



EMC Measurement / Technical Report

Test Specification : FCC Part 90,
Private Land Mobile Radio Services
Equipment Authorization : Type Acceptance

Manufacturer : ElectroCom Communication Systems
Equipment Under Test : DT800
800MHz Data Mobile Radio

Test Report No. : 56532
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Instrument Specialties Company, Inc. — World Compliance Center
Electromagnetic Compatibility

EMC Measurement / Technical Report

Document No.: 56532

from

Instrument Specialties Co. Inc.

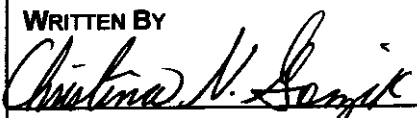
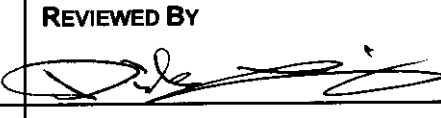
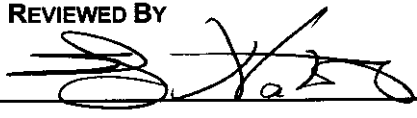
World Compliance Center

Test for

ElectroCom Communication Systems

DT800 Data Mobile Radio

FCC ID: MI7-ECSDT800TX

WRITTEN BY 	REVIEWED BY 	REVIEWED BY 
Christina Najera Gorzik EMC Report Writer EMC Technical Writing Division	Dick Chiang EMC Sr. Engineer	Ed Nakauchi EMC Chief Engineer NARTE, Certified

Test Personnel	Test Dates
Dick P. Chiang	18, 21, 22 July 1997

Test Facility	Instrument Specialties Company Incorporated
Address	545 Porter Way
City, State, Zip Code	Placentia, CA 92870
Country	USA
Phone	(714) 579-7100
Fax	(714) 961-2752

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MEASUREMENT/TECHNICAL REPORT SUMMARY

Representative Manufacturer Address City, State, Zip Phone Fax	Louis Chagoya ElectroCom Communication Systems 10400 Pioneer Blvd., Bldg. E-2 Santa Fe Springs, CA 90670 (562) 946-9493 (562) 946-7483
Type of Authorization	Type Acceptance for 800MHz Data Mobile Radio
Applicable FCC Rules	PART 90 – Private Land Mobile Radio Services Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 (10-1-96 Edition). The following subparts are applicable to the results in this test report: Part 90, Subpart I – General Technical Standards Part 2, Subpart J – Equipment Authorization Procedures for Type Acceptance The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2 section §2.981 through §2.1005 and Part 90. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions.
Equipment Under Test	800MHz Data Mobile Radio
Production Quantity	Multiple Units
Identification of EUT	Model: DT800 FCC ID: MI7-ECSDT800TX
Testing Date	18, 21, 22 July 1997

Test Facility Address City, State, Zip Code Country Phone Fax	Instrument Specialties Company Incorporated 545 Porter Way Placentia, CA 92870 USA (714) 579-7100 (714) 961-2752
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1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test	800MHz Data Mobile Radio
Model Number	DT800
Serial Number	Prototype
Description of EUT	The DT800 is a 800MHz data mobile radio with integral diversity reception system. The transmitter portion of the DT800 operates in the frequency range of 806 – 821MHz, transmit power 25 watts. The receiver side of the DT800 is a post-detection diversity reception system.
Clock Frequencies	10MHz, 44.545MHz

Refer to the product specification data that has been included as an attachment of this report for additional details

1.2 Tested System Details

The following table lists all of the components of the tested system. FCC ID numbers are included if available for a tested system component. Refer to the table following Tested System Details for cabling information.

Tested System Details					
Item	Manufacturer	Description	Model No.	Serial No.	FCC ID
1	ElectroCom	Data Mobile Radio	DT800	N/A	MI7-ECSDT800TX

The following table lists all of the cabling details for the tested system.

Cabling of the Tested System					
Item	Description	Length (m)	Type	Connected from	Connected to
A	Power Cords	1.2	8 gauge wires	EUT	Power Supply
B	DB25 Shielded Cable	2.0	RS232	EUT	Test Fixture
C	RF Coaxial Cable	0.2	RG214	EUT	Directional Coupler
D	RF Coaxial Cable	1.2	RG214	EUT (RX Port)	50 ohm Terminator
E	RF Coaxial Cable	0.5	RG214	Directional Coupler	Spectrum Analyzer
F	RF Coaxial Cable	1.2	RG214	Directional Coupler	50 ohm Terminator



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1.3 Test Facility

The open area test site and measurement facility used to collect the test data is located at the Instrument Specialties Co., Inc. test facility in Placentia, CA. This site has been fully described in a report submitted to the FCC and accepted in a letter dated 5, February 1997 (31040/SIT 1300F2). The test facility is also recognized and accredited from the following accreditation organizations.

