SUMMARY

The testing was performed under the provisions of ANSI C63.4/1992 and the OATS was calibrated in accordance with ANSI C63.4/1992.

The TV Interface Device, model number MAGNI-CAM, is hereafter referred to as the UUT. The UUT, with test setup as described in the block diagram of Appendix III, **PASSES** the radiated and conducted requirements, Output and Spurious conducted emissions and Transfer Switch Isolation tests of the FCC Part 15, Subpart B, Class B regulations, pp 15.115 governing TV Interface Device unintentional radiators. The radiated emissions which came closest to the limit are as follows, rounded to the nearest db:

FREQUENCY (MHz)	EMISSION LEVEL (dbμv/meter)	POLARIZATION	MARGIN(db)	TABLE Appendix I
143.03	26	Horizontal	-17.5	1
267	32	Horizontal	-14	1
286	36	Horizontal	-10	1
190.7	27	Vertical	-16.5	2
286	31	Vertical	-15	2
85.9	25	Horizontal	-15	3
85.9	24	Vertical	-16	4
40	20	Vertical	-20	5

For more details, see Appendix I, Tables 1 - 5. A negative margin means that the emissions are under the specified limit. All other emissions from Tables 1 - 5, not listed above, were further under the limit than what is listed in the table above.

The maximum, quasi-peak power line conducted emission, occurred on either conductor at 450 Khz and was 15 db down with respect to the Class B limit with the contrast control on the camera adjusted for maximum character density at the five modes of operation listed within this report. A 13 db relaxation in the quasi-peak level is allowed and was taken since the peak to average ratio at this frequency was more than 20 db. All other peak emissions were at least 10 db down from the quasi-peak limit for both conductors when either running in one of the five modes or charging the battery. See Appendix I, Graphs 6 - 11 for more details.

The Output and Spurious Conducted Emissions passed the requirements with at least 4 db of margin. The Transfer Switch isolation test showed there was 3.3 to 3.7 db of margin.

MODIFICATIONS DURING THE TEST

None

INFORMATION SUPPLIED TO THE USER

The manual contains the statement listed in Section 15.105 of the FCC rules for a Class B digital device as shown below under the title "Radio And Television Interference."

> ***NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*
>
> - *Reorient or relocate the receiving antenna.*
> - *Increase the separation between the equipment and receiver.*
> - *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
> - *Consult the dealer or an experienced radio/TV technician for help.*

On the same page, the user or instruction manual should contain the following cautionary statement or equivalent with regard to the user making unauthorized modifications to the equipment:

> ***CAUTION:** Changes or modifications not expressly approved or authorized by the manufacturer may violate the compliance of this equipment to the Class B limits for a digital device and could, thereby, void the users authority to operate the equipment.*

The label on the outside of the equipment enclosure contains the FCC ID and the following text:

> **FCC ID:** L64A00105
> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Innoventions Inc. shall maintain the records listed in Section 2.938 of the FCC rules.

1.0 SCOPE AND OBJECTIVE OF TEST

To determine the degree of compliance of products to the Federal Communications Commission Part 15 Subpart B Class B requirements which limit emissions of TV Interface Devices pursuant to pp 15.115 through the certification process.

2.0 UNIT TESTED

The Innoventions Inc. MAGNI-CAM TV Interface Device, manufactured by Innoventions Inc., 5921 Middlefield Road, Suite 102, Littleton, CO 80123, hereafter referred to as the UUT, is intended to be connected between an antenna, cable box or VCR and a Television set. The camera magnifies images as a reading aid and applies its baseband video signal to a ch.3/ch.4 RF modulator which outputs this signal to the TV or VCR. An external baseband video input signal can also be applied to the RF modulator. Refer to the block diagram in Appendix III for a description of the individual sub-assemblies which made up the test system. No modulated audio is placed on the modulator's audio carrier. The RF Modulator has a built in transfer switch. When the camera is turned off, the RF modulator is also turned off and the antenna "F" connector is directly connected to the modulator output "F" connector.

Key System Components are:

Panasonic BS7510 color video camera
TDK CXA-L10L DC-AC Power Supply Inverter
Sharp E7853 VHF channel 3/4 RF Modulator
Duracell DR36 smart re-chargeable battery

Based upon the above information, the applicable tests and limits are found in the FCC Rules sections:

15.115(a), 15.115(b)(1)(ii), 15.115(b)(2)(ii), 15.115(d), 15.107(a), 15.109(a).

3.0 FACILITY REQUIREMENTS

3.1 Site Attenuation

The radiated testing described herein was accomplished on the METRUM Inc. OATS which is located at 4800 E. Dry Creek Road, Littleton, Co 80122. This site meets the requirements of FCC 47 CFR rules, Section 2.948. Refer to FCC File # 31040/SIT/1300F2 for a detailed description of the site. The test area is free of reflecting objects in an area as defined in Figure 1.

3.2 Instrumentation

Measurements/Radiated (pp 4.xx):

Hewlett Packard 8568B Spectrum Analyzer, Control # 6003693/94/95, calibrated 3/7/98, calibration due 3/7/99.

Polarad ESV Receiver, Control # 6003594, calibrated 1/28/98, calibration due 1/28/99.

Ailtech 94455-1 Biconical Antenna, Control #6007717, Cal'd 6/11/98.

Ailtech 96005 Log Periodic Antenna, Control #6007716, Cal'd 6/11/98.

Avantek UTC 10-220-1, 25 db Preamp, Control #6009922, Calibrated 3/7/98, calibration due 3/7/99.

Power Line Conducted (pp 5.xx):

Hewlett Packard 8568B Spectrum Analyzer, Control # 6003693/94/95, calibrated 3/7/98, calibration due 3/7/99.

UUT LISNs, Solar 8028-50-TS-24-BNC, Control #s 6009941 & 6009942, calibrated 6/23/98, calibration due 6/23/99.

Simulator LISNs, Solar 8012-50-R-24-BNC, Control# 6009920, calibrated 3/7/98, calibration due 3/7/99.

HP 7550A Graphics Plotter, Asset # 313.030, No Calibration Required.

Output And Spurious Conducted (pp 6.xx):

Hewlett Packard 8568B Spectrum Analyzer, Control # 6003693/94/95, calibrated 3/7/98, calibration due 3/7/99.

HP 7550A Graphics Plotter, Asset # 313.030, No Calibration Required.

Transfer Switch Isolation Test (pp 7.xx):

Hewlett Packard 8568B Spectrum Analyzer, Control # 6003693/94/95, calibrated 3/7/98, calibration due 3/7/99.

Avantek UTC 10-220-1, 25 db Preamp, Control #6009922, Calibrated 3/7/98, calibration due 3/7/99.

Compliance Design P950 16 db Preamp, #281.058, Calibrated 5/5/98, Calibration Due 5/5/99.

4.0 RADIATED TEST PROCEDURE AND RESULTS

4.1 Procedure

4.1.1 Setup of equipment on the test site, for detailed measurements, was according to Figure 2, Appendix I. **The ANSI C63.4/1992 measurement procedure was followed in accordance with the guidelines of pp 12.2.1, 12.2.2 and 12.2.4 and pp 6.0 of MP-3.**

4.1.2 The UUT was set to Channel 3 since Denver has a Channel 4 television station and the spurious emissions during a preliminary survey did not appear to change significantly with either channel selected.

Investigate four UUT test mode configurations. 1. Camera Interface plugged into the charging base and powered from the AC Adapter. 2. Camera Interface separated from the charging base and powered from the AC adapter. 3. Camera Interface plugged into the charging base and powered from the battery. 4. Battery charging with camera turned off.

Configurations 1-3 above were investigated for five input modes: camera standard color mode input, normal video only; camera input, black and white, normal and reverse video; camera input, color enhanced, normal and reverse video; VITS 1 Volt input, Color Enhanced, normal and Reverse Video; VITS 5 volt input, Color enhanced, Normal and Reverse Video.

Configuration 4 was investigated with a VITS 1V and 5V input. There is no audio input option to this device.

During **Configurations 1 - 3,** scan black capital Hs on a white background.

4.1.3 All measurements were performed at 3 meters at the METRUM OATS. All cables were arranged in the typical configuration as described in ANSI C63.4/1992 with the antenna 1.5 meters high at the start. The antenna height was subsequently adjusted and the UUT rotated to maximize the emissions during the survey. A preliminary survey was performed with each antenna and polarization while tuning the ESV receiver in the CISPR mode in accordance with ANSI C63.4-1992, Appendix D procedure. A remote monitor at the turntable, fed from a camera which was fixed on the ESV receiver display, was viewed while adjusting the cable positions to maximize the emissions. The excess length of the interface cables were bundled so they hung no closer than 40 cm to the ground plane.

4.1.4 At the conclusion of the preliminary survey for each antenna/polarization combination, the cable positions were re - tweaked to maximize the emission at the frequency having the highest emission during the survey. The final position of the interface cables was recorded with a photograph. The detailed measurements were then performed for that polarization/antenna combination before going on to the next one. The maximum field strength at each significant frequency found was recorded with the height of the antennas remotely and automatically varied between 1 and 4 meters off the ground plane. The orientation of the UUT which produced the maximum field strength was obtained by remotely rotating an automatic turntable and recording the angle as indicated in Tables 1 - 4. Only the frequencies which produced the highest emissions are reported.

UUT orientation in Tables 1 & 2 is defined as follows:

FRONT
0

LEFT 90 270 RIGHT

180
BACK

4.1.5 During Configurations 1-4 test, perform pp 4.1.3 & 4.1.4 in the following order for each frequency band and polarization combination while varying the modes:

1. 30 - 200 MHz, Horizontal Polarization
2. 30 - 200 MHz, Vertical Polarization
3. 200 MHz - 1 GHz, Vertical Polarization
4. 200 MHz - 1 GHz, Horizontal Polarization

4.1.6 The specified limit is defined as follows:

Quasi peak detection

Separation (Meters) is 3.

30-88MHz	40 dbμV/m
88-216MHz	43.5 dbμV/m
216-960MHz	46 dbμV/m
above 960 MHz	54 dbμv/m

4.1.8 The radiated signal level, in dbμV vs. frequencies found, was determined from the correction factors found in Appendix II. The receiver reads directly in dbμV.

Emission level = ESV Receiver reading (dbμV) + antenna factor + cable loss - Preamp Gain.

4.1.9 Calculation

As an example in Table 1 of Appendix I, the 26 dbμV/m level at 247.9 MHz was calculated using the formula in paragraph 4.1.5. From Appendix II, the antenna factor is 12 db. From Appendix II, the cable loss is 4 db. The receiver reading was 35 dbμV. The preamp gain is 25 db.

Emission Level(247.9 MHz) = 35 + 12 + 4 - 25 = 26 dbμV/m.

There were no other factors involved such as external attenuators which would modify the calculations. The internal RF attenuation of the receiver was kept at 10 db minimum, but the receiver reading takes this into account so it does not enter into the calculation.

4.2 Results

Preliminary tests showed no significant difference in emissions when operating the UUT in Configurations 1 - 3 with the camera as the source (Modes 1 - 3). Therefore Configuration 1 was chosen with normal video & max contrast (Mode 3) for the first set of representative detailed measurements (Results1). For the second set of detailed measurements, Configuration 1 was chosen with a VITS 5 volt input (Color Enhanced, normal video, max contrast), since it produced the next highest level of emissions, even though the emissions were significantly reduced when the VITS was the video source for the internal RF modulator (Results2). The preliminary survey during the Mode 4 configuration testing showed that the system was noisy only below 50 MHz, so only those additional emissions are reported in the Third Emissions Test (Results3).

See Appendix I, Tables 1 - 5 and GRAPHS I - V.

Table 1/Graph 1: Results1, Horizontal Polarization.
Table 2/Graph 2: Results1, Vertical Polarization.
Table 3/Graph 3: Results2, Horizontal Polarization.
Table 4/Graph 4: Results2, Vertical Polarization.
Table 5/Graph 5: Results3, Vertical Polarization

No measurable emissions were detected when running Test 4 in the horizontally polarized mode.

The final cable configurations during the Results1 test configuration were as indicated in Appendix III, Photos 4-7 as follows:

Photo 4, 143.03 MHz, Horizontal Polarization.
Photo 5, 190.7 MHz, Vertical Polarization.
Photo 6, 286 MHz, Horizontal Polarization.
Photo 7, 286 MHz, Vertical Polarization.

The final cable configurations during the Results2 test is as shown in Appendix III, Photos 8 - 11 as follows:

Photo 8, 85.9 MHz, Horizontal Polarization.
Photo 9, 85.9 MHz, Vertical Polarization.
Photo 10, 267 MHz, Horizontal Polarization.
Photo 11, 267 MHz, Vertical Polarization.

The cables were tweaked at 40 MHz during the Results3 test.

Photograph 12 shows the VITS Generator and Video Amp off to the side of the OATS.

The temperature at the time the final radiated measurements were taken was around 87 °F.

5.0 POWER LINE CONDUCTED EMISSION TEST PROCEDURE AND RESULTS

5.1 Test Equipment Set-up

5.1.1 The conducted noise was measured using the LISN circuit defined in ANSI C63.4/1992 and in accordance with the ANSI C63.4/1992 12.2.1 - 12.2.3 measurement procedure and MP-3 pp 6.0. The circuits are as shown in Figures 3 - 5. The UUT was connected to the UUT LISNs. The rest of the test system equipment was connected to a separate pair of LISNs called the simulator LISNs. 120 VAC/60 Hz was applied to the LISNs.

5.1.2 The UUT and simulators were placed on the 80 cm. table, inside the shielded room. Both sets of LISNs are connected to the ground plane. The photographs of the setup for power line conducted tests are shown in Appendix III, 12 -14.

5.2 Data Measurement Scan

5.2.1 A scan of the applicable frequency range with the 8568B spectrum analyzer was made to identify the frequencies and levels. The output of the UUT LISN which was wired to the hot side of the line was connected to input 2 on the 8568B analyzer. The signal output of the unused LISN was terminated into 50 ohms. S1 was closed in Figure 4. The signal outputs of both simulator LISNs were terminated into 50 ohms.

Analyzer Set-up

SWEEP	FREQUENCY RANGE	SYSTEM(*) BANDWIDTH	VIDEO/RESOLUTION(**) BANDWIDTH
30 Sec.	450 Khz - 30 MHz	9 Khz	100KHz

* Includes HP85650 quasi peak adapter IF bandwidth.
** 8568B analyzer resolution bandwidth

5.2.2 The RF voltage in dbuv was plotted with the 8568B analyzer in the peak mode over the entire frequency range. The specified quasi-peak limit is 48 dbμv from 450 Khz to 30 MHz.

5.2.3 5.2.1 and 5.2.2 were performed with the UUT operating as indicated in pp 4.1.2. All mode combinations were tested as described in the radiated procedure and results.

5.2.4 Paragraphs 5.2.1 - 5.2.3 were repeated with the analyzer connected to the neutral LISN.

PROCEDURE (cont)

5.2.5 If the quasi-peak level exceeds the 48 dbμV limit, measure the "average" level with the ESH2 receiver. If the level drops at least 13 db, then reduce the quasi-peak reading by 13 db.

5.3 Results

See Appendix I, Graphs 6 - 11. These graphs represent the worst case emissions from all the possible combinations of camera and VITS inputs with all the color and black and white modes with normal and reverse video and contrast adjustments. The **quasi-peak and average emissions** of the UUT at 450 Khz were as follows:

GRAPH #	Quasi-Peak (db)	Average (db)
6	47	21
7	47	21
8	44	19
9	44	19
10	43	18
11	43	18

Therefore the quasi-peak level may be reduced by 13 db, placing the level at least 14 db under the limit in all the graphs. All other peak emissions in all graphs had at least 10 db of margin with respect to the quasi-peak limit.

It did not make any difference when channel 3 or channel 4 were selected, so channel 3 was selected for the purposes of testing.

The Header Code in the Graphs is as follows:

H stands for the Hot Conductor
N stands for the Neutral Conductor
ON UUT running on the AC Adapter with Battery Charger Attached.
B stands for battery charging mode.
Mode 1 Normal Color, Normal Video (Contrast is not adjustable)
Mode 2 Black and White, Max Contrast, Reverse Video
Mode 3 Color Enhanced, Max Contrast, Normal Video
Mode 4 VITS 1V P-P, Color Enhanced, Normal Video, Max Contrast
Mode 5 VITS 5V P-P, Color Enhanced, Normal Video, Max Contrast

See Photos 12 - 14 of Appendix III for the placement of the UUT and cables during the conducted tests.

6.0 OUTPUT AND SPURIOUS CONDUCTED EMISSIONS

6.1 PROCEDURE

6.1.1 The guidelines of FCC Test Procedure MP-3 pp 5.0, 5.1 & 5.2 were followed with help from the ANSI C63.4-1992 pp 12.2.5 except the measurements were performed inside the shielded room to eliminate all background emissions.

6.1.2 Setup of the UUT (Appendix III) test configuration was according to Photo 12 in Appendix III. The components and cables were placed on the 80 cm. high table and moved to at least 80 cm. from all conductive walls.

6.1.3 The maximum amplitude of the video carrier, audio carrier and spurious emissions over a frequency range of 30 MHz - 1 GHz were plotted using the 8568B Spectrum Analyzer with the RF output of the UUT set to CH.3 and then CH.4. The camera contrast control was adjusted to provide a maximum video carrier, audio carrier or video sideband amplitudes during the spurious measurements.

6.1.4 The 8568B analyzer was configured to read in dbμV. The specifications are defined as follows and are in accordance with paragraphs 15.115(b)(1)(ii) and 15.115(b)(2)(ii). These values have been rounded to the nearest 0.1 dbμV and are based on a 75 ohm system.

Maximum Video Carrier Amplitude: 69.5 dbμV
Maximum Audio Carrier Amplitude: 56.5 dbμV
Maximum Spurious Amplitude: 39.6 dbμV

6.1.5 **Sample calculation to find the corrected reading.** Refer to Graph 12. The marker is at 58.8 dbμV which indicates the uncorrected 61.244 MHz video carrier emission level.

Corrected Level (dbμVrms) = Analyzer Reading(Raw-db) + 6 db (50/75Ω pad) + Cable Loss* (db)

Corrected Level (61.286 MHz) = 58.8 + 6 + .5 = 65.3 dbμVrms

Margin is therefore - 4.2 db. with respect to the limit.

* measured at the video carrier frequency)

A negative margin means the emission is under the limit.

6.2 RESULTS

All measured levels were under the specified limits. Please refer to Appendix I, Graphs 12 - 23. Table 6.2 shows the correction factors and corrected readings for these graphs. Photographs 15-16 in Appendix III show the typical arrangement of the components during this set of measurements. Although a full set of measurements were made on channel 3 and channel 4 for each mode, only the mode which produced the maximum level has been included in the graphs. Modes are as defined in pp 5.3 or pp 7.3.1.2.

Key to Graph Symbols:

VID Video Carrier Amplitude
AUD Audio Carrier Amplitude
SPUR Spurious Emissions Amplitude
Mode 1 Normal Color, Normal Video, Fixed Contrast
Mode 2 Black and White, Max Contrast, Reverse Video
Mode 3 Color Enhanced, Max Contrast, Normal Video
Mode 4 VITS 1V P-P, Color Enhanced, Normal Video, Max Contrast
Mode 5 VITS 5V P-P, Color Enhanced, Normal Video, Max Contrast

Graph 12: CH.3 Video Carrier Amplitude, 61.244 MHz. Mode 1
Graph 13: CH.3 Audio Carrier Amplitude, 65.740 MHz, Mode 1
Graph 14: CH.3 Spurious Emissions, 30 - 56 MHz, Mode 5
Graph 15: CH.3 Video Carrier Out showing out of band rolloff 4.6 MHz below the video carrier frequency. Mode 3
Graph 16: CH.3 Video Carrier Out showing out of band rolloff 7.4 MHz above the video carrier frequency. Mode 2
Graph 17: CH.3 Spurious Emissions, 68.6 MHz - 1 GHz, Mode 1
Graph 18: CH.4 Video Carrier Amplitude, 67.248 MHz, Mode 1
Graph 19: CH.4 Audio Carrier Amplitude, 71.750 MHz, Mode 5
Graph 20: CH.4 Spurious Emissions, 30 - 62 MHz, Mode 2
Graph 21: CH.4 Video Carrier Out showing out of band rolloff 4.6 MHz below the video carrier frequency, Mode 3.
Graph 22: CH.4 Video Carrier Out showing out of band rolloff 7.4 MHz above the video carrier frequency, Mode 2.
Graph 23: CH.4 Spurious Emissions, 75 MHz - 1 GHz, Mode 5.

