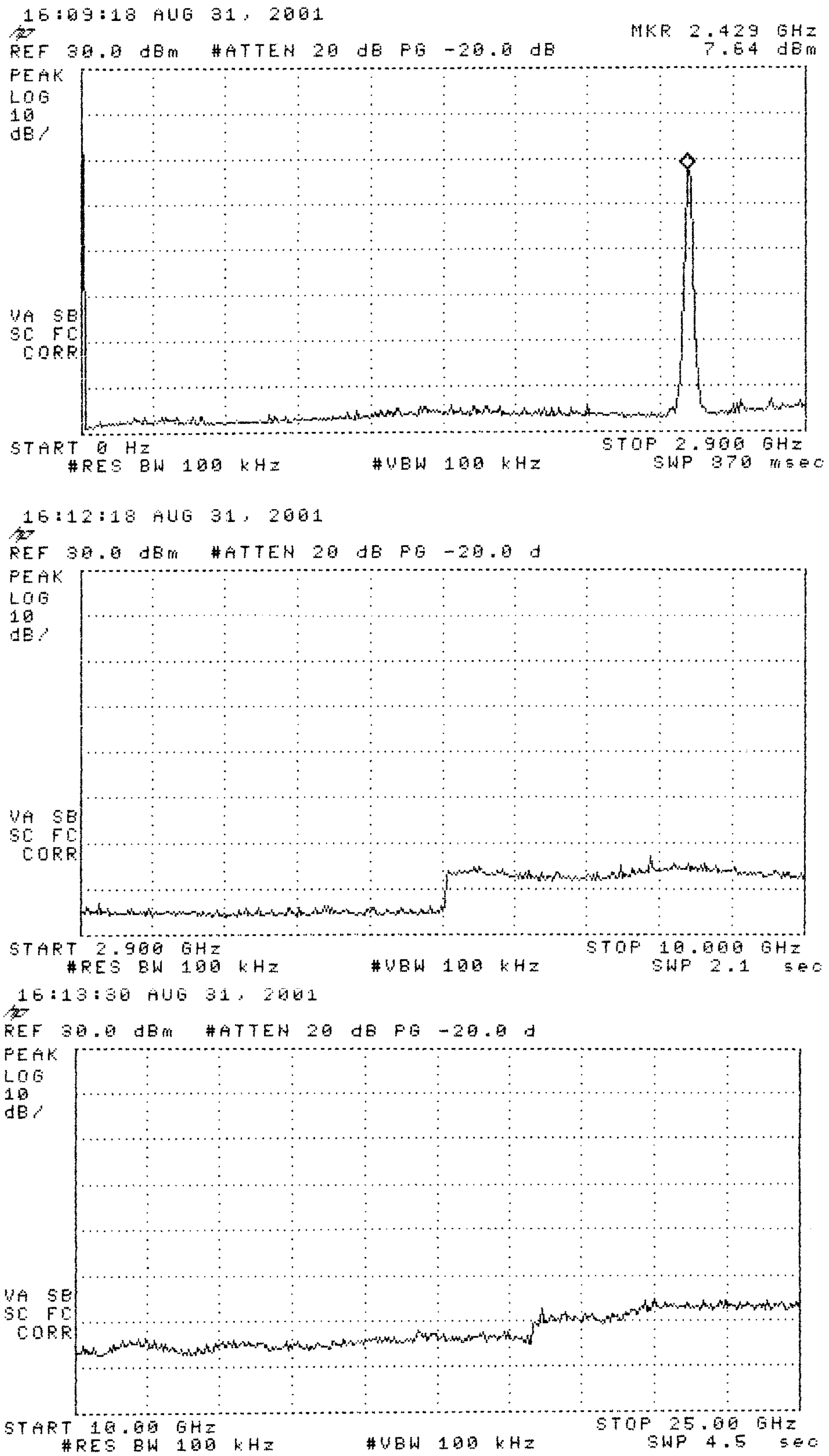


Figure 6.9 Antenna conducted spurious emissions, mid channel.

