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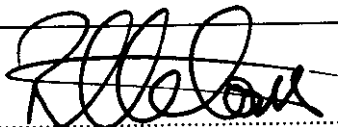
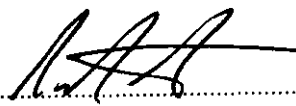
Switchboard Tel: +44 (0) 1256 851193  
Accounts Tel: +44 (0) 1256 855490  
Sales Tel: +44 (0) 1256 855400  
Fax: +44 (0) 1256 851192  
E-mail: sales@rfi.co.uk  
Web Site: www.rfi.co.uk

## TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: Texecom Ltd.  
Mirage Intruder Detection Unit

To: F.C.C. Part 15  
Subpart C. Section 15.245  
(Intentional Radiators)

Test Report Serial No:  
RFI/EMCB1/RP36585B

This Test Report is Issued Under The Authority Of Brian Watson, Technical Director:		
Tested By: 	Checked By: 	
Report Copy No: 1		
Issue Date: 7 July 1998	Test Date: 4 July to 5 July 1998	

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The results in this report apply only to the sample(s) tested.

**RADIO FREQUENCY INVESTIGATION LTD.**

**TEST REPORT**

**EMC Department**

**S.No. RFI/EMCB1/RP36585B**

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**Issue Date: 7 July 1998**

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            Mirage Intruder Detection Unit

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**1. Client Information**

<b>Company Name:</b>	Texecom Ltd
<b>Address:</b>	Texecom House 559, Wilbraham Road Chorlton Manchester M21 0AE
<b>Contact Name:</b>	Mr A Rust

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## **2. Equipment Under Test (EUT)**

The following information (with the exception of the Date of Receipt) has been supplied by the client:

### **2.1. Identification Of Equipment Under Test (EUT)**

<b>Brand Name:</b>	Texecom
<b>Model Name or Number:</b>	Mirage
<b>Unique Type Identification:</b>	Dual Technology Microwave and Infrared Detector
<b>Serial Number:</b>	579503
<b>Country of Manufacture:</b>	UK
<b>FCC ID Number:</b>	MYJDTD001-1
<b>Date of Receipt:</b>	3 July 1998

### **2.2. Description Of EUT**

The equipment under test was an intruder detection unit combining passive infrared (PIR) detection to sense body heat, and a Microwave Doppler (mw) detection to sense movement. Only when both technologies detect simultaneously will the unit produce an alarm.

### **2.3. Modifications Incorporated In EUT**

None stated by client.

### **2.4. Additional Information Related To Testing**

<b>Power Supply Requirement:</b>	+ 12 V DC (supplied by Veritas 8 support equipment)
<b>Intended Operating Environment:</b>	Domestic, Indoors
<b>Weight:</b>	160 g
<b>Dimensions:</b>	0.066m (W) x 0.041 m (L) x 0.116 m (H)
<b>Interface Ports:</b>	A – Tamper Contact (Not Used) B – Tamper Contact (Not Used) C - Alarm Contact (Not Used) D - Alarm Contact (Not Used) E - 12 V DC F - 0 V

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**2.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

<b>Description:</b>	Alarm Control Panel
<b>Brand Name:</b>	Texecom
<b>Model Name or Number:</b>	Veritas 8
<b>Serial Number:</b>	None stated by client
<b>FCC ID Number:</b>	None stated by client
<b>Cable Length And Type:</b>	2 Core Telephone Cable, 2 m
<b>Connected to Port:</b>	DC Input

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### **3. Test Specification, Methods And Procedures**

#### **3.1. Test Specification**

<b>Reference:</b>	F.C.C. Part 15 Subpart C. Section 15.245 - Intentional Radiators*
<b>Title:</b>	Code of Federal Regulations, Part 15 (47CFR15), 1995 Radio Frequency Devices: Intentional Radiators.
<b>Comments:</b>	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
<b>Purpose of Test:</b>	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

\*Sections 15.209 (Radiated Emissions; general requirements) and 15.245 (Operation within the band 2.435 to 2.465GHz).

#### **3.2. Methods And Procedures**

The methods and procedures used were as detailed in:

ANSI C63.2 (1987)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (1992)

Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)

Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)

Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16 (1987)

Title: Specification for Radio Interference measuring apparatus and measurement methods.

#### **3.3. Definition Of Measurement Equipment**

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

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#### **4. Deviations From The Test Specification**

None.

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## **5. Operation Of The EUT During Testing**

### **5.1. Operating Conditions**

The EUT was tested in a normal laboratory environment. During testing, the EUT was powered by a +12 V DC supply, which was supplied by the support equipment (The Veritas Control Unit). As the Veritas Control Unit was powered from 115 V, 60 Hz, a full conducted emissions test was performed. The Veritas Control Unit also has an internal battery backup supply of 12 V. Throughout testing, the Veritas Control Unit was powered by 115 V/60Hz.

### **5.2. Operating Modes**

The EUT was tested in the following operating mode: "Armed" - detecting movement.

The reason for choosing this mode was that it was defined by the client as being likely to be the worst case with regards EMC.

### **5.3. Configuration And Peripherals**

Throughout testing, the EUT was configured, connected to the relevant support equipment as shown in the diagram in Appendix 3.

The reason for choosing this configuration was that it was defined by the client as being likely to be the worst case with regards EMC.

NB Section 2 of this report contains a full list of support equipment used.

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## **6. Summary Of Test Results**

### **6.1. Conducted Emissions**

<b>Range Of Measurements</b>	<b>Specification Reference</b>	<b>Compliance Status</b>
AC Powerline Conducted Emissions, 450 kHz to 30 MHz	Section 15 of C.F.R. 47: 1995	Complied

### **6.2. Radiated Emissions**

<b>Range Of Measurements</b>	<b>Specification Reference</b>	<b>Compliance Status</b>
Electric Field Strength, 30 MHz to 26.5 GHz	Section 15 of C.F.R. 47: 1995	Complied

### **6.3. Location Of Tests**

All the measurements described in this report were performed at the premises of Radio Frequency Investigation Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RG, England.

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## **7. Measurements, Examinations And Derived Results**

### **7.1. General Comments**

7.1.1. This section contains test results only. Details of the test methods and procedures can be found in Appendix 2 of this report.

7.1.2. The measurement uncertainties stated were calculated in accordance with the requirements of NAMAS Document NIS 81 with a confidence level of 95%. Please refer to Section 8 for details of measurement uncertainties.

7.1.3. As the support equipment (Veritas control unit) does not carry an FCC identification number, a full conducted emissions test was performed. Also throughout all testing, the Veritas Control Unit was configured with the EUT.

7.1.4. As the support equipment (Veritas control unit) has an internal battery backup, radiated emission scans were performed with the unit powered from the battery backup in the range 30 to 1000 MHz only in order to demonstrate compliance in this mode. These scans can be seen in Appendix 4 of this report.

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**7.2. Test Results For AC Mains Conducted Emissions to the Veritas Control Panel.****7.2.1. Quasi-Peak Detector Measurements On Live And Neutral Lines**

7.2.1.1. Plots of the initial scans can be found in Appendix 4.

7.2.1.2. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector:

Frequency (MHz)	Line	Q-P Level (dB $\mu$ V)	Q-P Limit (dB $\mu$ V)	Margin (dB)	Result
2.258	Neutral	4.5	48.0	43.5	Complied
3.444	Neutral	12.7	48.0	35.3	Complied
5.173	Neutral	12.3	48.0	35.7	Complied
5.677	Neutral	12.1	48.0	35.9	Complied
6.137	Live	5.8	48.0	42.2	Complied
6.423	Neutral	11.8	48.0	36.2	Complied
9.857	Live	4.8	48.0	43.2	Complied
16.763	Live	7.9	48.0	40.1	Complied
19.909	Live	9.4	48.0	38.6	Complied
20.955	Live	16.2	48.0	31.8	Complied
20.955	Neutral	26.1	48.0	21.9	Complied
22.003	Live	10.7	48.0	37.3	Complied

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**7.3. Test Results For Radiated Emissions (Section 15.209)****7.3.1. Electric Field Strength Measurements of Spurious Emissions**

7.3.1.1. The client has stated that the highest frequency generated or used in the EUT was 2.450 GHz. Therefore tests were performed up to 26.5 GHz.

7.3.1.2. Plots of the initial scans can be found in Appendix 4.

7.3.1.3. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector at a test distance of 3m. (results incorporate antenna factors and cable losses):

Frequency (MHz)	Ant. Pol.	Q-P Level (dB $\mu$ V/m)	Q-P Limit (dB $\mu$ V/m)	Margin (dB)	Result
46.237	Vert.	22.6	40.0	17.4	Complied
49.389	Vert.	21.4	40.0	18.6	Complied
63.049	Vert.	28.4	40.0	11.6	Complied
65.151	Vert.	23.0	40.0	17.0	Complied
70.202	Vert.	15.8	40.0	24.2	Complied
74.393	Vert.	14.7	40.0	25.3	Complied
216.700	Vert.	11.1	46.0	34.9	Complied
237.000	Vert.	11.6	46.0	34.4	Complied
249.000	Vert.	14.9	46.0	31.1	Complied
263.400	Vert.	12.5	46.0	33.5	Complied
277.400	Vert.	12.6	46.0	33.4	Complied
322.300	Vert.	14.3	46.0	31.7	Complied

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**7.3.2. Electric Field Strength Measurements of the Fundamental Frequency, Harmonics and Spurious Emissions above 1GHz. (Section 15.245)**

7.3.2.1. Plots of the initial scans can be found in Appendix 4.

7.3.2.2. The following table lists frequencies at which emissions were measured using an Average detector:

Frequency (GHz)	Ant. Pol.	Level (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor (dB/m)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4499	Vert.	74.9	2.2	20.0	97.1	114.0	16.9	Complied
2.4499	Horiz.	69.4	2.2	20.0	91.6	114.0	22.4	Complied
4.9002	Vert.	23.4	2.9	24.1	50.4	54.0	3.6	Complied
4.9002	Horiz.	24.2	2.9	24.1	51.2	54.0	2.8	Complied
7.3499	Vert.	22.0	3.7	26.8	52.5	54.0	1.5	Complied
7.3499	Horiz.	23.2	3.7	26.8	53.7	54.0	0.3	Complied
9.3514	Vert.	9.8	4.0	30.5	44.3	54.0	9.7	Complied
9.3514	Horiz.	9.8	4.0	30.5	44.3	54.0	9.7	Complied
9.8060	Vert.	9.9	4.1	30.5	44.5	54.0	9.5	Complied
9.8060	Horiz.	9.9	4.1	30.5	44.5	54.0	9.5	Complied
12.000	Vert.	10.8	5.0	30.7	46.5	54.0	7.5	Complied
12.000	Horiz.	10.8	5.0	30.7	46.5	54.0	7.5	Complied

N/R

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7.3.2.3. The following table lists frequencies at which emissions were measured using a Peak detector:

Frequency (GHz)	Ant. Pol.	Level (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor (dB/m)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4499	Vert.	75.5	2.2	20.0	97.7	134.0	36.3	Complied
2.4499	Horiz.	70.3	2.2	20.0	92.5	134.0	41.5	Complied
4.9002	Vert.	33.3	2.9	24.1	60.3	74.0	13.7	Complied
4.9002	Horiz.	32.8	2.9	24.1	59.8	74.0	14.2	Complied
7.3499	Vert.	27.3	3.7	26.8	57.8	74.0	16.2	Complied
7.3499	Horiz.	29.7	3.7	26.8	60.2	74.0	13.8	Complied
9.3514	Vert.	21.4	4.0	30.5	55.9	74.0	18.1	Complied
9.3514	Horiz.	23.1	4.0	30.5	57.6	74.0	16.4	Complied
9.8060	Vert.	23.0	4.1	30.5	57.6	74.0	16.4	Complied
9.8060	Horiz.	21.9	4.1	30.5	56.5	74.0	17.5	Complied
12.000	Vert.	24.2	5.0	30.7	59.9	74.0	14.1	Complied
12.000	Horiz.	24.2	5.0	30.7	59.9	74.0	14.1	Complied

**Notes:**

1. EUT fundamental frequency = 2.4499 GHz.

The FCC Code Of Federal Regulations, Section 15.245 states that the fundamental frequency must not exceed a field strength of more than 500 mV/m = 114 dB $\mu$ V/m, and any harmonic must not exceed a field strength or more than 1.6 mV/m = 64.1 dB $\mu$ V/m unless the harmonic falls into the restricted bands specified in section 15.205, where it is then required to meet the limit specified in section 15.209. These limits apply when using an average detector. These limits have been increased by 20.0 dB for use with a peak detector as listed in section 15.35 (b).

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## 8. Measurement Uncertainty

8.1. Company Policy, as based on the NAMAS Accreditation Standard, M10, paragraph 12.11 (o), states that Test Reports shall include estimated uncertainty of the calibration or test result (this information need only appear in test reports and test certificates where it is relevant to the validity or application of the test result, where a client's instructions so require or where uncertainty affects compliance to a specification or limit).

8.2. The global uncertainties have been calculated in accordance with NAMAS NIS 81 (Edition 1, May 1994) as follows:

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Conducted Emissions	450 kHz to 30 MHz	95%	+/- 2.2 dB
Radiated Emissions	30 MHz to 1000 MHz	95%	+/- 4.9 dB
Radiated Emissions	1 GHz to 26.5 GHz	95%	+/- 4.3 dB

8.3. Measurement uncertainties have been applied in accordance with NAMAS document NIS 81 (edition 1, May 1994), and in the absence of any specification criteria, guidance, or code of practice, compliance has been judged on the basis of shared risk.

8.4. In the case of emissions tests, the measured value of the disturbance from the product sample shall be compared directly with the limits. If the measured value is equal to or less than the limit the product is deemed to pass the test.

8.5. In the case of immunity tests, the equipment is deemed to pass the test if it fulfils the stated performance criteria at the required or a higher severity level. The measurement uncertainty has been taken into account in the calibration procedures stated in the relevant basic standard.

8.6. The methods used to calculate the above uncertainties are in line with those used for calibration laboratories contained in NAMAS document NIS 3003 Edition 8 "The Expression of Uncertainty and Confidence in Measurement" May 1995, which align with international recommendations "Guide to the Expression of Uncertainty in Measurement" ISO/IEC/OIML/BIPM (Prepared by ISO/TAG 4: January 1993).

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**Appendix 1. Test Equipment Used**

Instrument	Manufacturer	Model	RFI No.
<b>Screened Enclosure: Emissions</b>			
Receiver / Spectrum Analyser System	R & S	ESBI	M090
L.I.S.N.	R & S	ESH3-Z5	A004
1 to 2 GHz Horn Antenna	Eaton	91889-2	A031
Co-Axial Cable (1 to 18GHz)	Rosenberger	64639	C371
Bilog Antenna	Chase	CBL6111A	A490
Pulse Limiter	R&S	ESH3-Z2	A287
<b>Open Area Test Site</b>			
Receiver	R & S	ESVP	M002
Spectrum Monitor	R & S	EZM	M003
Bilog Antenna	Chase	CBL6111	A259
OATS Positioning Controller	R & S	HCC	A276
OATS Antenna Mast	R & S	HCM	A277
Receiver/Analyser	R & S	ESMI	M069
Co-Axial Cable (18 to 26.5GHz)	Rosenberger	64639	C184
Co-Axial Cable (1 to 18GHz)	Rosenberger	64639	C371
1 - 2 GHz Horn	Eaton	91889-2	A031
2 - 4 GHz Horn	Eaton	9188-2	A027
3 - 6 GHz Horn	Flann	12240-20	A253
5 - 8.2 GHz Horn	Flann	12420-20	A254
8.2 - 12.5 GHz Horn	Flann	16240-20	A255
12.5 - 18 GHz Horn	Flann	18240-20	A256
18 - 26.5 GHz Horn	Flann	20240-20	A203

**NB** In accordance with NAMAS requirements, all the measurement equipment is on a calibration schedule.

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## **Appendix 2. Measurement Methods**

### **A2.1. AC Mains Conducted Emissions: FCC Part 15**

A2.1.1. AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

A2.1.2. The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane and with the EUT powered via a 60 Hz AC mains supply.

A2.1.3. Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

A2.1.4. Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

A2.1.5. The test equipment settings for conducted emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements
Detector Type:	Peak	Quasi-Peak (CISPR)*
Mode:	Max Hold	Not applicable
Bandwidth:	10 kHz	9 kHz
Amplitude Range:	60 dB	20 dB
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

\* In some instances an Average detector function may also have been used.

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## **A2.2. Radiated Emissions: FCC Part 15**

A2.2.1. Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

A2.2.2. Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

A2.2.3. The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested on the open area test site, at the appropriate distance, using a measuring receivers with a Quasi-Peak detector (below 1000 MHz), where applicable, for measurements above 1000 MHz average and peak detectors were used.

A2.2.4. For the main (final) measurements the EUT was arranged on a non-conducting table on an open area test site, as detailed in the specification.

A2.2.5. All measurements on the open area test site were performed using broadband antennas.

A2.2.6. On the open area test site, at each frequency where a signal was found, the levels were maximised by initially rotating the turntable through 360°. For frequencies below 1 GHz the antenna height was varied between 1 m and 4 m. Above 1GHz, the antenna was fixed at a height of 1.5m. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

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A2.2.7. The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan Below 1 GHz	Initial Scan Above 1 GHz
Detector Type:	Peak	Peak
Mode:	Max Hold	Max Hold
Bandwidth:	100 kHz	1 MHz
Amplitude Range:	60 dB	60 dB
Measurement Time:	Not applicable	Not applicable
Observation Time:	Not applicable	Not applicable
Step Size:	Continuous sweep	Continuous sweep
Sweep Time:	Coupled	Coupled

Receiver Function	Final Measurements Below 1 GHz	Final Measurements Above 1 GHz
Detector Type:	Quasi-Peak (CISPR)	Peak/Average
Mode:	Not applicable	Not applicable
Bandwidth:	120 kHz	1 MHz
Amplitude Range:	20 dB (typical)	20 dB (typical)
Measurement Time:	> 1 s	> 1 s
Observation Time:	> 15 s	> 15 s
Step Size:	Not applicable	Not applicable
Sweep Time:	Not applicable	Not applicable

Spurious radiated emissions were measured against the limits specified in Section 15.209 of C.F.R. 47 Part 15 Subpart C - Intentional Radiators OR those of Section 15.245 depending upon whichever permitted a higher field strength. Unless otherwise stated, the limits given in this report correspond to those specified in Section 15.209 as these are the most stringent.