TABLE 6.2
Corrections to Analyzer Graphs Readings

GRAPH #	FREQ (MHz)	Cable Loss (db)	75/50 Pad Loss (db)	Readings (db) Raw	Corrected	Spec. Margin (db)
12	61.244	.5	6	58.8	65.3	-4.2
13	65.740	.5	6	44.8	51.3	-5.2
14	34.06	.3	6	26.6	32.9	-6.7
15	56.642	.5	6	26.4	32.9	-6.7
16	68.64	.5	6	24.3	30.8	-8.8
17	909.7	2.5	6	27.2	35.7	-3.9
18	67.248	.6	6	58.2	64.8	-4.7
19	71.75	.7	6	43.6	50.3	-6.2
20	49.55	.5	6	26.4	32.9	-6.7
21	62.648	.6	6	27.5	34.1	-5.5
22	74.648	.7	6	24.8	31.5	-8.1
23	938.9	2.7	6	26.5	35.2	-4.4

7.0 Transfer Switch Isolation Test

7.1 SCOPE AND OBJECTIVE OF TEST

To determine the suitability of the RF Modulator transfer switch to provide the isolation required pursuant to section 15.115c(1)ii of Chapter 47 of the FCC Code of Federal Regulations. In this case. since it is a 75Ω system, the maximum signal level at the antenna "F" Jack, with the camera turned on and the battery charging (two different modes) is 3 μVrms from 30 MHz to 1 GHz.

7.2 UNIT TESTED

Part of Sharp E7853 Commercial RF Modulator

7.3 TEST PROCEDURE AND RESULTS

7.3.1 PROCEDURE

7.3.1.2 The Channel 3 RF output from the UUT was terminated into 75Ω. The camera was powered from the AC adapter and was outputting Hs to the RF modulator for Modes 1 - 3. The RF modulator antenna terminal was connected to the spectrum analyzer through the 6 db pad, cables and preamps as shown in Block Diagram 3 of Appendix III. Test the five modes as follows with the contrast adjusted for maximum contrast:

Mode 1 Normal Color, Normal Video, Fixed Contrast
Mode 2 Black and White, Max Contrast, Reverse Video
Mode 3 Color Enhanced, Max Contrast, Normal Video
Mode 4 VITS 1V P-P, Color Enhanced, Normal Video*
Mode 5 VITS 5V P-P, Color Enhanced, Normal Video*
* Max Contrast

Black Hs on a white background were used. The noise level from 30 MHz to 1 GHz was plotted at the terminal which would normally be connected to an antenna or cable box.

7.3.1.3 PP 7.3.1.2 was repeated with the UUT Channel 4 output selected.

7.3.1.4 Check the isolation as in pp 7.3.1.2 & 7.3.1.3 with the camera running from the battery source.

7.3.1.5 Check the isolation as in pp 7.3.1.2 & 7.3.1.3 with the battery charger charging the battery and the VITS 1 & 5 volt inputs.

7.3.2 RESULTS

See Photographs 17 - 18 of Appendix III for two views of the test setup.

Refer to Graphs 24 - 27, Appendix I for the maximum signal levels attained during the test as follows:

GRAPH 24: AC Camera Power, Channel 3 RF Output, Mode 2
GRAPH 25: AC Camera Power, Channel 4 RF Output, Mode 2
GRAPH 26: Running on Battery, Channel 3 RF Output, Mode 5
GRAPH 27: Running on Battery, Channel 4 RF Output, Mode 2

Key to Graph Symbols:

AC Running on the AC Adapter
B Running on the re-chargeable battery
C3 Channel 3 output selected
C4 Channel 4 output selected
Mode 1 Normal Color, Normal Video (Contrast not adjustable)
Mode 2 Black and White, Max Contrast, Reverse Video
Mode 3 Color Enhanced, Max Contrast, Normal Video
Mode 4 VITS 1V P-P, Color Enhanced, Normal Video*
Mode 5 VITS 5V P-P, Color Enhanced, Normal Video*
* Max Contrast

With the VITS input, the noise was the same no matter what the color mode, normal or reverse video or black and white options selected with the contrast set to maximum.

Maximum level on each graph was calculated as follows:

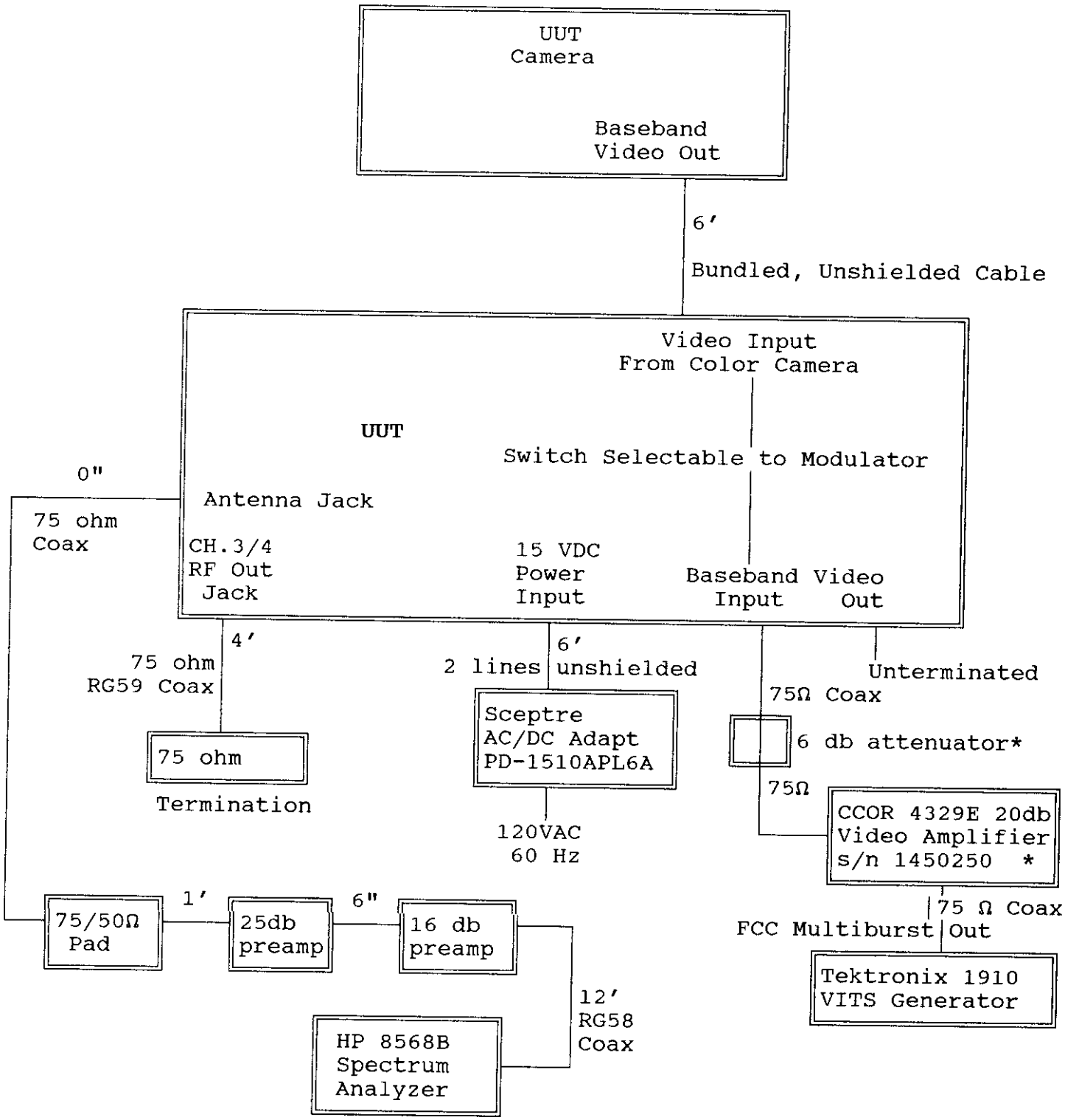
Analyzer reading (db) - Preamps Gain (db) + 75/50Ω Pad Attenuation (db) + Cable Loss (db) = Corrected Reading (db).

TABLE 7.3.2

GRAPH #	FREQ (MHz)	Analyzer Reading (dbμV)	Preamps Gain (db)	Cable Loss (db)	75/50Ω Pad Loss (db)	Corrected Level dbμV*
24	366.6	40.6	41.4	1	6	.2
25	402.5	40.1	41.4	1.1	6	5.8
26	366.6	40.2	41.4	1	6	5.8
27	402.5	40.3	41.4	1.1	6	.0

* specification is 3 μVrms or 9.5 db, so spec is met with 3.3 or more db of margin.

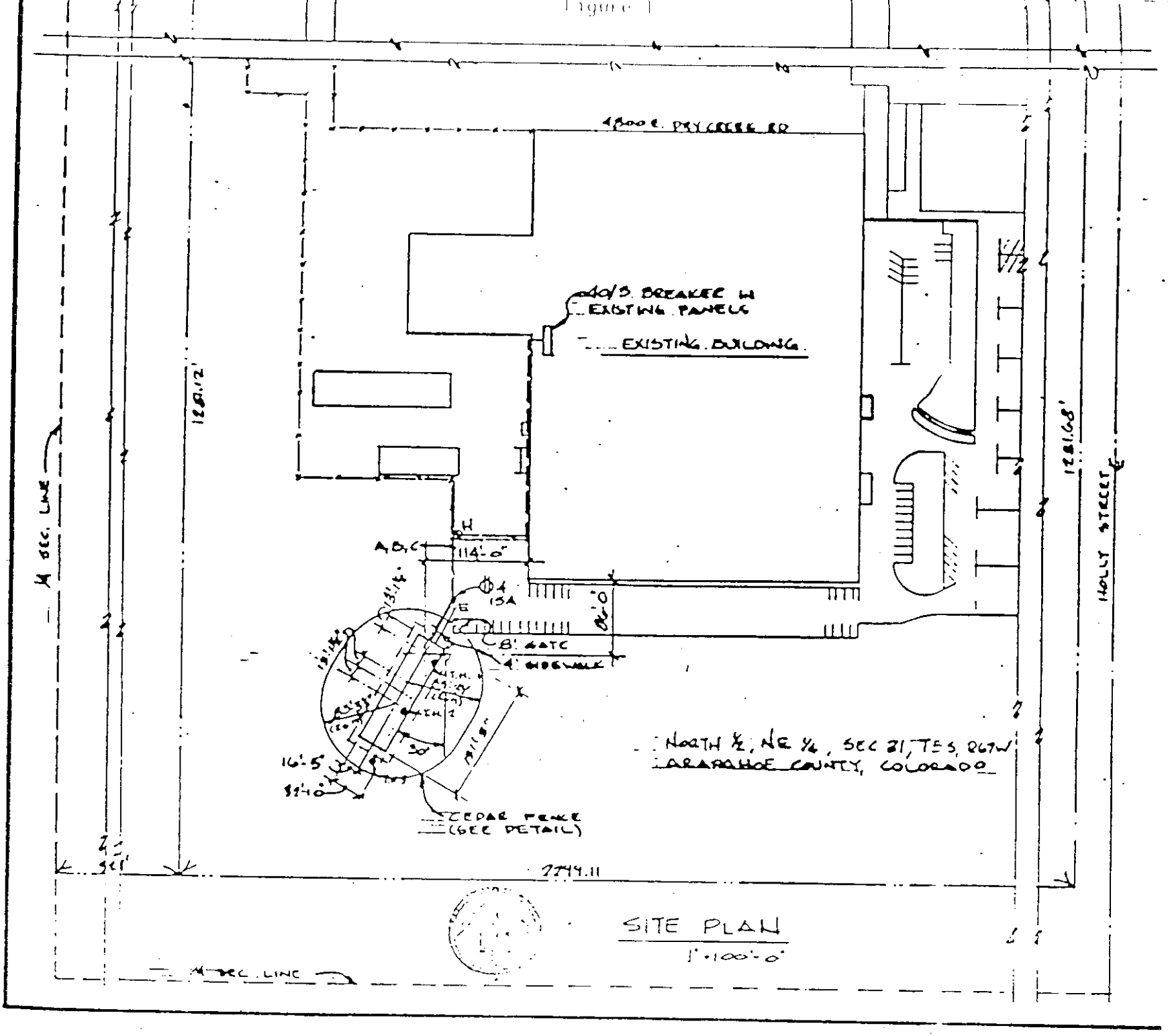
TRANSFER SWITCH ISOLATION TEST BLOCK DIAGRAM



* These components inserted when a 5 V P-P VITS signal was required. Otherwise the Tektronix 1910 Output was connected directly to the UUT when a 1 V P-P signal was needed.

FCC ID: L64A00105

Appendix I


4800 E. PRY CREEK RD
400/3 BREAKER IN EXISTING PANELS
EXISTING BUILDING
128.12'
SEC. LINE
H
A,B,C
114'-0"
4
15A
E
8' GATE
4' SIDEWALK
16'-5"
9'-4"
CEDAR FENCE (SEE DETAIL)
1249.11
128.68'
HOLLY STREET
NORTH ½, NE ¼, SEC 21, T5S, R67W
ARAPAHOE COUNTY, COLORADO
SITE PLAN
1"=100'-0"

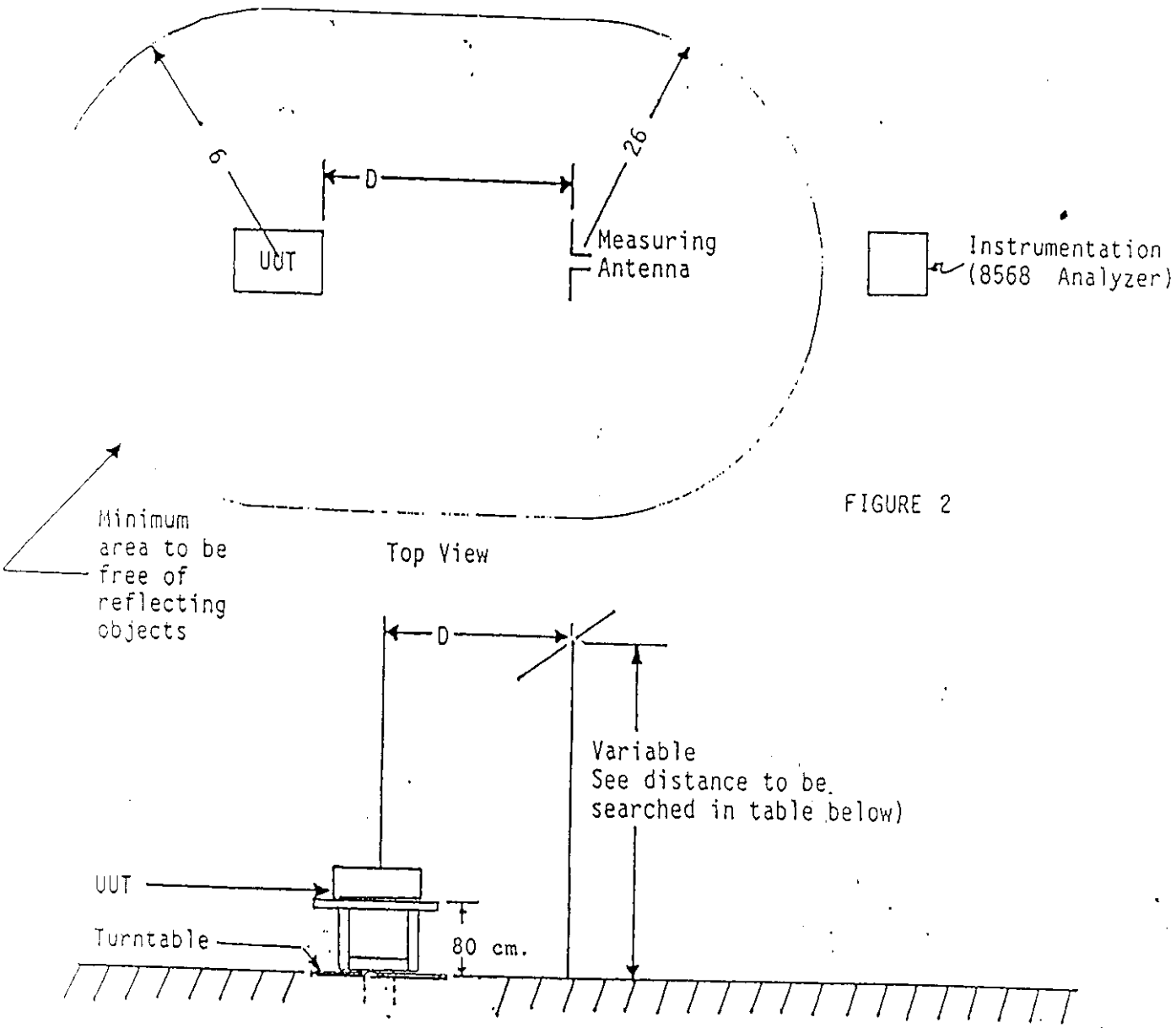
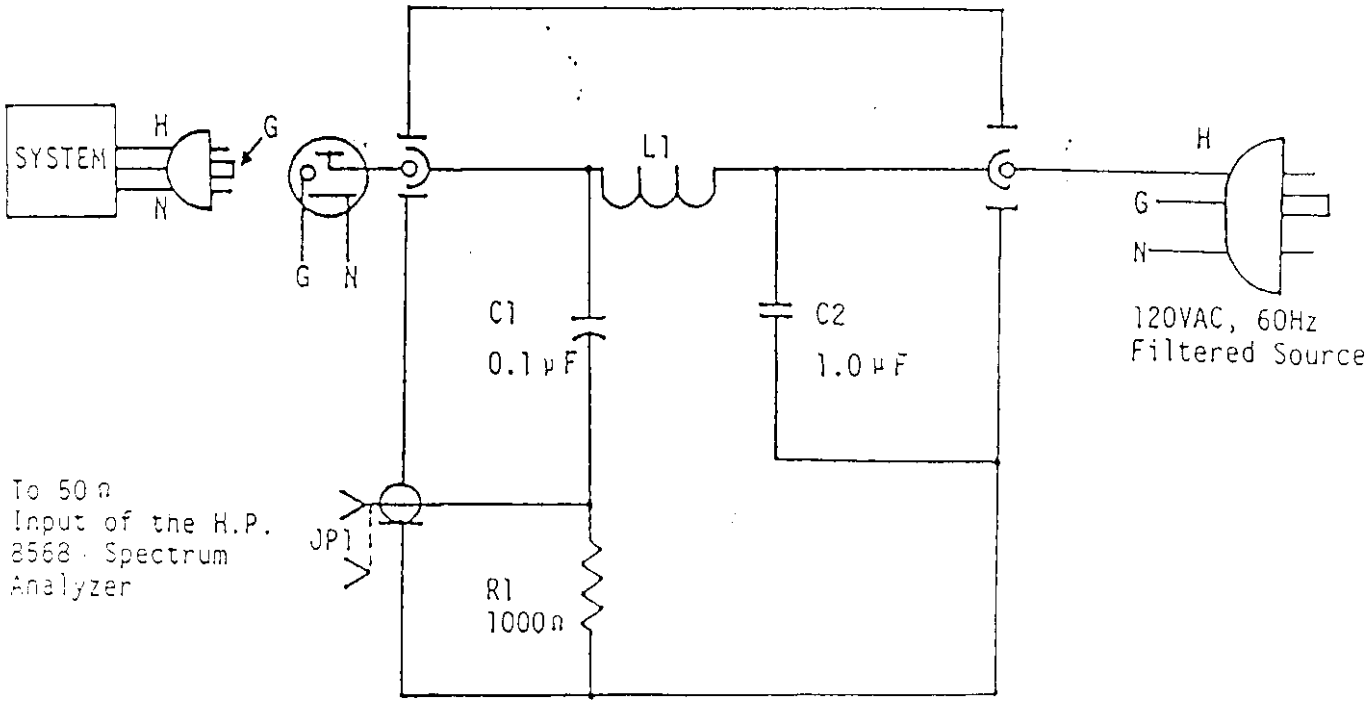


FIGURE 2

NOTE: Dimensions in meters.