(250 mW AGC)

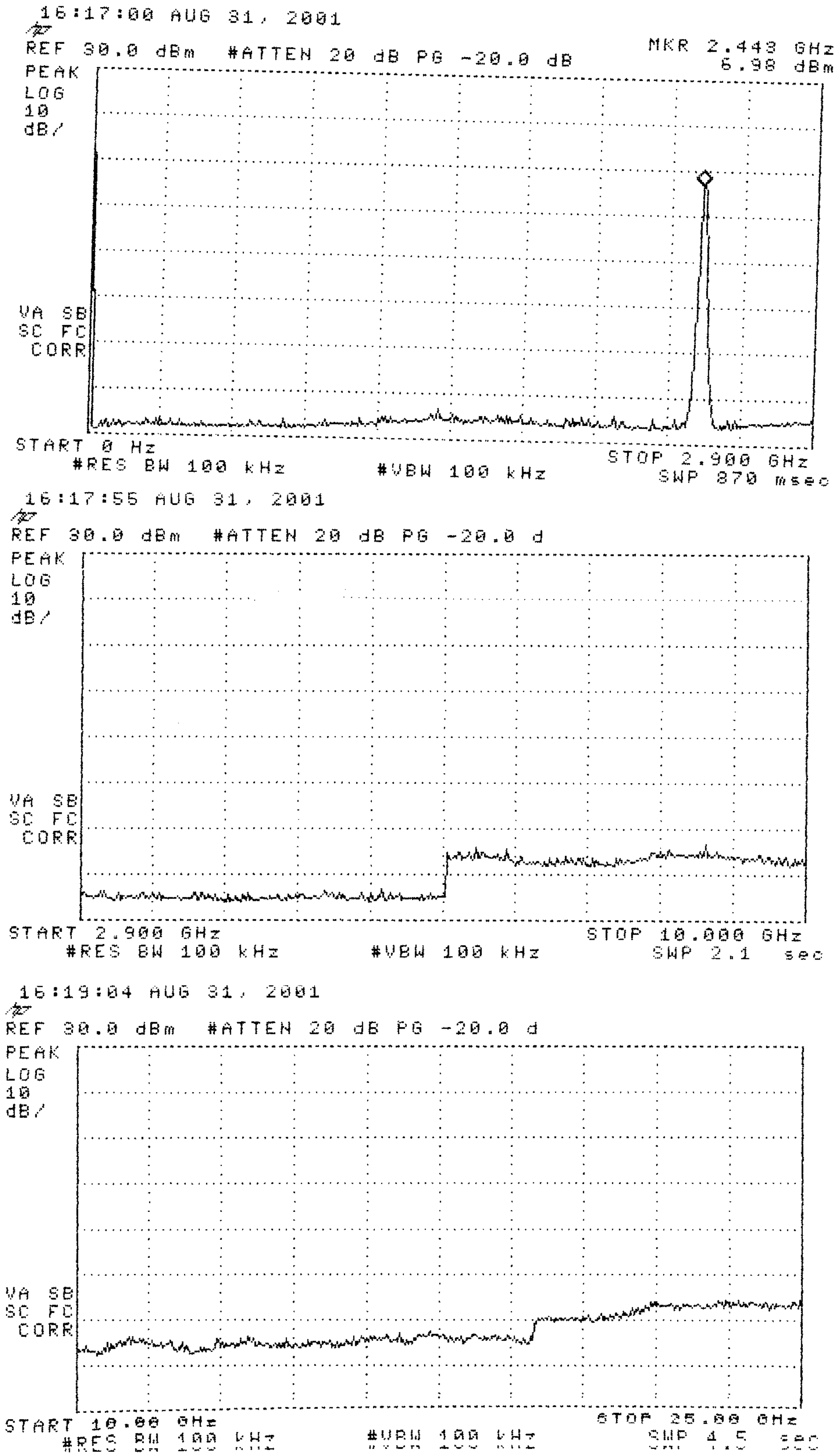


Figure 6.10 Antenna conducted spurious emissions, high channel.