ISO 9001 (SGS ICS)	Registration Number: US94/0022 MIL-I-45208A, MIL-STD-45662A	Dated: 02/07/1994
NVLAP (NIST)	NVLAP Lab Code: 200119-0 FCC, CISPR	Dated: 12/31/1996
AUSTEL (NATA)	Listing Test House: A97/TH/014 AS / NZS 3548	Dated: 03/27/1997
IT (Interference Tech. International)	Certificate Number: 7619 CE Mark for European Country	Dated: 03/11/1997
Acemark (Acemark Europe)	Laboratory Number: 0007 CE Mark for European Country	Dated: 03/21/1997
VCCI (Voluntary Control Council)	Registration Number: C-574~6, R-561 VCCI for Japan	Dated: 07/04/1997



2. Technical Description

Type of Emission	20K0F1D
Frequency Range	806 ~ 821 MHz
Range of Operating Power	25W
Maximum output Power Level	25W
Maximum Specified Output Power Rating	Location Dependant per Part 90 Subpart S
Final Stage Amplifier DC Voltage, Current	Voltage: 13.8 Vdc, Current: 5.5 Amps

2.1 Function of All Active Circuit Devices

Please refer to Attachment (Exhibits).

2.2 Circuit Diagram

Refer to Figure in Attachment (Exhibits).

2.3 Instruction Manual(s)

See Attachment (Exhibits).



4. SYSTEM TEST CONFIGURATION

4.1 Justification

The EUT was used in a system configured for testing in a typical installation as a customer would normally use it.

4.2 EUT Exercise Software/Equipment

The EUT requires exercise software program used during testing to activate data from PC to modem and deliver to test fixture by manually switch EUT turned on or off.

4.3 Special Accessories

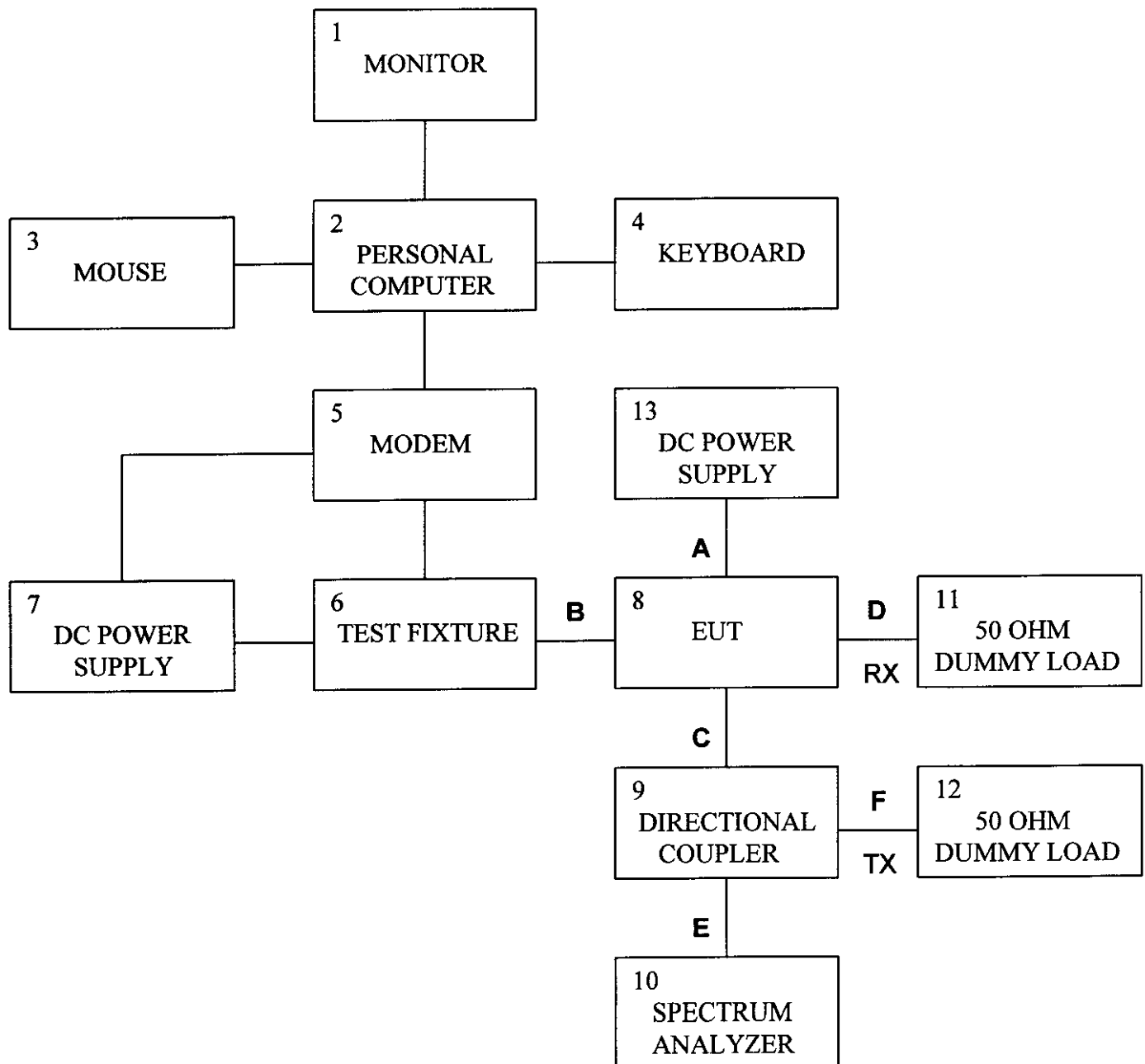
The EUT requires no special accessories to comply with the FCC regulations.