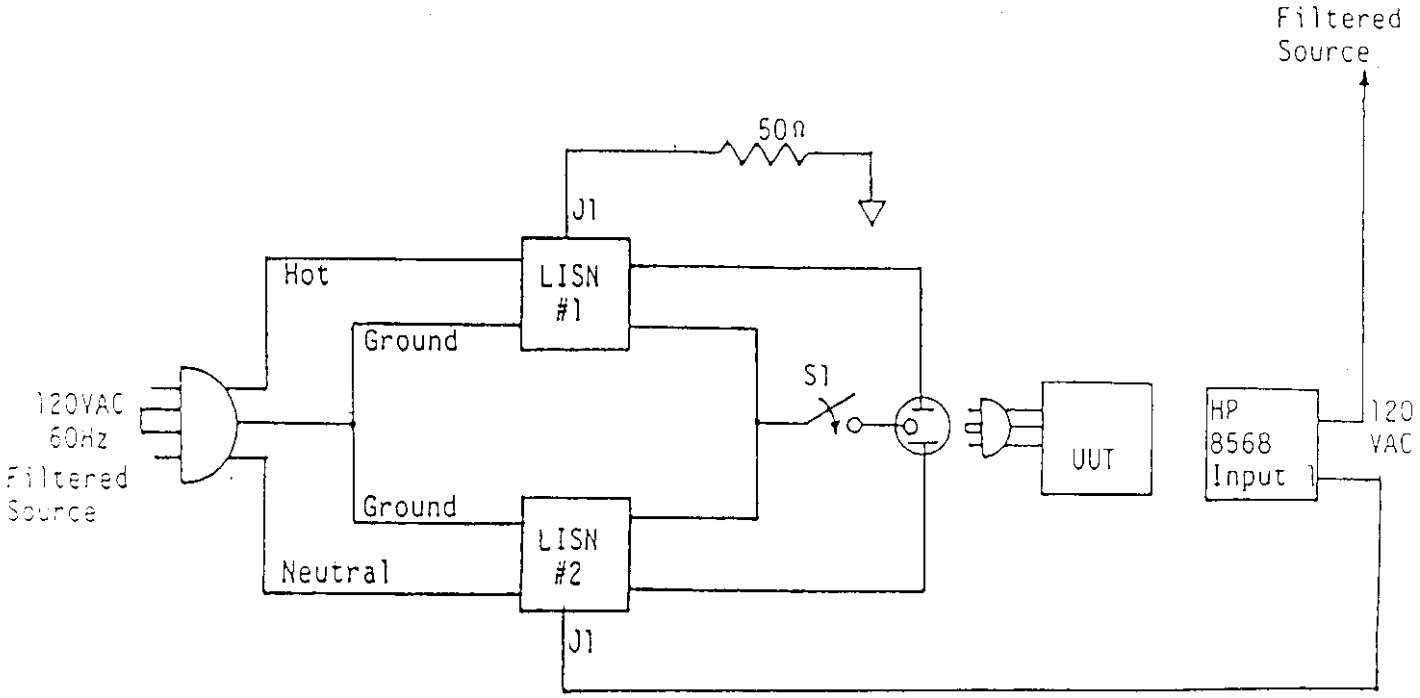
Measuring Antenna Height		"D" Spacing
Fixed Low	Preliminary Scan	1 - 3 meters
1m - 4m*	Detailed Measurement	3 meters
1m - 4m	Detailed Measurement	10 meters FCC Part 15

*Height is varied to find peak emission level.



LISN - AILTECH M/N 94641
Solar m/n 8028-50-TS-24-BNC,
L1 = 50µh

FIGURE 3 Circuit diagram of the LISN to provide the correct impedance curve over the .45-30 MHz frequency range.



FCC ID: L64A00105

FIGURE 4 C-35

TABLE 1

Polarization: Horizontal
Antennas: AilTech
Test Distance: 3 Meters
Product: MAGNI-CAM
Mode: Camera Powered from AC Source and reading Hs; Configuration 1, Mode 3
Date: 9/3/98; spurious radiated

		degrees	dbuv	dbuv/m	FCC Class B
Freq(MHz)	Uncorrected	Azimuth	Correction Factor(db)	Corrected Level(db)	Margin (db)
34.5	23	130	-11	12	-28.0
85.8	30	0	-13	17	-23.0
86	34	0	-13	21	-19.0
95.34	32	226	-12	20	-23.5
95.4	34	0	-12	22	-21.5
114.4	24	77	-12	12	-31.5
123.95	36	253	-11	25	-18.5
133.46	34	253	-9	25	-18.5
143.03	33	259	-7	26	-17.5
162.07	26	0	-6	20	-23.5
171.6	31	238	-7	24	-19.5
181.15	30	124	-8	22	-21.5
190.7	32	0	-8	24	-19.5
200.26	31	0	-11	20	-23.5
228.83	33	40	-10	23	-23.0
233.38	33	40	-10	23	-23.0
247.9	35	180	-9	26	-20.0
267	40	63	-8	32	-14.0
276.5	35	219	-7	28	-18.0
286	43	216	-7	36	-10.0
295.6	32	227	-6	26	-20.0
305.11	32	223	-6	26	-20.0
314.67	31	220	-7	24	-22.0

FCC ID: L64A00105

TABLE 2

Polarization: Vertical
Antennas: AilTech
Test Distance: 3 Meters
Product: MAGNI-CAM
Mode: Camera Powered from AC Source and reading Hs; Configuration 1, Mode 3
Date: 9/3/98; spurious radiated

		degrees	dbuv	dbuv/m	FCC Class B
Freq(MHz)	Uncorrected	Azimuth	Correction Factor(db)	Corrected Level(db)	Margin (db)
43	31	0	-11	20	-20.0
47.7	32	150	-12	20	-20.0
64	23	0	-18	5	-35.0
85.9	23	0	-13	10	-30.0
114.4	32	0	-12	20	-23.5
123.93	30	142	-11	19	-24.5
143.15	27	0	-7	20	-23.5
171.62	23	128	-7	16	-27.5
181.15	26	0	-8	18	-25.5
190.7	35	360	-8	27	-16.5
200.26	26	168	-11	15	-28.5
228.83	25	223	-10	15	-31.0
238.38	26	233	-10	16	-30.0
247.9	28	226	-9	19	-27.0
267	30	186	-8	22	-24.0
276.5	28	192	-7	21	-25.0
286	38	176	-7	31	-15.0
295.6	28	193	-6	22	-24.0
305.12	26	199	-6	20	-26.0

TABLE 3

Polarization: Horizontal
Antennas: AilTech
Test Distance: 3 Meters
Product: MAGNI-CAM
Mode: Configuration 1, VITS 5 Volt Input
Date: 9/3/98; spurious radiated

		degrees	dbuv	dbuv/m	FCC Class B
Freq(MHz)	Uncorrected	Azimuth	Correction Factor(db)	Corrected Level(db)	Margin (db)
85.9	38	65	-13	25	-15.0
200.42	24	93	-11	13	-30.5
267	25	48	-8	17	-29.0

TABLE 4

Polarization: Vertical
Antennas: AilTech
Test Distance: 3 Meters
Product: MAGNI-CAM
Mode: Configuration 1, VITS 5 Volt Input
Date: 9/3/98; spurious radiated

		degrees	dbuv	dbuv/m	FCC Class B
Freq(MHz)	Uncorrected	Azimuth	Correction Factor(db)	Corrected Level(db)	Margin (db)
57.2	34	128	-15	19	-21
85.9	37	168	-13	24	-16
200.42	23	0	-11	12	-32
267	26	0	-8	18	-28

TABLE 5

Polarization: Vertical
Antennas: AilTech
Test Distance: 3 Meters
Product: MAGNI-CAM
Mode: Charging Battery
Date: 9/3/98; spurious radiated

		degrees	dbuv	dbuv/m	FCC Class B
Freq(MHz)	Uncorrected	Azimuth	Correction Factor(db)	Corrected Level(db)	Margin (db)
40	30	203	-10	20	-20
43	29	0	-11	18	-22
48	31	0	-12	19	-21

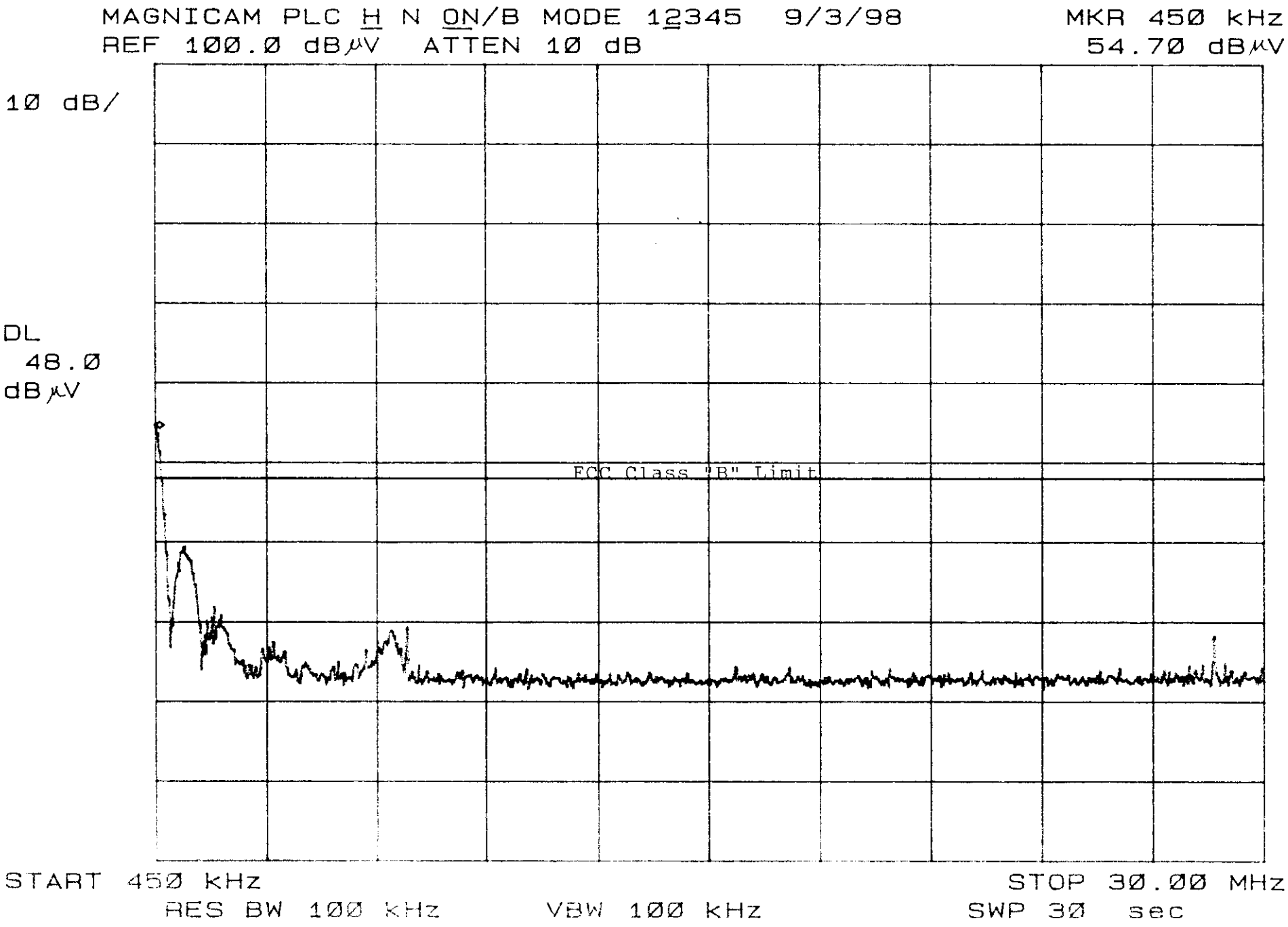
FCC ID: L64A00105

FCC ID: L64A00105

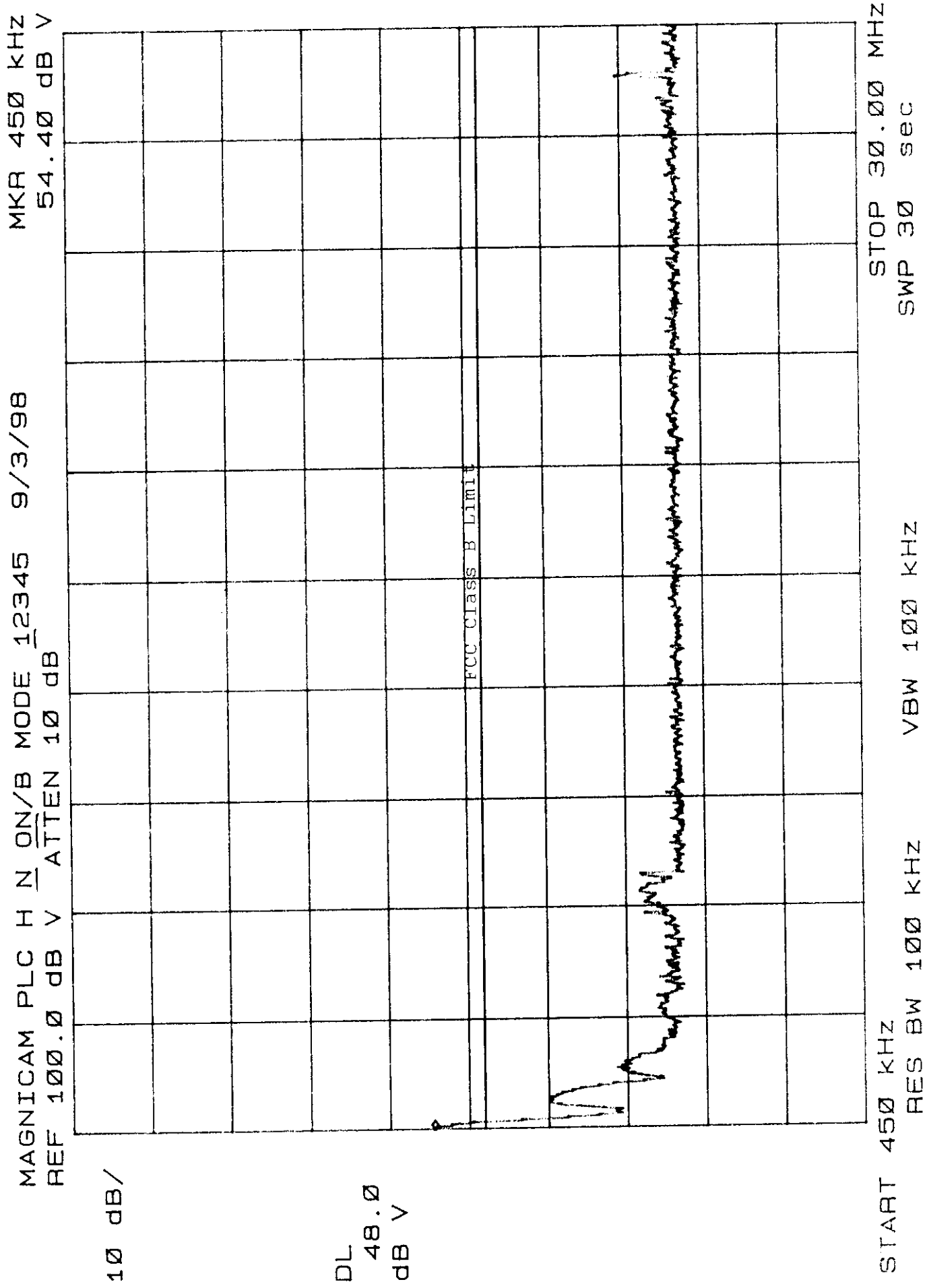
FCC ID: L64A00105

FCC ID: L64A00105

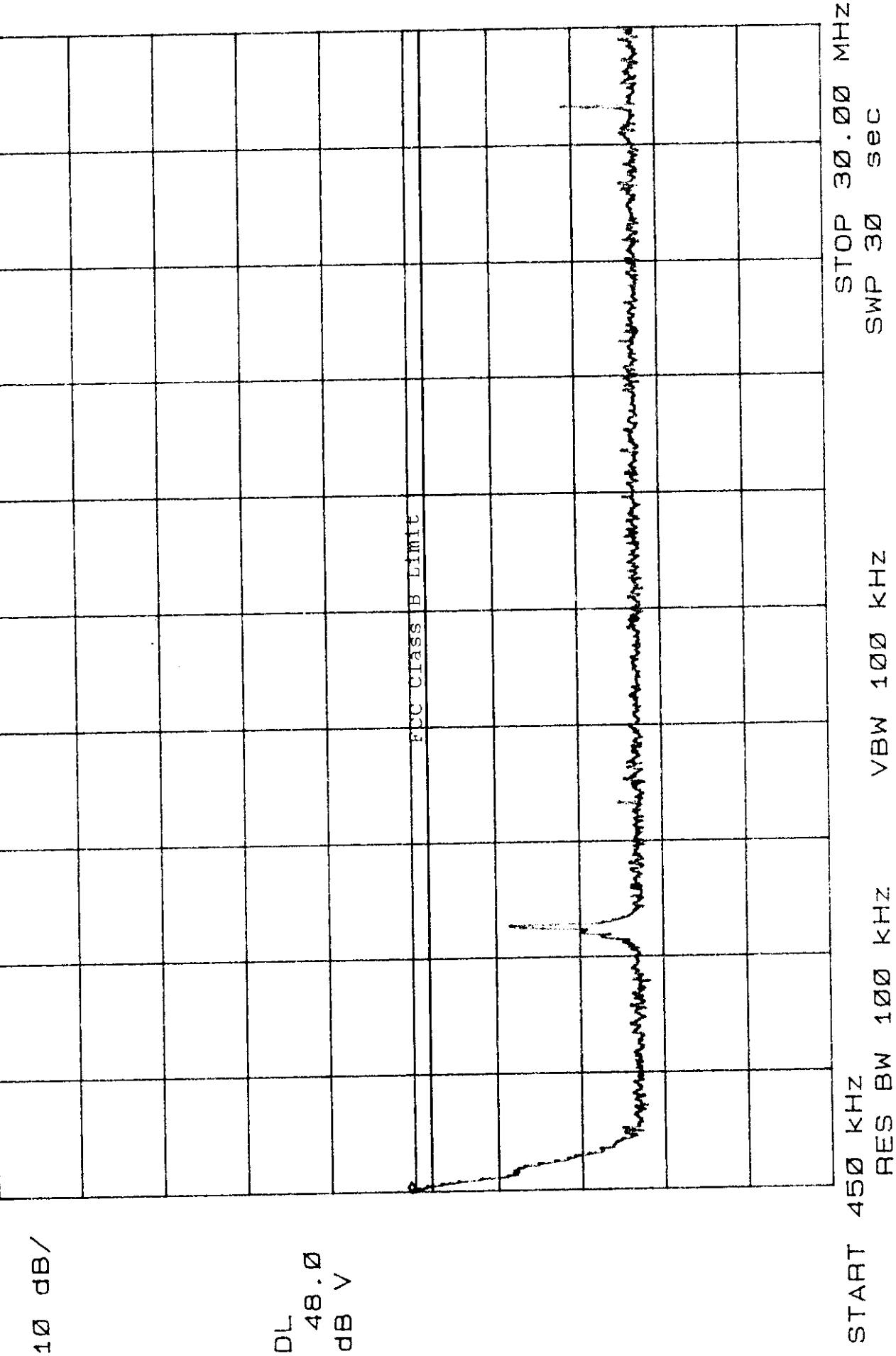
FCC ID: L64A00105



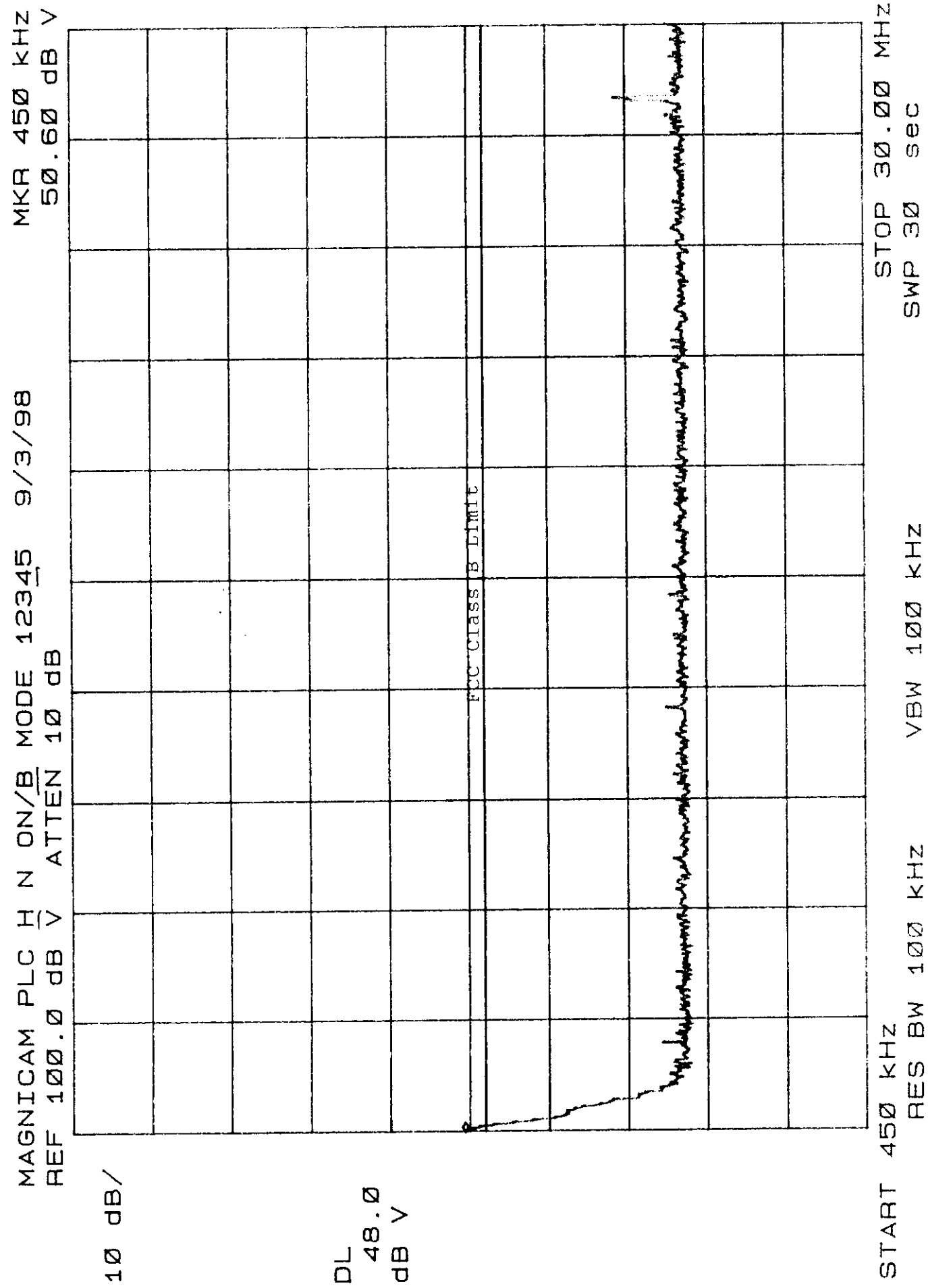
GRAPH 7


MAGNICAM PLC H N ON/B MODE 12345 9/3/98
REF 100.0 dB V ATTEN 10 dB
MKR 450 kHz
54.40 dB V
10 dB/
DL
48.0
dB V
FCC Class B Limit
START 450 kHz
RES BW 100 kHz
VBW 100 kHz
STOP 30.00 MHz
SWP 30 sec