(250 mW AGC)

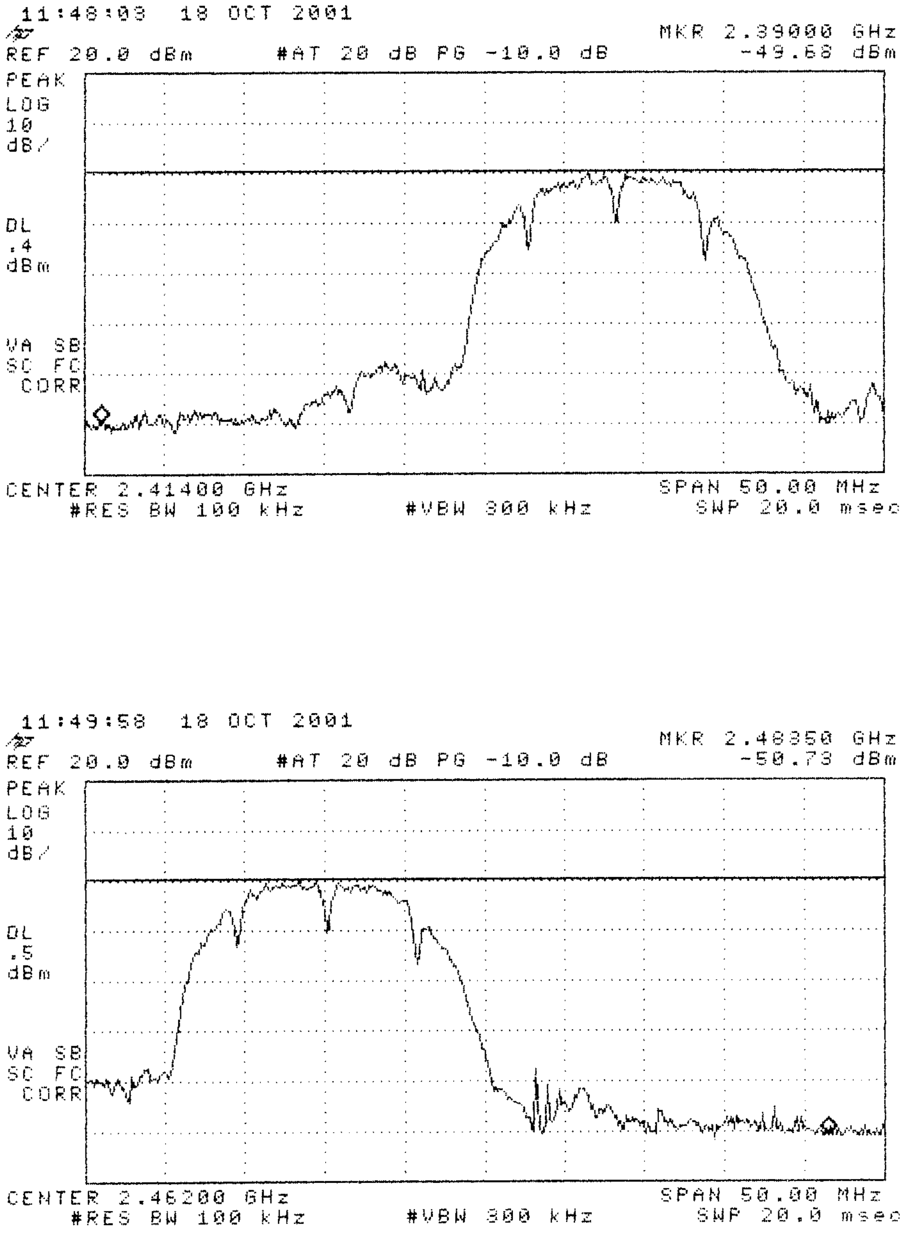
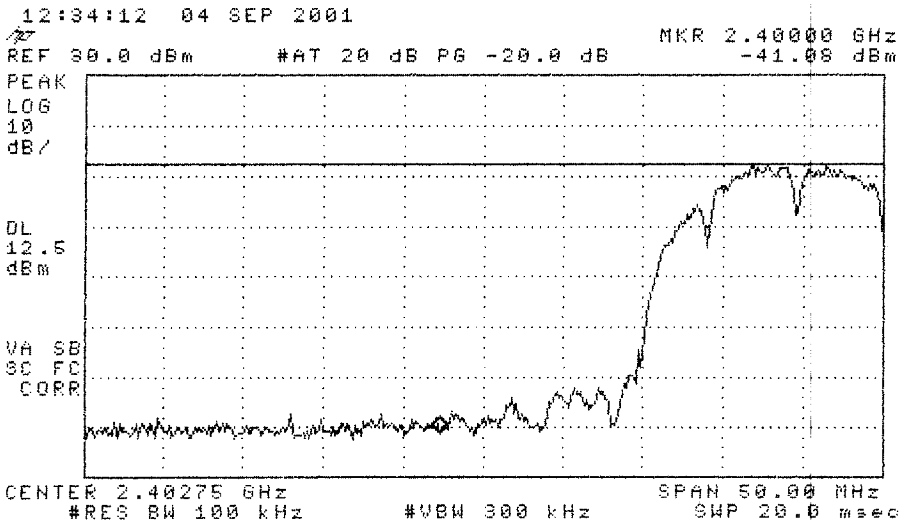