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### **Appendix 3. Test Configuration Drawings**

This appendix contains the following drawings:

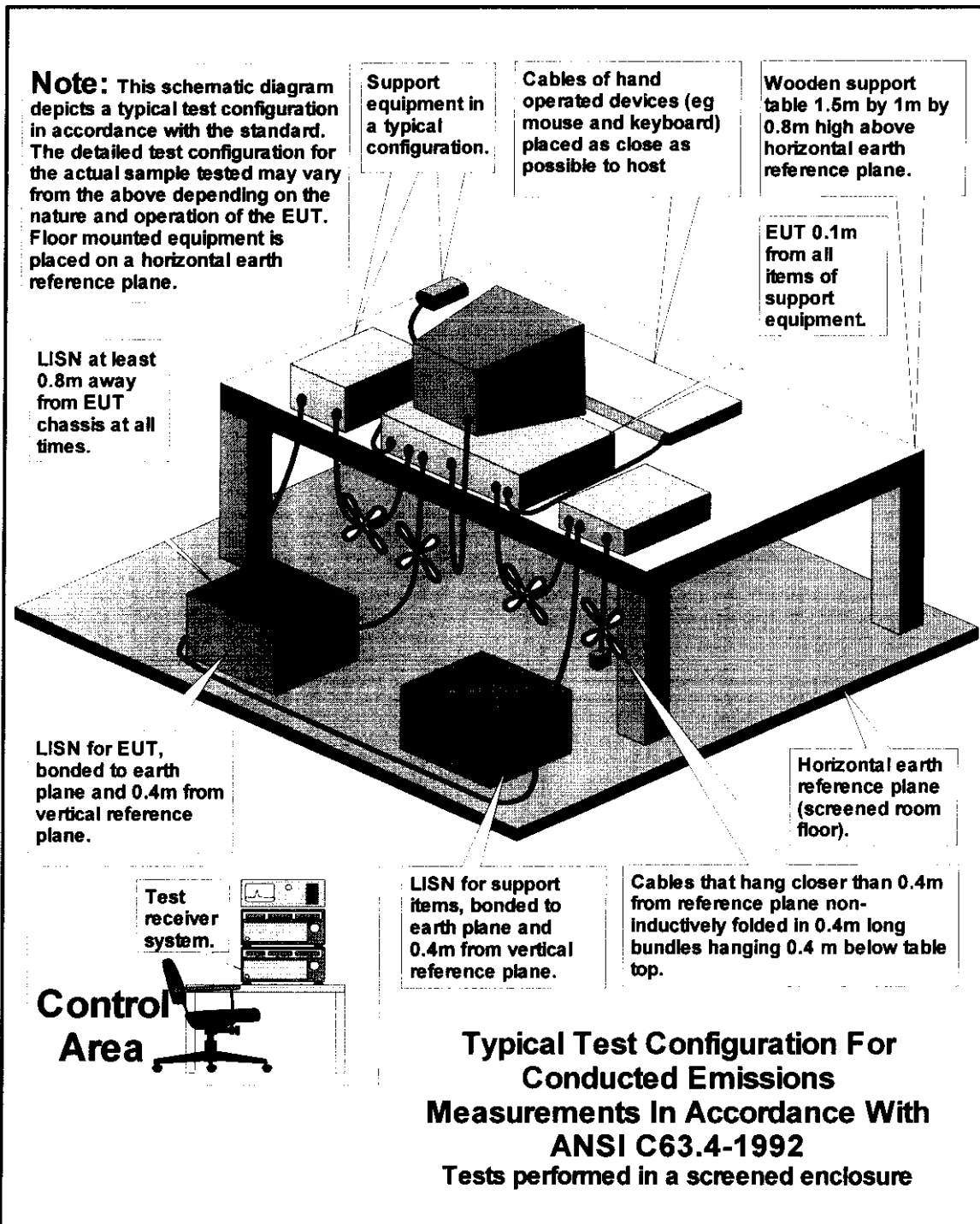
<b>Drawing Reference Number</b>	<b>Title</b>
DRG\36585\EMICON	Test configuration for measurement of conducted emissions
DRG\36585\EMIRAD	Test configuration for measurement of radiated emissions
DRG\36585\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

DRG\36585\EMICON

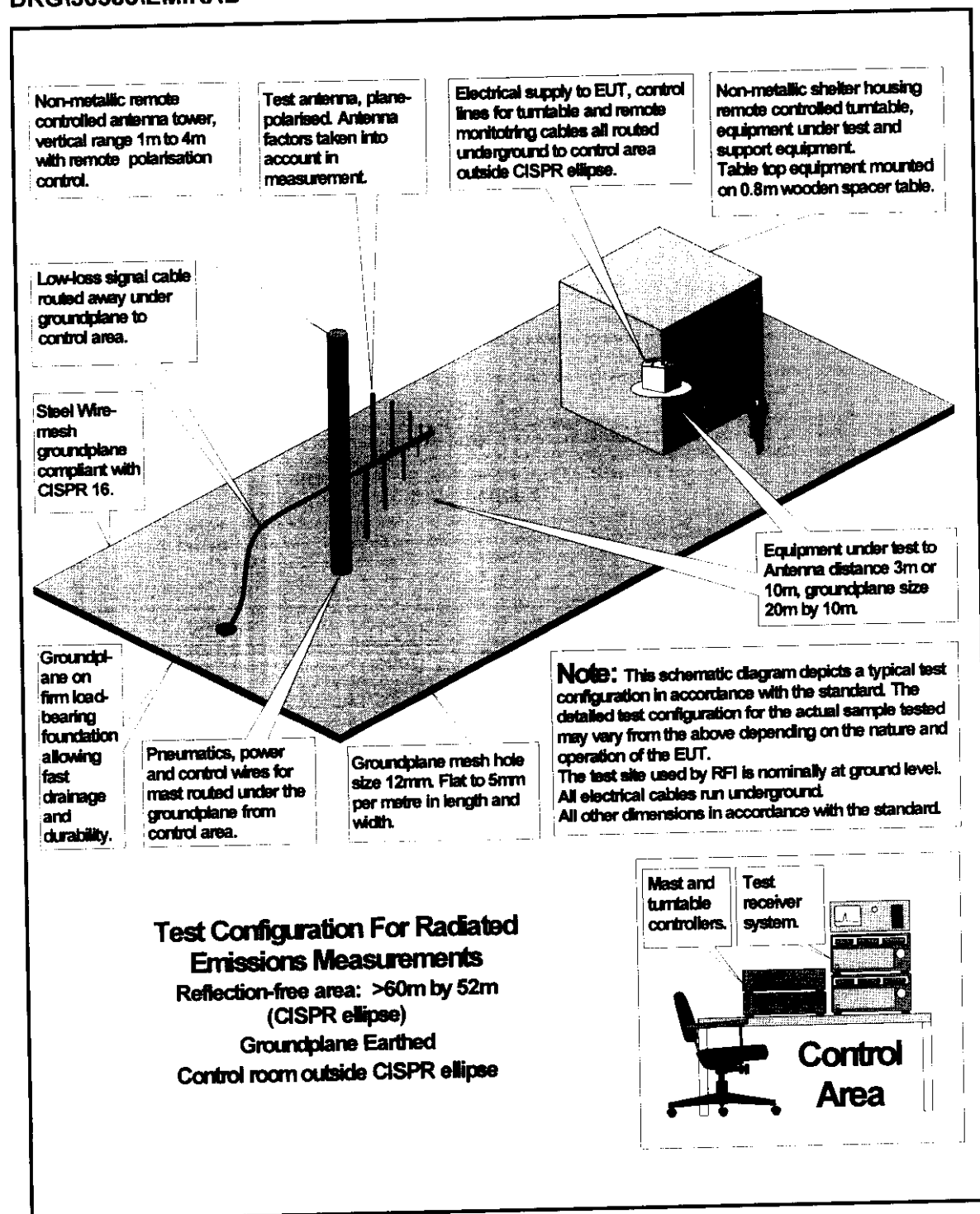


Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

DRG\36585\EMIRAD



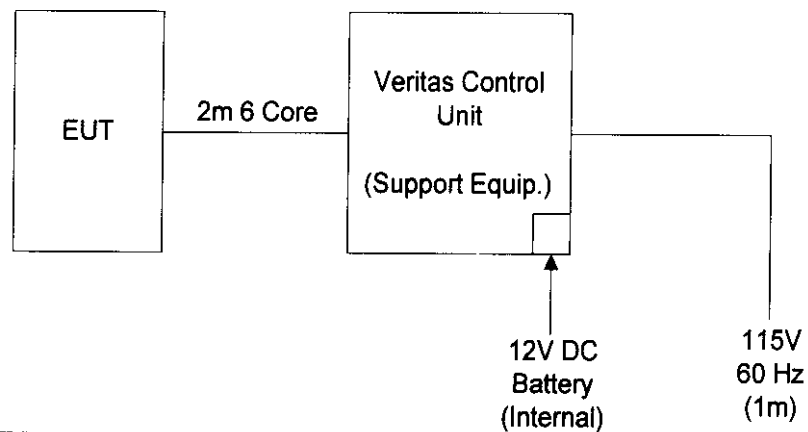
Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

DRG\36585\001

### Configuration of EUT and Local Support Equipment



### Configuration of Remote Support Equipment



Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

**Appendix 4. Graphical Test Results**

This appendix contains the following graphs:

Graph Reference Number	Title
GPH\36585\JD02\001	Scan of radiated electric field: both polarisations (30 to 200 MHz), Veritas control unit, mains supplied
GPH\36585\JD02\002	Scan of radiated electric field: non-polarised (200 to 1000 MHz), Veritas control unit, mains supplied
GPH\36585\JD02\003	Scan of radiated electric field: both polarisations (30 to 200 MHz), Veritas control unit, Battery backup supplied
GPH\36585\JD02\004	Scan of radiated electric field: non-polarised (200 to 1000 MHz), Veritas control unit, Battery backup supplied
GPH\36585\JD02\005	Scan of radiated electric field both polarisations (1 to 2 GHz)
GPH\36585\JD02\006	Scan of radiated electric field both polarisations (2 to 4 GHz)
GPH\36585\JD02\007	Scan of radiated electric field both polarisations (2 to 4 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\008	Scan of radiated electric field both polarisations (2.43 to 2.47 GHz), Frequency Allocation (Section 15.245)
GPH\36585\JD02\009	Scan of radiated electric field both polarisations (2.43 to 2.47 GHz), Frequency Allocation 120kHz Resolution Bandwidth
GPH\36585\JD02\010	Scan of radiated electric field both polarisations (2.44996 GHz), Peak Transmitter Level at 3m
GPH\34980\E\01\011	Scan of radiated electric field both polarisations (4 to 5 GHz)
GPH\36585\JD02\012	Scan of radiated electric field both polarisations (4 to 5 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\013	Scan of radiated electric field both polarisations (5 to 6 GHz)
GPH\36585\JD02\014	Scan of radiated electric field both polarisations (5 to 6 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\015	Scan of radiated electric field both polarisations (6 to 8.2 GHz)

Please refer to next page for continuation of graphical results.

Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

**Graphical Test Results (continued)**

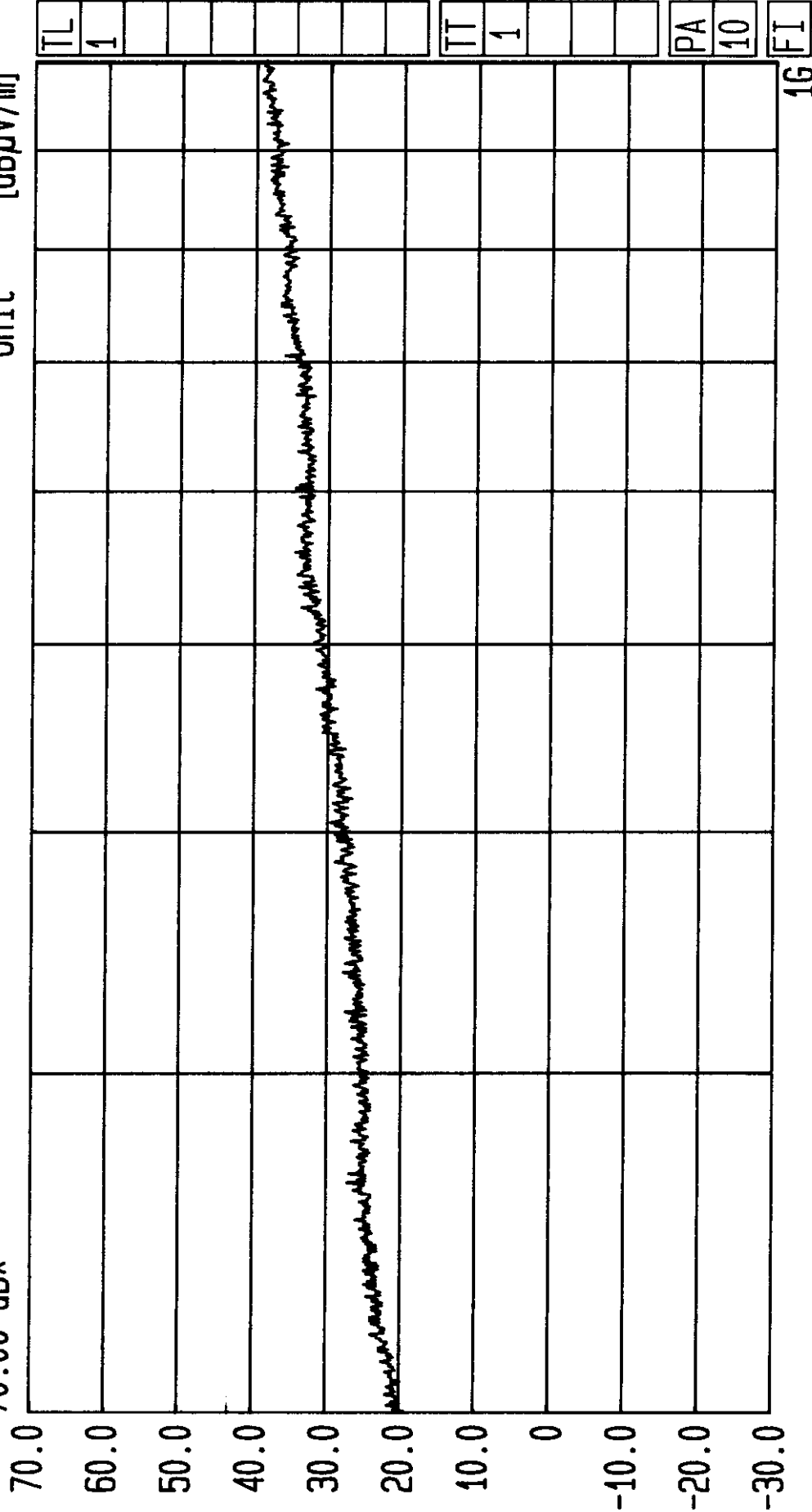
Graph Reference Number	Title
GPH\36585\JD02\016	Scan of radiated electric field both polarisations (6 to 8.2 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\017	Scan of radiated electric field both polarisations (8.2 to 12.5 GHz)
GPH\36585\JD02\018	Scan of radiated electric field both polarisations (8.2 to 12.5 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\019	Scan of radiated electric field both polarisations (12.5 to 18.0 GHz)
GPH\36585\JD02\020	Scan of radiated electric field both polarisations (12.5 to 18.0 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\021	Scan of radiated electric field both polarisations (12.5 to 18.0 GHz), 120kHz Resolution Bandwidth. Test Distance 1m. <b>(This plot was performed at a 1m distance in order to determine that any noise seen on plots GPH\36585\JD02\019 and GPH\36585\JD02\020 was not generated by the EUT)</b>
GPH\36585\JD02\022	Scan of radiated electric field both polarisations (18.0 to 26.5 GHz)
GPH\36585\JD02\023	Scan of radiated electric field both polarisations (18.0 to 26.5 GHz), 120kHz Resolution Bandwidth
GPH\36585\JD02\024	Scan of radiated electric field both polarisations (18.0 to 26.5 GHz), 120kHz Resolution Bandwidth. Test Distance 1m. <b>(This plot was performed at a 1m distance in order to determine that any noise seen on plots GPH\36585\JD02\022 and GPH\36585\JD02\023 was not generated by the EUT)</b>
GPH\36585\JD02\025	Scan of conducted Emissions (0.45 to 30 MHz) Veritas Control Panel. Live Line.
GPH\36585\JD02\026	Scan of conducted Emissions (0.45 to 30 MHz) Veritas Control Panel. Neutral Line.

**These pages are not included in the total number of pages for this report.**



Res.BW 120 kHz [imp] Vid.Bw 100 kHz  
 TG.Lvl off RF.Att 0 dB  
 CF.Stp 80.000 MHz Unit [dBμV/m]

Ref.Lvl  
 70.00 dBx



Start 200 MHz Span 800 MHz Center 447.2 MHz Sweep 360 ms Stop 1 GHz

Ref.Lvl  
 70.00 dB\*

Res.Bw  
 120 kHz [imp]

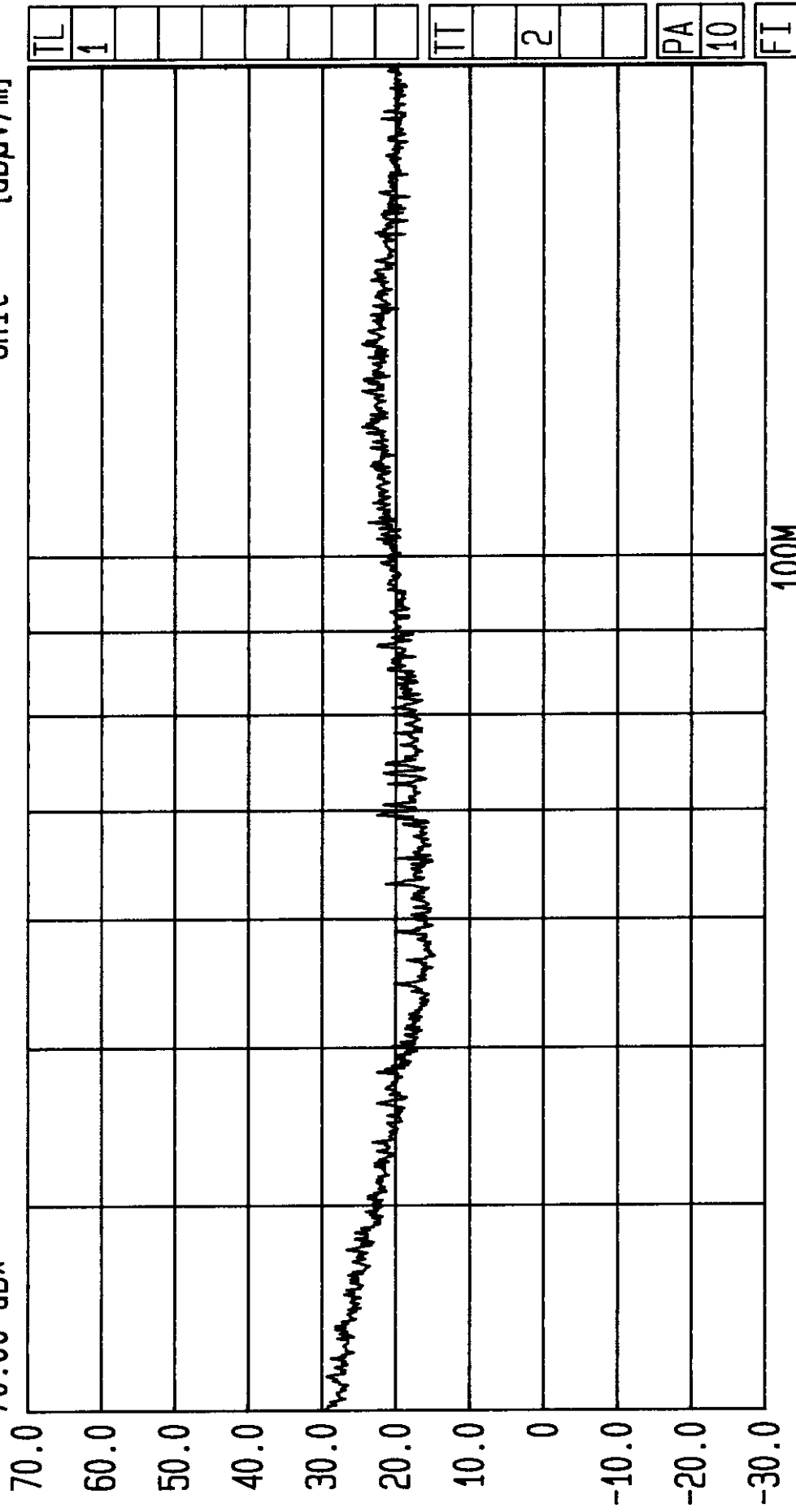
TG.Lvl  
 Off

CF.Stp  
 17.000 MHz

Vid.Bw  
 100 kHz

RF.Att  
 0 dB

Unit  
 [dBμV/m]