4.4 Equipment Modifications

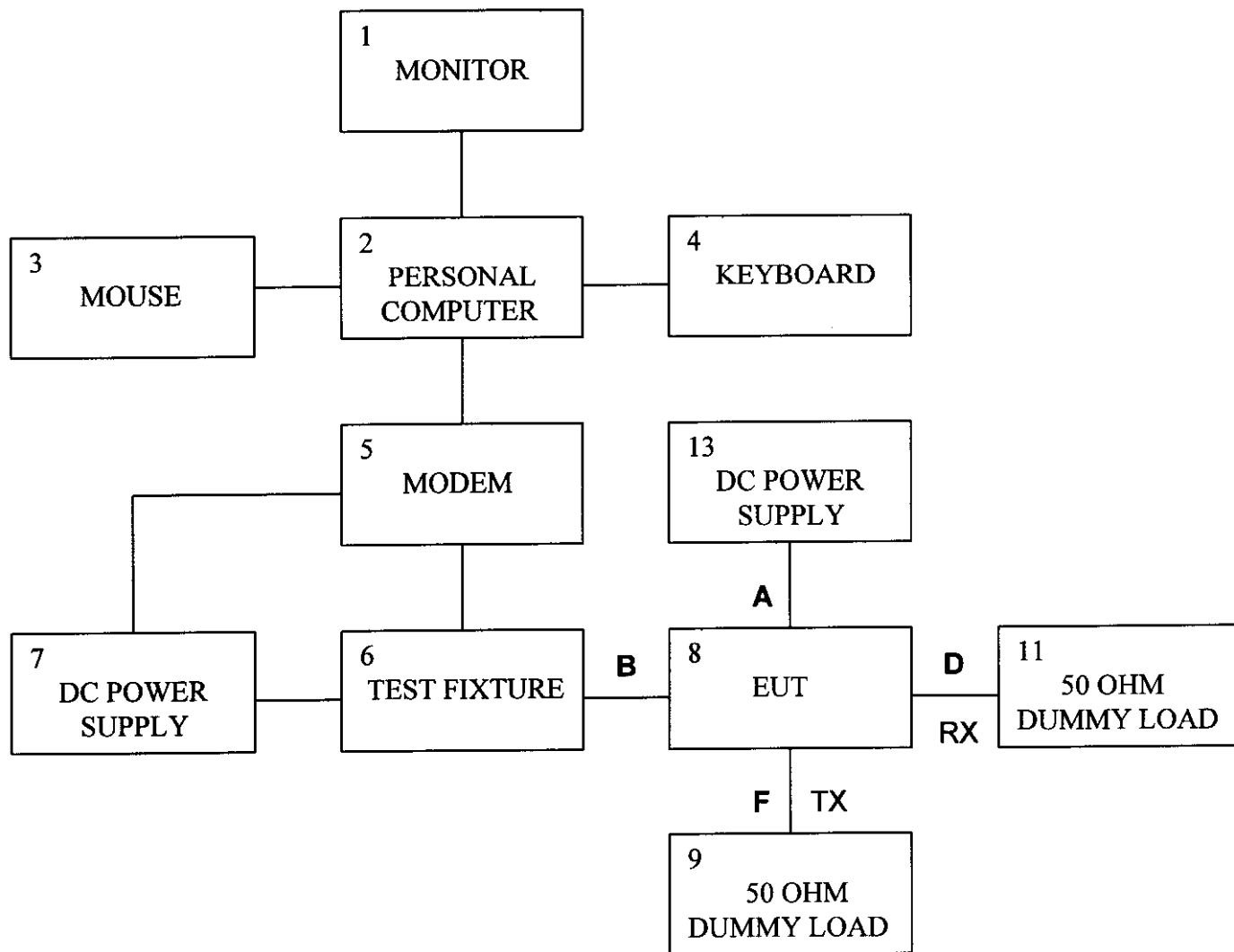
No modifications and or adjustments were made to the EUT during compliance testing to achieve the required specification limits.