Figure 6.11 Band-edge behavior at low end and high end of the band (16 mW AGC).



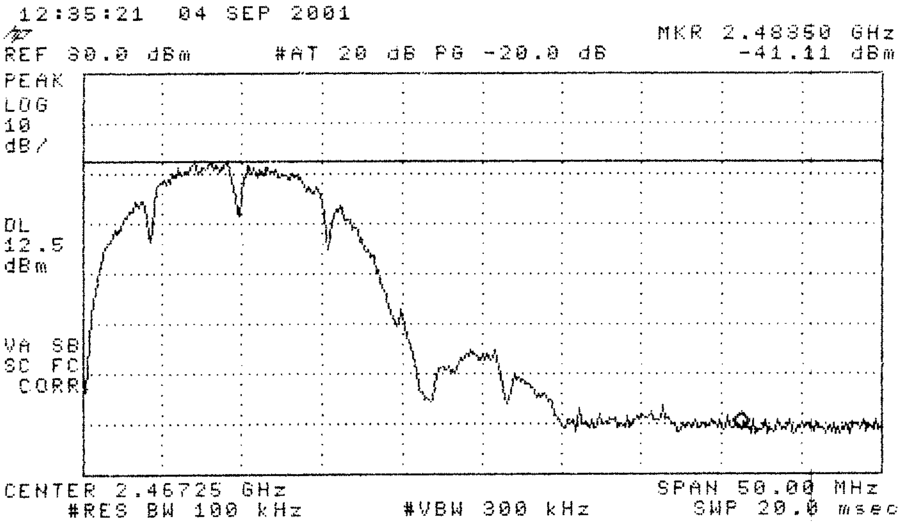


Figure 6.12 Band-edge behavior at low end and high end of the band (250 mW AGC).