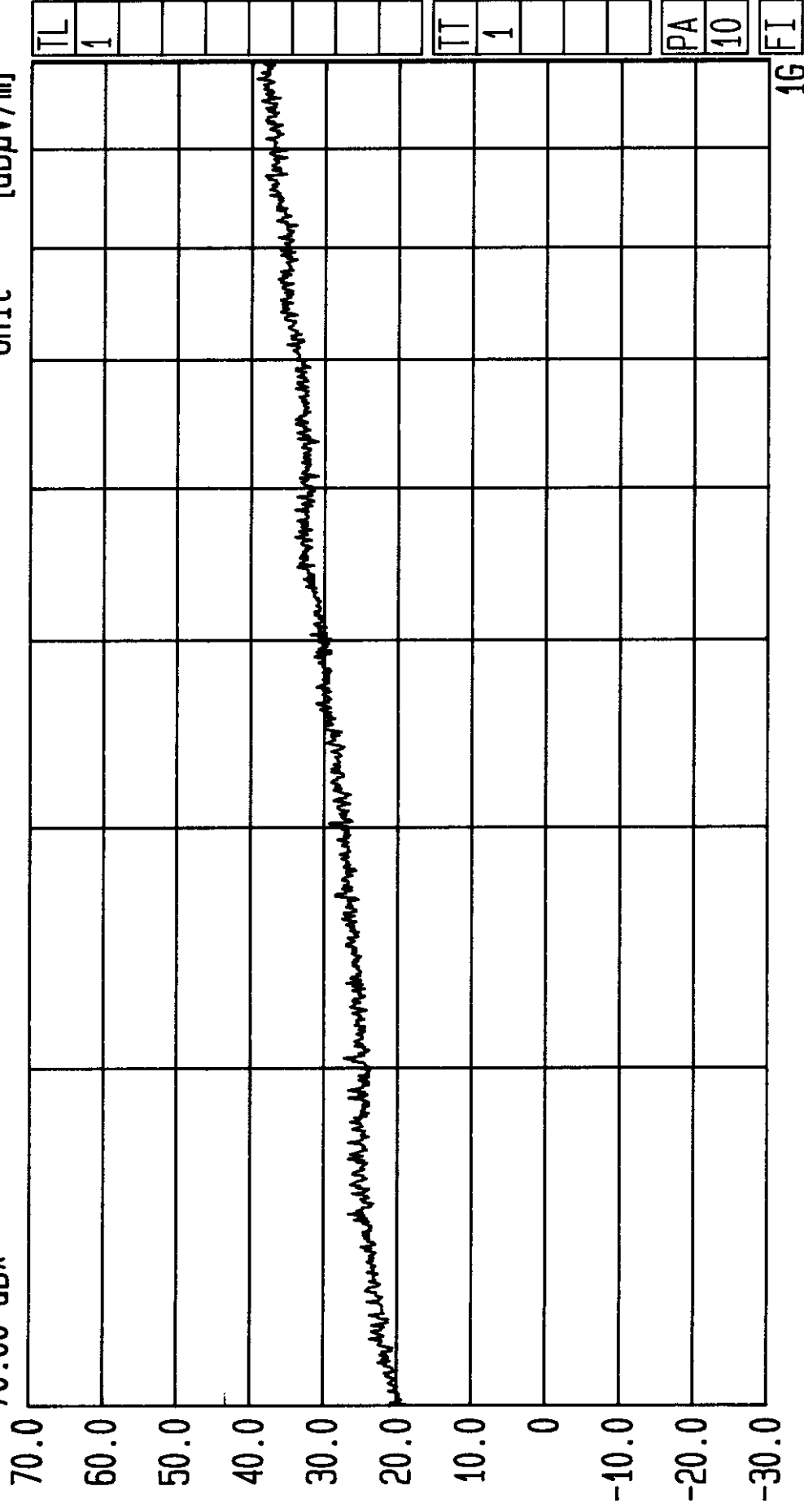
Ref.Lvl  
70.00 dB\*

Res. Bw  
TG. Lvl  
CF. Stp

120 kHz [imp]  
off  
80.000 MHz

Vid.Bw  
RF.Att  
Unit

100 kHz  
0 dB  
[dB $\mu$ V/m]



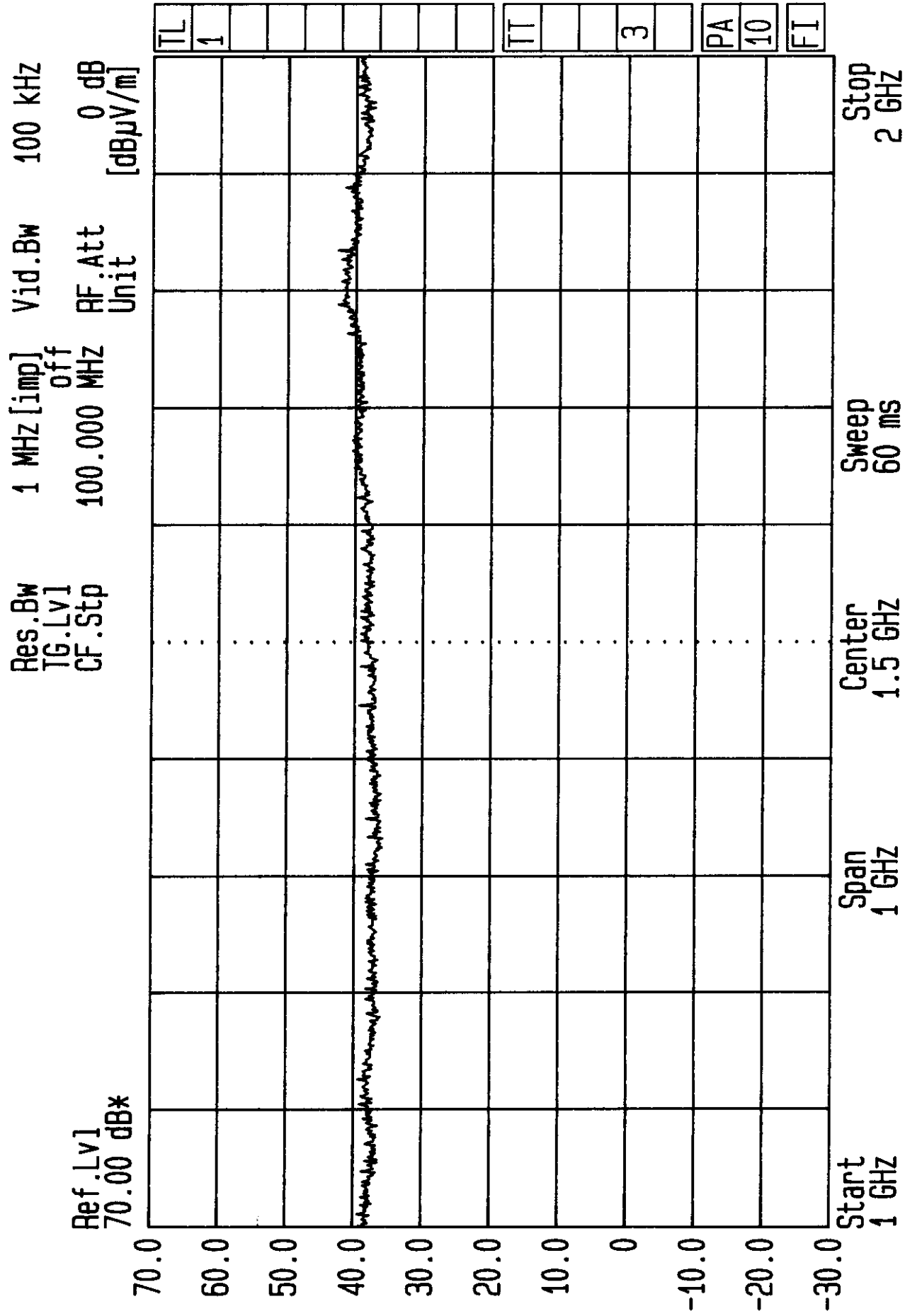
Start  
200 MHz

Span  
800 MHz

Center  
447.2 MHz

Sweep  
360 ms

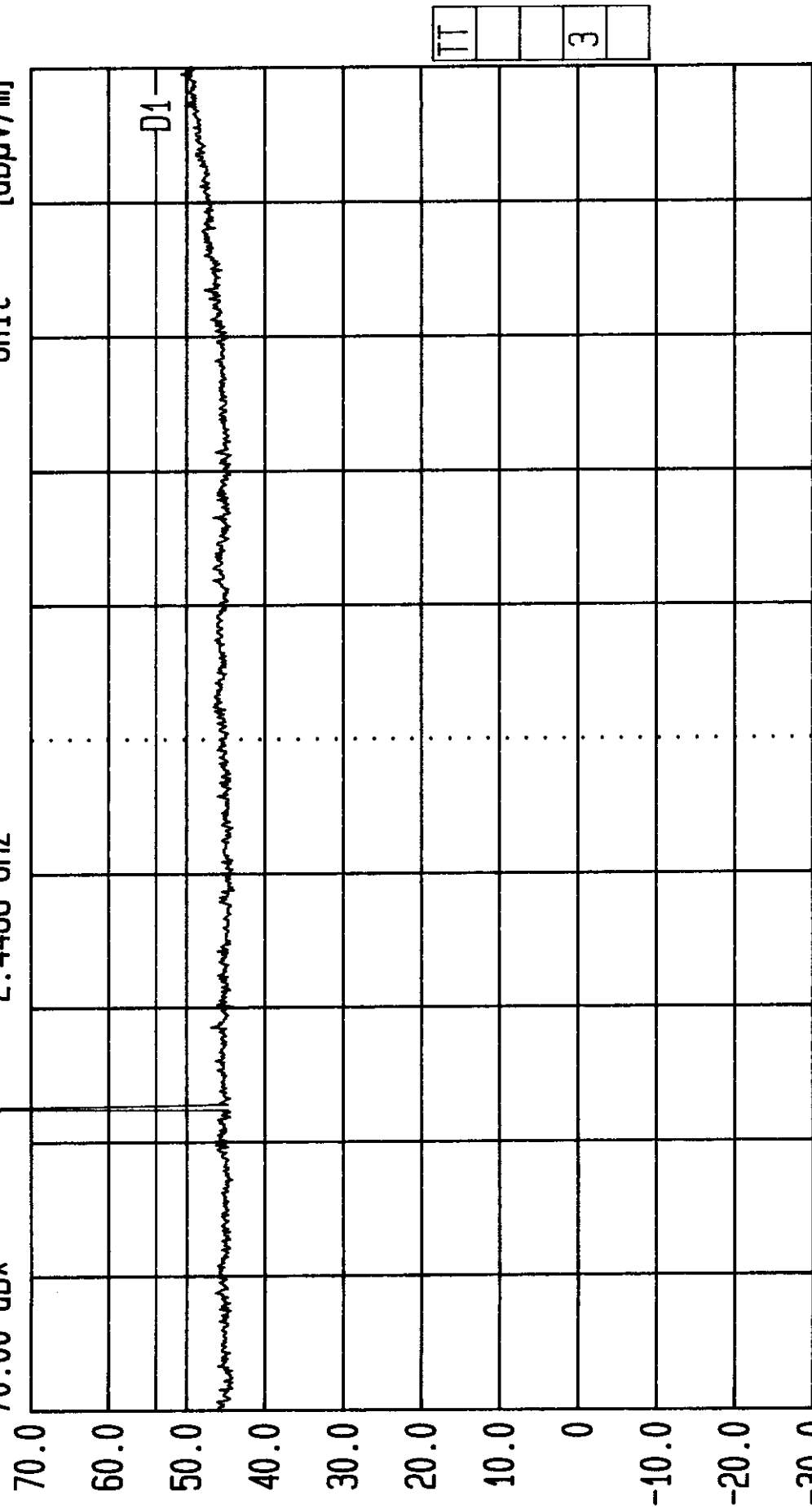
Stop  
1 GHz





Date 04.Jul.'98 Time 11:26:14  
Ref.Lvl 70.00 dB\*  
Marker 73.98 dB\*  
2.4488 GHz

Res.BW 1 MHz [imp]  
TG.Lvl Off  
CF.Stp 200.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



TT  
3

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

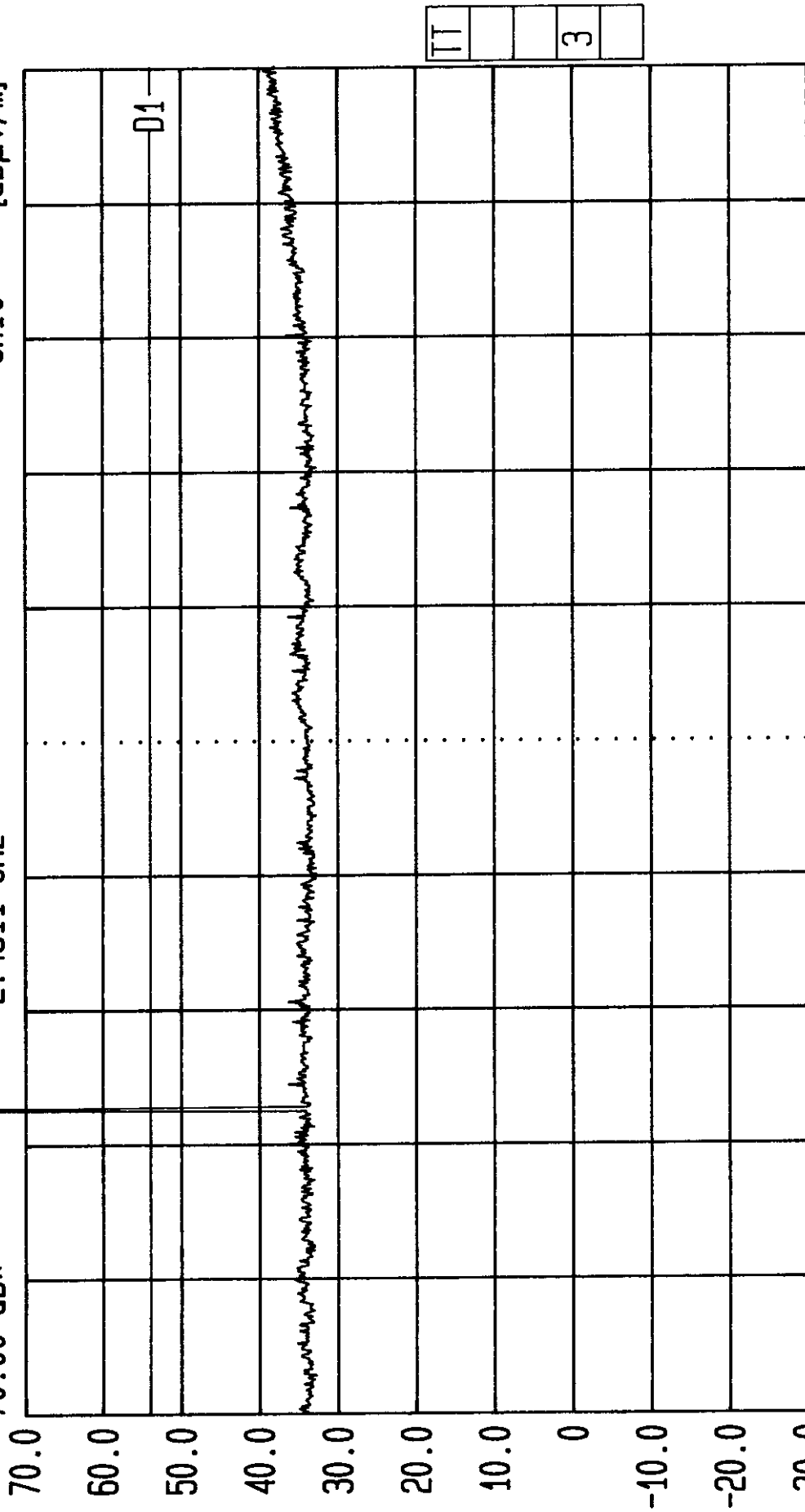
FCC Part 15.245  
GPH/36585/JD02/006





Date 04.Jul.'98 Time 11:33:18  
Ref.Lvl 70.00 dB\*  
Marker 73.98 dB\*  
2.4511 GHz

Res.Bw 120 kHz [imp]  
TG.Lvl Off  
CF.Stp 200.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



TT  
3

Start 2 GHz  
Span 2 GHz  
Center 3 GHz  
Sweep 880 ms  
Stop 4 GHz  
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W  
FCC Part 15.245  
GPH/36585/JD02/007



Date 04.Jul.'98 Time 11:42:15

Ref.Lvl 100.00 dBx

Marker 95.26 dBx

2.44986 GHz

Res.Bw 1 MHz [imp]

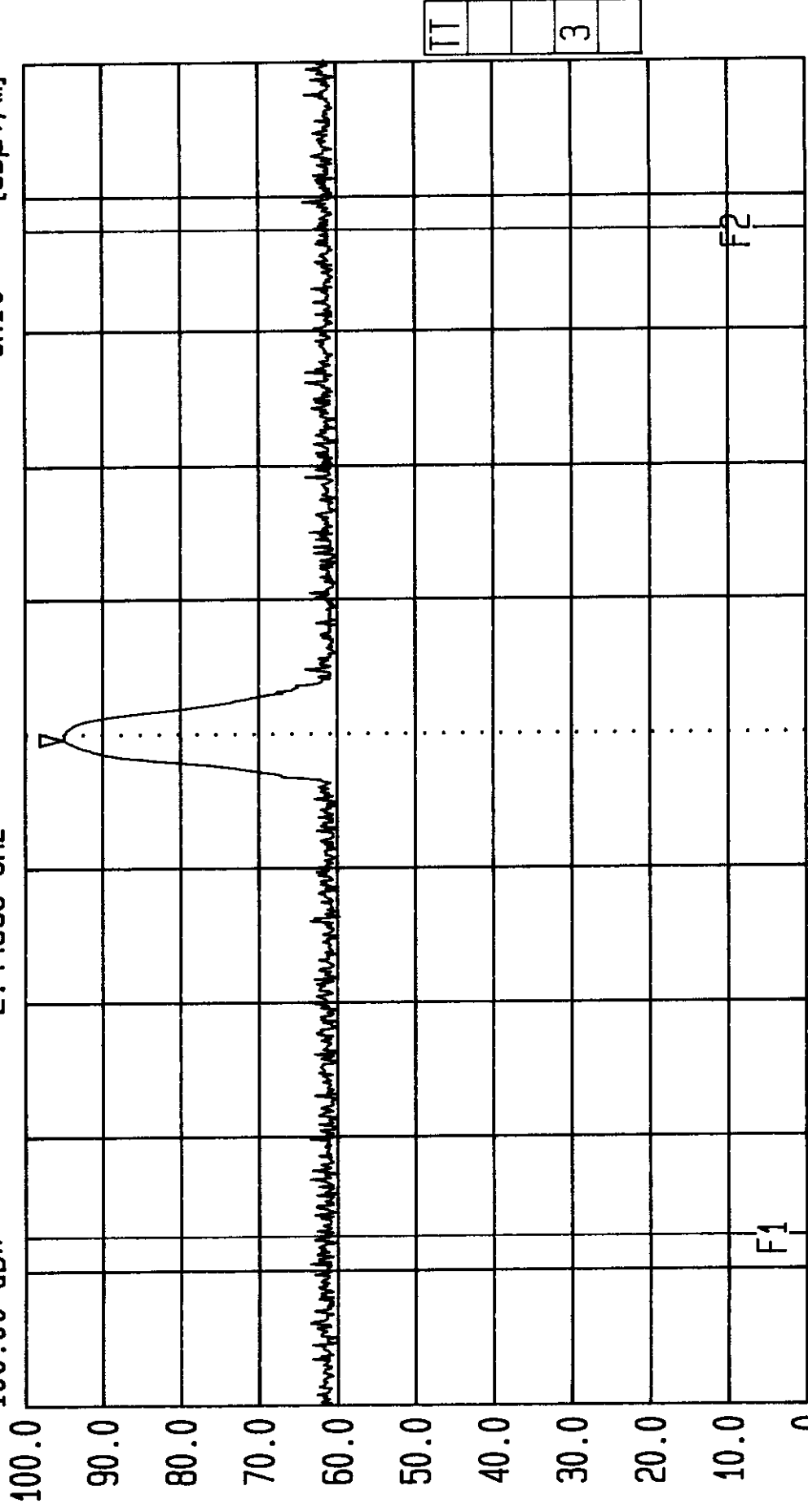
TG.Lvl Off

CF.Stp 4.000 MHz

RF.Att 10 dB

Unit [dBuV/m]