4.5 Configuration of Tested System



Test Setup Configuration 1



Test Setup Configuration 2



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Legend:

Item	Manufacturer	Description	Model No.	Serial No.	FCC ID
1	Dell Computer	Monitor	D1728D-LS	4036A0UJGA5	A3LCMG737
2	Dell Computer	Personal Computer	MMS-P75T	60NCN	E2KHNTMT
3	Logitech	Mouse	M-S34-6MD	LCA51603467	DZL210472
4	Dell Computer	Keyboard	SK-1000RE	M950401343	GYUR10SK
5	ElectroCom	Modem	Prototype	N/A	N/A
6	ElectroCom	Test Fixture	Prototype	N/A	N/A
7	Elenco	DC Power Supply	XP581	N/A	N/A
8	Werlatone	Directional Coupler	C3271	5320	N/A
9	ElectroCom	Data Mobile Radio	DT800	N/A	N/A
10	Hewlett Packard	Spectrum Analyzer	HP8566B	2747A05747	N/A
11	Bird Electronics	50 ohm Load	50-T-FN	9708	N/A
12	Bird Electronics	50 ohm Load	8833-300	2109	N/A
13	DC Power Supply	Lambda	ZT-803	N/A	N/A

Item	Description	Length (m)	Type	Connected from	Connected to
A	Power Cords	1.2	8 gauge wires	EUT	Power Supply
B	DB25 Shielded Cable	2.0	RS232	EUT	Test Fixture
C	RF Coaxial Cable	0.2	RG214	EUT	Directional Coupler
D	RF Coaxial Cable	1.2	RG214	EUT (RX Port)	50 ohm Terminator
E	RF Coaxial Cable	0.5	RG214	Directional Coupler	Spectrum Analyzer
F	RF Coaxial Cable	1.2	RG214	Directional Coupler	50 ohm Terminator



5 TEST DATA

5.1 RF Power Output

Output power was measured at the Transmitter Module RF output terminal. The test setup and method as shown in Fig. 1

The output power was measured 25W at each frequency 806MHz, 814MHz, 821MHz tuned with nominal voltage 13.70V, and the output power was measured at the DC power supply was adjusted to $\pm 15\%$ of nominal voltage. The HP437B power meter and HP8481H power sensor was used to measure RF output power.

Freq. tuned	85% nominal voltage (11.65V)	nominal voltage (13.70V)	115% nominal voltage (15.76V)
806 MHz	11.8W	17.4W	22.0W
814 MHz	12.3W	17.4W	23.0W
821 MHz	11.8W	17.0W	20.0W



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5.2 Modulation Characteristics

Please refer to Attachment C, FSK modem, Product Support Manual and Product Specification Manual for details description. The modulation characteristics test results are enclosed in appendix B pages B4-6.



5.3 Occupied Bandwidth

Occupied bandwidth is the frequency bandwidth below its lower and above its upper frequency limits, the mean power radiated by a given emission, the measurements were made with the modulating signal. The authorized occupied bandwidth for emission mask G is 20KHz. The measured occupied bandwidth that was the manufacturer intended to design for sufficient data transmission. Test setup was connected the equipment per Fig. 1. Test results were attached in appendix B pages B7-9.

Necessary bandwidth $B_n = 2M + 2D = 19.6\text{KHz}$
Where $M = 4.8\text{KHz}$
 $D = 5.0\text{KHz}$



5.4 Spurious Emissions at Antenna Terminals

Antenna conducted spurious emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information or required quality for the class of communication desired. The reduction in the level of the spurious emissions will not affect the quality of the information being transmitted. Conducted spurious emissions shall be attenuated at least; $43 + 10 \log (P_o) = 57\text{dB}$ (where P_o is 25W output power) below the maximum level of the carrier frequency in accordance with the transmitter was authorized. Connect the equipment as shown in Fig. 1. Adjust the spectrum analyzer to display the modulated carrier, and scan the frequency spectrum from the lowest radio frequency generated in the equipment through the 10th harmonic of the carrier frequency. Test results were attached in appendix B pages B10-15.