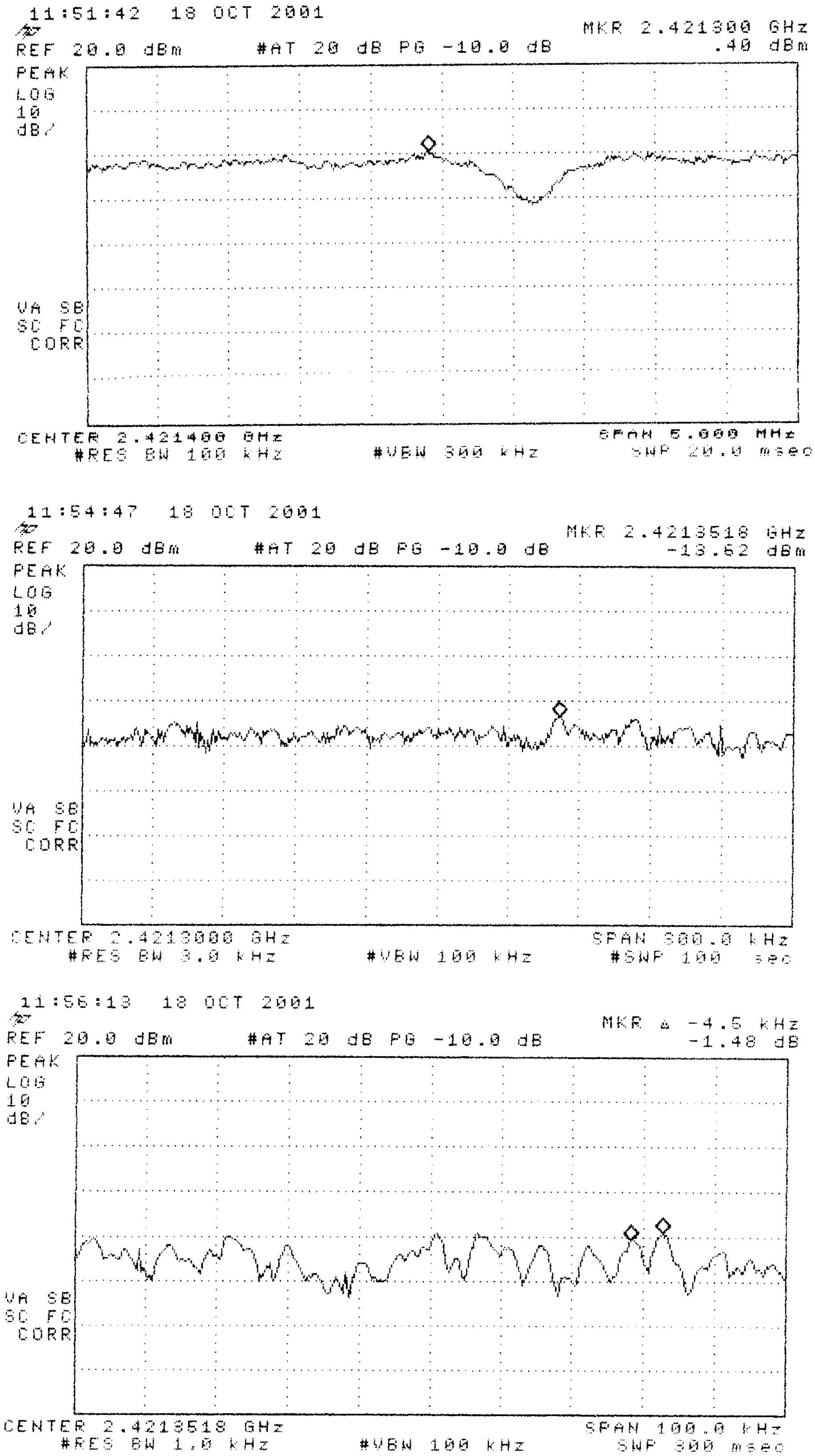


Figure 6.13 Spectral Density (low channel); (top) Spectrum Scan, (mid) Spectral Density, (bottom) Line Spacing. (16 mW AGC)