Vid.Bw 1 MHz



Start 2.43 GHz Stop 2.47 GHz

Sweep 20 ms

Center 2.45 GHz

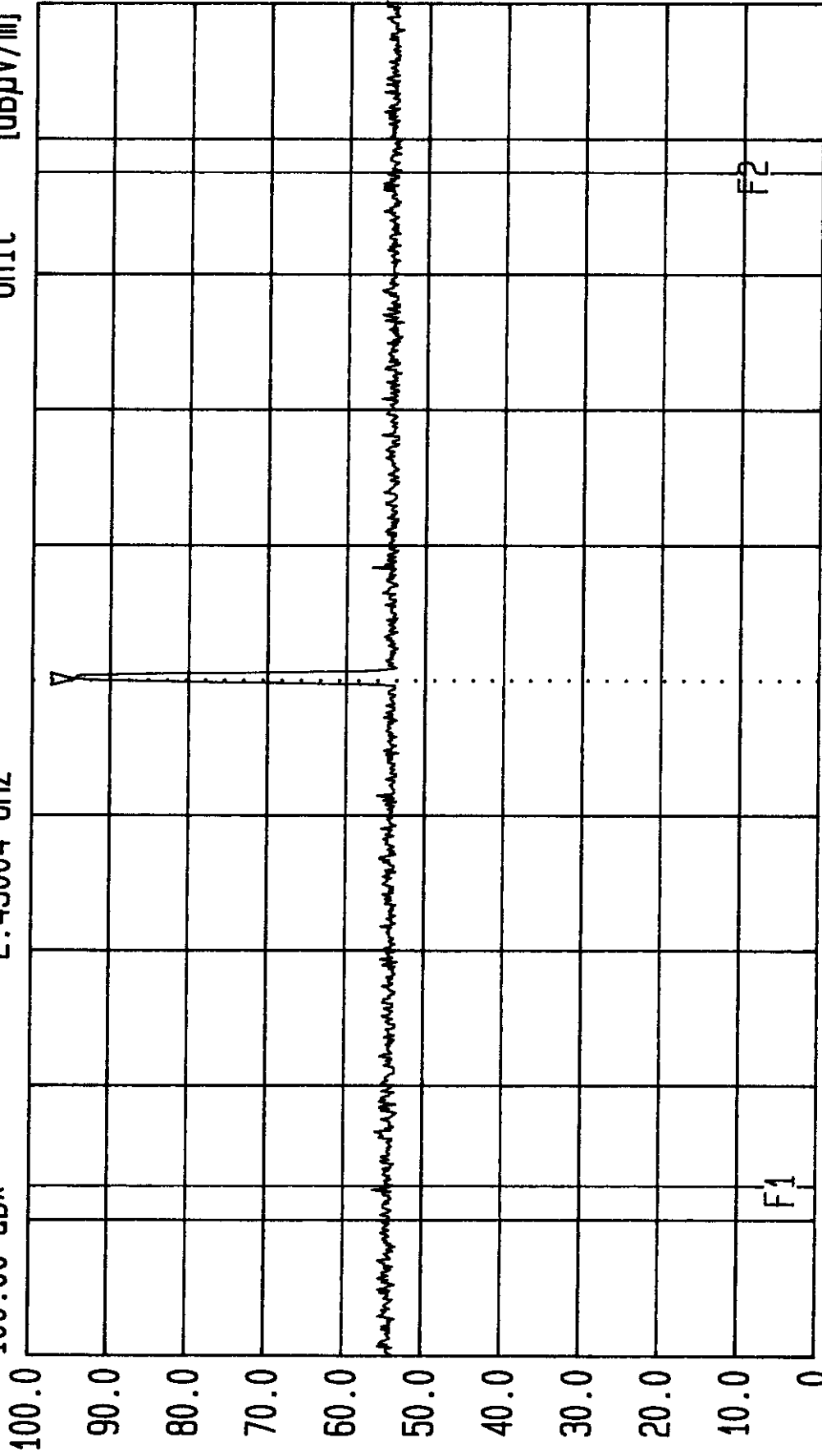
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 114dBuV/m. EUT in Alarm Sense Mode. F1/F2 Band Edge.

FCC Part 15.245  
GPH/36585/JD02/008



Date 04.Jul.'98 Time 11:50:07  
Ref.Lvl 100.00 dB\*  
Marker 94.67 dB\*  
2.45004 GHz

Res.Bw 100 kHz [imp]  
TG.Lvl Off  
CF.Stp 4.000 MHz  
Vid.Bw 1 MHz  
RF.Att 10 dB  
Unit [dB $\mu$ V/m]



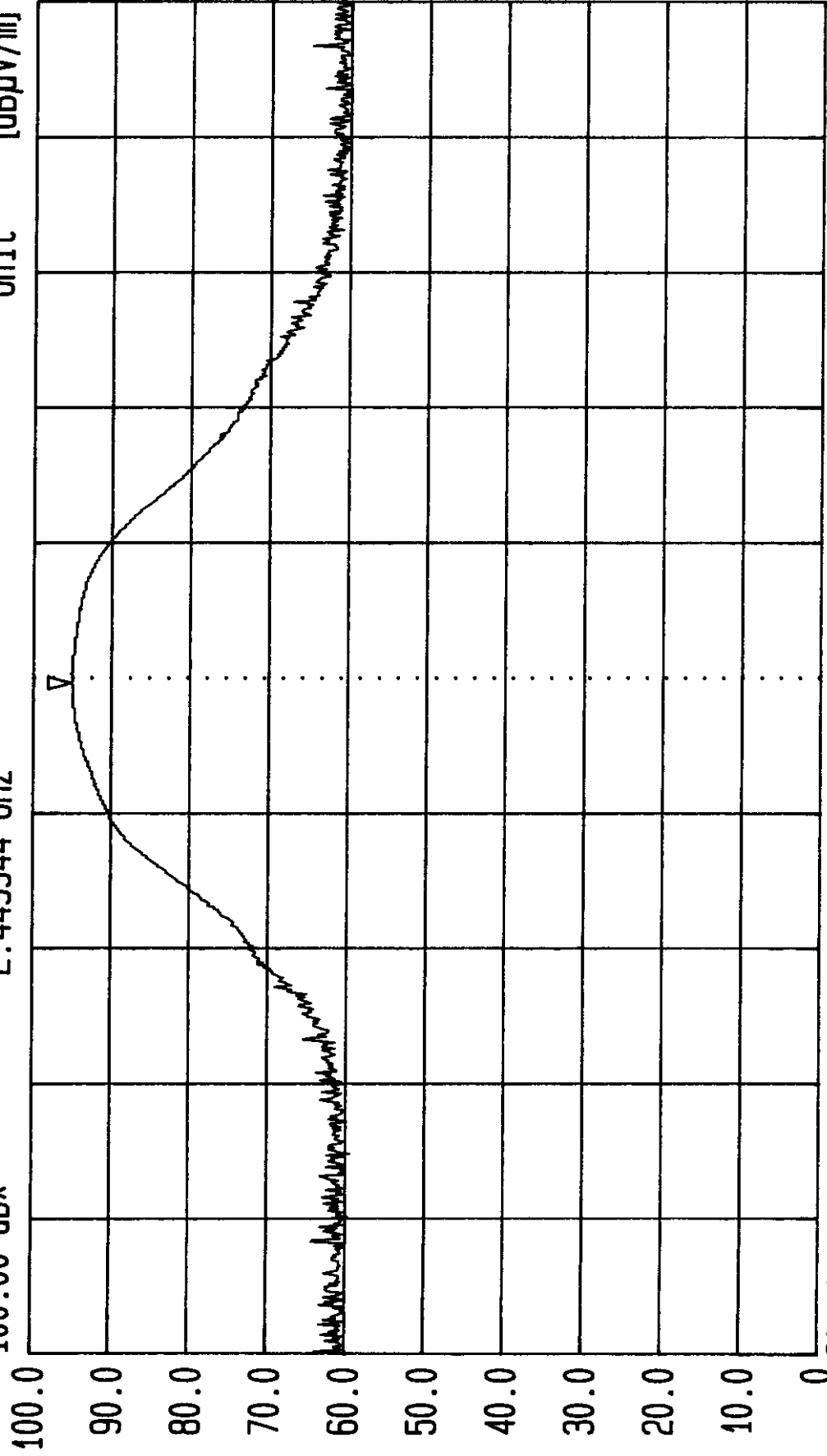
TT  
3

Start 2.43 GHz Stop 2.47 GHz  
Span 40 MHz Sweep 40 ms  
Center 2.45 GHz  
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 114dB $\mu$ V/m. EUT in Alarm Sense Mode. F1/F2 Band Edge.  
FCC Part 15.245  
GPH/36585/JD02/009



Date 04.Jul.'98 Time 11:55:19  
Ref.Lvl 100.00 dB\*  
Marker 95.23 dB\*  
2.449944 GHz

Res.Bw 1 MHz [imp]  
TG.Lvl Off  
CF.Stp 500.000 kHz  
Vid.Bw 1 MHz  
RF.Att 10 dB  
Unit [dBuV/m]



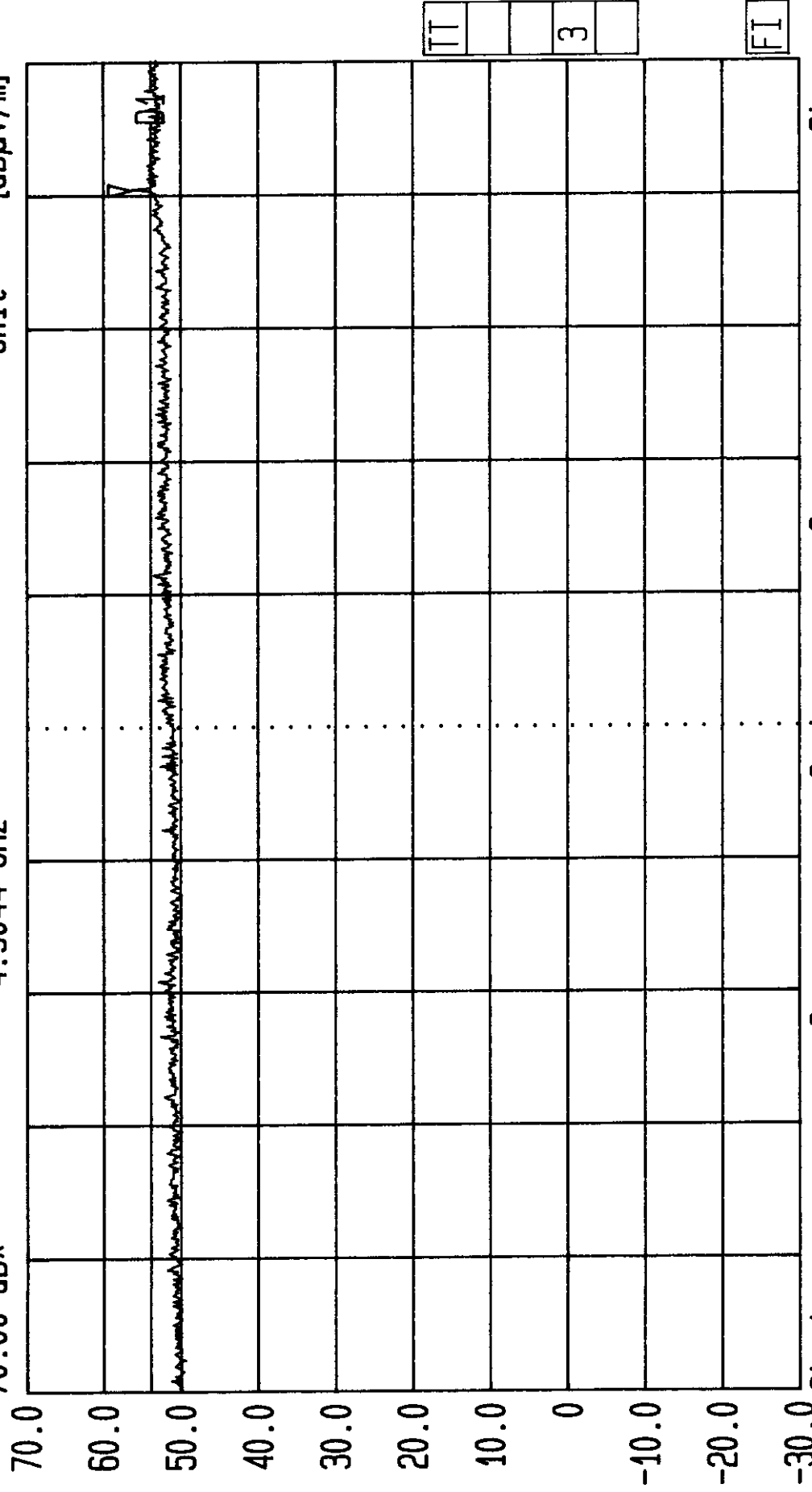
TT
3

Start 2.447461111 GHz Span 5 MHz Center 2.449961111 GHz Sweep 20 ms Stop 2.452461111 GHz  
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 114dBuV/m. EUT in Alarm Sense Mode. Tx Level.  
GPH/36585/JD02/010



Date 04.Jul.'98 Time 12:14:21  
Ref.Lvl 70.00 dB\* Marker 56.44 dB\*  
70.00 dB\* 4.9044 GHz

Res.BW 1 MHz [imp] Off  
TG.Lvl 100.000 MHz  
CF.Stp  
Vid.BW 1 MHz  
RF.Att 0 dB  
Unit [dB $\mu$ V/m]



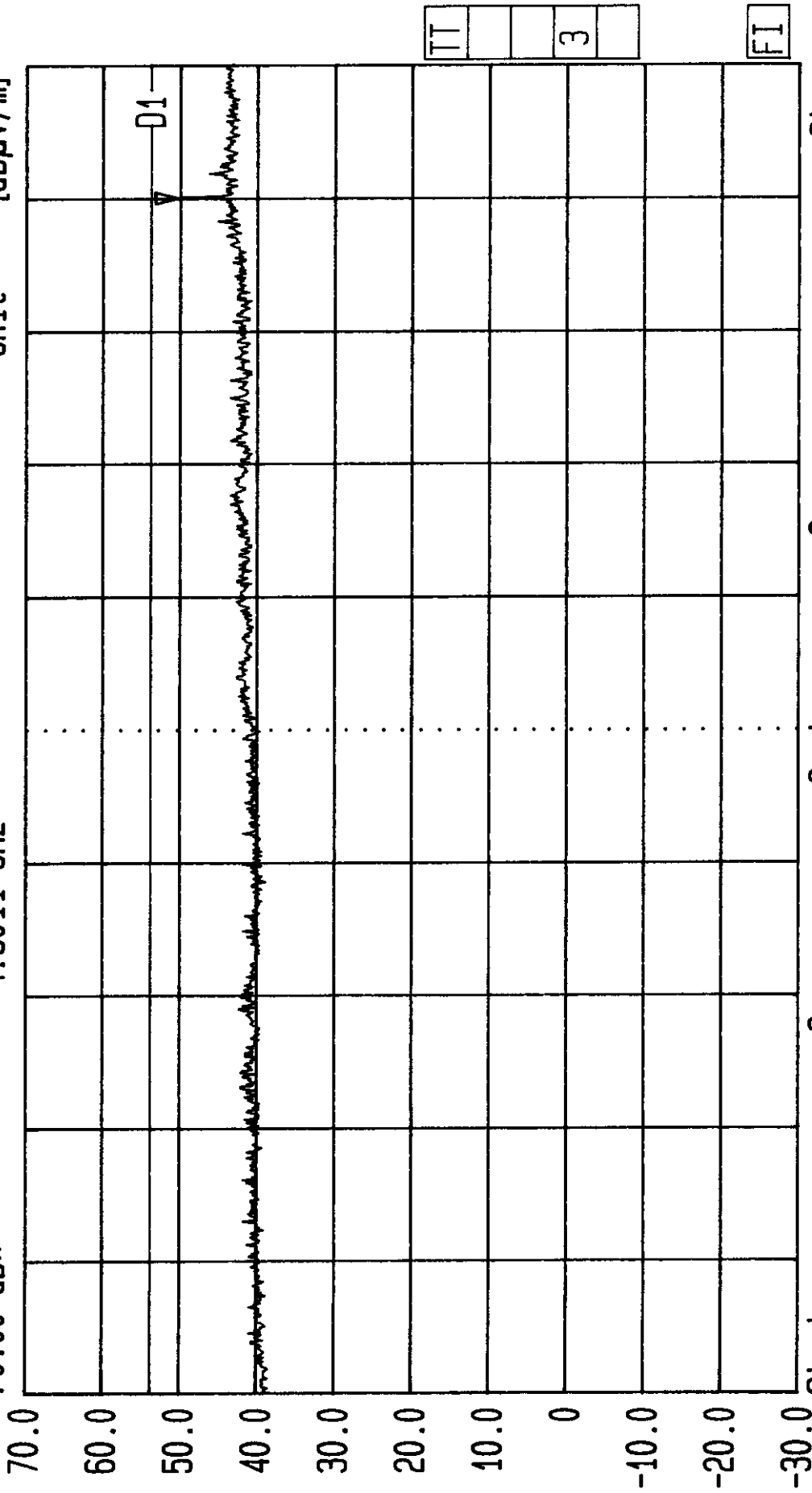
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/011



Date 04.Jul.'98 Time 12:28:03  
Ref.Lvl 70.00 dB\* Marker 50.40 dB\*  
4.9011 GHz

Res.Bw 120 kHz [imp] Vid.Bw 1 MHz  
TG.Lvl off  
CF.Stp 100.000 MHz RF.Att 0 dB  
Unit [dBμV/m]



Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W  
FCC Part 15.245  
GPH/36585/JD02/012



Date 04.Jul.'98 Time 13:46:17

Ref.Lvl

70.00 dB\*

Res.Bw

TG.Lvl

CF.Stp

1 MHz [imp]

Off

100.000 MHz

Vid.Bw

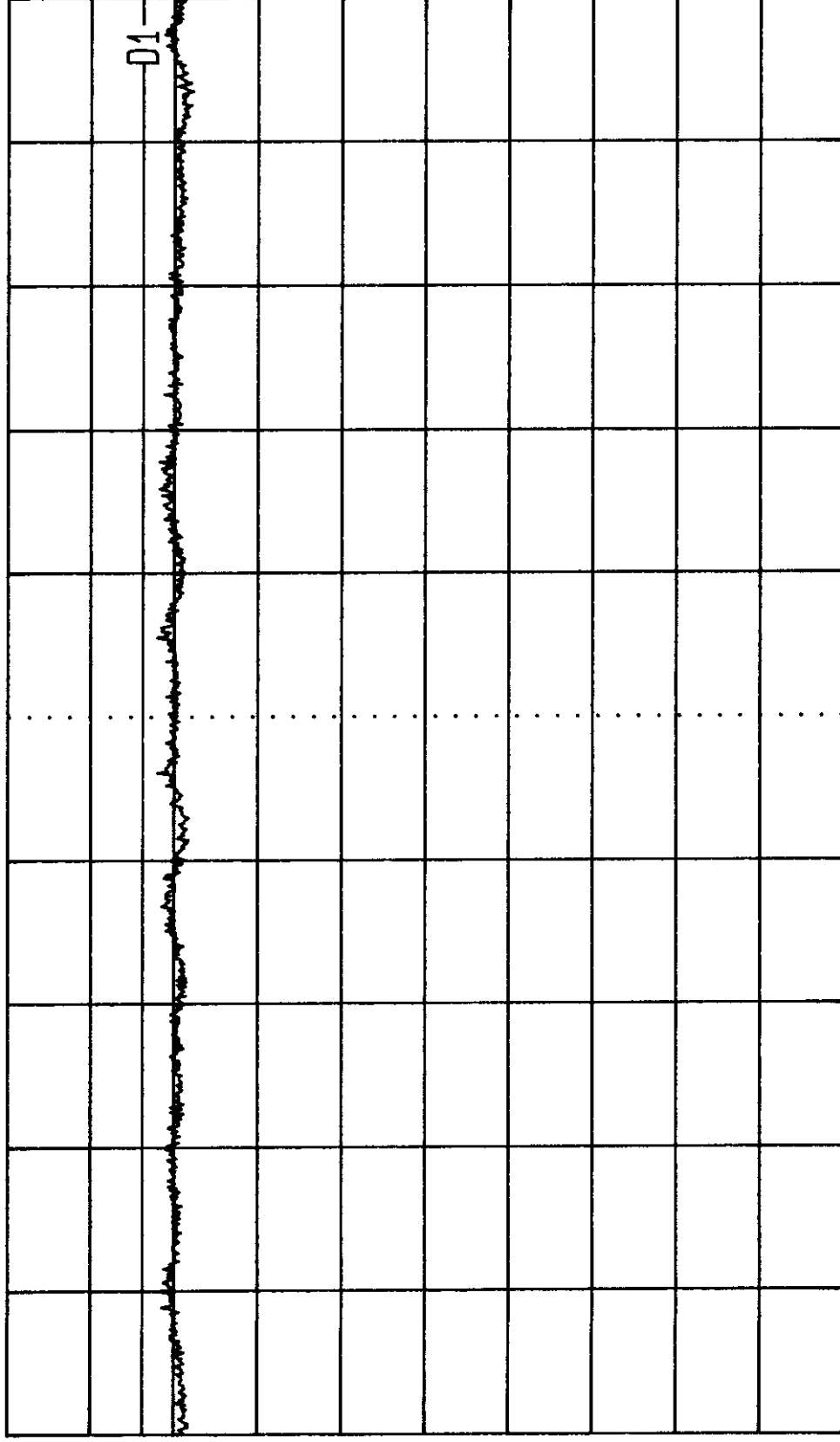
1 MHz

RF.Att

0 dB

[dB $\mu$ V/m]