5.5 Radiated Spurious Emission

Emissions from the equipment when connected into a non-radiating load on a frequency of frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted. Connect the equipment as shown in Fig. 2. All cables connected to generate maximum emissions from the EUT. The EUT was placed 80 centimeters above the ground plane on a non-conductive tabletop 1.0 meters wide by 1.5 meters long. The amplitude levels of the emissions were maximized by varying the configuration of the EUT and cables. The highest emissions were maximized by rotating the turntable 360 degrees and varying the antenna height 1 to 4 meters. The frequency range was measured up to 10th harmonic utilizing a BiLog antenna. measurements were made in vertical and horizontal polarizations. The distance between EUT and measuring antenna is 3 meters. Amplitude levels were recorded in dB μ V/m. All spurious emissions were attenuated at least 63 dB below each tuned carrier field strength. Test results were attached in appendix B pages B16-18.

$$\begin{aligned} * \text{ Field strength} &= 1/D \times (P_o \times R_L)^{1/2}, \text{ where } D = 3 \text{ meters, } P_o = 25.0W, R_L = 50.2 \text{ ohm} \\ &= 1/3 \times (25 \times 50.2)^{1/2} \\ &= 141.4 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\begin{aligned} ** \text{ FCC Limit} &= 43 + 10 \log (P_o), \text{ where } P_o = 25W \\ &= 57\text{dB} \end{aligned}$$



5.6 Frequency Stability

The EUT carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency over the variations of extreme ambient temperature. The DT800 was placed in the temperature chamber and measured the power output with the variation of DC power input in room temperature. The temperature was set to the lowest requirement -30°C and wait for a period of at least 2 hours to reach stability inside the unit. Once the chamber temperature and inside unit thermocouple temperatures reach the -30°C , the unit was turned on and output power was measured within one minute with the variations of DC input power from 85% to 115% of nominal voltage. Increasing the temperature by every 10°C step to the maximum extreme temperature of this test is $+50^{\circ}\text{C}$. For each temperature setting, wait for both chamber and unit inside thermocouple reach desired temperature and repeat the measurement. Please refer to pages B19 –B21 in appendix B for the test results



APPENDIX A - TEST EQUIPMENT USED

A complete list of test equipment used for each test can be found in their perspective test procedure. The equipment absolute performance calibration, of the equipment requiring calibration, is performed on an as needed basis in accordance with MIL-STD-45662. However, calibration periods do not exceed one (1) year. The test equipment is capable of making measurements within tolerances of at least +/- 2 dB amplitude and +/-2% frequency deviation. Equipment certifications showing traceability to NIST (National Institute of Standards and Technology) are maintained on file at Instrument Specialties Corporate offices in Delaware Water Gap, PA or Placentia CA. All equipment is checked and verified for proper operation before and after each series of tests.

A.1 Specific Equipment Used

<i>Test Instrument</i>	<i>Mfg</i>	<i>Model No.</i>	<i>Serial No.</i>	<i>Freq. or Range</i>	<i>Cal. Due Date</i>
EMI Spectrum Analyzer	Hewlett Packard	8566B	2747A05747	100 Hz – 22 GHz	11/23/97
Communication Test Set	Hewlett Packard	8920A	3524A07112	.4 – 1000 MHz	12/06/97
Directional Coupler	Hewlett Packard	11692D	1212A02005	2 – 18 GHz	11/27/97
Directional Coupler	Werlatone	C3271	5320	80 – 2000 MHz	12/13/97
Digital Power Meter	Hewlett Packard	437B	3125U23484	0.1 MHz – 110 GHz	01/20/98
Power Sensor	Hewlett Packard	8481H	3318A17843	.01 – 18 GHz	12/19/97
RF Preamplifier	Hewlett Packard	8449B	3008A00357	1 – 26 GHz	09/13/97
Double Ridged Antenna	EMCO	3115	9511-4575	1 – 18 GHz	11/27/97
Signal Generator	Macorni	2022	119006-050	10 KHz – 1 GHz	10/08/97
50 ohm Resistive Load	Bird Electronics	50-T-FN	9708	50W	CIP
50 ohm Resistive Load	Bird Electronics	8833-30	2109	1KW	CIP
RF Combiner	Mini-Circuits	ZA3PD-1	N/A	0.4 – 1 GHz	CIP
DC Power Supply	Elenco	XP581	N/A	0 – 18V	CIP
DC Power Supply	Lambda	ZT803	N/A	0 – 36V, 0 – 34.5A	12/06/97
RF Coax Cable	Pasternack	PE-142LL	038	.02 – 10 GHz	CIP