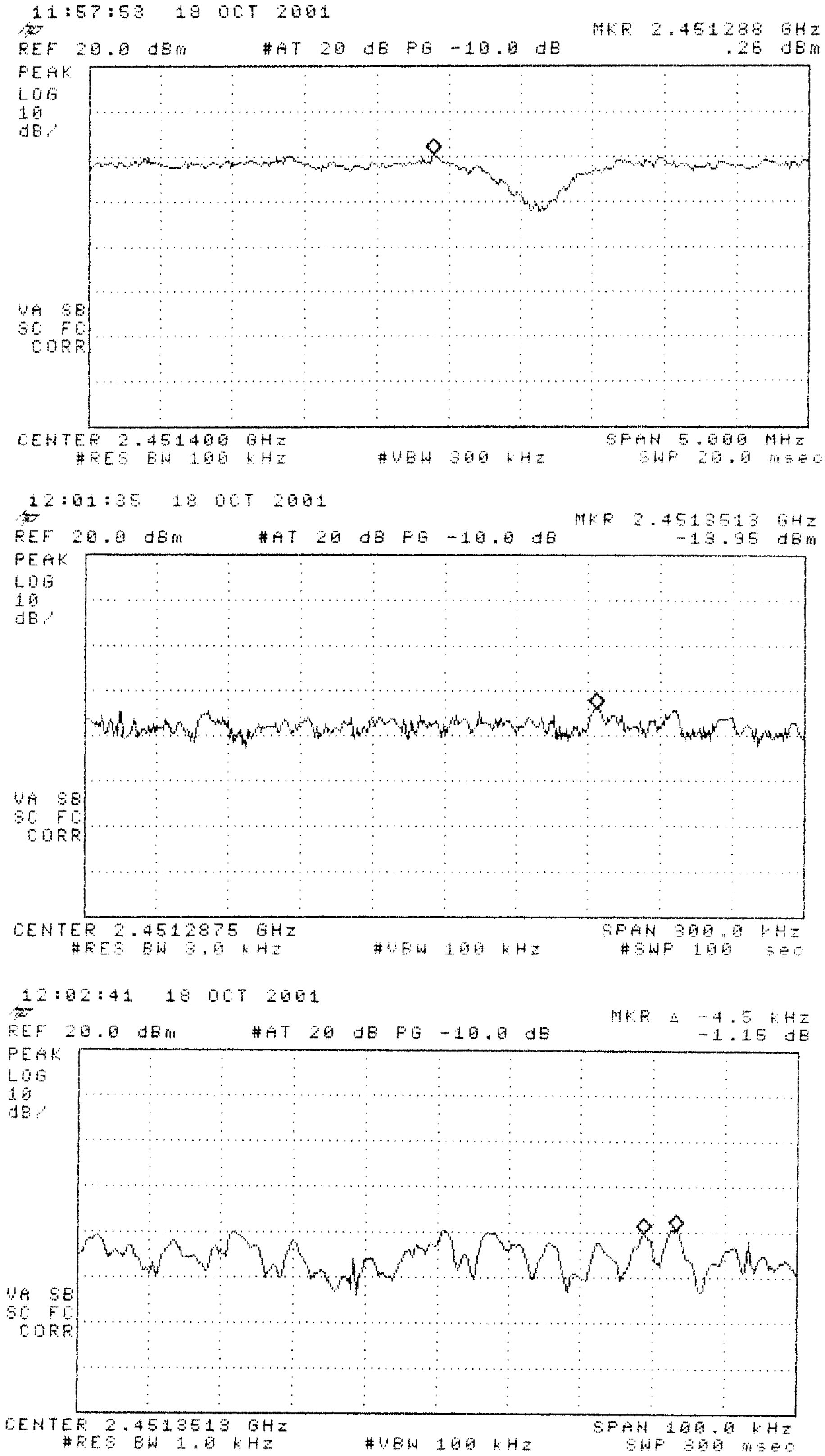


Figure 6.14 Spectral Density (high channel);(top) Spectrum Scan, (mid) Spectral Density, (bottom) Line Spacing. (16 mW AGC)