70.0  
60.0  
50.0  
40.0  
30.0  
20.0  
10.0  
0  
-10.0  
-20.0  
-30.0



Start  
5 GHz

Span  
1 GHz

Center  
5.5 GHz

Sweep  
20 ms

Stop  
6 GHz

TT  
3

FI

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/013



Date 04.Jul.'98 Time 13:51:53

Ref.Lvl

70.00 dB\*

Res.Bw

TG.Lvl

CF.Stp

120 kHz [imp]

Off

100.000 MHz

Vid.Bw

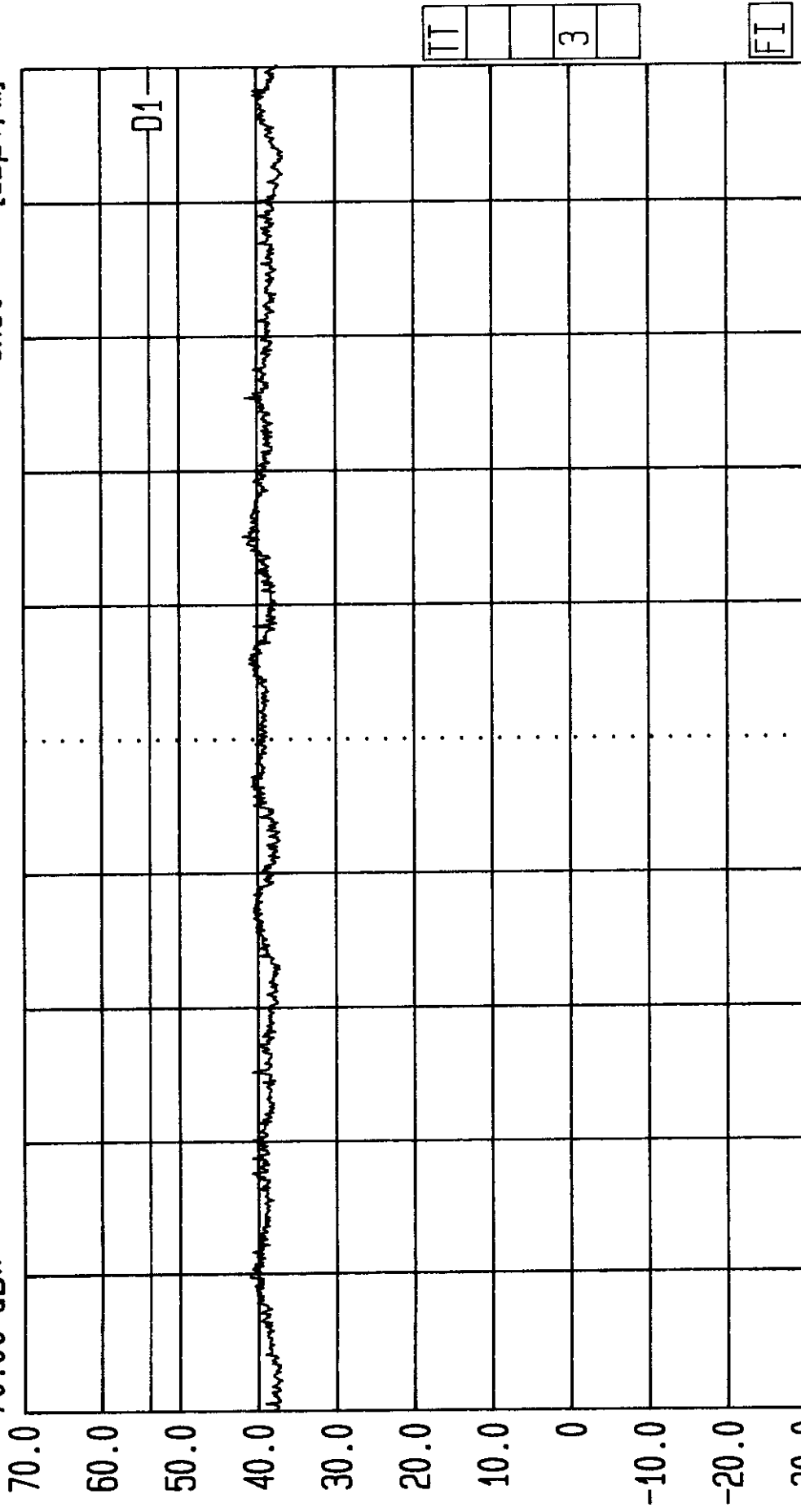
RF.Att

Unit

1 MHz

0 dB

[dBμV/m]



Start  
5 GHz

Span  
1 GHz

Center  
5.5 GHz

Sweep  
440 ms

Stop  
6 GHz

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W.

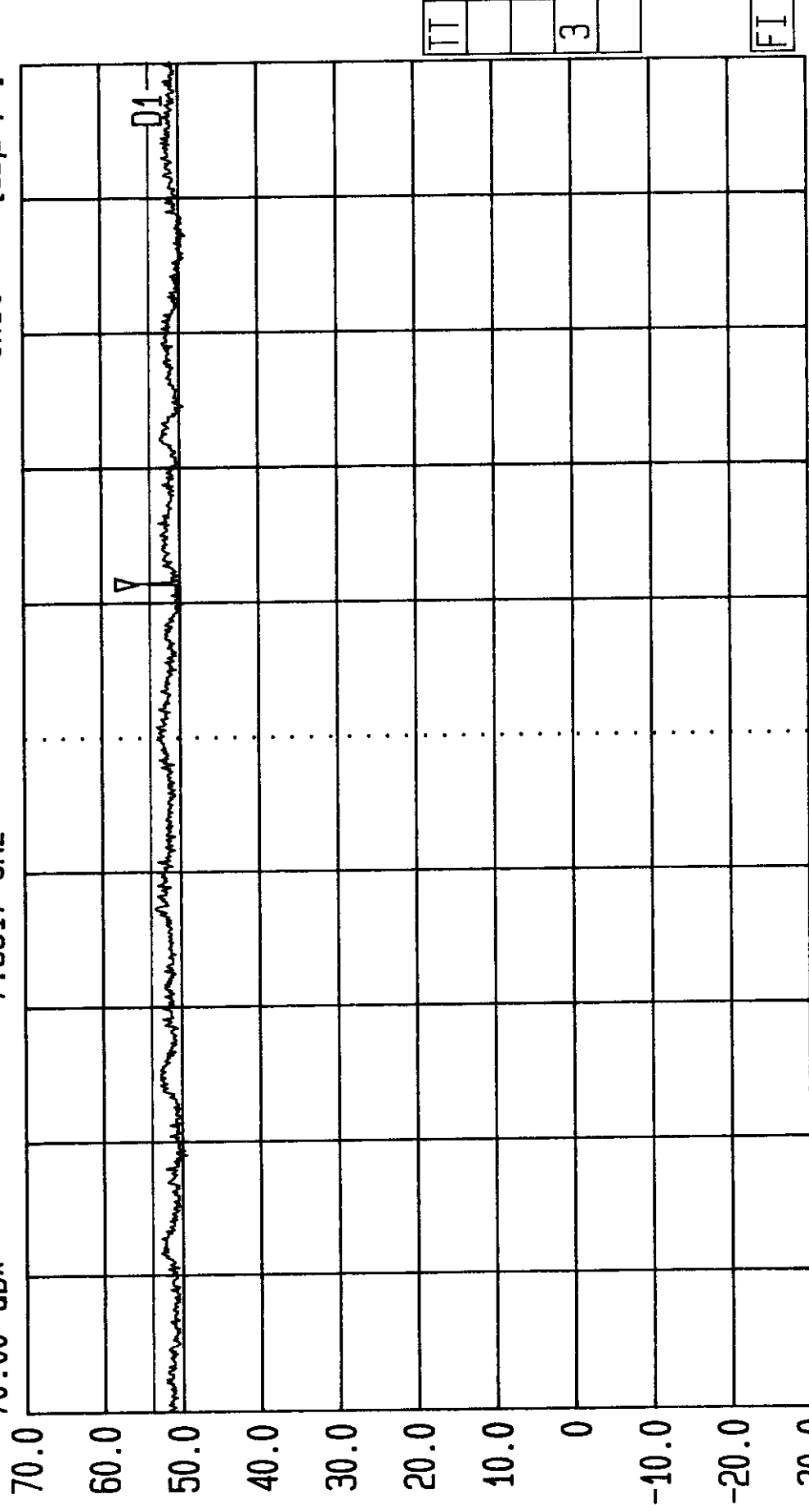
FCC Part 15.245  
GPH/36585/JD02/014





Date 04.Jul.'98 Time 13:59:20  
Ref.Lvl 70.00 dB\*  
Marker 55.38 dB\*  
7.3517 GHz

Res.BW 1 MHz [imp]  
TG.Lvl Off  
CF.Stp 220.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



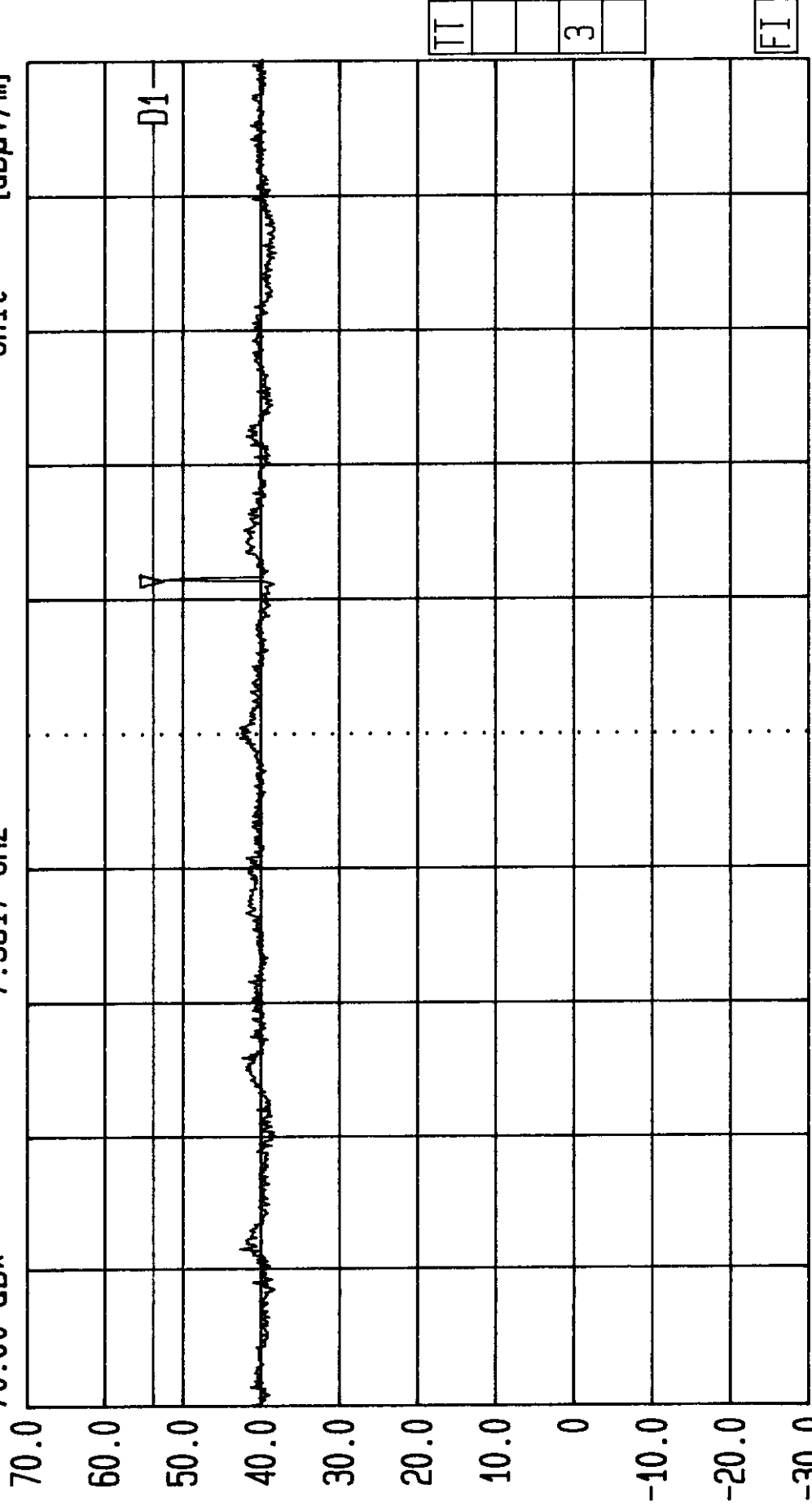
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/015



Date 04.Jul.'98 Time 14:04:12  
Ref.Lvl 70.00 dB\*  
Marker 52.69 dB\*  
7.3517 GHz

Res.Bw 120 kHz [imp]  
TG.Lvl Off  
CF.Stp 220.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



Start 6 GHz Stop 8.2 GHz  
Span 2.2 GHz Sweep 980 ms  
Center 7.1 GHz  
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W. FCC Part 15.245  
GPH/36585/JD02/016



Date 04. Jul. '98

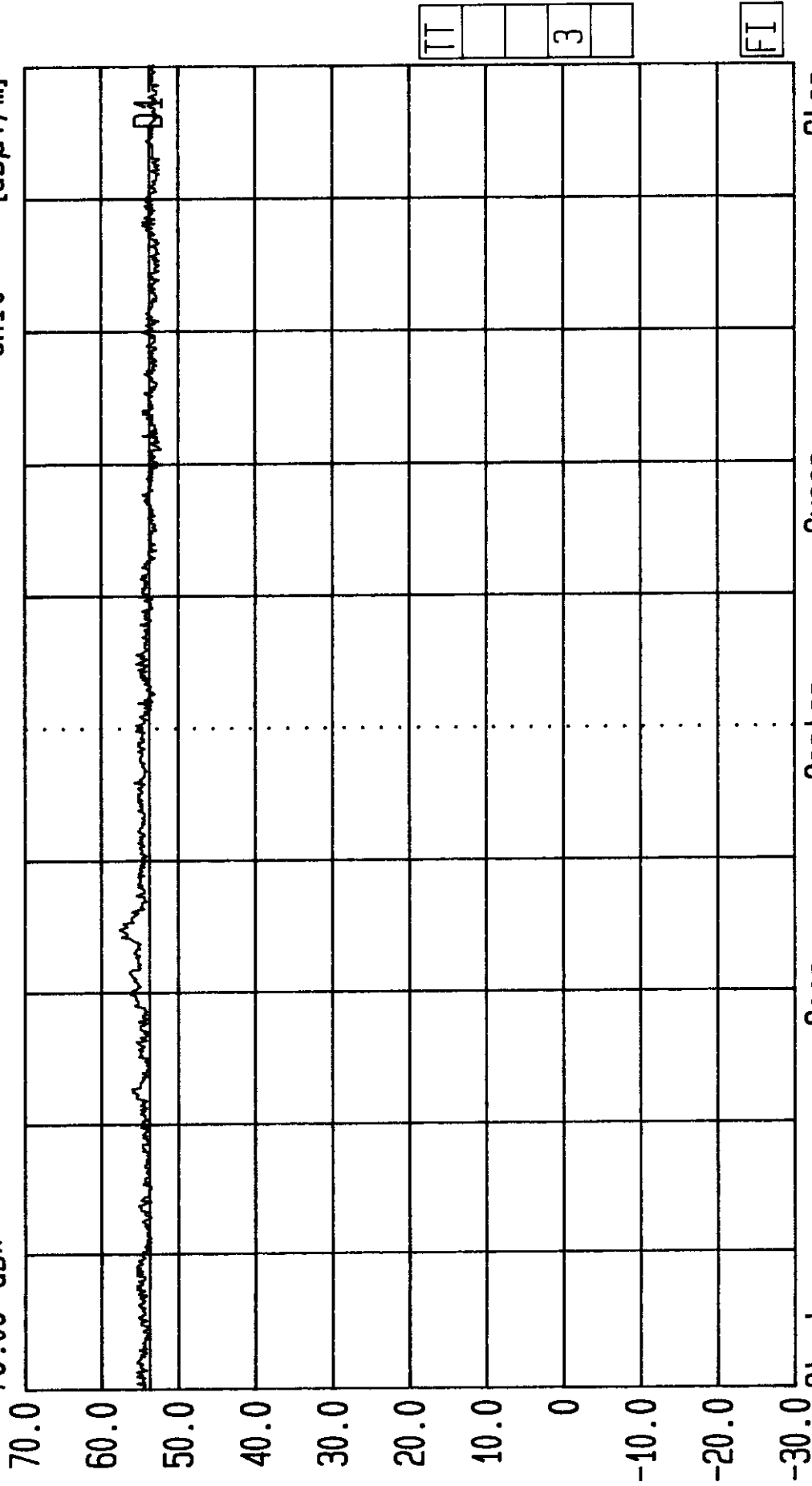
Time 14:34:43

Res. BW  
TG. Lvl  
CF. Stp

1 MHz [imp]  
off  
430.000 MHz

Vid.Bw  
RF.Att  
Unit

1 MHz  
0 dB  
[μV/m]



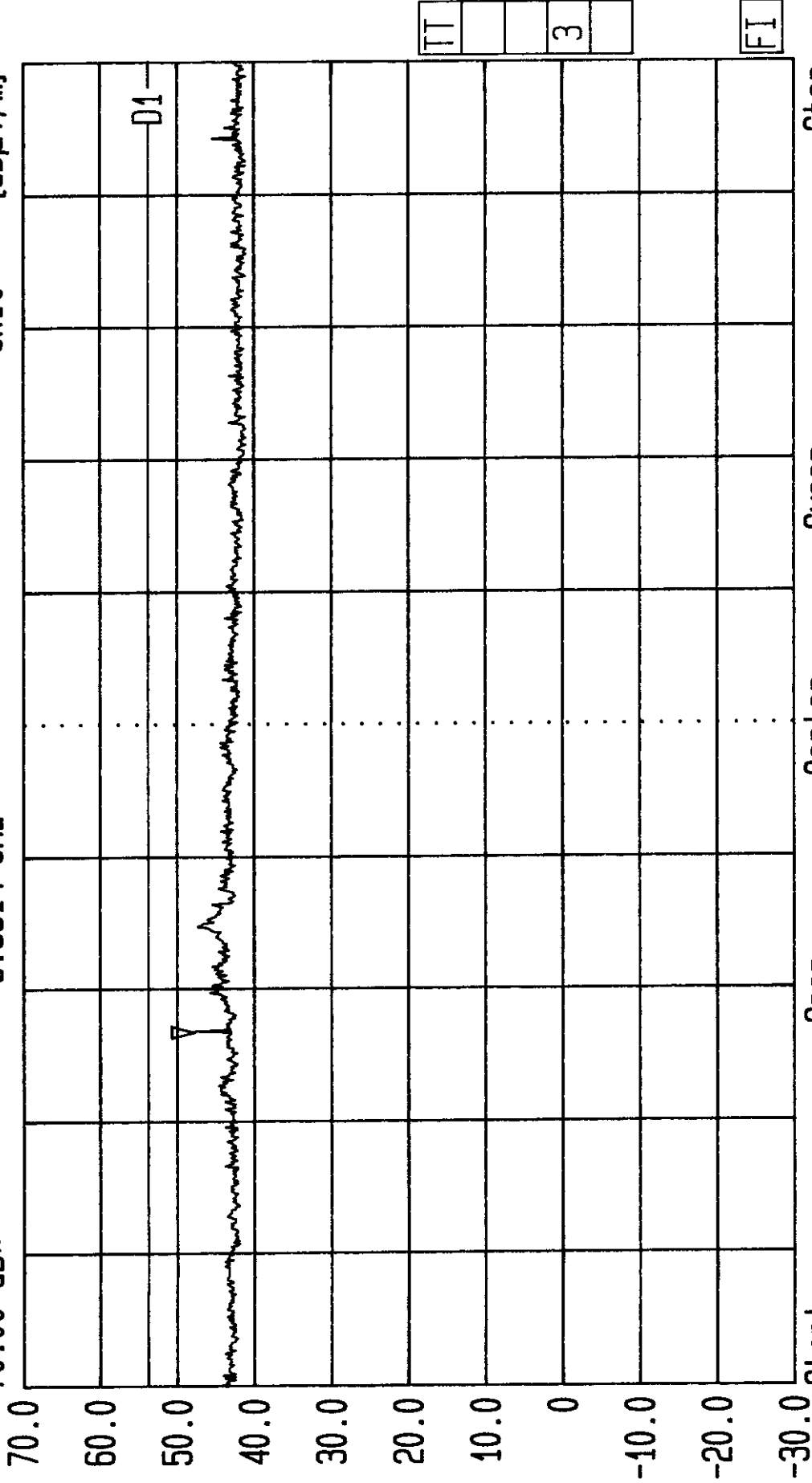
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/017