* CIP – calibrate in place



APPENDIX B – SUPPLEMENTS TEST DATA

<i>Basic Standard</i>	<i>Details</i>	<i>Data Format</i>	<i>Page No.</i>
Part 90 Subpart I Part 2 Subpart J	Power Output	Plotted	B1 – B3
	Modulation Characteristics	Plotted	B4 – B6
	Occupied Bandwidth	Plotted	B7 – B9
	Antenna Terminal Spurious	Plotted	B10 – B15
	Radiated Spurious	Tabulated	B16 – B18
	Frequency Stability	Tabulated	B19 – B21



ATTACHMENTS

INDEX OF ATTACHMENTS

<i>Description of Contents</i>	<i>Page No.</i>
DT800 Product Specification Manual	Exhibit A
DT800 Product Support Manual	Exhibit B
MX919B FSK Modem Manual	Exhibit C

ELECTROCOM DT800 POWER OUTPUT
MKR 806.000 MHz
42.50 dBm

hp

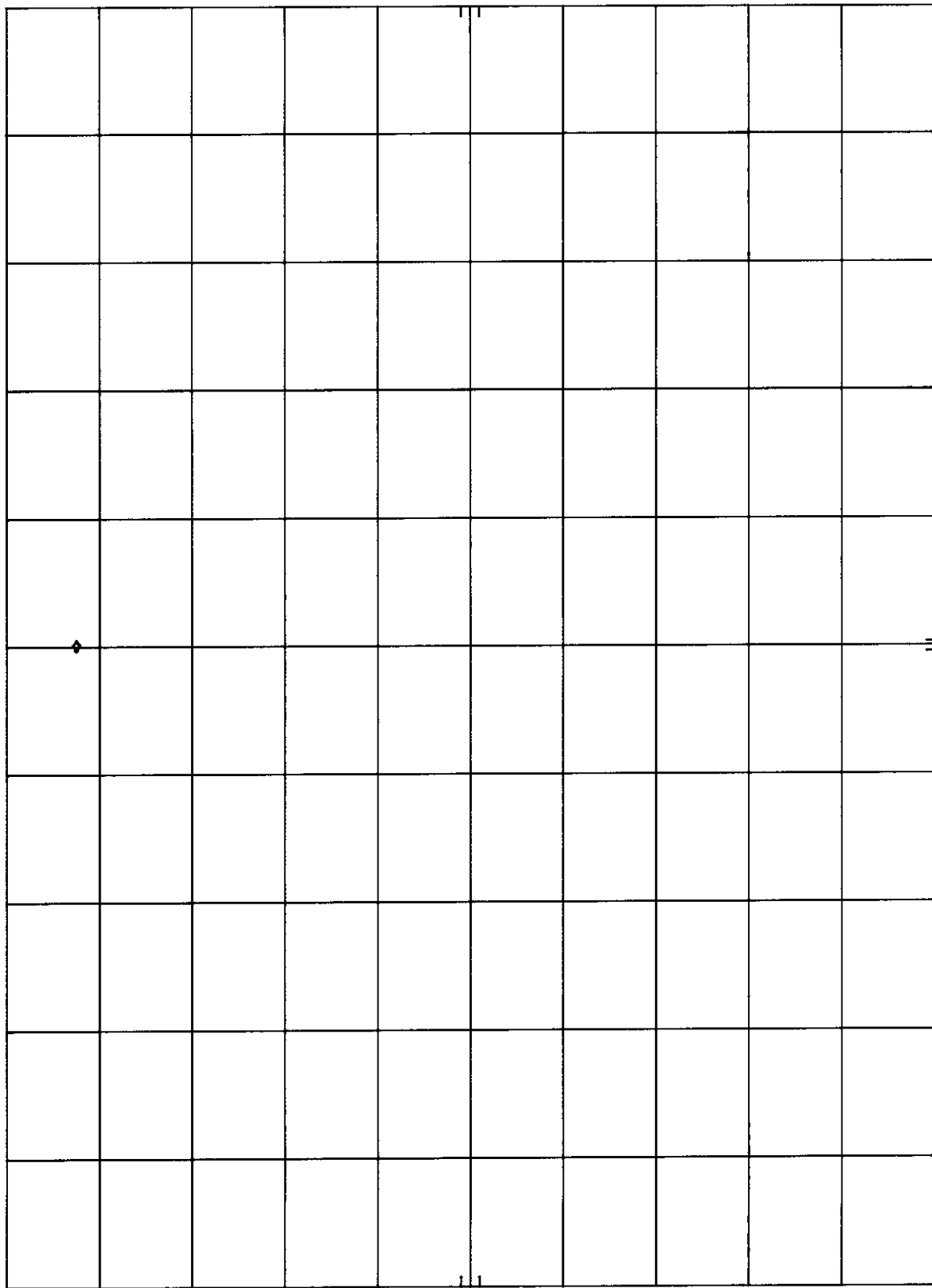
10 dB/

POS PK

OFFSET

50.0

dB



CORR'D

CENTER 806.00 MHz
RES BW 100 KHz
SPAN 5.00 MHz