GRAPH 8

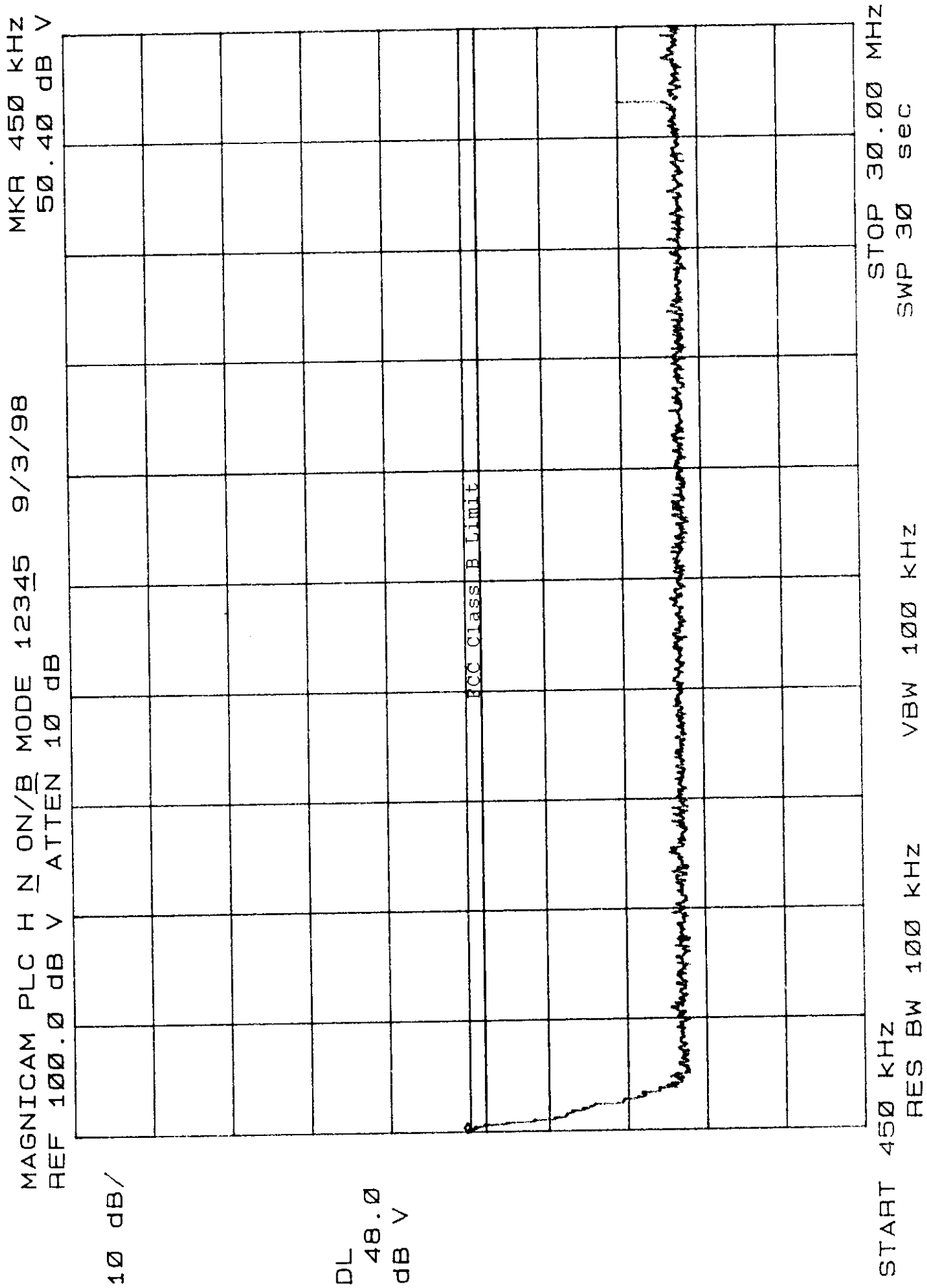

MAGNICAM PLC H N ON/B MODE 12345 9/3/98
REF 100.0 dB V ATTEN 10 dB
MKR 450 kHz
50.50 dB V
10 dB/
DL
48.0
dB V
FCC Class B Limit
START 450 kHz
RES BW 100 kHz
VBW 100 kHz
STOP 30.00 MHz
SWP 30 sec

GRAPH 9

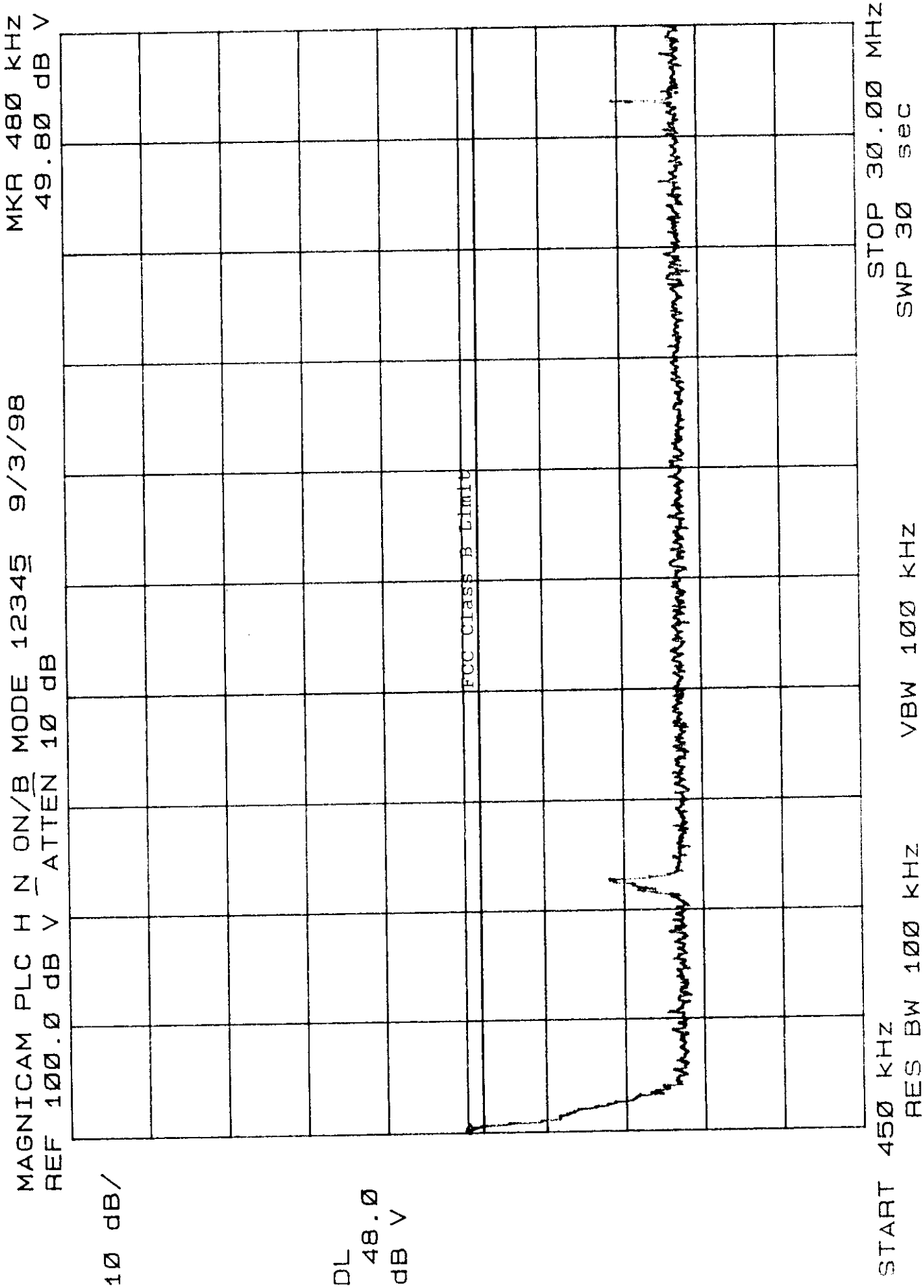


FCC ID: L64A00105

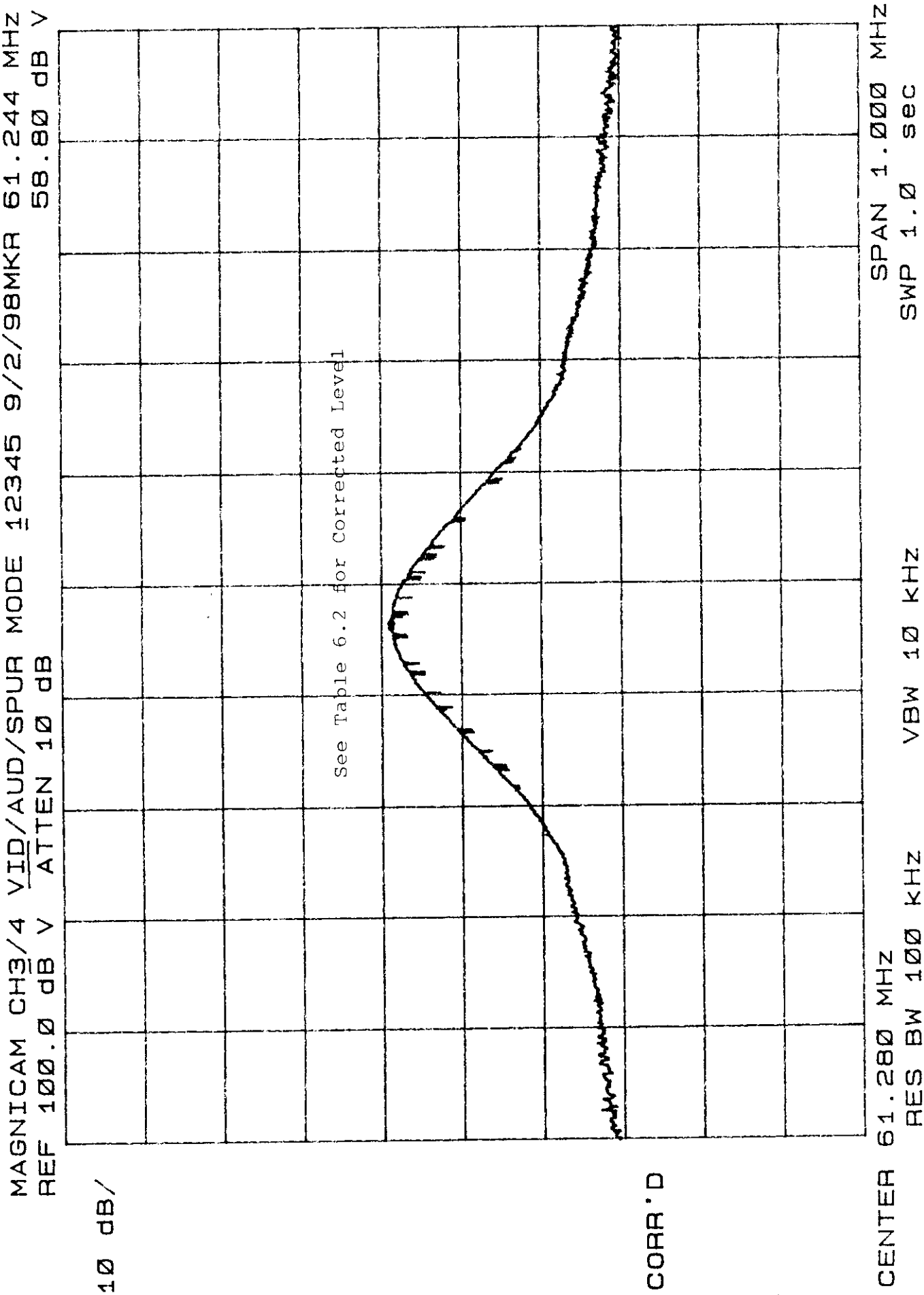
GRAPH 10


MAGNICAM PLC H N ON/B MODE 12345 9/3/98
REF 100.0 dB V ATTEN 10 dB
MKR 450 kHz
50.40 dB V
10 dB/
DL
48.0
dB V
FCC Class B Limit
START 450 kHz
RES BW 100 kHz
VBW 100 kHz
STOP 30.00 MHz
SWP 30 sec

GRAPH 11

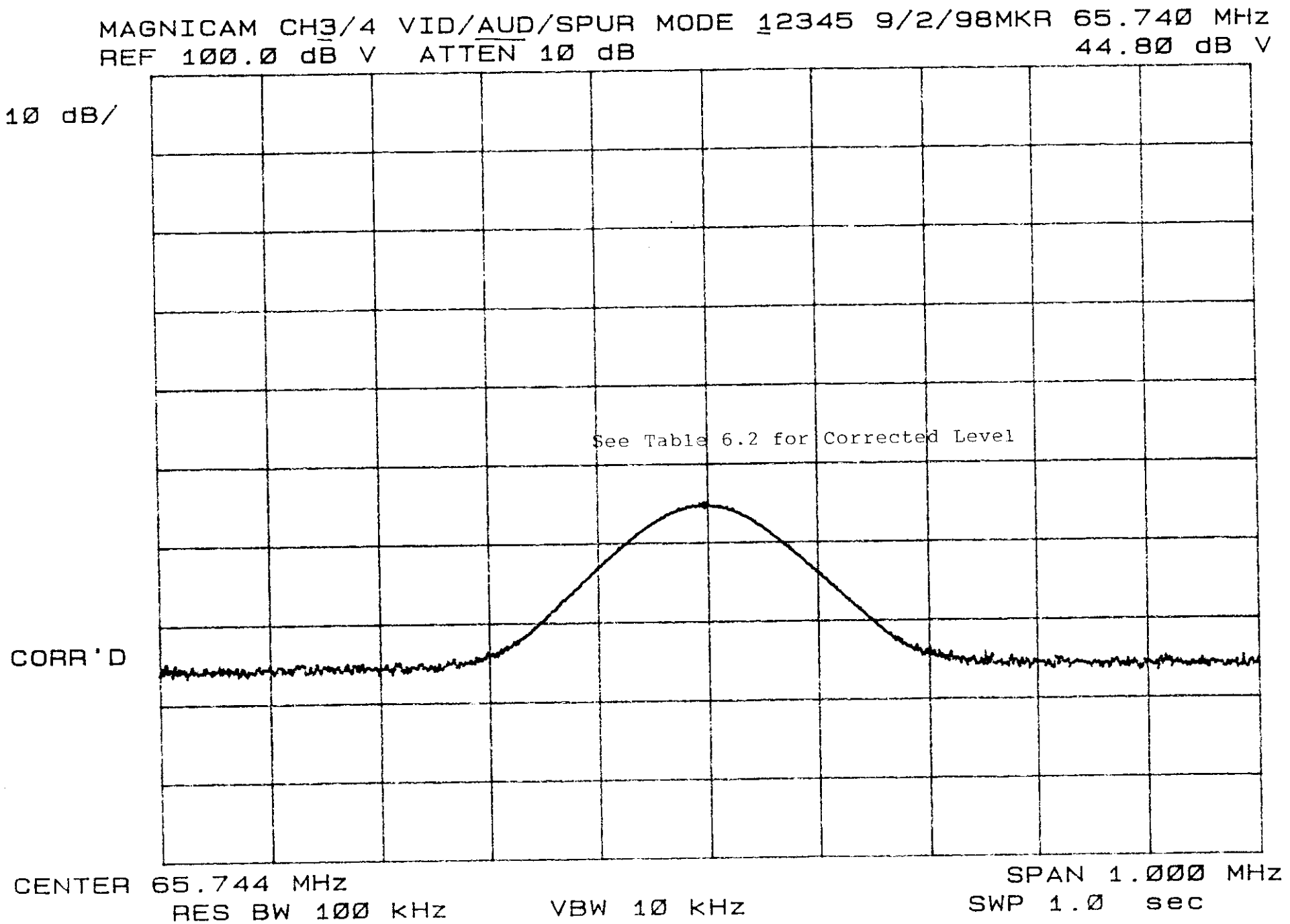

MAGNICAM PLC H N ON/B MODE 12345 9/3/98
REF 100.0 dB V ATTEN 10 dB
MKR 480 kHz
49.80 dB V
10 dB/
DL
48.0
dB V
FCC Class B Limit
START 450 kHz
RES BW 100 kHz
VBW 100 kHz
STOP 30.00 MHz
SWP 30 sec

GRAPH 12

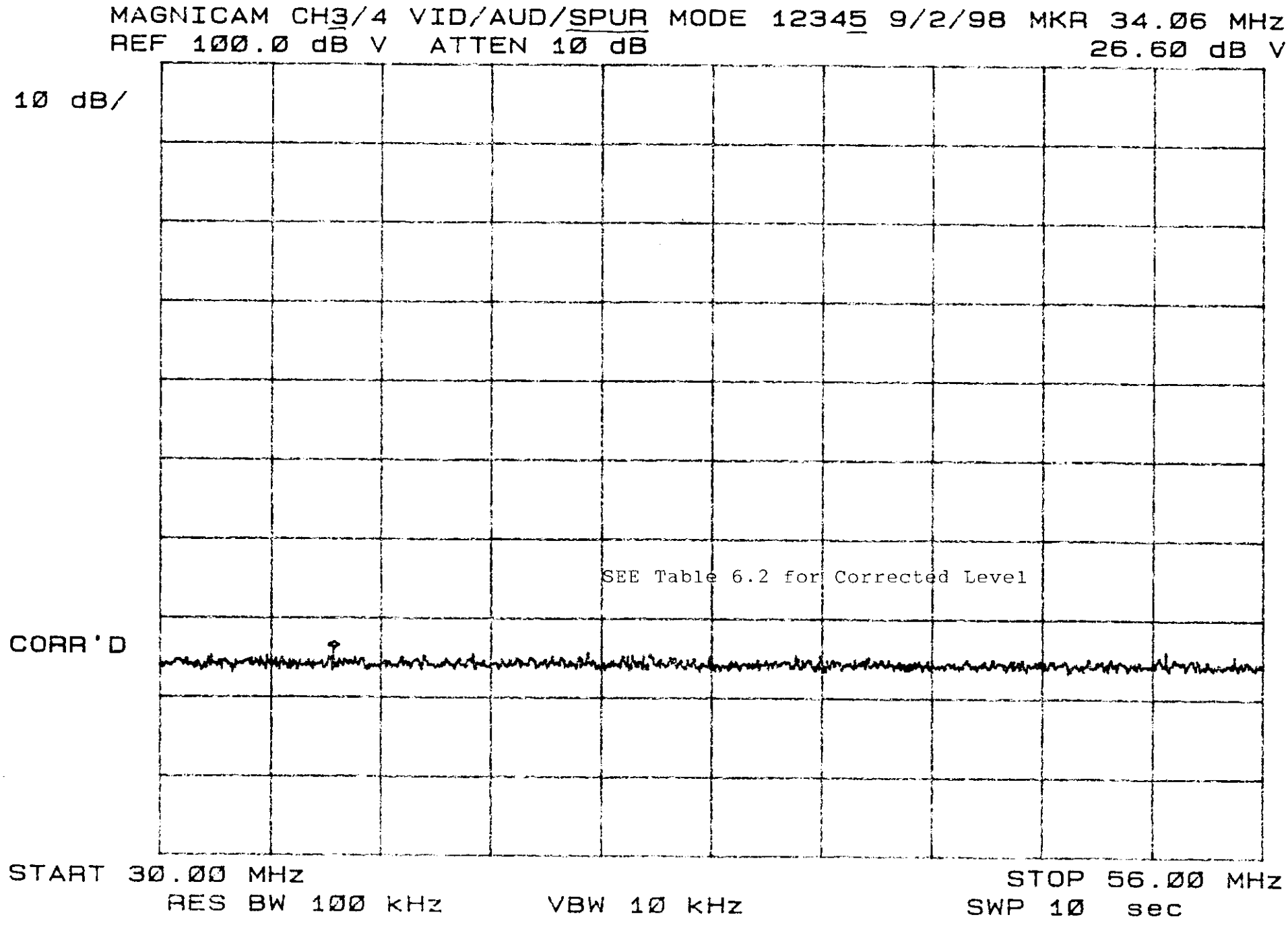

MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98MKR 61.244 MHz
REF 100.0 dB V ATTEN 10 dB 58.80 dB V
10 dB/
CORR'D
See Table 6.2 for Corrected Level
CENTER 61.280 MHz
RES BW 100 kHz
VBW 10 kHz
SPAN 1.000 MHz
SWP 1.0 sec