Date 04.Jul.'98 Time 14:39:33  
Ref.Lvl 70.00 dBx  
Marker 9.3514 GHz

Res.Bw 120 kHz [imp]  
TG.Lvl Off  
CF.Stp 430.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



Start 8.2 GHz Stop 12.5 GHz  
Span 4.3 GHz Center 10.35 GHz Sweep 1.90 s  
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W. FCC Part 15.245  
GPH/36585/JD02/018



Date 04.Jul.'98 Time 15:00:21

Ref.Lvl

70.00 dBx

Res.Bw

TG.Lvl

CF.Stp

1 MHz [imp]

Off

550.000 MHz

Vid.Bw

1 MHz

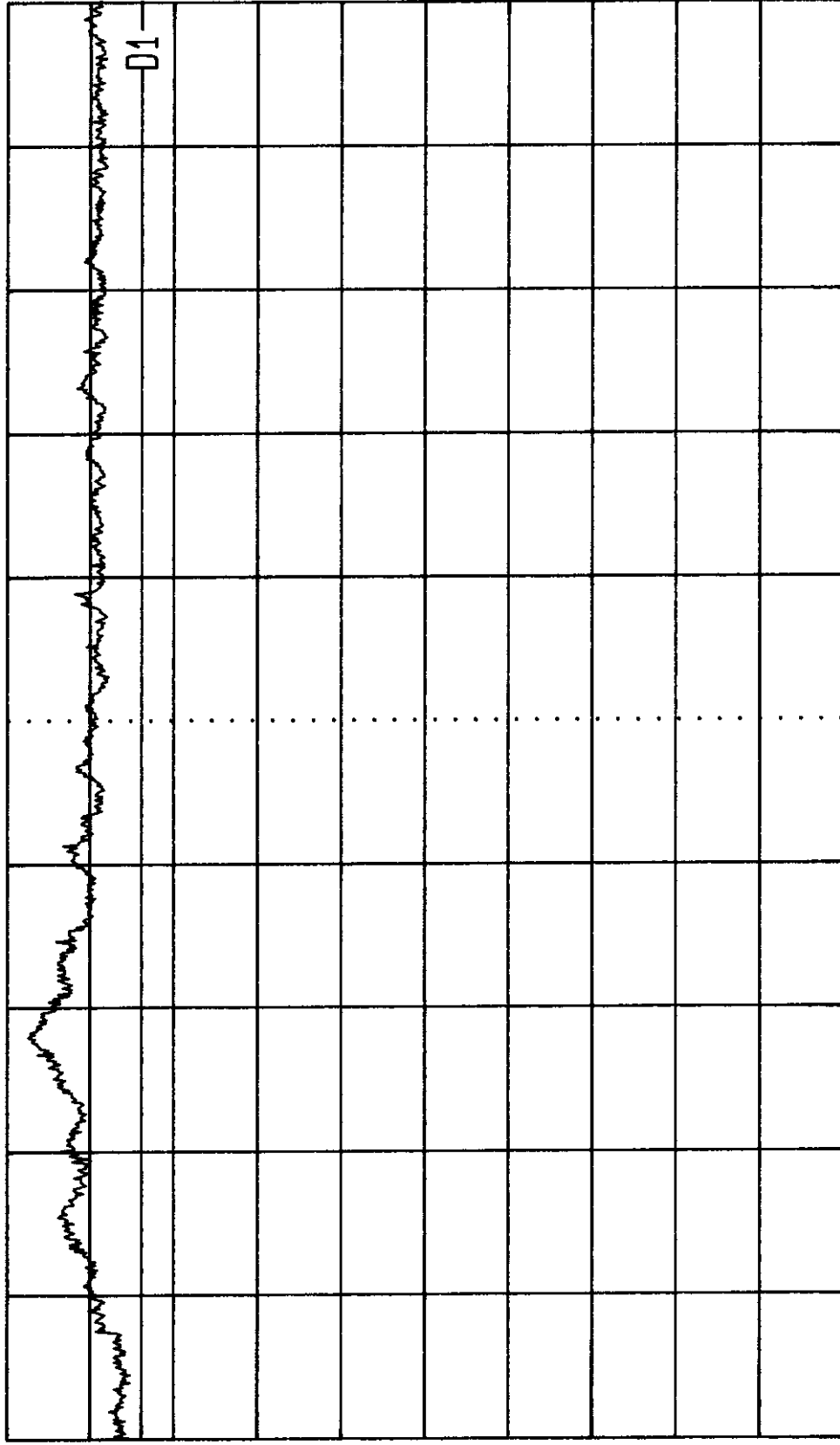
RF.Att

0 dB

Unit

[dBμV/m]

70.0  
60.0  
50.0  
40.0  
30.0  
20.0  
10.0  
0  
-10.0  
-20.0  
-30.0



TT  
3

FI

Start

12.5 GHz

Span

5.5 GHz

Center

15.25 GHz

Sweep

40 ms

Stop

18 GHz

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/019



Date 04.Jul.'98 Time 15:05:00

Ref.Lvl

70.00 dB\*

Res.Bw

TG.Lvl

CF.Stp

120 kHz [imp]

Off

550.000 MHz

Vid.Bw

1 MHz

RF.Att

Unit

0 dB

[dBμV/m]

70.0

60.0

50.0

40.0

30.0

20.0

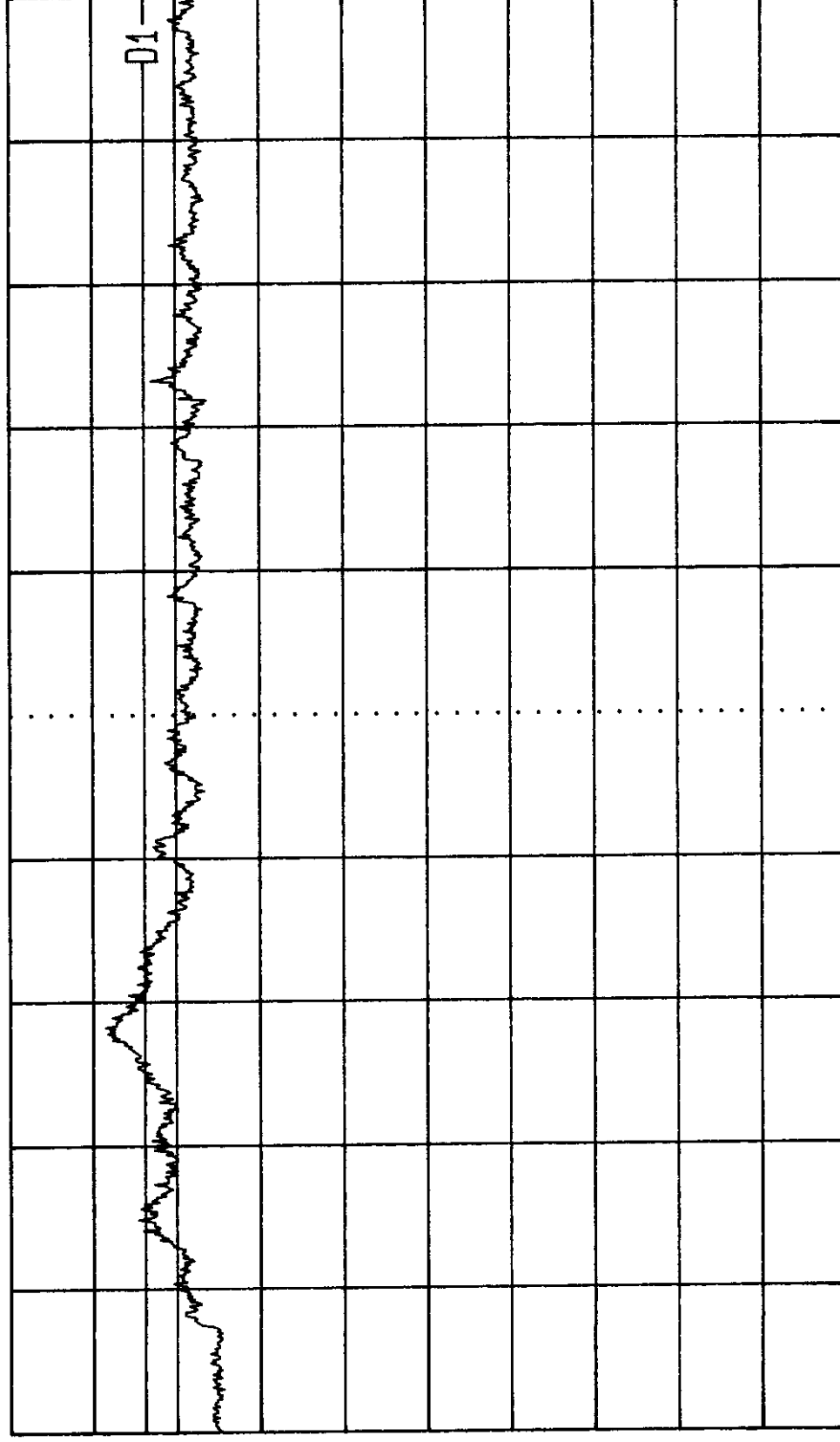
10.0

0

-10.0

-20.0

-30.0



TT

3

FI

Start

12.5 GHz

Span

5.5 GHz

Center

15.25 GHz

Sweep

2.6 s

Stop

18 GHz

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/w.

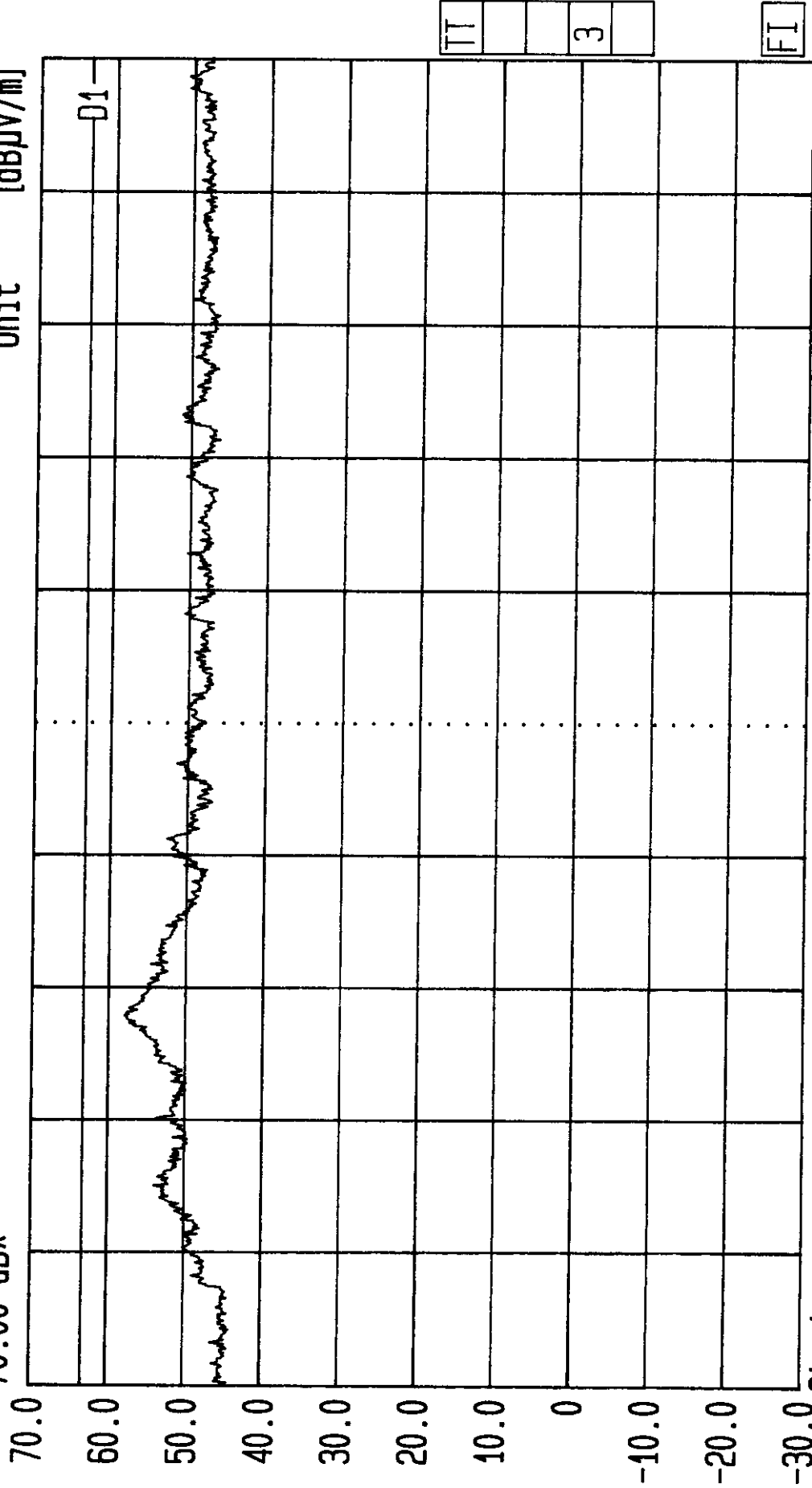
FCC Part 15.245  
GPH/36585/JD02/020



Date 04.Jul.'98 Time 15:13:10

Ref.Lvl  
70.00 dB\*

Res.Bw 120 kHz [imp] Vid.Bw 1 MHz  
TG.Lvl off  
CF.Stp 550.000 MHz RF.Att 0 dB  
Unit [dBμV/m]



Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209 @ 1m. Scan @ 1m. Alarm Sense Mode. 120kHz Res B/W. GPH/36585/JD02/021



Date 04.Jul.'98 Time 15:54:23

Ref.Lvl

70.00 dB\*

Res.Bw

TG.Lvl

CF.Stp

1 MHz [imp]

off

850.000 MHz

Vid.Bw

1 MHz

RF.Att

0 dB

Unit

[dBμV/m]

70.0

60.0

50.0

40.0

30.0

20.0

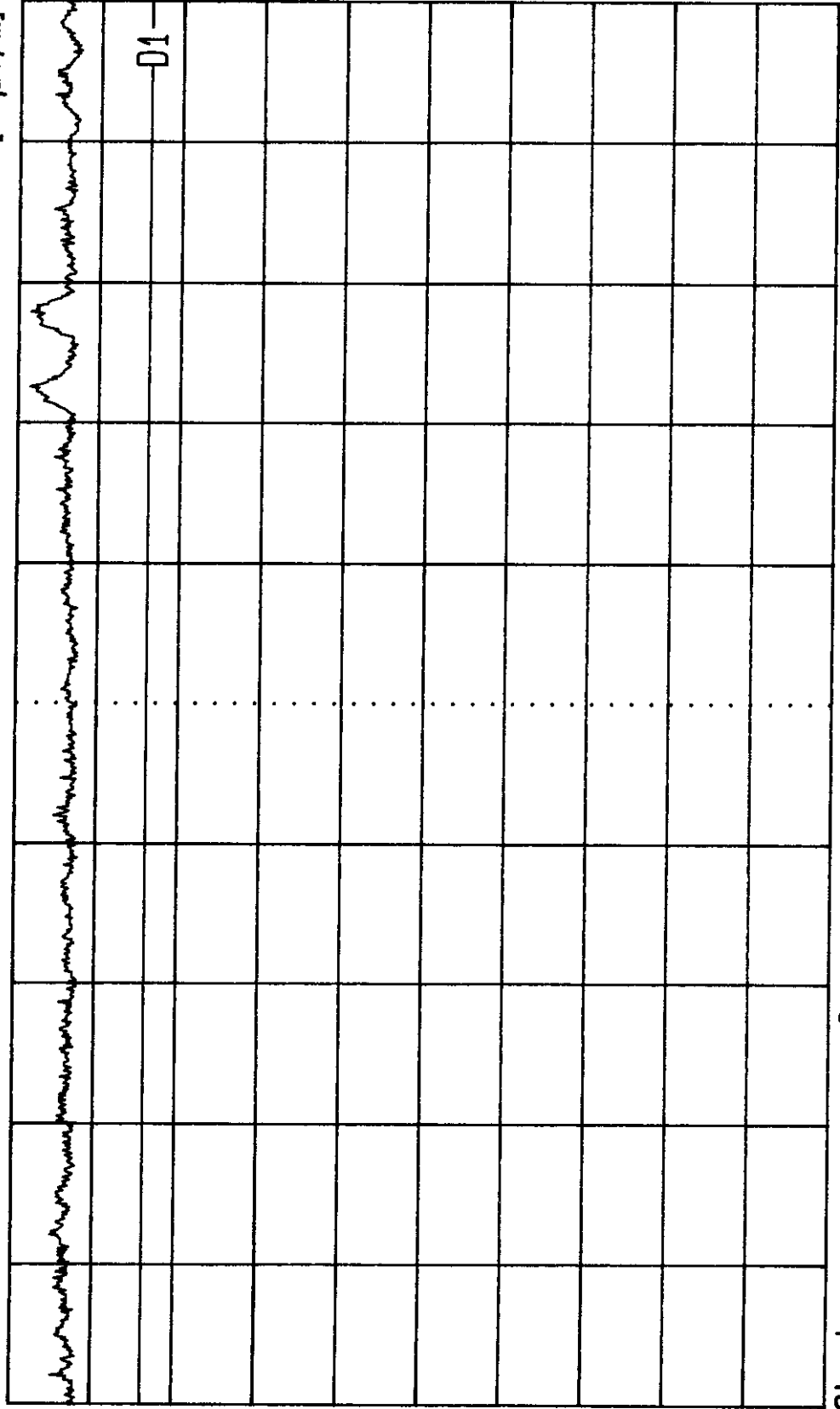
10.0

0

-10.0

-20.0

-30.0



TT

3

FI

Start

18 GHz

Span

8.5 GHz

Center

22.25 GHz

Sweep

60 ms

Stop

26.5 GHz

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.

Limit. 15.209. EUT in Alarm Sense Mode.