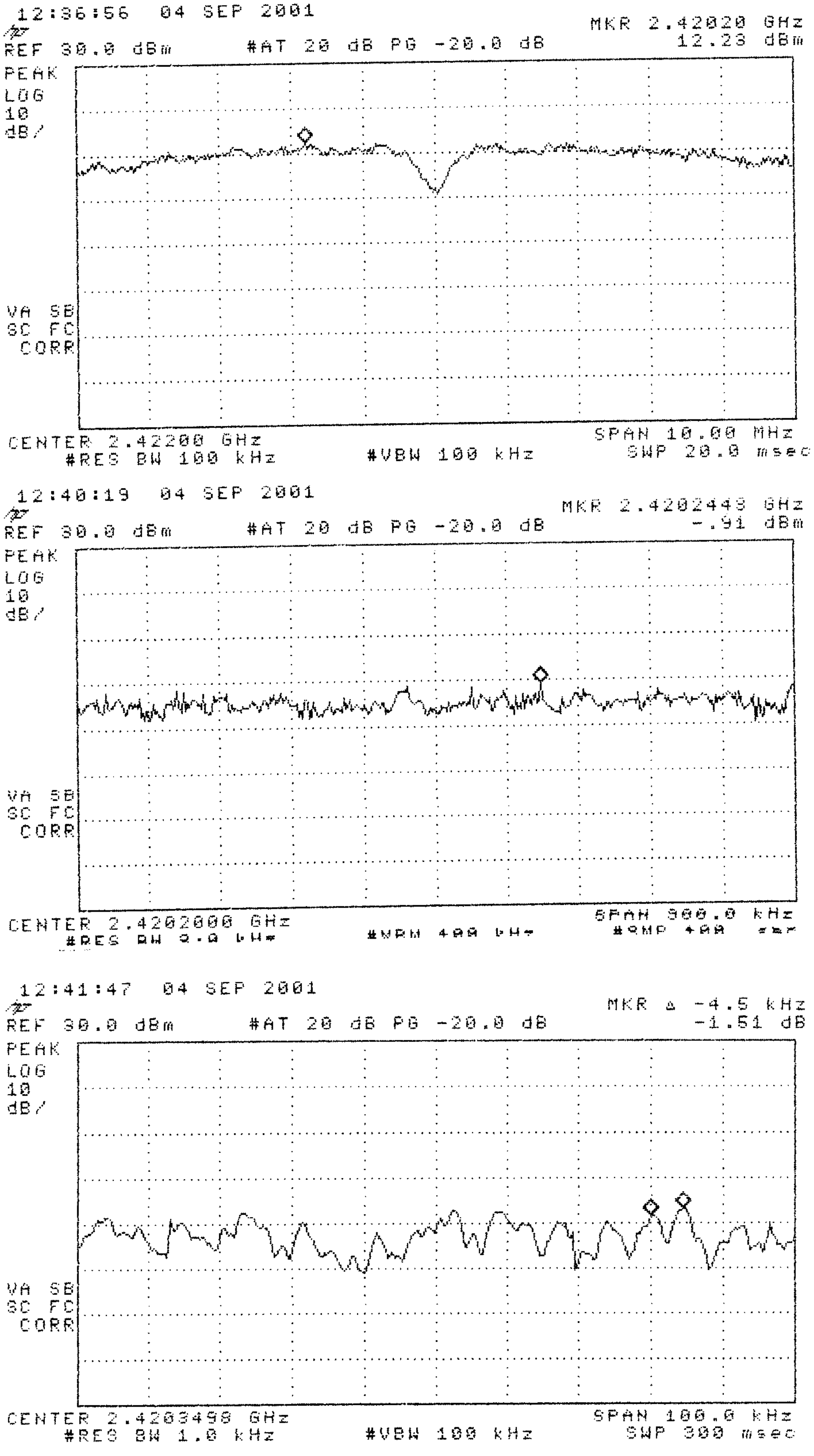


Figure 6.15 Spectral Density (low channel); (top) Spectrum Scan, (mid) Spectral Density, (bottom) Line Spacing. (250 mW AGC)