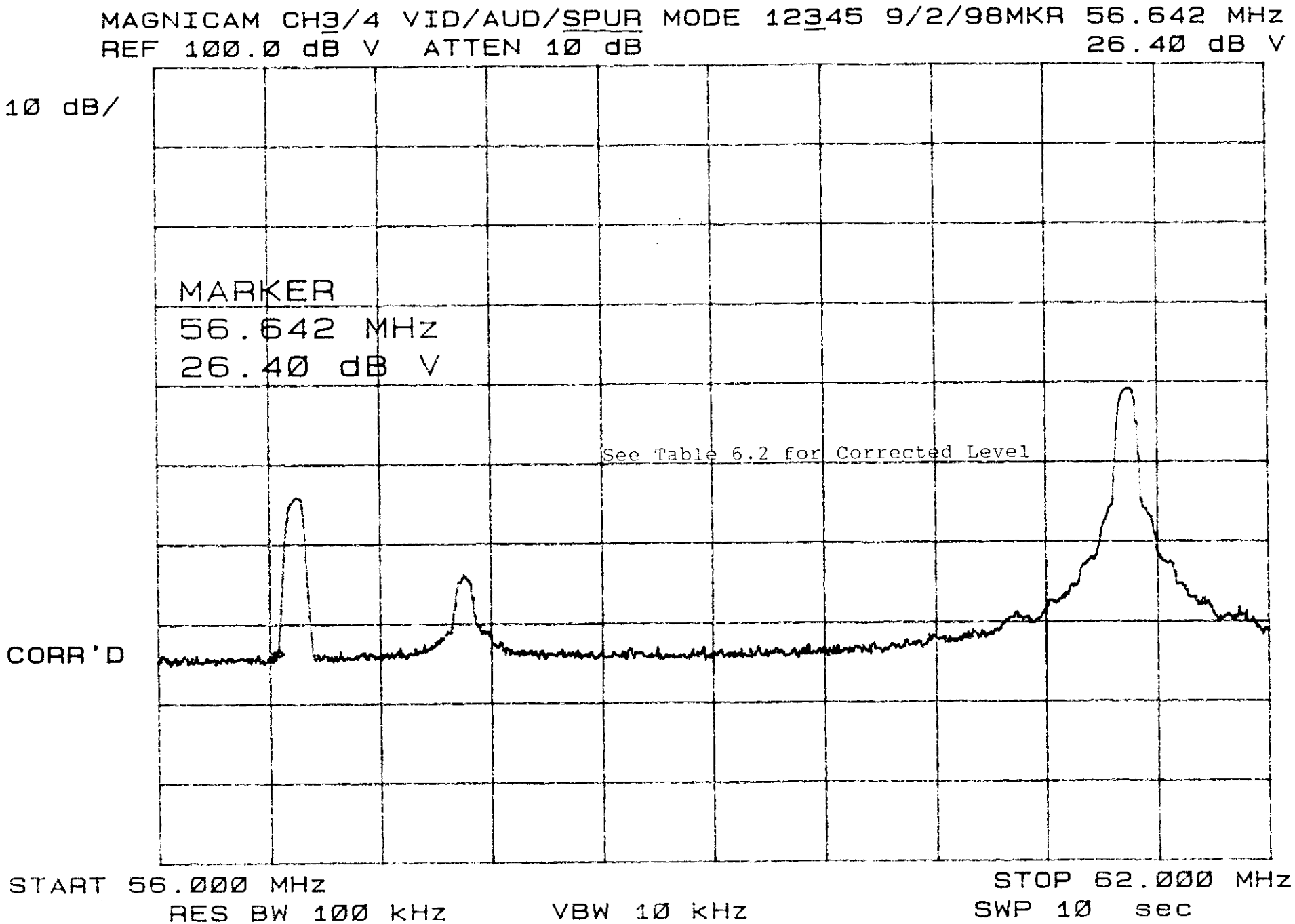
FCC ID: LG4A00105

GRAPH 13

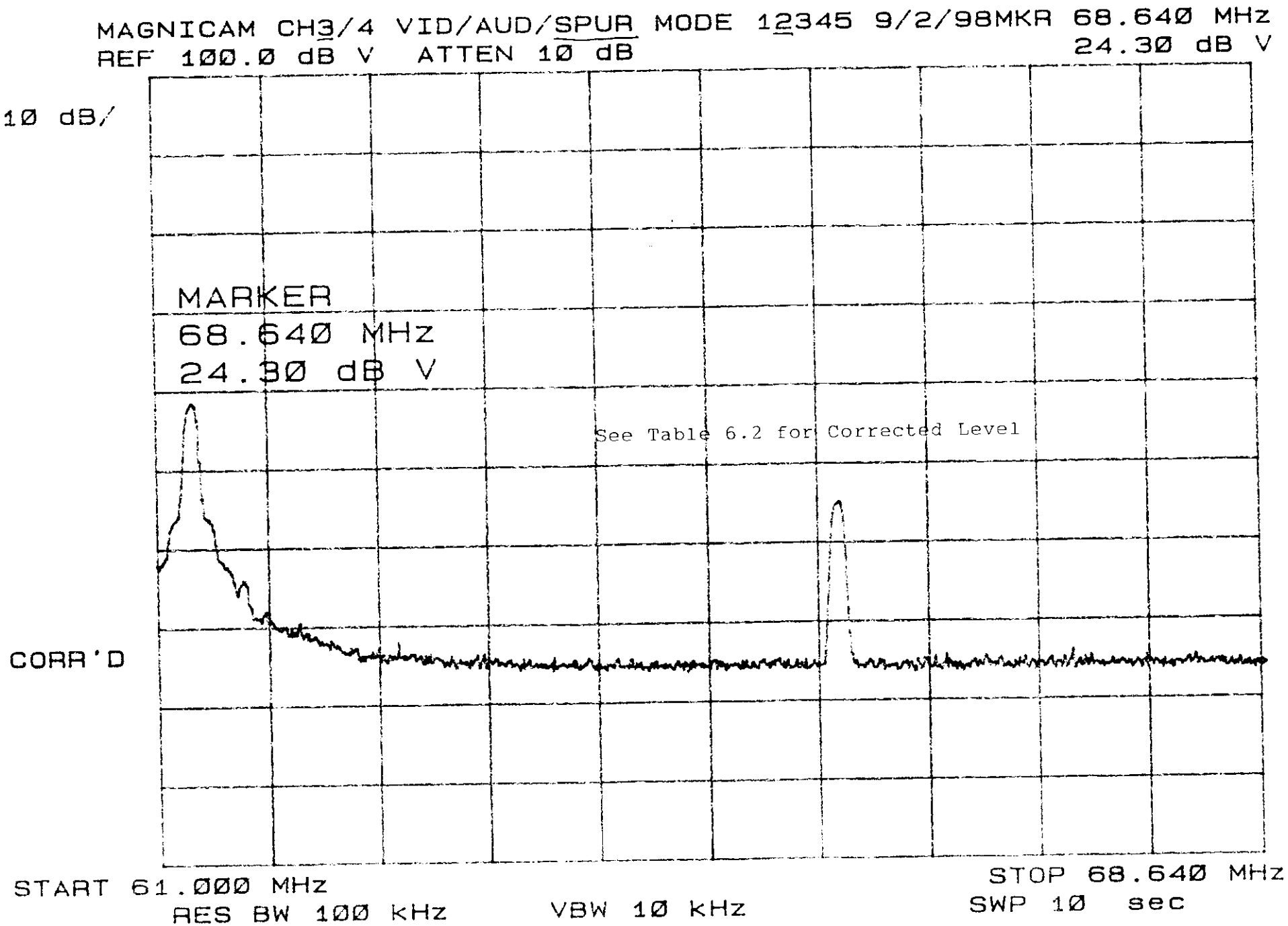


GRAPH 14

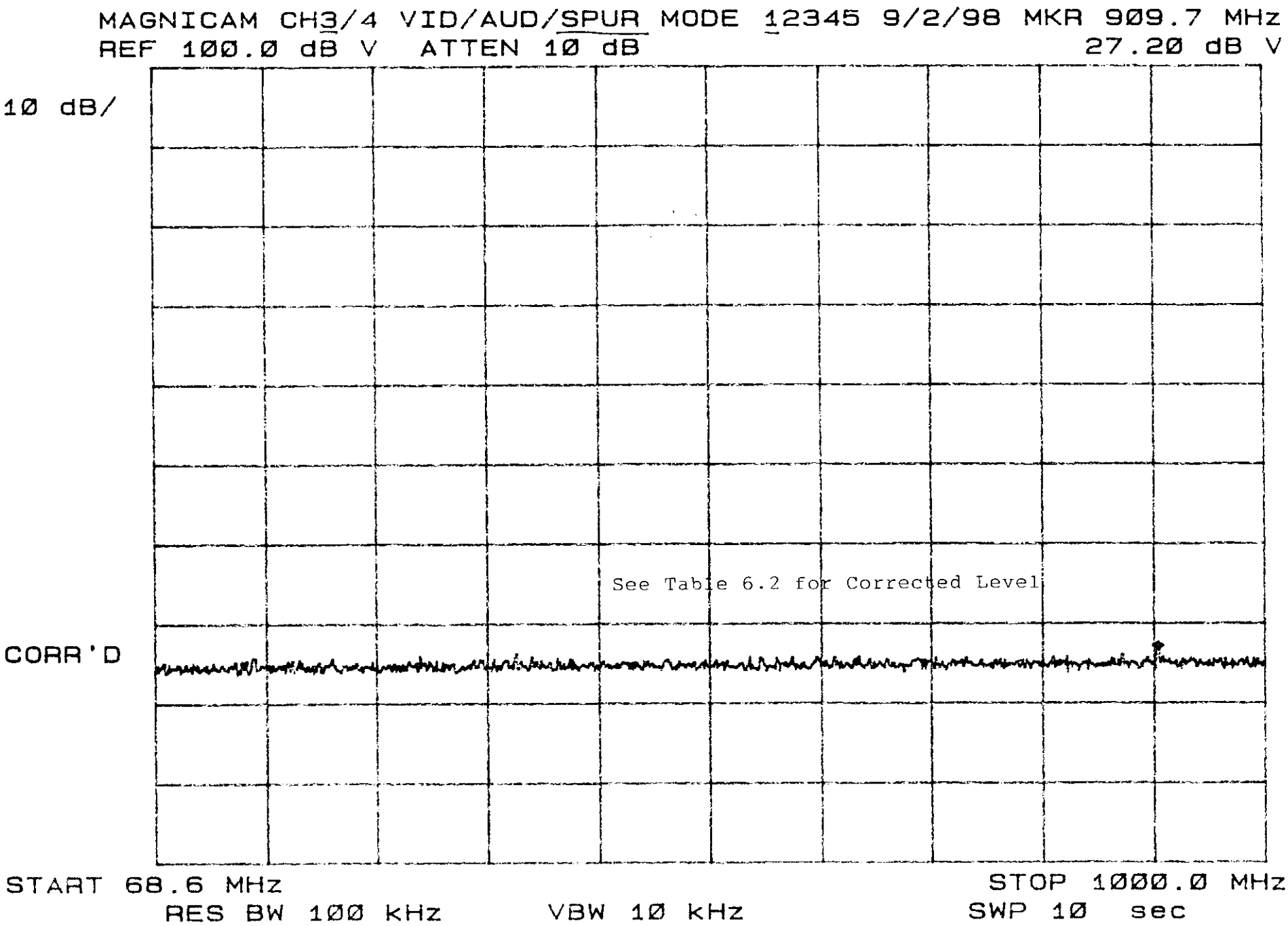

MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98 MKR 34.06 MHz
REF 100.0 dB V ATTEN 10 dB
26.60 dB V
10 dB/
SEE Table 6.2 for Corrected Level
CORR'D
START 30.00 MHz
STOP 56.00 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec

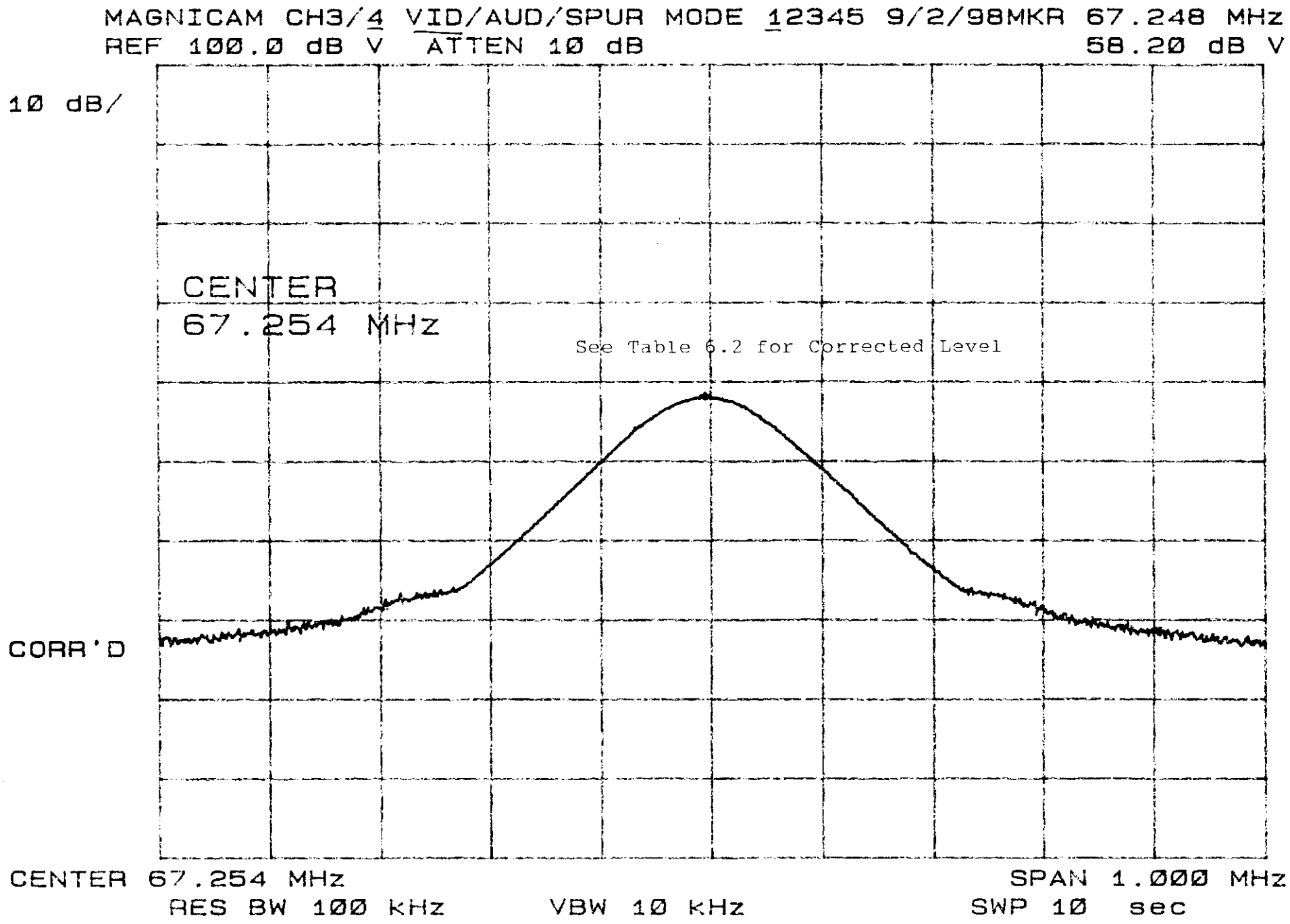

MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98MKR 56.642 MHz
REF 100.0 dB V ATTEN 10 dB
26.40 dB V
10 dB/
MARKER
56.642 MHz
26.40 dB V
See Table 6.2 for Corrected Level
CORR'D
START 56.000 MHz
STOP 62.000 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec

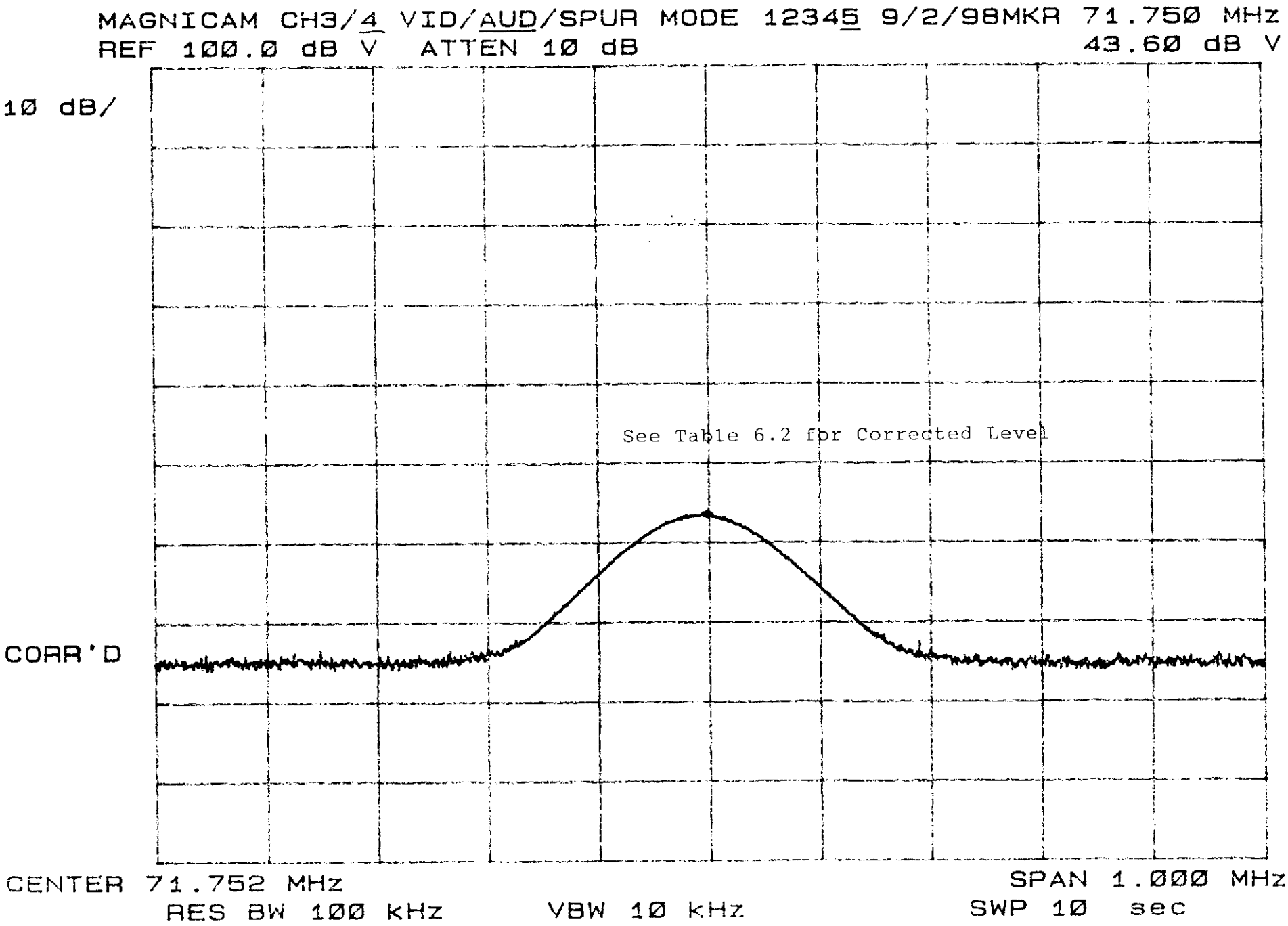
GRAPH 16

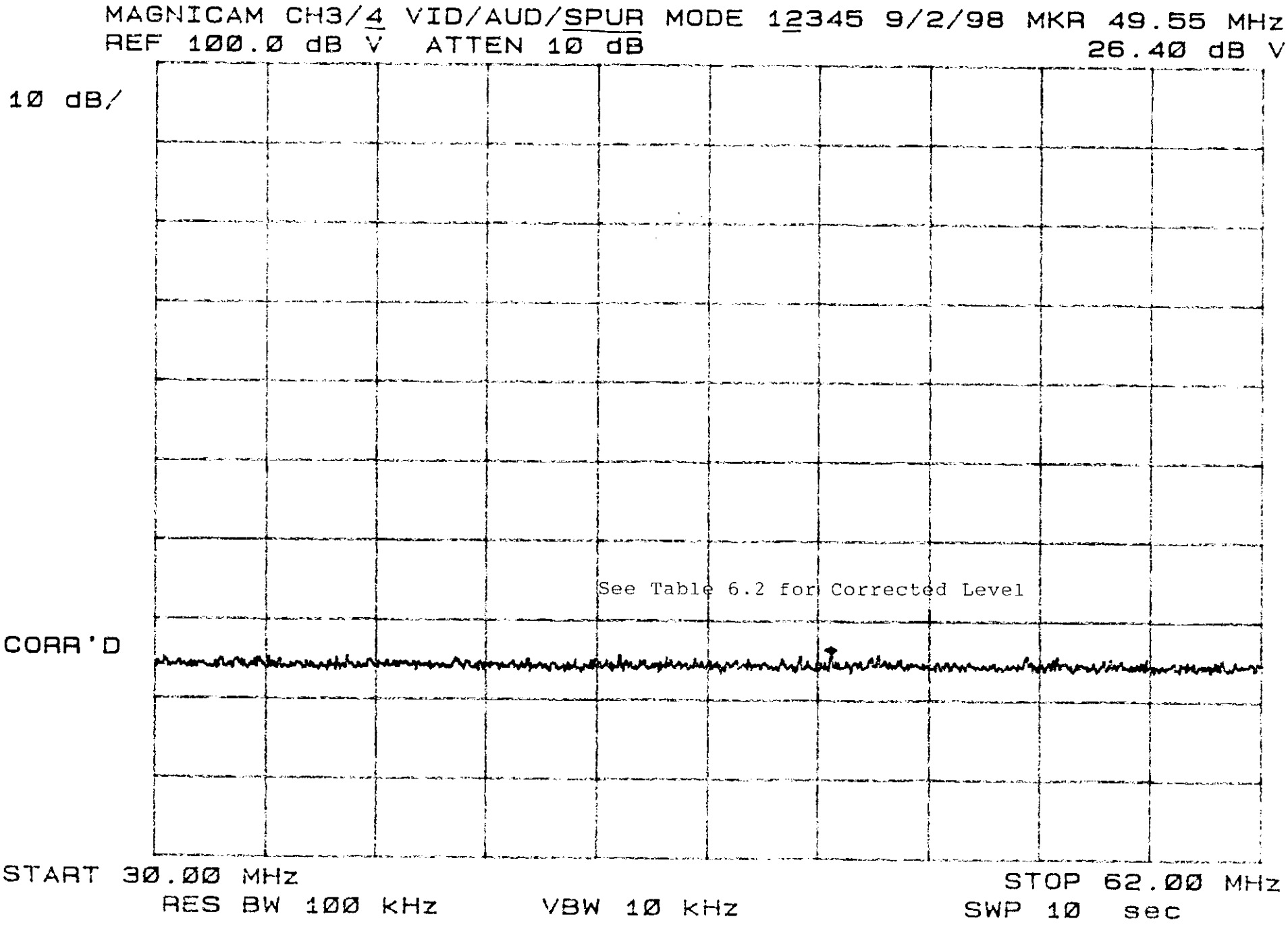

MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98MKR 68.640 MHz
REF 100.0 dB V ATTEN 10 dB
24.30 dB V
10 dB/
MARKER
68.640 MHz
24.30 dB V
See Table 6.2 for Corrected Level
CORR'D
START 61.000 MHz
STOP 68.640 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec

GRAPH 17

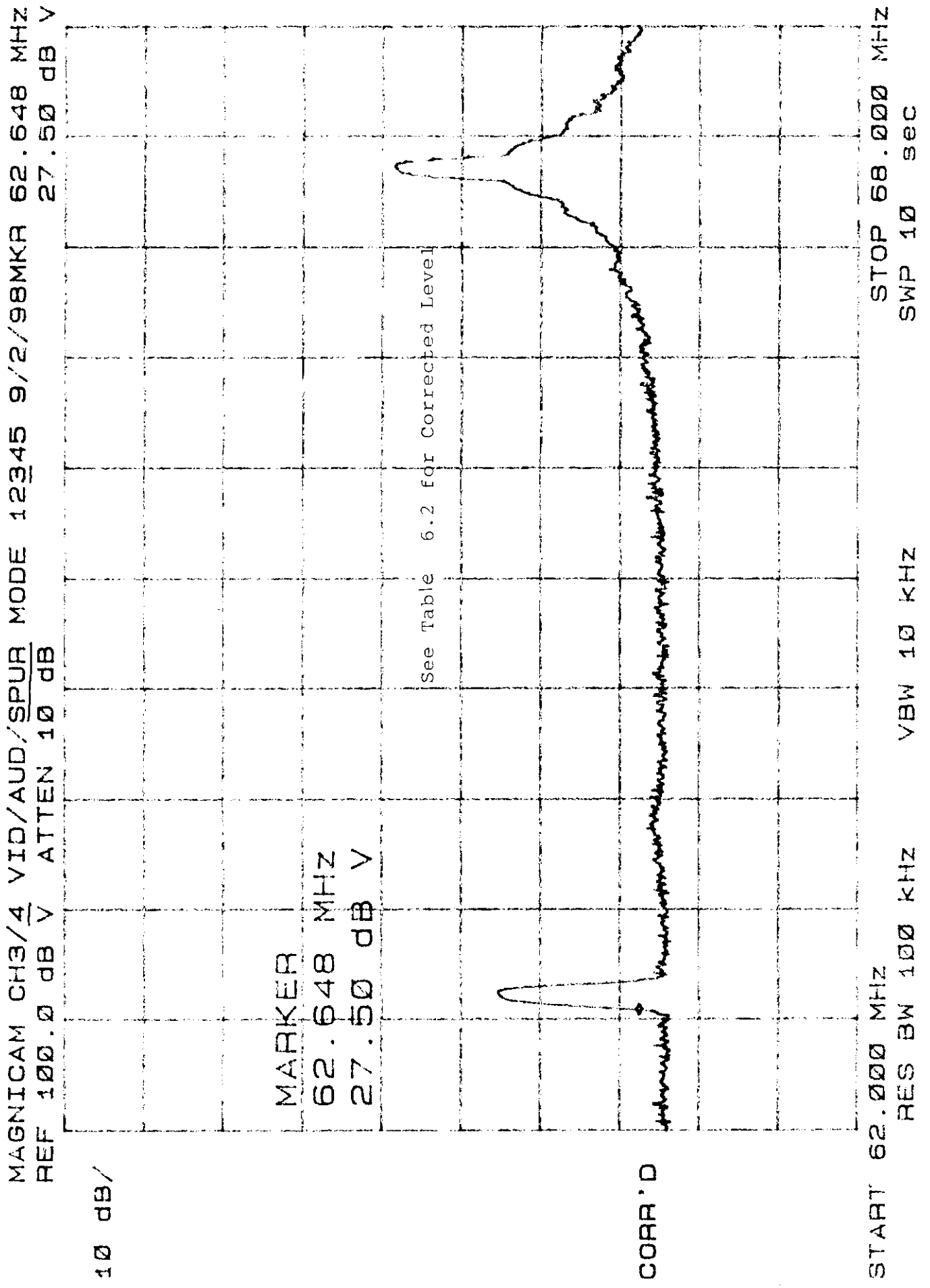

MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98 MKR 909.7 MHz
REF 100.0 dB V ATTEN 10 dB
27.20 dB V
10 dB/
See Table 6.2 for Corrected Level
CORR'D
START 68.6 MHz
STOP 1000.0 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec


MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98MKR 67.248 MHz
REF 100.0 dB V ATTEN 10 dB
58.20 dB V
10 dB/
CENTER
67.254 MHz
See Table 6.2 for Corrected Level
CORR'D
CENTER 67.254 MHz
SPAN 1.000 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec



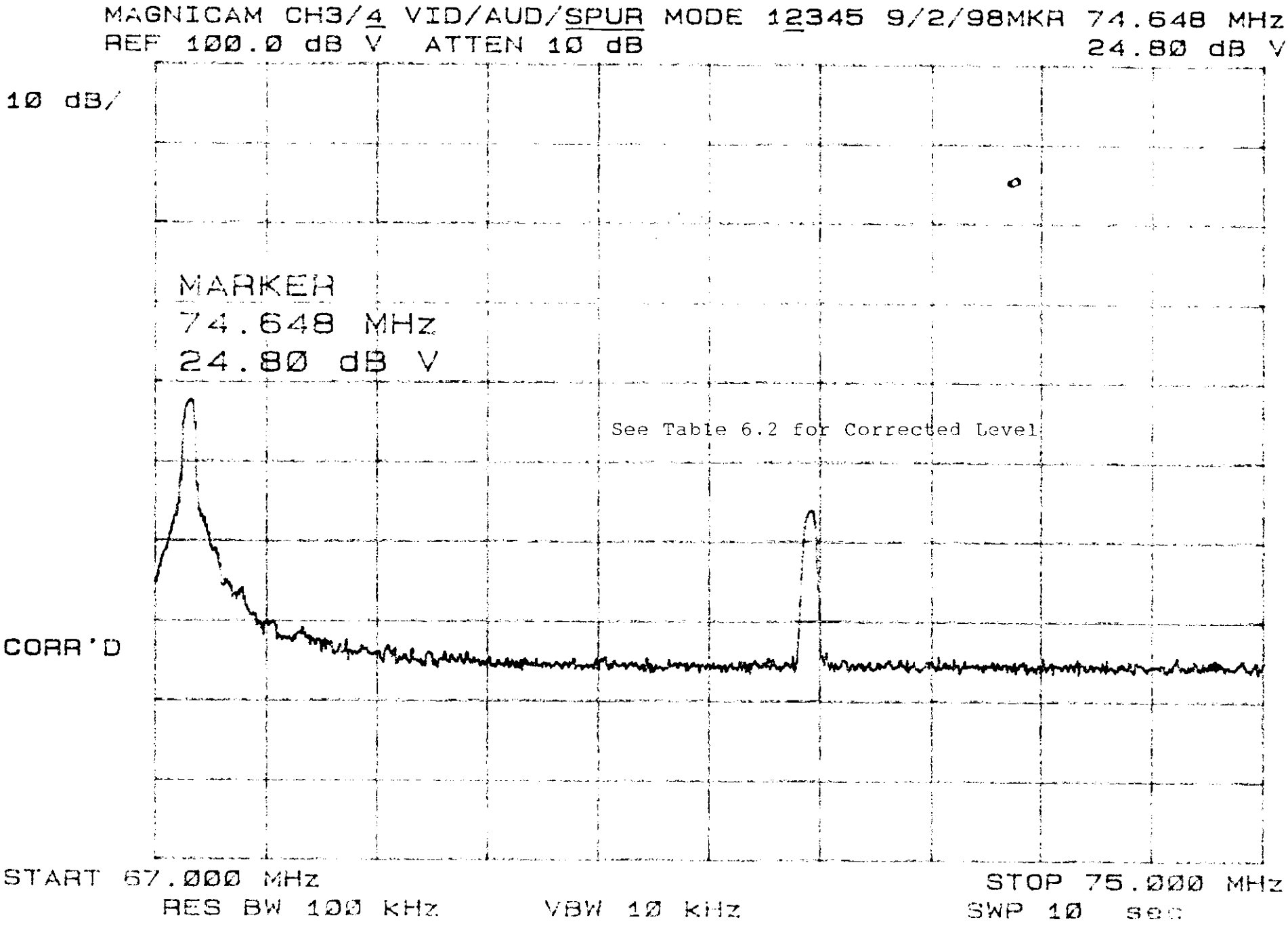


GRAPH 21

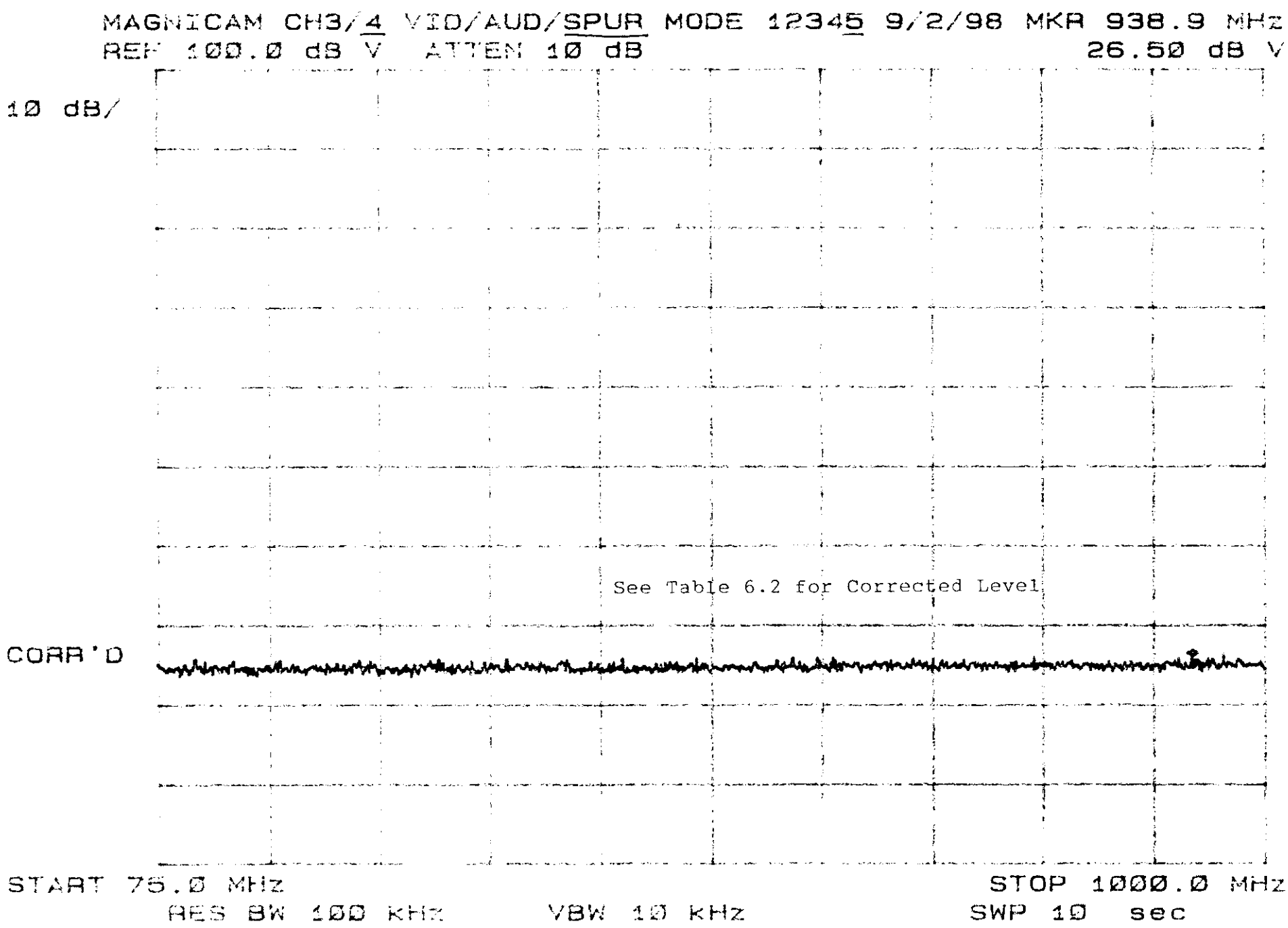


FCC ID: L64A00105

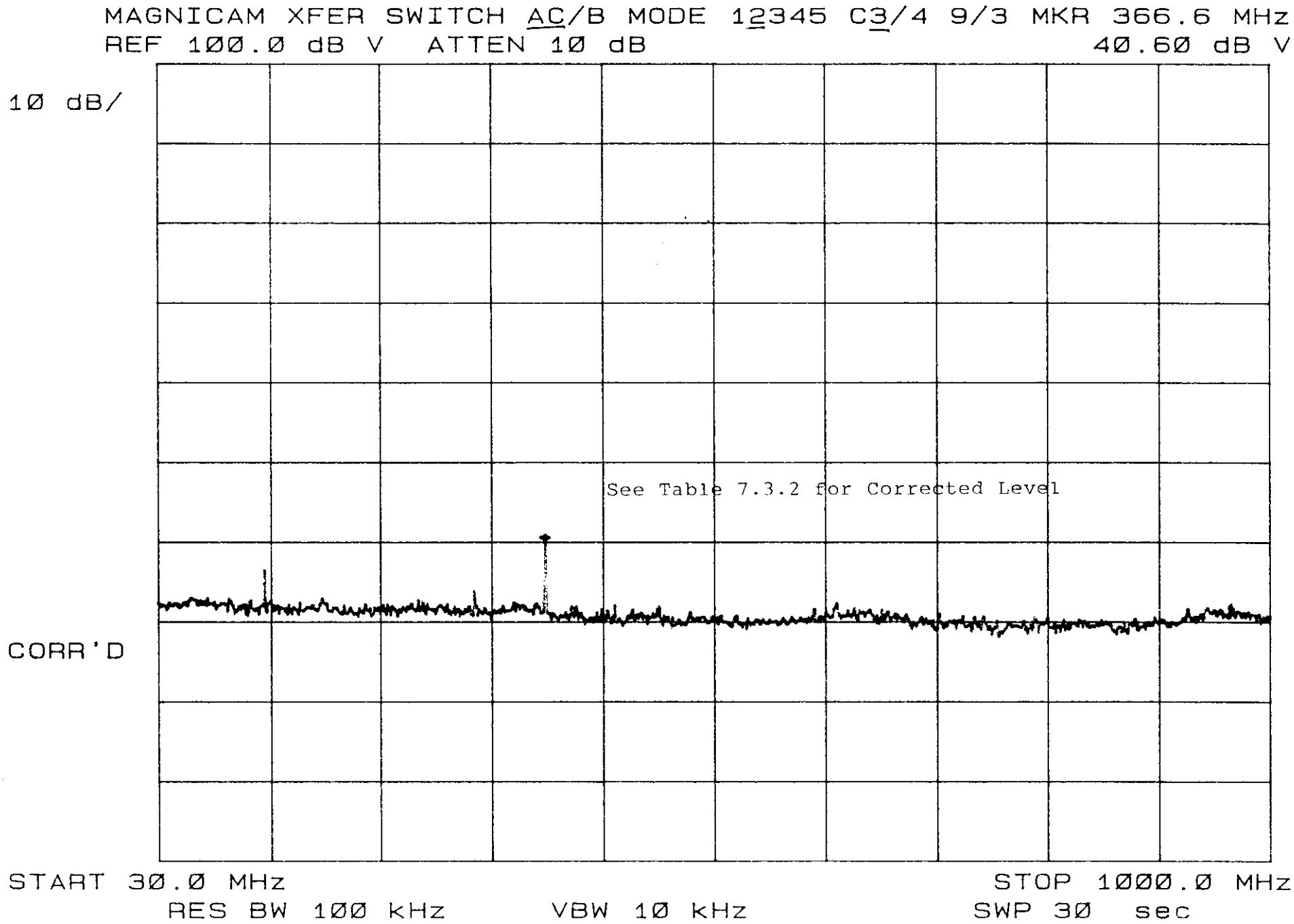
GRAPH 22


MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98MKR 74.648 MHz
REF 100.0 dB V ATTEN 10 dB
24.80 dB V
10 dB/
MARKER
74.648 MHz
24.80 dB V
See Table 6.2 for Corrected Level
CORR'D
START 67.000 MHz
STOP 75.000 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 10 sec

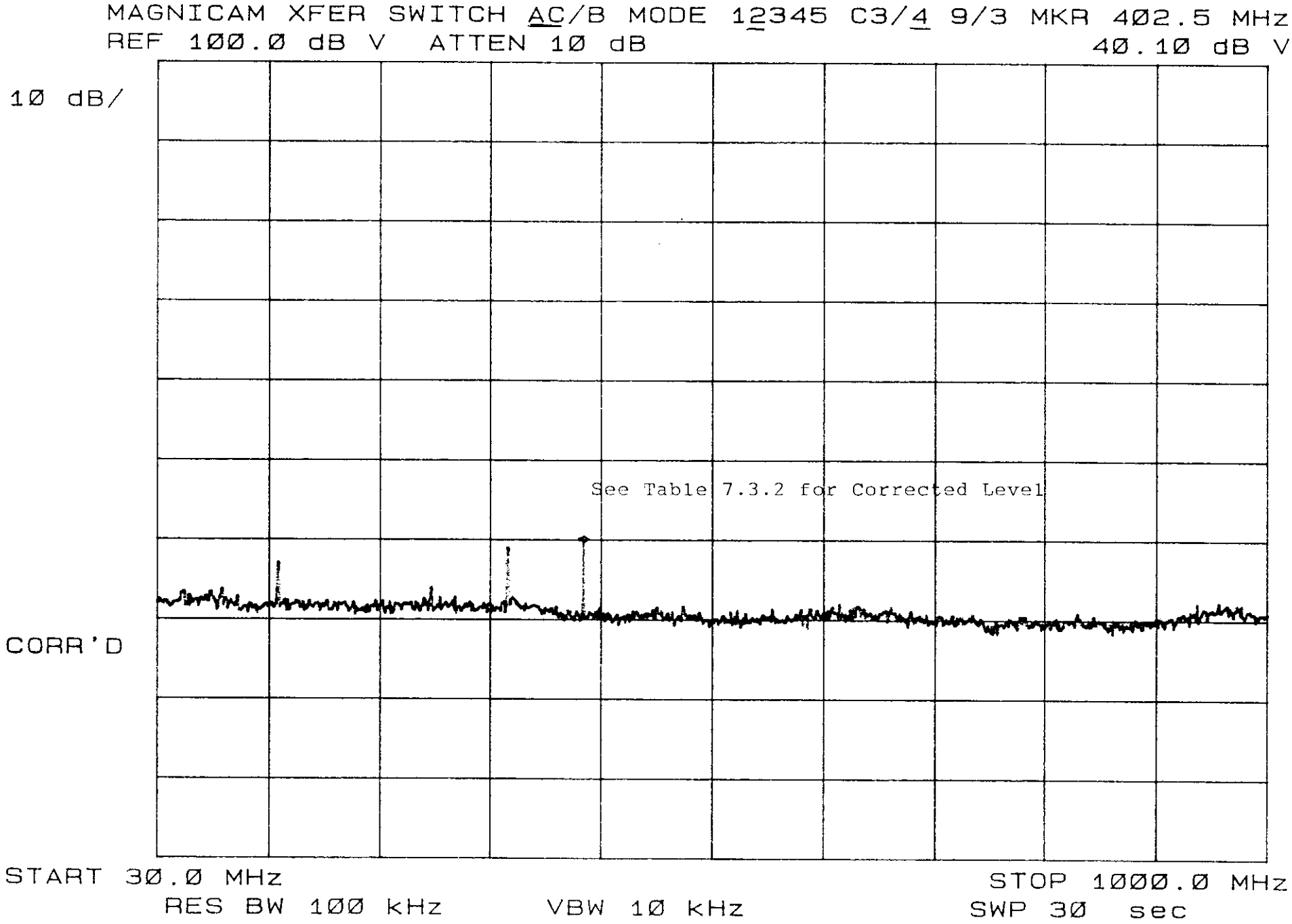
GRAPH 23


MAGNICAM CH3/4 VID/AUD/SPUR MODE 12345 9/2/98 MKR 938.9 MHz
REF 100.0 dB V ATTEN 10 dB 26.50 dB V
10 dB/
See Table 6.2 for Corrected Level
CORR'D
START 75.0 MHz STOP 1000.0 MHz
RES BW 100 kHz VBW 10 kHz SWP 10 sec