FCC Part 15.245  
GPH/36585/JD02/022





Date 04.Jul.'98 Time 15:59:04

Ref.Lvl  
70.00 dB\*

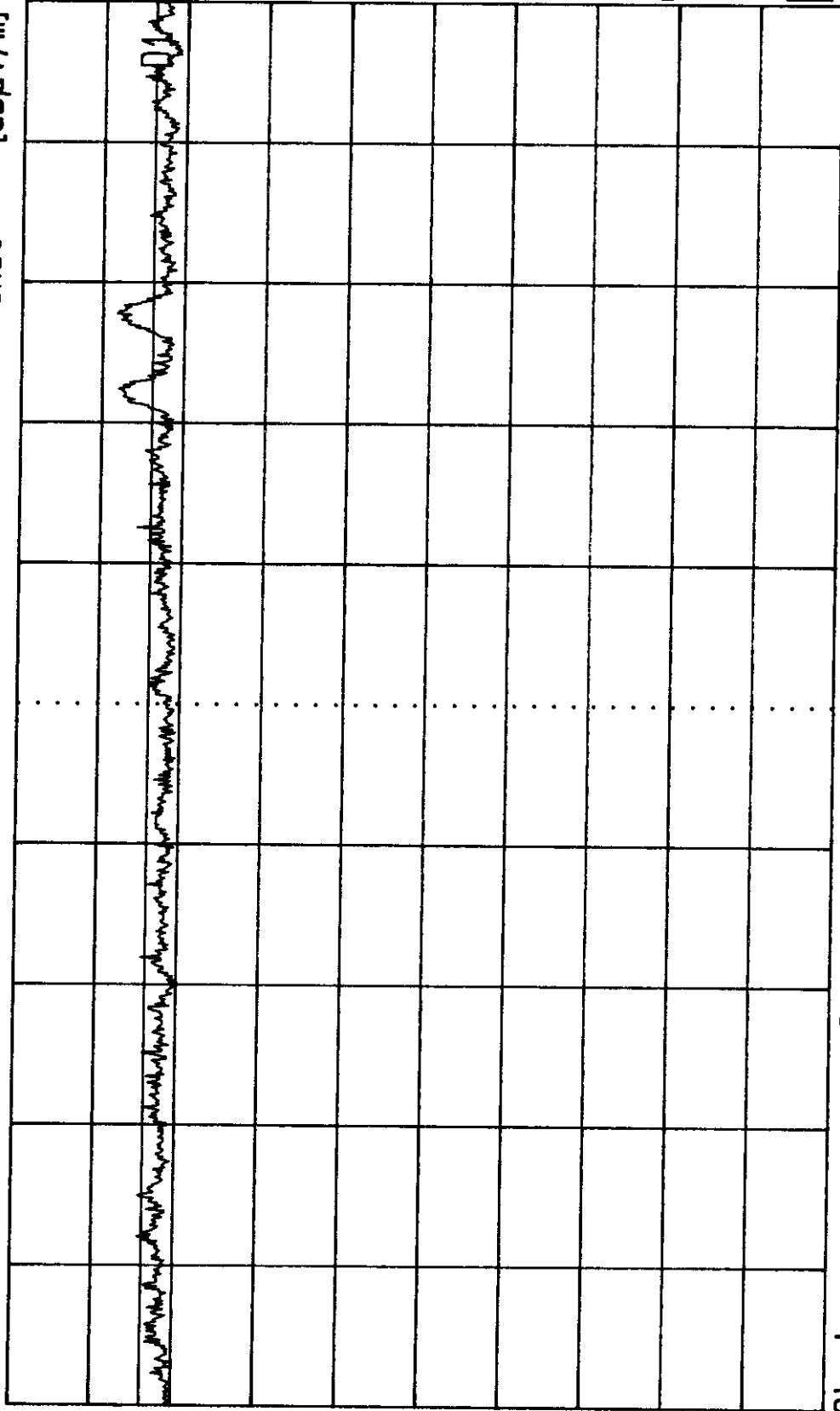
Res.Bw  
TG.Lvl  
CF.Stp

120 kHz [imp]  
off  
850.000 MHz

Vid.Bw  
RF.Att  
Unit

1 MHz  
0 dB  
[dBμV/m]

70.0  
60.0  
50.0  
40.0  
30.0  
20.0  
10.0  
0  
-10.0  
-20.0  
-30.0



TT  
3

FI

Start  
18 GHz

Span  
8.5 GHz

Center  
22.25 GHz

Sweep  
3.8 s

Stop  
26.5 GHz

Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209. EUT in Alarm Sense Mode. 120kHz Res B/W.

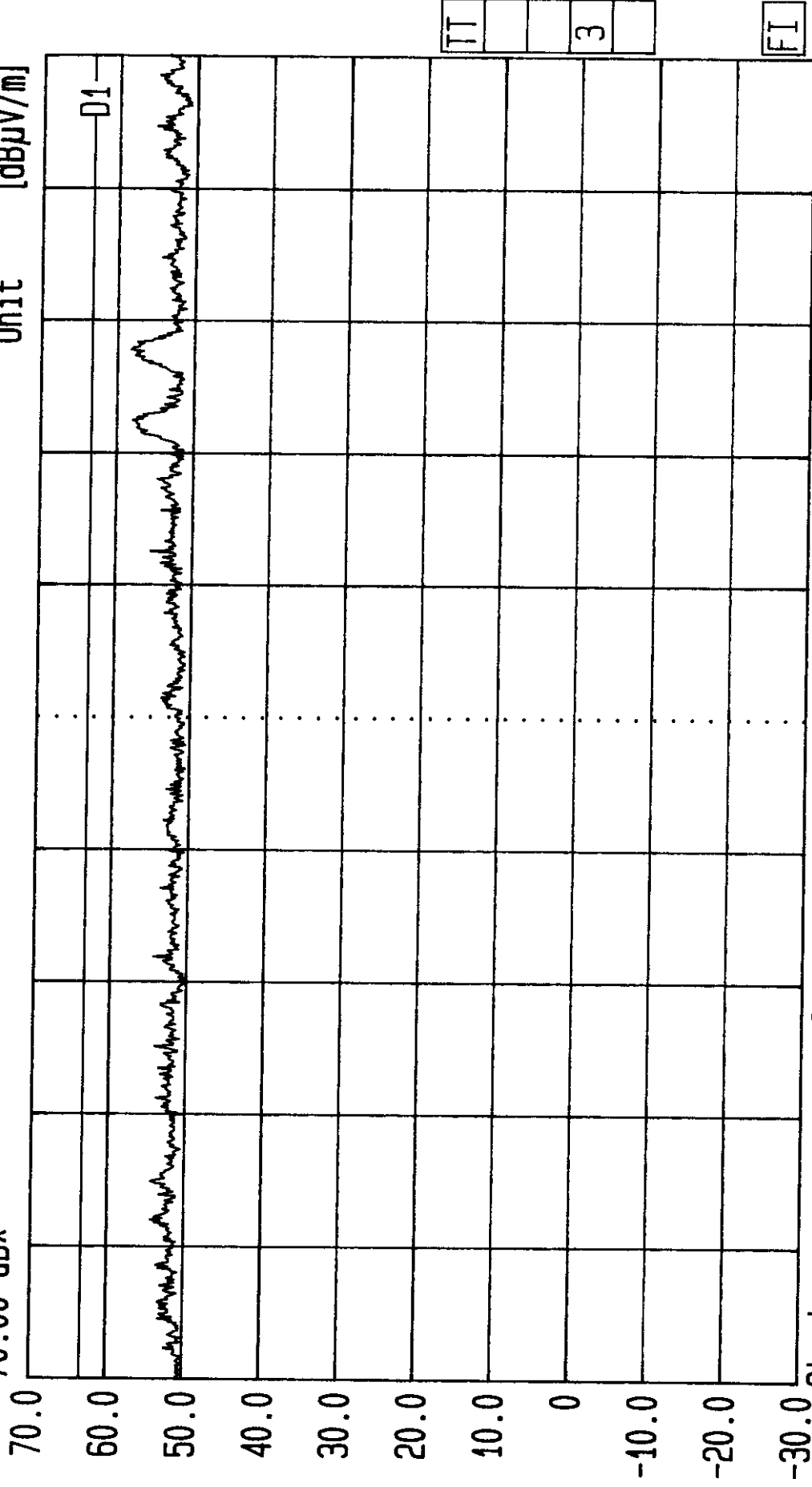
FCC Part 15.245  
GPH/36585/JD02/023



Date 04.Jul.'98 Time 16:04:27

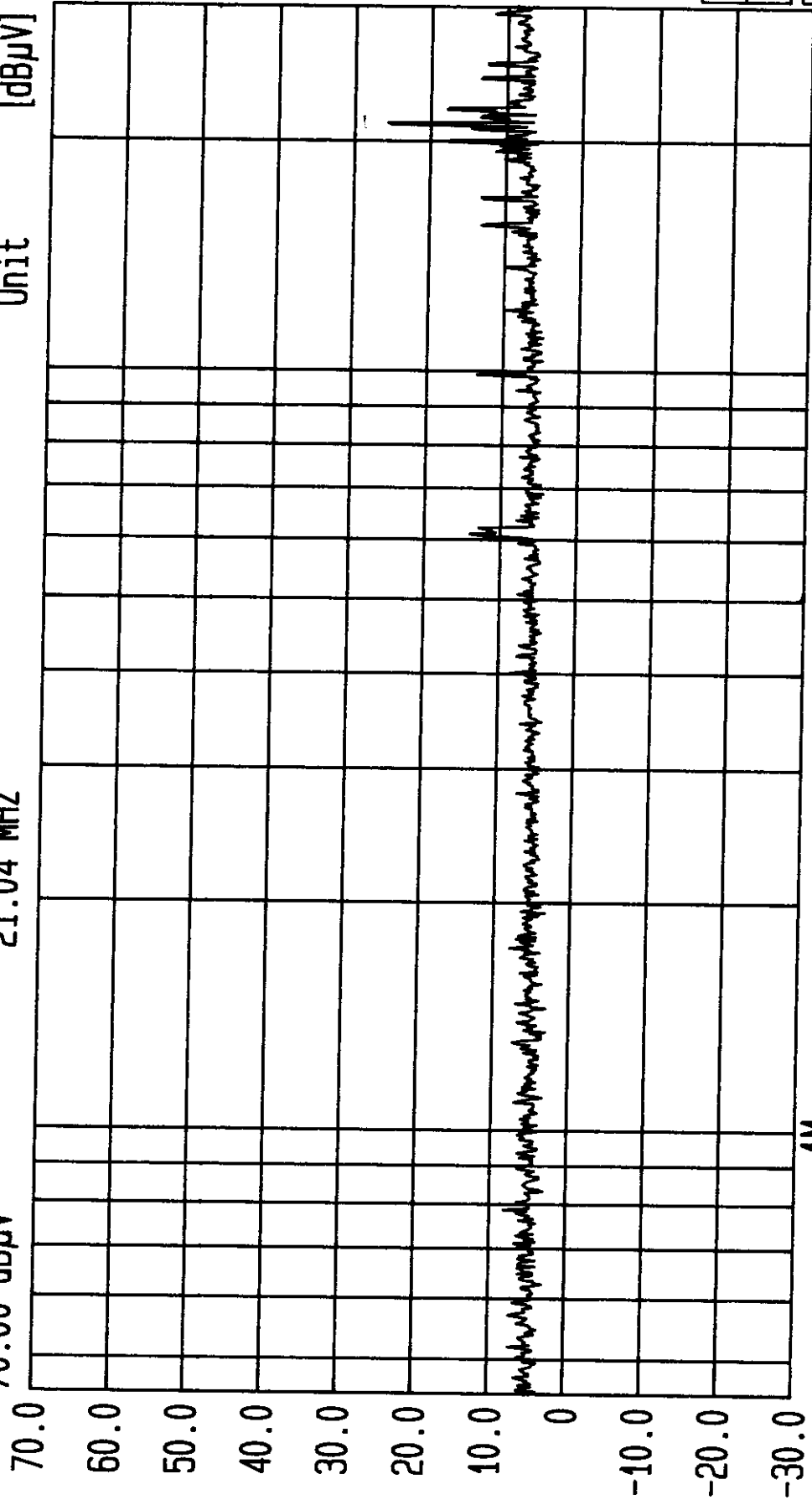
Ref.Lvl  
70.00 dB\*

Res.Bw 120 kHz [imp]  
TG.Lvl Off  
CF.Stp 850.000 MHz  
Vid.Bw 1 MHz  
RF.Att 0 dB  
Unit [dBμV/m]



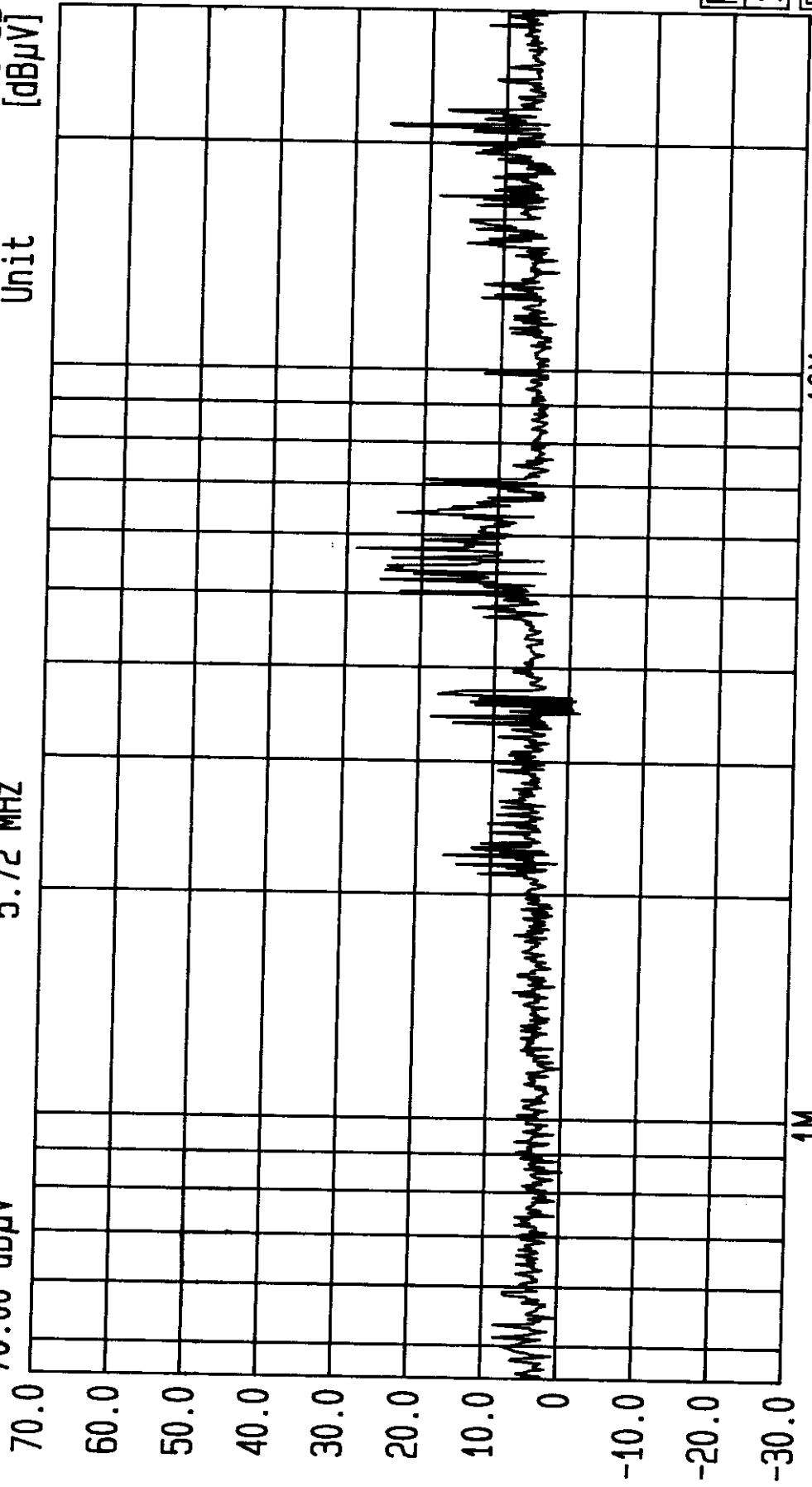
Radiated. Tested by RFI for Texecom. EUT Mirage Detector.  
Limit. 15.209 @ 1m. Scan @ 1m. Alarm Sense Mode. 120kHz Res B/W. GPH/36585/JD02/024

Ref.Lvl 70.00 dBμV  
 Marker 25.74 dBμV  
 Res.Bw 9 kHz [imp]  
 TG.Lvl off  
 CF.Stp 2.955 MHz  
 Vid.Bw 10 kHz  
 RF.Att 0 dB  
 Unit [dBμV]



Start 450 kHz  
 Span 29.55 MHz  
 Center 3.67423 MHz  
 Sweep 2.2 s  
 Stop 30 MHz

Ref.Lvl 70.00 dBμV  
 Marker 28.99 dBμV  
 Res.Bw 9 kHz [imp]  
 TG.Lvl Off  
 CF.Stp 2.955 MHz  
 Vid.Bw 10 kHz  
 RF.Att 0 dB  
 Unit [dBμV]



PA  
 10  
 FI

Start 450 kHz  
 Span 29.55 MHz  
 Center 3.67423 MHz  
 Sweep 2.2 s  
 Stop 30 MHz

## EMC Department

Test Of: Texecom Ltd.  
Mirage Intruder Detection Unit  
To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

**Appendix 5. Antenna Factors and Cable Factors**

This appendix details the factors for each antenna and the cable losses for measurements above 1GHz.

**Eaton 1 - 2 GHz Horn**

Frequency (MHz)	Antenna Factor (dB/m)
1000	21.2
2000	21.7

**Eaton 2 - 4 GHz Horn**

Frequency (MHz)	Antenna Factor (dB/m)
2000	19.7
3600	20.8
4000	24.1

**Flann 3 - 6 GHz Horn**

Frequency (MHz)	Antenna Factor (dB/m)
4000	24.1
4200	24.1
4400	24.1
4600	24.2
4800	24.1
5000	24.2
5200	24.2
5400	24.3
5600	24.3
5800	24.3
6000	24.4

**Test Of: Texecom Ltd.****Mirage Intruder Detection Unit****To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)**

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**Flann 5 - 8.2 GHz Horn**

<b>Frequency (MHz)</b>	<b>Antenna Factor (dB/m)</b>
6000	26.7
6200	26.8
6400	26.7
6600	26.8
6800	26.8
7000	26.8
7200	26.9
7400	26.8
7600	26.8
7800	26.9
8000	26.9
8200	26.9

**Test Of: Texecom Ltd.****Mirage Intruder Detection Unit****To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)**

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**Flann 8.2 - 12.5 GHz Horn**

<b>Frequency (MHz)</b>	<b>Antenna Factor (dB/m)</b>
8200	30.5
8400	30.5
8600	30.5
8800	30.5
9000	30.5
9200	30.5
9400	30.5
9600	30.6
9800	30.5
10000	30.5
10200	30.6
10400	30.6
10600	30.6
10800	30.6
11000	30.6
11200	30.6
11400	30.6
11600	30.6
11800	30.6
12000	30.7
12200	30.7
12400	30.7
12500	30.7

**Test Of: Texecom Ltd.****Mirage Intruder Detection Unit****To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)**

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**Flann 12.5 - 18 GHz Horn**

<b>Frequency (MHz)</b>	<b>Antenna Factor (dB/m)</b>
12500	33.6
13000	33.6
13500	33.6
14000	33.6
14500	33.7
15000	33.7
15500	33.7
16000	33.8
16500	33.8
17000	33.8
17500	33.9
18000	33.9

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Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

**Flann 18 - 26.5 GHz Horn**

Frequency (MHz)	Antenna Factor (dB/m)
18000	37.0
18500	37.1
19000	37.1
19500	37.1
20000	37.0
20500	37.0
21000	37.1
21500	37.2
22000	37.2
22500	37.2
23000	37.1
23500	37.2
24000	37.2
24500	37.2
25000	37.3
25500	37.2
26000	37.2
26500	37.3

Test Of: Texecom Ltd.

Mirage Intruder Detection Unit

To: FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)

**Insertion Loss for C371 and C184 Cables**

Frequency (GHz)	Loss (dB)
1	1.5
2	2.0
3	2.35
4	2.7
5	2.9
6	3.1
7	3.6
8	3.9
9	4.0
10	4.1
11	4.2
12	5.0
13	5.35
14	5.2
15	5.0
16	5.9
17	5.9
18	6.2
19	6.9
20	6.6
21	4.5
22	4.9
23	4.9
24	5.0
25	5.1
26	5.1
27	5.7

**Test Of:      Texecom Ltd.****Mirage Intruder Detection Unit****To:            FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)**

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**Appendix 6. Photographs of EUT**

This appendix contains the following photographs:

<b>Photo Reference Number</b>	<b>Title</b>
PHT/36585/001	Side view of conducted emissions test configuration
PHT/36585/002	Front view of conducted emissions test configuration
PHT/36585/003	Rear view of radiated emissions test configuration
PHT/36585/004	Front view of radiated emissions test configuration

These pages are not included in the total number of pages for this report.