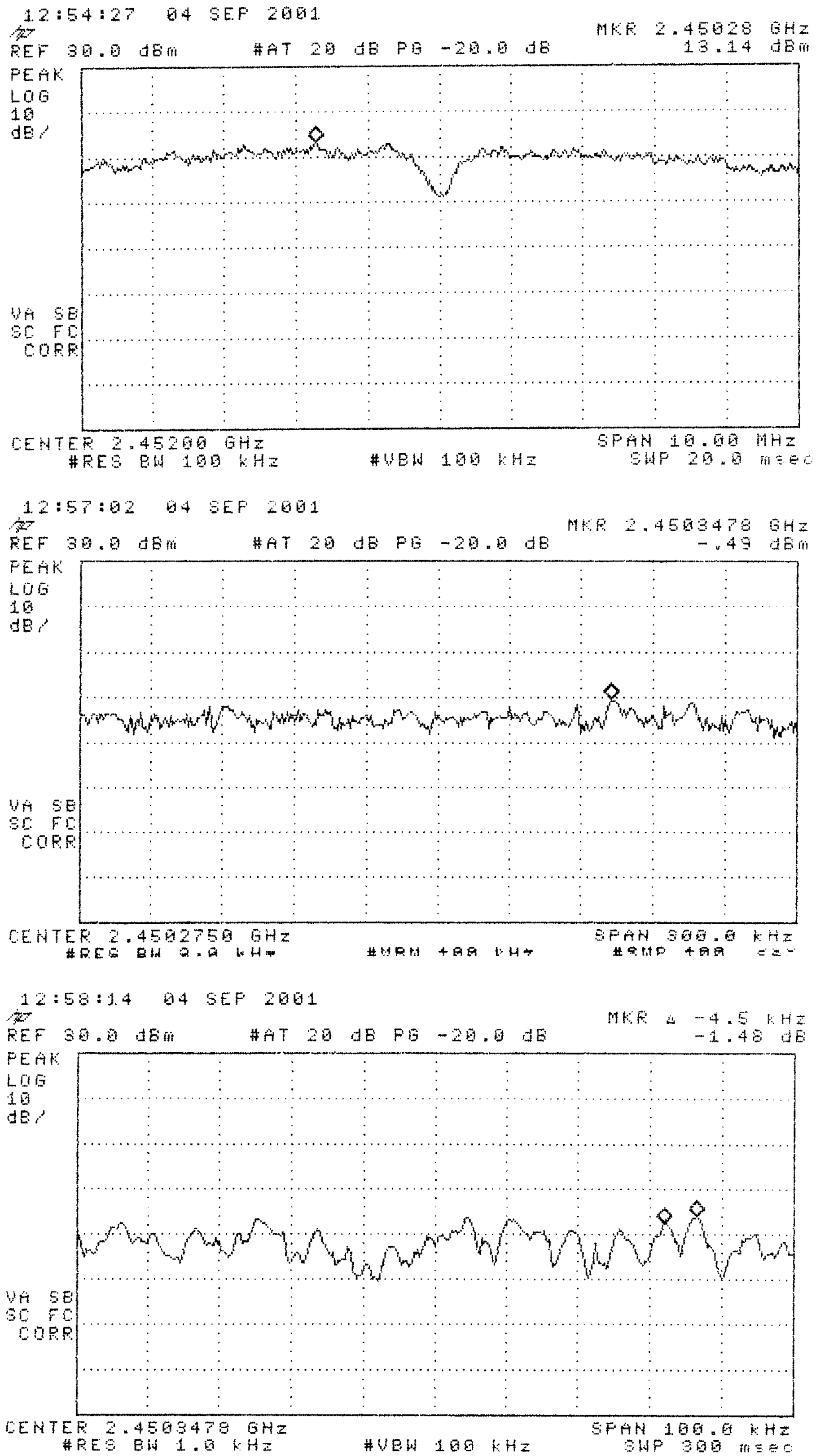


Figure 6.16 Spectral Density (high channel);(top) Spectrum Scan, (mid) Spectral Density, (bottom) Line Spacing. (250 mW AGC)