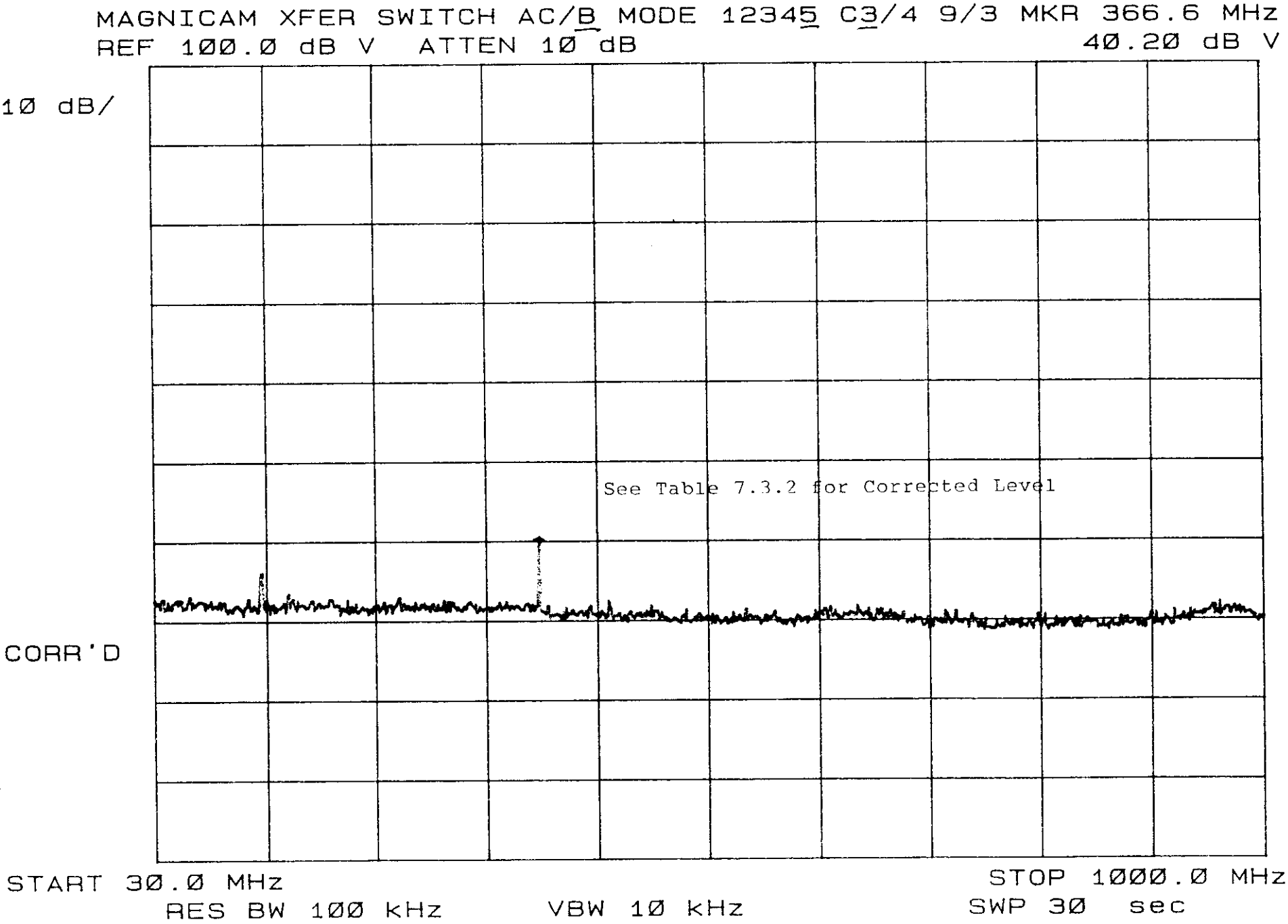
GRAPH 24


MAGNICAM XFER SWITCH AC/B MODE 12345 C3/4 9/3 MKR 366.6 MHz
REF 100.0 dB V ATTEN 10 dB
40.60 dB V
10 dB/
See Table 7.3.2 for Corrected Level
CORR'D
START 30.0 MHz
STOP 1000.0 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 30 sec

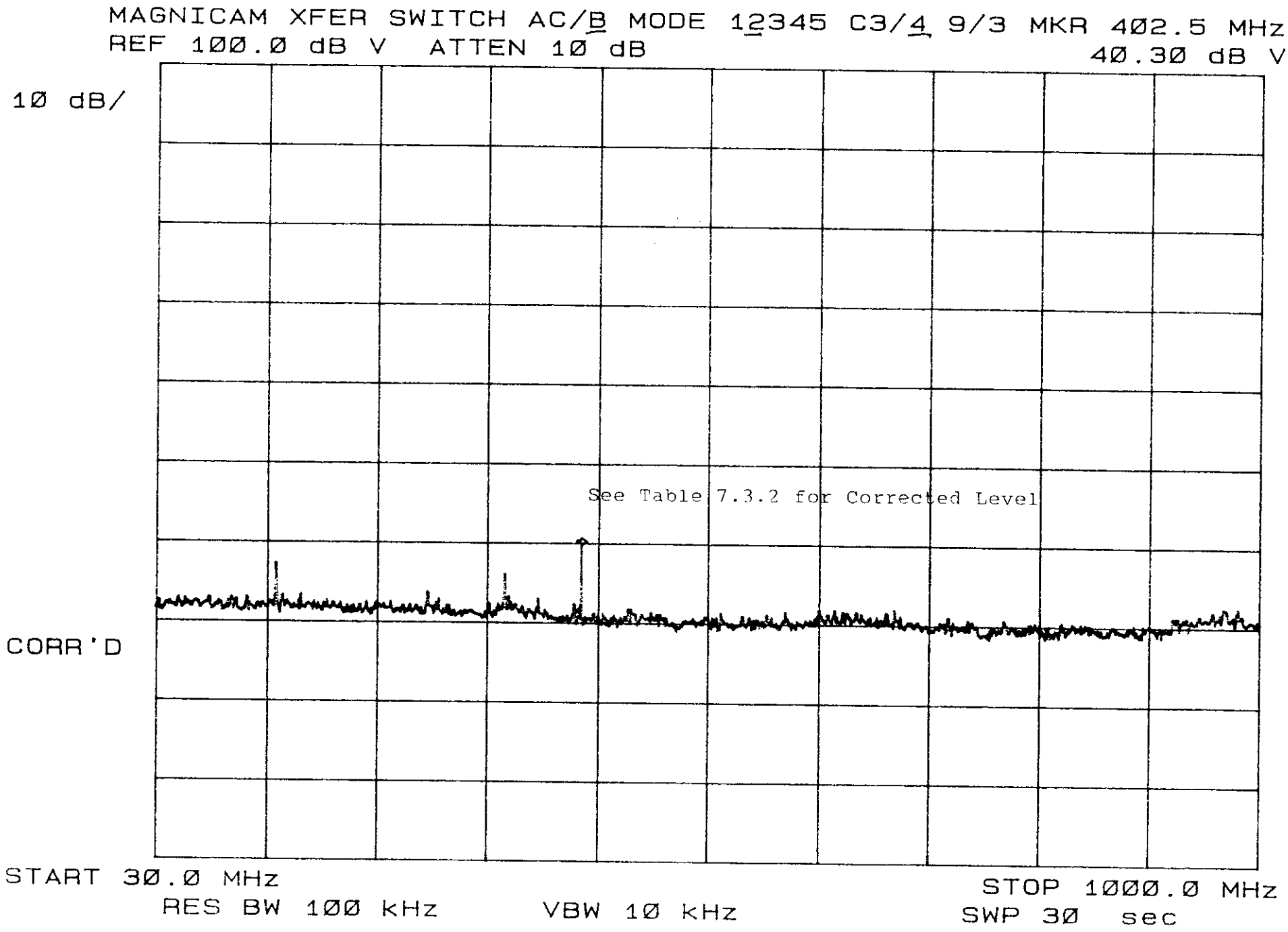
GRAPH 25


MAGNICAM XFER SWITCH AC/B MODE 12345 C3/4 9/3 MKR 402.5 MHz
REF 100.0 dB V ATTEN 10 dB
40.10 dB V
10 dB/
See Table 7.3.2 for Corrected Level
CORR'D
START 30.0 MHz
STOP 1000.0 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 30 sec

GRAPH 26


MAGNICAM XFER SWITCH AC/B MODE 12345 C3/4 9/3 MKR 366.6 MHz
REF 100.0 dB V ATTEN 10 dB
40.20 dB V
10 dB/
See Table 7.3.2 for Corrected Level
CORR'D
START 30.0 MHz
STOP 1000.0 MHz
RES BW 100 kHz
VBW 10 kHz
SWP 30 sec

GRAPH 27

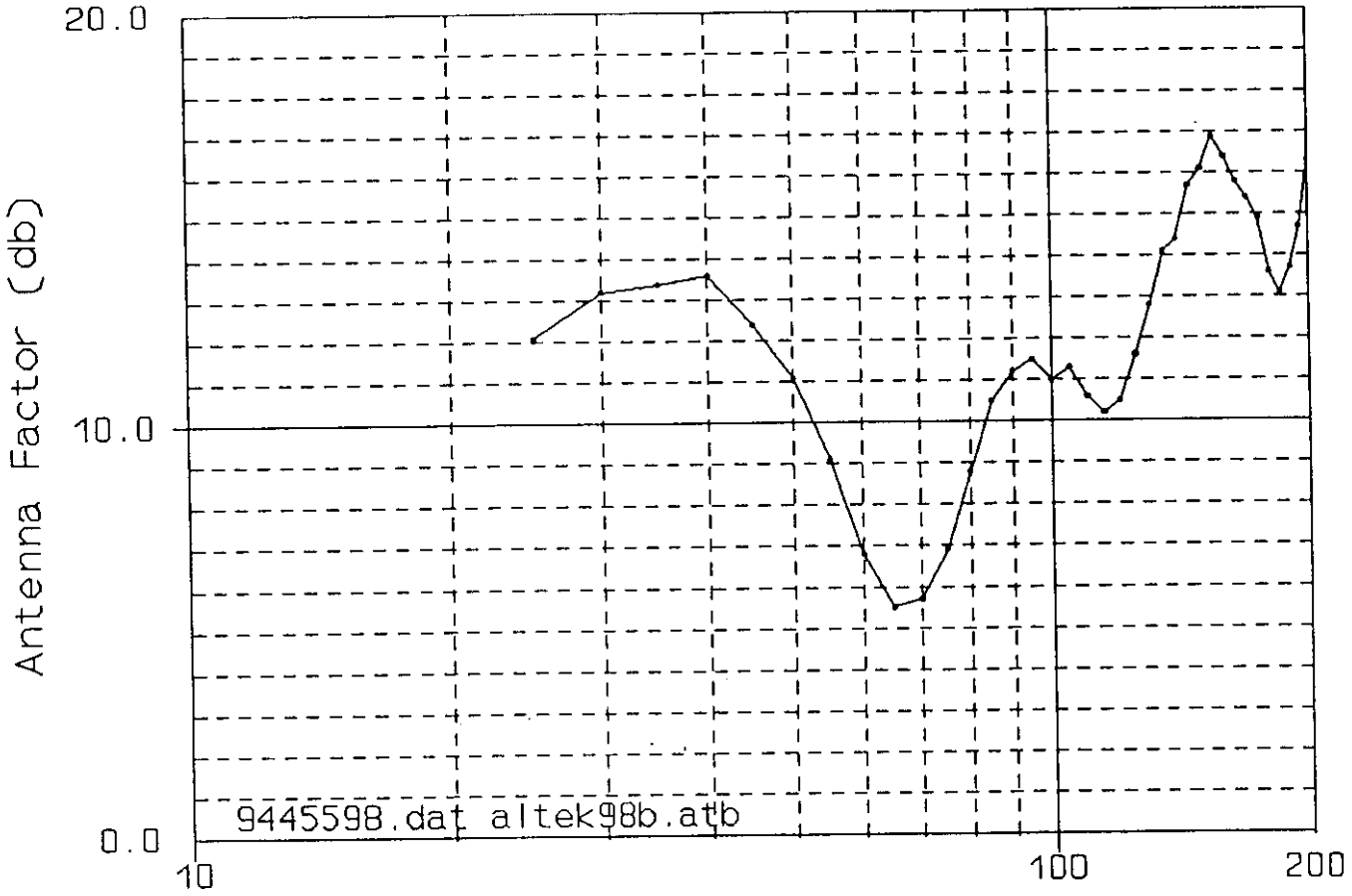

MAGNICAM XFER SWITCH AC/B MODE 12345 C3/4 9/3 MKR 402.5 MHz
REF 100.0 dB V ATTEN 10 dB
40.30 dB V
10 dB/
See Table 7.3.2 for Corrected Level
CORR'D
START 30.0 MHz
RES BW 100 kHz
VBW 10 kHz
STOP 1000.0 MHz
SWP 30 sec

Appendix II

Rec #0: 74400s

AILTECH MODEL 94455-1 BICONICAL ANTENNA

Serial No: 918 Calibrated 6/11/98



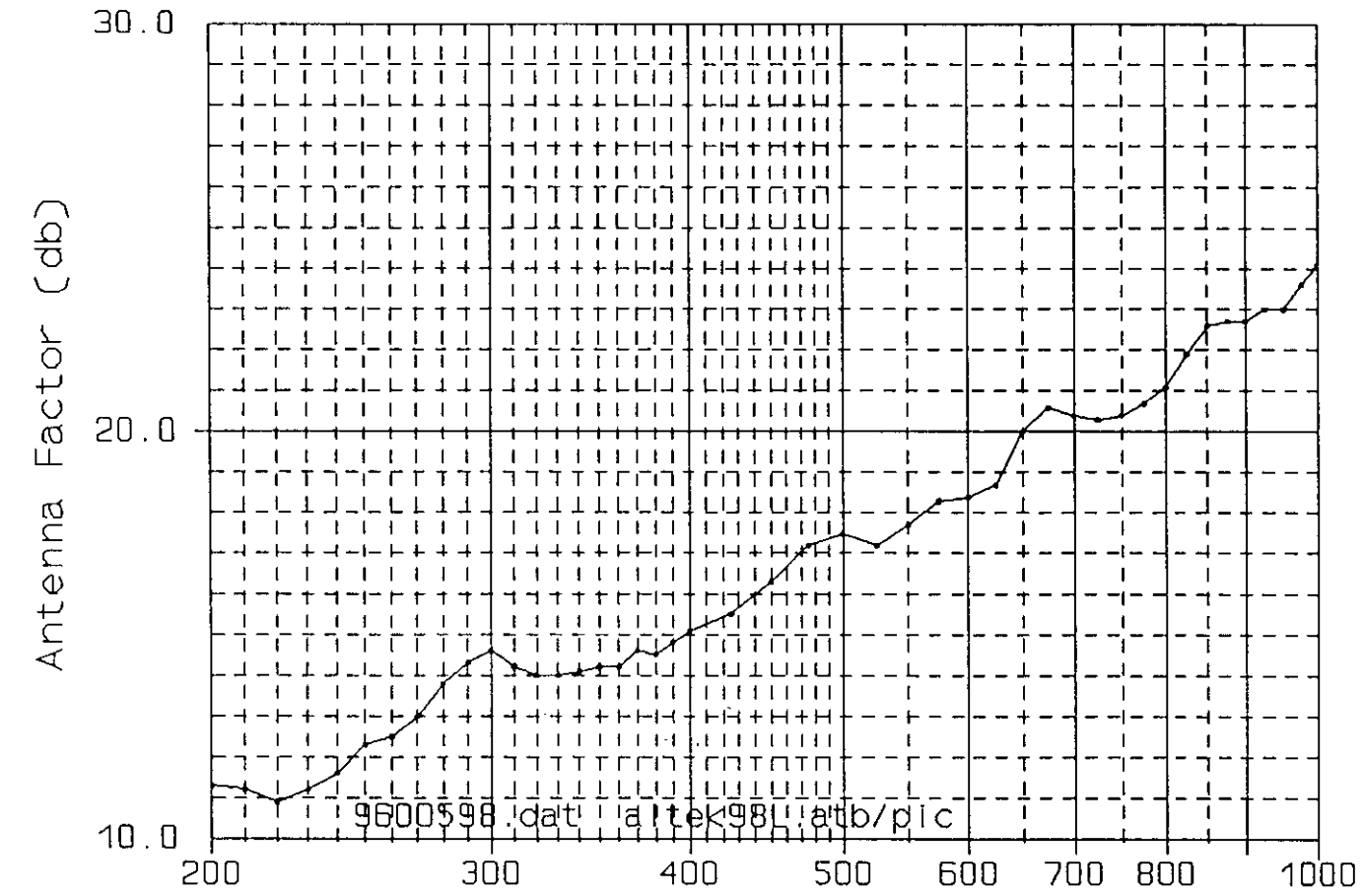
Transmit Height = 1 Meter
10 Meter Spacing

FCC ID: 4948001S

(55)