**RADIO FREQUENCY INVESTIGATION LTD.**

**TEST REPORT**

**EMC Department**

**S.No. RFI/EMCB1/RP36585B**

**Page 34 of 34**

**Issue Date: 7 July 1998**

**Test Of:      Texecom Ltd.**

**Mirage Intruder Detection Unit**

**To:            FCC Part 15 Subpart C. Section 15.245 (Intentional Radiators)**

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To: John Parnell (Texecom Limited)  
From: Rich Fabina FCC Application Processing Branch  
Date: June 29, 1998  
FCC ID: MYJDTD001-1

Applicant Name: John Parnell

Subject: ADDITIONAL INFORMATION ON FCC ID: MYJDTD001-1 PERMISSIVE CHANGE

The items indicated below must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days may result in application dismissal pursuant to Section 2.917(c) and forfeiture of the filing fee pursuant to Section 1.1106

- ✓ 1. Describe the type of transmitted signal this device uses. Is it CW or modulated? What type of modulation does it use, AM, FM or pulsed?

Please note that if this device uses pulsed transmissions, you cannot measure the average level of an emission from this transmitter using an average detector function as you appear to have done. The correct way to determine the average level of an emission is to measure the peak level and correct it with the transmitter's duty cycle. If this transmitter uses pulsed emissions, determine its duty cycle and correct the measured peak levels with the duty cycle correction factor for comparison to the average limits. Be sure to provide duty cycle calculations, and time domain plots showing the period of several pulses (or pulse trains) and the individual length(s) of the pulse (or various pulses in the pulse train) to support these calculations.

- ✓ 2. Remeasure radiated emissions from this device over the frequency range specified in Section 15.33(a)(1) of the FCC Rules. This section requires measurements from the lowest frequency generated in the device without going below 9 kHz up to the 10th harmonic of the fundamental or 40 GHz, whichever is the lower frequency. Measurements were only made up to the 5th harmonic.
- ✓ 3. In accordance with Section 15.245(a)(3), provide a plot of this transmitter's occupied bandwidth to show that its emissions at the bandedges of 2435 and 2465 MHz are attenuated at least 50 dB below the fundamental emission level or to the general limits in Section 14.209, whichever is the lesser attenuation.
- ✓ 4. A list of the test equipment used to perform measurements on this transmitter.
- ✓ 5. Resolution bandwidth and video bandwidth of the measuring instrument during both peak and average radiated emissions measurements.

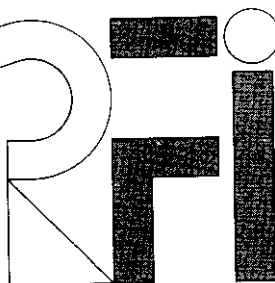
DO NOT Reply to this email by using the 'Reply' button. In order for your response to be processed expeditiously, you must upload your response via the Internet at <https://dettifoss.fcc.gov/beta/oet/index.html>

Replies to this letter MUST contain the Reference Number: 1552



6 April, 1998

FCC  
Equipment Approval Services  
PO Box 358315  
Pittsburgh  
PA 15251-5315



Ewhurst Park  
Ramsdell  
Basingstoke  
Hampshire  
England  
RG26 5RQ

Switchboard Tel: +44 (0) 1256 851193  
Accounts Tel: +44 (0) 1256 855490  
Sales Tel: +44 (0) 1256 855400  
Fax: +44 (0) 1256 851192  
E-mail: sales@rfi.co.uk  
Web Site: www.rfi.co.uk

Subject: Application for Mirage Radio Type Approval

Our Ref: Ittexe02\jp

Dear Sir/Madam,

Please find attached an application for a Class II Permissive change.

**Device; Mirage Dual Technology Detector**  
**Original FCCID Number; MYJDTD001-1**

List of Exhibits;

- Exhibit 1; FCC 159 form
- Exhibit 2; FCC 731 form.
- Exhibit 3; Description of Mirage Detector
- Exhibit 4; List of Modifications to Mirage Detector
- Exhibit 5; Circuit Diagrams.
- Exhibit 6; Partial Test Report to FCC Part 15.

If you require further information, please feel free to contact me directly.

Yours sincerely

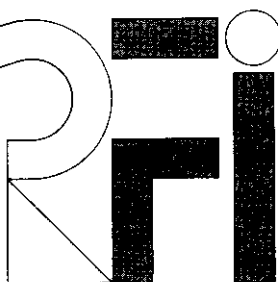
A handwritten signature in black ink, appearing to read 'John Parnell'.

John Parnell  
Regulatory and Technical Support  
Tel ; + 44 (0) 1256 855410  
Fax; + 44 (0) 1256 851192  
Email; john\_parnell@rfi.co.uk

Enc.







Ewhurst Park  
Ramsdell  
Basingstoke  
Hampshire  
England  
RG26 5RQ

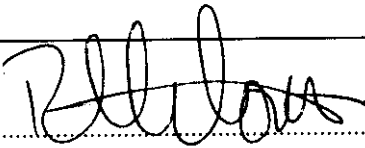
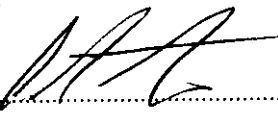
Switchboard Tel: +44 (0) 1256 851193  
Accounts Tel: +44 (0) 1256 855490  
Sales Tel: +44 (0) 1256 855400  
Fax: +44 (0) 1256 851192  
E-mail: sales@rfi.co.uk  
Web Site: www.rfi.co.uk

## ADDENDUM SUMMARY REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Partial Test Of: Texecom Ltd.  
Mirage Intruder Detector

To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)  
(Partial Test of Radiated Emissions only)

**Addendum Summary Report**  
**Serial No:**  
RFI/EMCB1/TS36585A

This Addendum Summary Report is Issued Under The Authority Of Brian Watson, Technical Director:	
Tested By: 	Checked By: 
Summary Report Copy No:	
Issue Date: 30 March 1998	Test Dates: 16 March 1998

This addendum summary report may be reproduced in full. Partial reproduction may only be made with the written consent of Radio Frequency Investigation Ltd..  
The results in this summary report apply only to the sample(s) tested.

**Test Of: Texecom Ltd. Mirage Intruder Detector**  
**To: F.C.C. Part 15 Subpart C**  
**Section 15.245 (Intentional Radiators)**

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**Test Of:**      **Texecom Ltd. Mirage Intruder Detector**  
**To:**            **F.C.C. Part 15 Subpart C**  
                    **Section 15.245 (Intentional Radiators)**

---

## **1. Client Information**

<b>Company Name:</b>	Texecom Limited
<b>Address:</b>	559, Wilbraham Road Chorlton Manchester M21 0AE
<b>Contact Name:</b>	Mr M Pitts

Test Of: Texecom Ltd. Mirage Intruder Detector  
To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)

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## **2. Equipment Under Test (EUT)**

The following information (with the exception of the Date of Receipt) has been supplied by the client:

### **2.1. Identification Of Equipment Under Test (EUT)**

Brand Name:	Mirage
Model Name or Number:	MYJDTD001-1
Unique Type Identification:	MYJDTD001-1
Serial Number:	579503
Country of Manufacture:	Great Britain
FCC ID Number:	MYJDTD001-1
Date of Receipt:	16 March 1998

### **2.2. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

Description:	Alarm Control Panel 115 V, 60 Hz
Brand Name:	Veritas 8
Model Name or Number:	None stated by client
Serial Number:	012502
FCC ID Number:	None stated by client
Cable Length And Type:	1m 6 Core Telephone Cable
Connected to Port:	12 V, 0 V on Mirage

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**Test Of: Texecom Ltd. Mirage Intruder Detector**  
**To: F.C.C. Part 15 Subpart C**  
**Section 15.245 (Intentional Radiators)**

---

### **3. Deviations From The Test Specification**

At the request of the client, the radiated emissions testing to FCC Part 15 Subpart C (Intentional Radiators) was only performed at 2.45 GHz and above. No initial preliminary scans of the EUT were performed. Measurements of only the fundamental frequency and the first four harmonics were recorded for the purpose of this test.

**Test Of:**      **Texecom Ltd. Mirage Intruder Detector**  
**To:**            **F.C.C. Part 15 Subpart C**  
                    **Section 15.245 (Intentional Radiators)**

---

## **4. Summary Of Test Results**

### **4.1. Summary Of Tests**

<b>Test Name</b>	<b>Port Type</b>	<b>Compliance Status</b>
Electric Field Strength Measurements (2.45 GHz to 12.0 GHz)	Enclosure	Complied

### **4.2. Overall Result**

For the tests contained within this summary report, the EUT complied with the requested parts of the specification.

Test Of: **Texecom Ltd. Mirage Intruder Detector**  
To: **F.C.C. Part 15 Subpart C**  
**Section 15.245 (Intentional Radiators)**

### 4.3. Radiated Emissions

#### 4.3.1. Electric Field Strength Measurements

4.3.1.1. The client has stated that the highest clock frequency for the EUT was 2.45 GHz. Therefore tests were performed at the fundamental and first four harmonics as described in section 3 of this test report.

4.3.1.2. The following tables list frequencies at which emissions were measured at a measurement distance of 3.0 metres using Peak and Average detector functions:

#### Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dB $\mu$ V)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Average Margin (dB)	Result
2.4509	Vert.	67.4	20.0	1.3	88.7	114.0 ✓	25.3	Complied
2.4509	Horiz.	64.8	20.0	1.3	86.1	114.0	27.9	Complied
4.9016	Vert.	20.1	24.1	1.8	46.0	54.0	8.0	Complied
4.9016	Horiz.	19.6	24.1	1.8	45.5	54.0	8.5	Complied
7.3524	Vert.	19.7	26.9	2.2	48.8	54.0	5.2	Complied
7.3524	Horiz.	24.5	26.9	2.2	53.6	54.0	0.4	Complied
9.8060	Vert.	15.5	30.5	2.4	48.4	64.1	15.7	Complied
9.8060	Horiz.	15.5	30.5	2.4	48.4	64.1	15.7	Complied
12.0000	Vert.	17.8	30.7	3.3	51.8	54.0	2.2	Complied
12.0000	Horiz.	17.8	30.7	3.3	51.8	54.0	2.2	Complied

Test Of: Texecom Ltd. Mirage Intruder Detector  
 To: F.C.C. Part 15 Subpart C  
 Section 15.245 (Intentional Radiators)

**Highest Peak Level:**

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dB $\mu$ V)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Peak Margin (dB)	Result
2.4509	Vert.	67.7	20.0	1.3	89.0	134.0	45.0	Complied
2.4509	Horiz.	65.1	20.0	1.3	86.4	134.0	47.6	Complied
4.9016	Vert.	31.8	24.1	1.8	57.7	74.0	16.3	Complied
4.9016	Horiz.	30.9	24.1	1.8	56.8	74.0	17.2	Complied
7.3524	Vert.	29.9	26.9	2.2	59.0	74.0	15.0	Complied
7.3524	Horiz.	34.2	26.9	2.2	63.3	74.0	10.7	Complied
9.8060	Vert.	25.5	30.5	2.4	58.4	84.1	25.7	Complied
9.8060	Horiz.	25.4	30.5	2.4	58.3	84.1	25.8	Complied
12.0000	Vert.	28.8	30.7	3.3	62.8	74.0	11.2	Complied
12.0000	Horiz.	28.8	30.7	3.3	62.8	74.0	11.2	Complied

**Notes:**

1. The EUT fundamental frequency is 2.4509 GHz.

The FCC Code Of Federal Regulations, Section 15.245 states that the fundamental frequency must not exceed a field strength of more than 500 mV/m (114 dB $\mu$ V/m), and any harmonic must not exceed a field strength or more than 1.6 mV/m (64.1 dB $\mu$ V/m). Where the limit is shown to be a level of 54.0dB $\mu$ V/m, these frequencies fall in the restricted bands specified in section 15.205 and therefore the limit stated in section 15.209 is applied. These limits apply when using an average detector. These limits have been increased by 20.0dB for use with a peak detector as listed in section 15.35 (b).



Test Of: **Texecom Ltd. Mirage Intruder Detector**  
To: **F.C.C. Part 15 Subpart C**  
**Section 15.245 (Intentional Radiators)**

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## **5. Measurement Uncertainty**

5.1. Company Policy, as based on the NAMAS Accreditation Standard, M10, paragraph 12.11 (o), states that Test Reports shall include estimated uncertainty of the calibration or test result (this information need only appear in test reports and test certificates where it is relevant to the validity or application of the test result, where a client's instructions so require or where uncertainty affects compliance to a specification or limit).

5.2. The global uncertainties have been calculated in accordance with NAMAS NIS 81 (Edition 1, May 1994) as follows:

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Radiated Emissions	1 GHz to 26.5 GHz	95%	+/- 4.3 dB

5.3. Measurement uncertainties have been applied in accordance with NAMAS document NIS 81 (edition 1, May 1994), and in the absence of any specification criteria, guidance, or code of practice, compliance has been judged on the basis of shared risk.

5.4. In the case of emissions tests, the measured value of the disturbance from the product sample shall be compared directly with the limits. If the measured value is equal to or less than the limit the product is deemed to pass the test.

5.5. In the case of immunity tests, the equipment is deemed to pass the test if it fulfils the stated performance criteria at the required or a higher severity level. The measurement uncertainty has been taken into account in the calibration procedures stated in the relevant basic standard.

5.6. The methods used to calculate the above uncertainties are in line with those used for calibration laboratories contained in NAMAS document NIS 3003 Edition 8 "The Expression of Uncertainty and Confidence in Measurement" May 1995, which align with international recommendations "Guide to the Expression of Uncertainty in Measurement" ISO/IEC/OIML/BIPM (Prepared by ISO/TAG 4: January 1993).

Test Of: Texecom Ltd. Mirage Intruder Detector  
To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)

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## Appendix 1. Test Equipment Used

Instrument	Manufacturer	Model	RFI No.
<b>Open Area Test Site</b>			
Analyser	R & S	ESMI	M069
Co-Axial Cable	Rosenberger	64639	C171
2 - 4 GHz Horn	Eaton	9188-2	A027
3 - 6 GHz Horn	Flann	12240-20	A253
5 - 8.2 GHz Horn	Flann	12420-20	A254
8 2 - 12.5 GHz Horn	Flann	16240-20	A255

**NB** In accordance with NAMAS requirements, all the measurement equipment is on a calibration schedule.

**Test Of:**      **Texecom Ltd. Mirage Intruder Detector**  
**To:**            **F.C.C. Part 15 Subpart C**  
                  **Section 15.245 (Intentional Radiators)**

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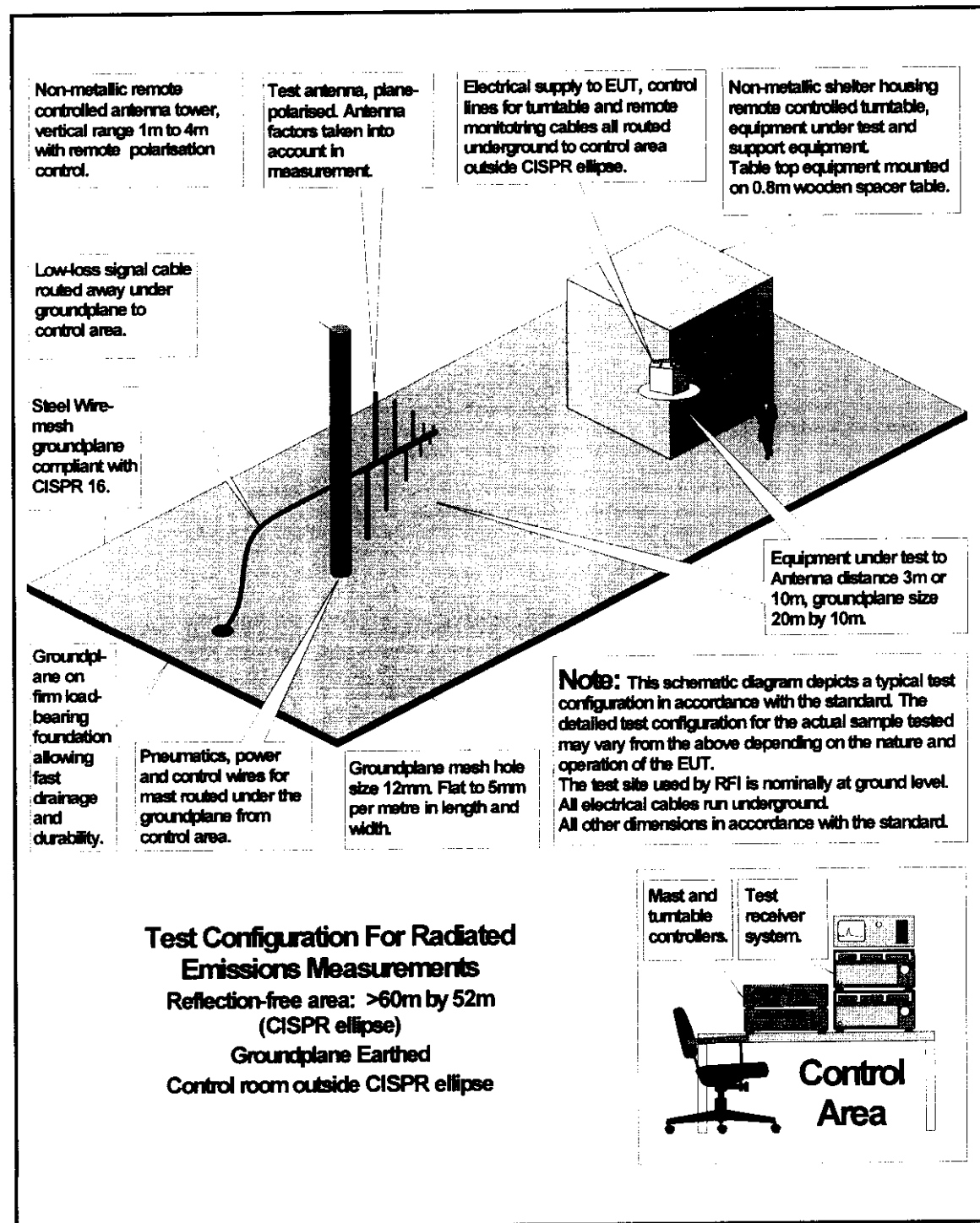
## **Appendix 2. Test Configuration Drawings**

This appendix contains the following drawings:

<b>Drawing Reference Number</b>	<b>Title</b>
DRG\3658536585JD02\ETF01\EMIR AD	Test configuration for measurement of radiated emissions
DRG\36585\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

Test Of: Texecom Ltd. Mirage Intruder Detector  
To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)

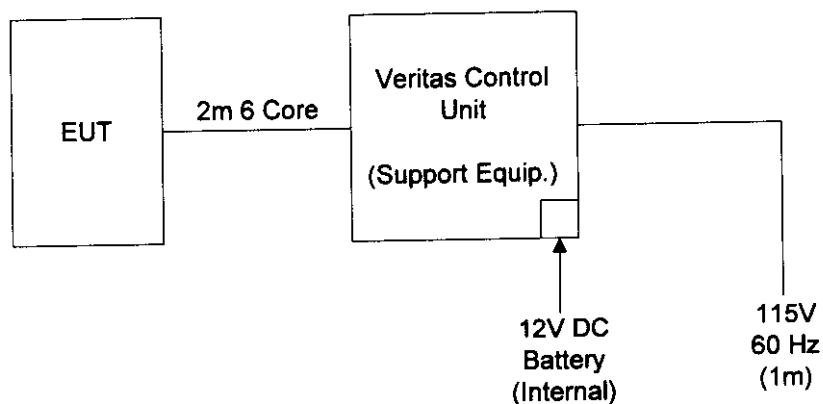
DRG\36585\EMIRAD



Test Of: Texecom Ltd. Mirage Intruder Detector  
To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)

DRG\3658536585\JD02\ETF01\001

### Configuration of EUT and Local Support Equipment



### Configuration of Remote Support Equipment

EMC Department

Test Of: Texecom Ltd. Mirage Intruder Detector  
To: F.C.C. Part 15 Subpart C  
Section 15.245 (Intentional Radiators)

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### **Appendix 3. Photographs of EUT**

This appendix contains the following photographs:

Photograph Reference Number	Title
PHT\36585\001	Front view of radiated emissions test configuration
PHT\36585\002	Rear view of radiated emissions test configuration

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