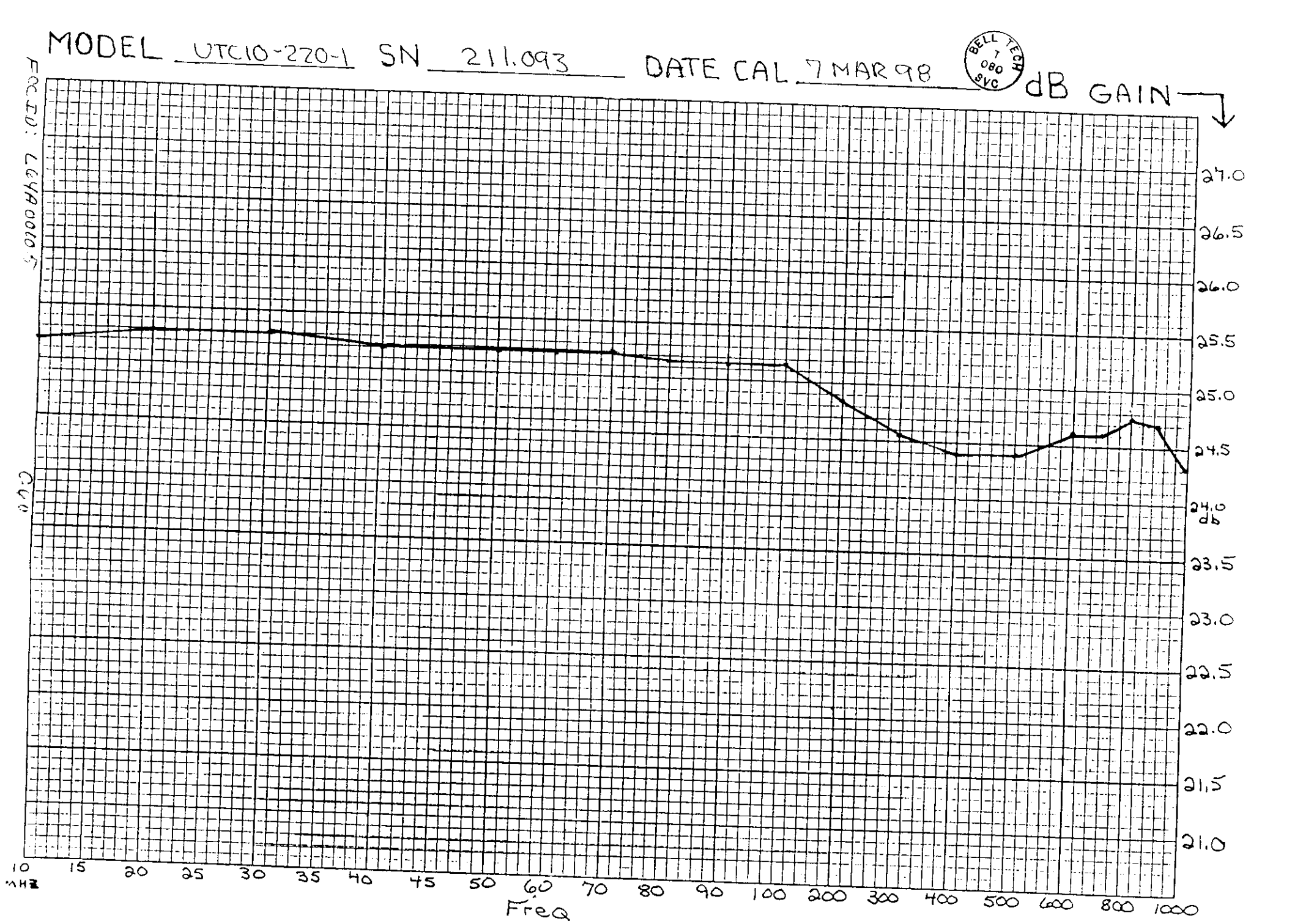
AILTECH 96005 LOG PERIODIC ANTENNA

Serial No: 1058 Calibrated 6/11/98



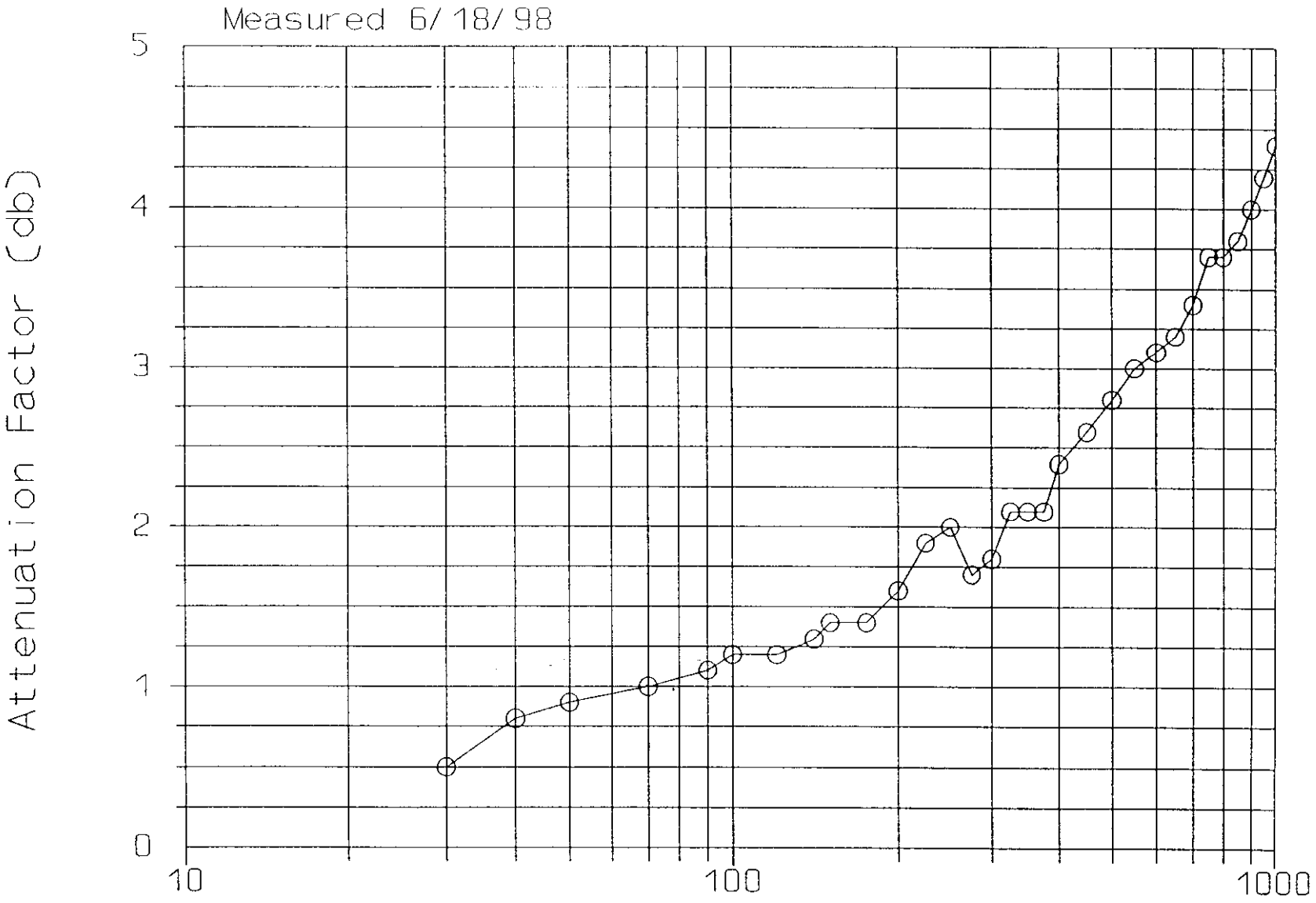
Transmit Height = 1 Meter
Spacing = 10 Meters

MODEL UTC10-220-1 SN 211.093 DATE CAL 7 MAR 98



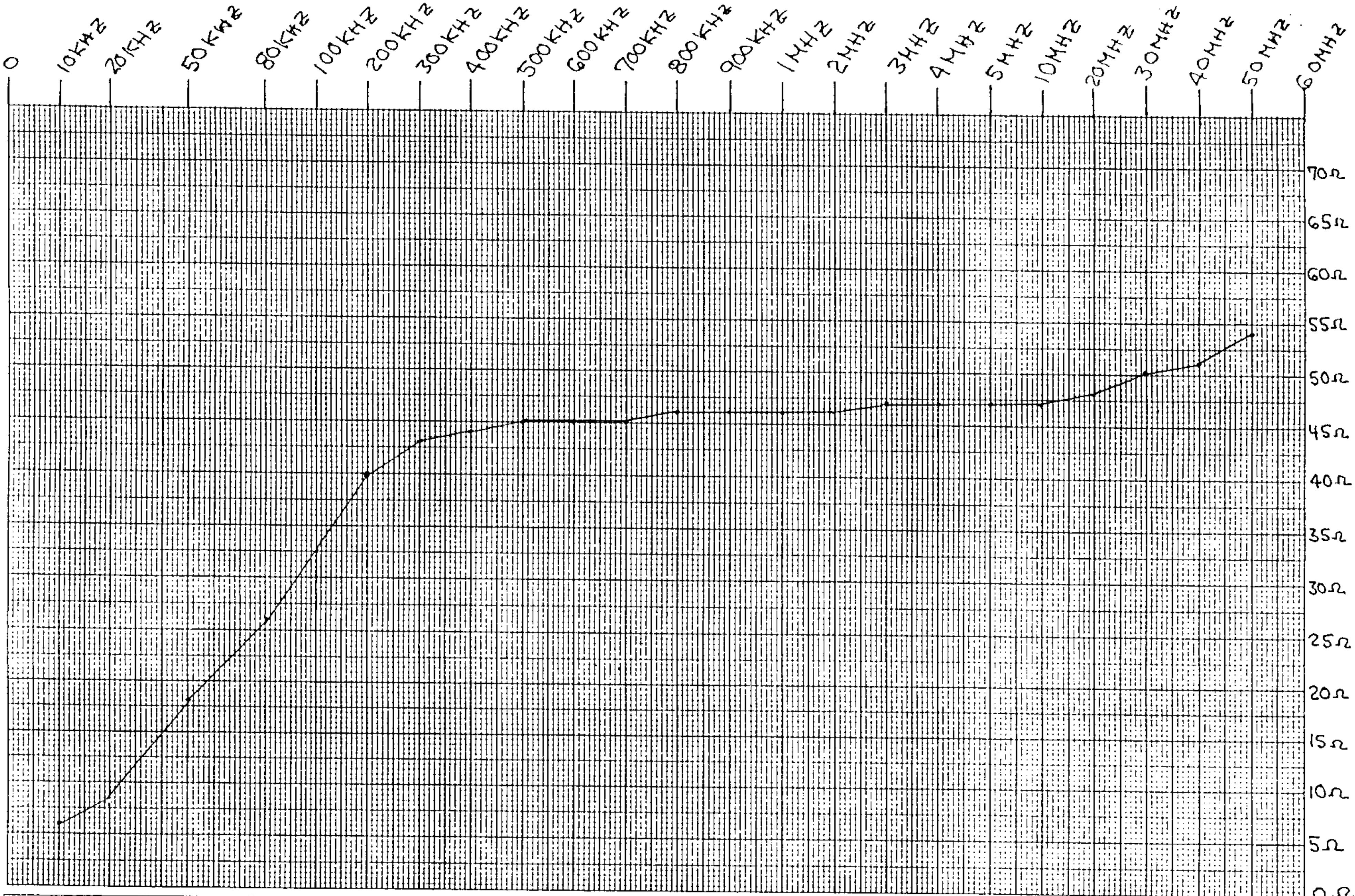
FCC ID: L6YA00105

3 METER CABLE ATTENUATION



10MCB98.dat
10MCB98.atb

LINE IMPEDANCE STABILIZATION NETWORK



Model 8012-50-R-24-BNC

Serial Number 6009942

Tested by C. DIEHL

Date 23 JUN 98

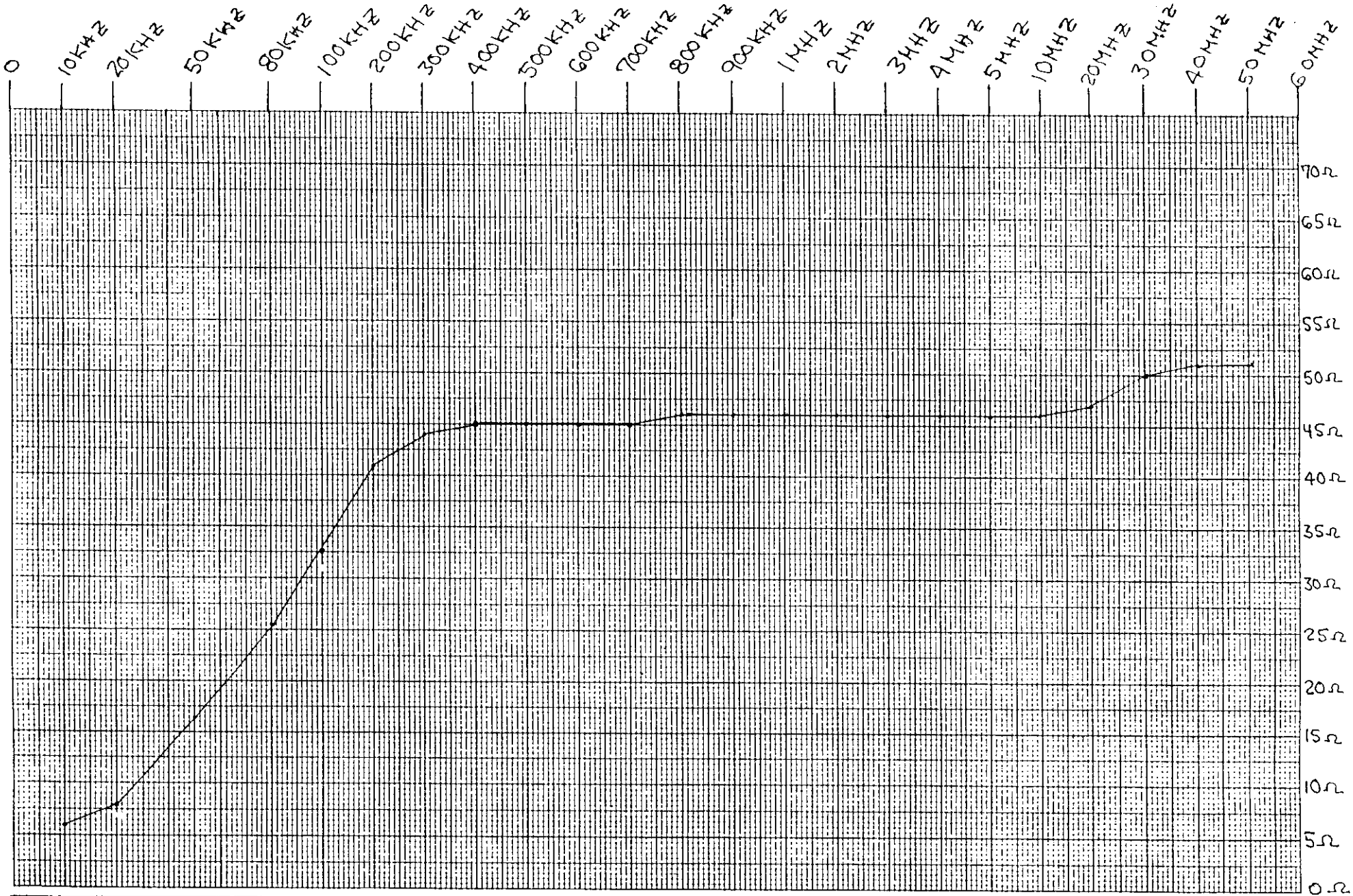
BELL TECH T CPO 8VC

Bell Technologies
SERVICES DIVISION

FCC ID: L4YA00105

C.6.2

LINE IMPEDANCE STABILIZATION NETWORK



Model 8012-50-R-24-BNC

Serial Number 6009941

Tested by C. DIEHL

Date 23 JAN 98

BELL TECH SYS

Bell Technologies
SERVICES DIVISION

FCC ID: L6400105

FILTER MODEL 7930-10 SN 6009940

CAL DATE 23JUN98

BELL TECH 080 SVC

ATTEN. AT 3.3KHz 98.9 dB

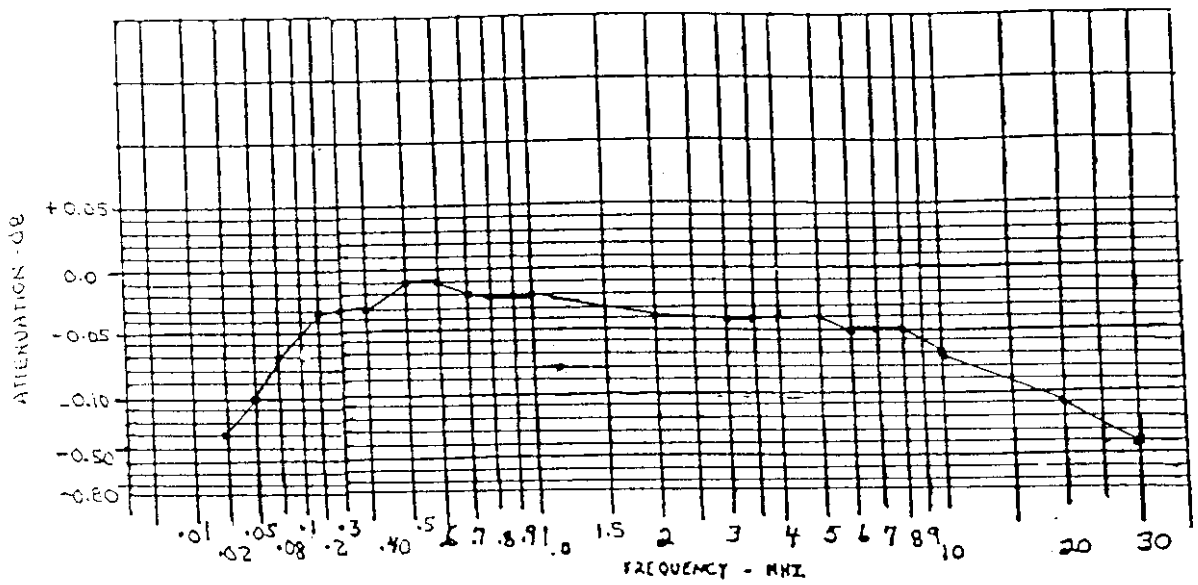


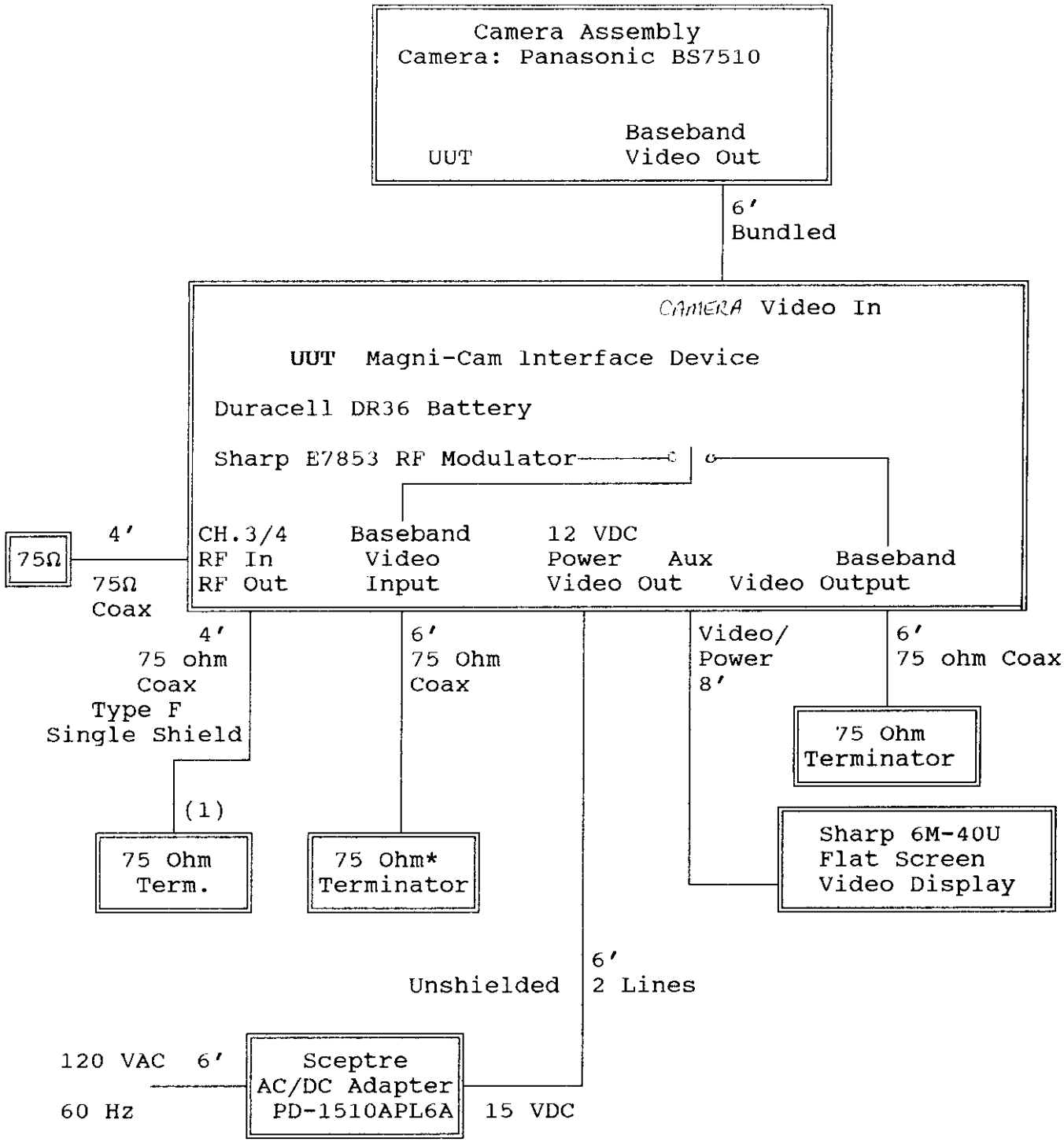
FIGURE - HP FILTER FREQUENCY CHARACTERISTICS

(450 Hz to 30 MHz)

FCC ID: L64A00109

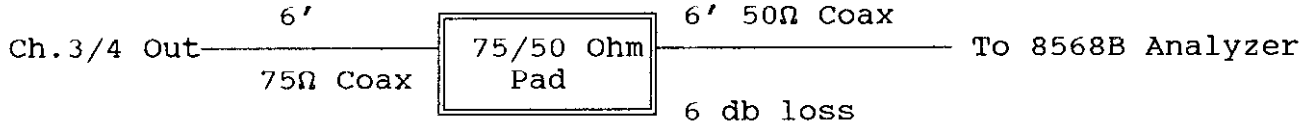
Appendix III

UUT BLOCK DIAGRAM



* For a VITS 1V & 5 V input, the terminator is replaced with a TEK 1910 Generator and a CCOR Electronics Video Amp as shown in the transfer switch isolation test block diagram.

(1) For Output And Spurious Conducted, the 75 ohm terminator is replaced with:



FCC ID: L64A00105

C46