SWP 20.0 msec
VBW 100 KHz

ELECTROCOM DT800 POWER OUTPUT
REF 50.0 dBm ATTN 10 dB MKR 814.000 MHz
42.60 dBm

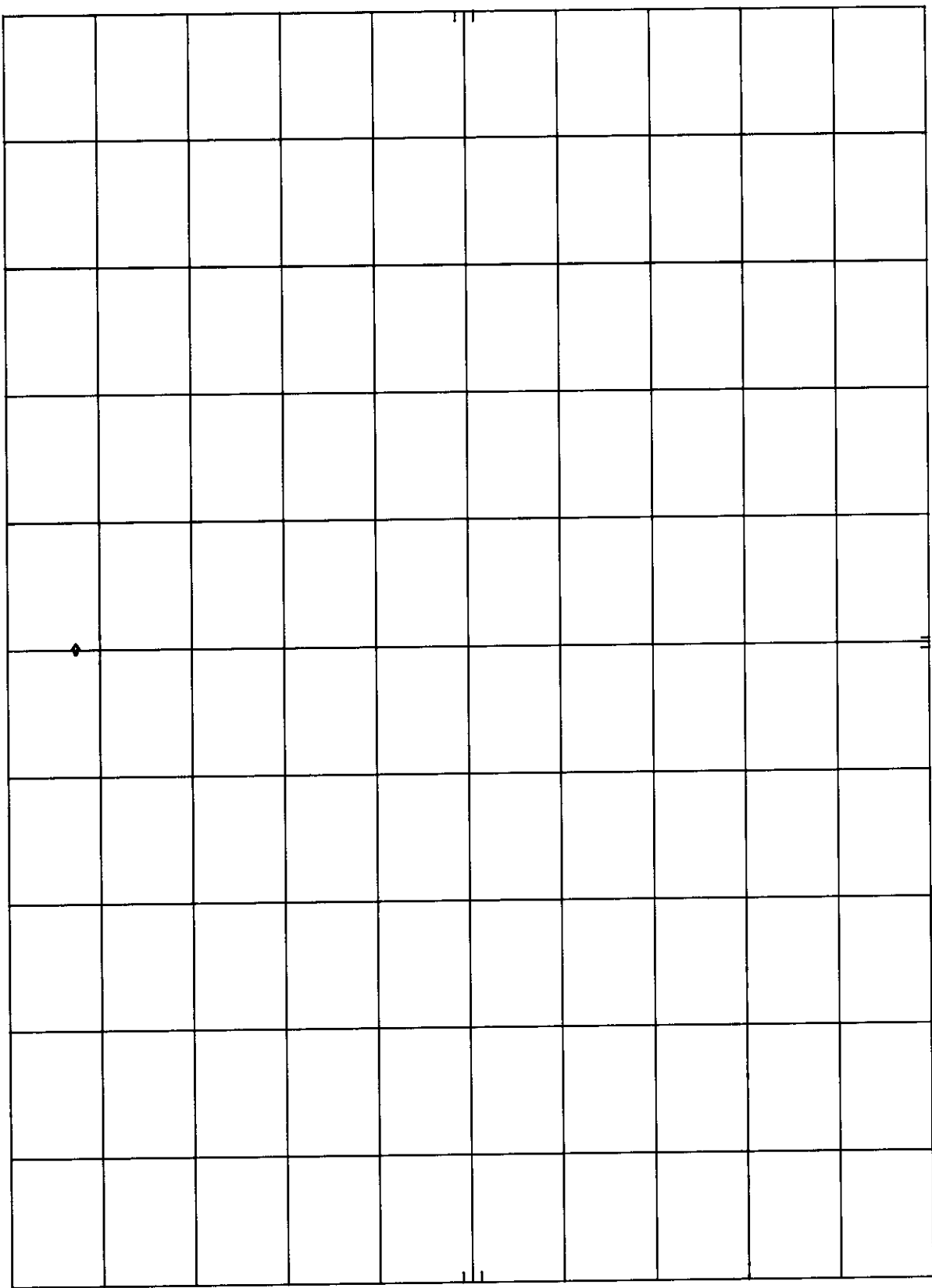
hp

10 dB/

POS PK

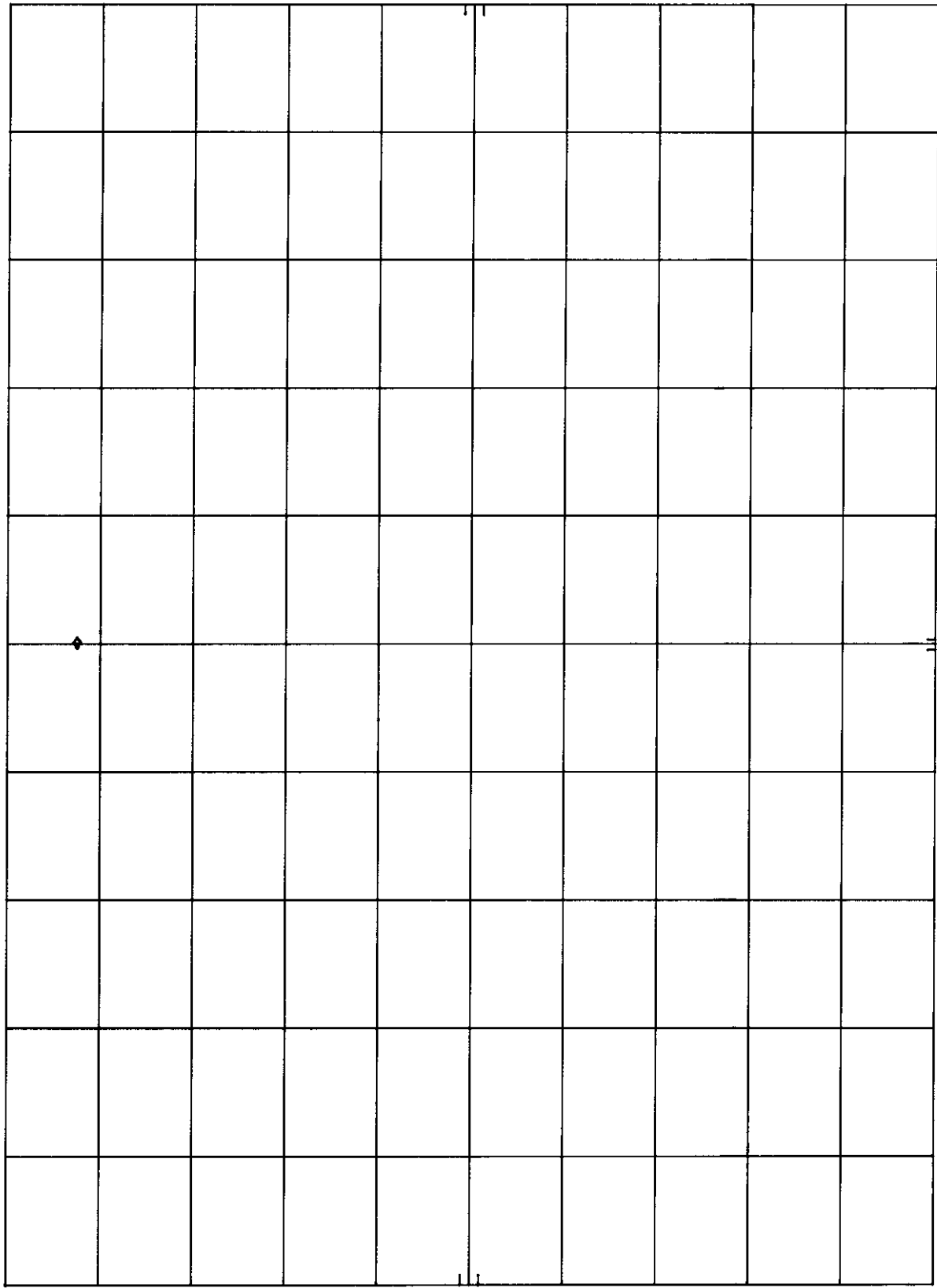
OFFSET
50.0
dB

CORR'D



CENTER 814.000 MHz
RES BW 100 KHz
SPAN 5.00 MHz
SWP 20.0 msec
VBW 100 KHz

hp ELECTROCOM DT800 POWER OUTPUT MKR 821.000 MHz
REF 50.0 dBm ATTEN 10 dB 42.50 dBm



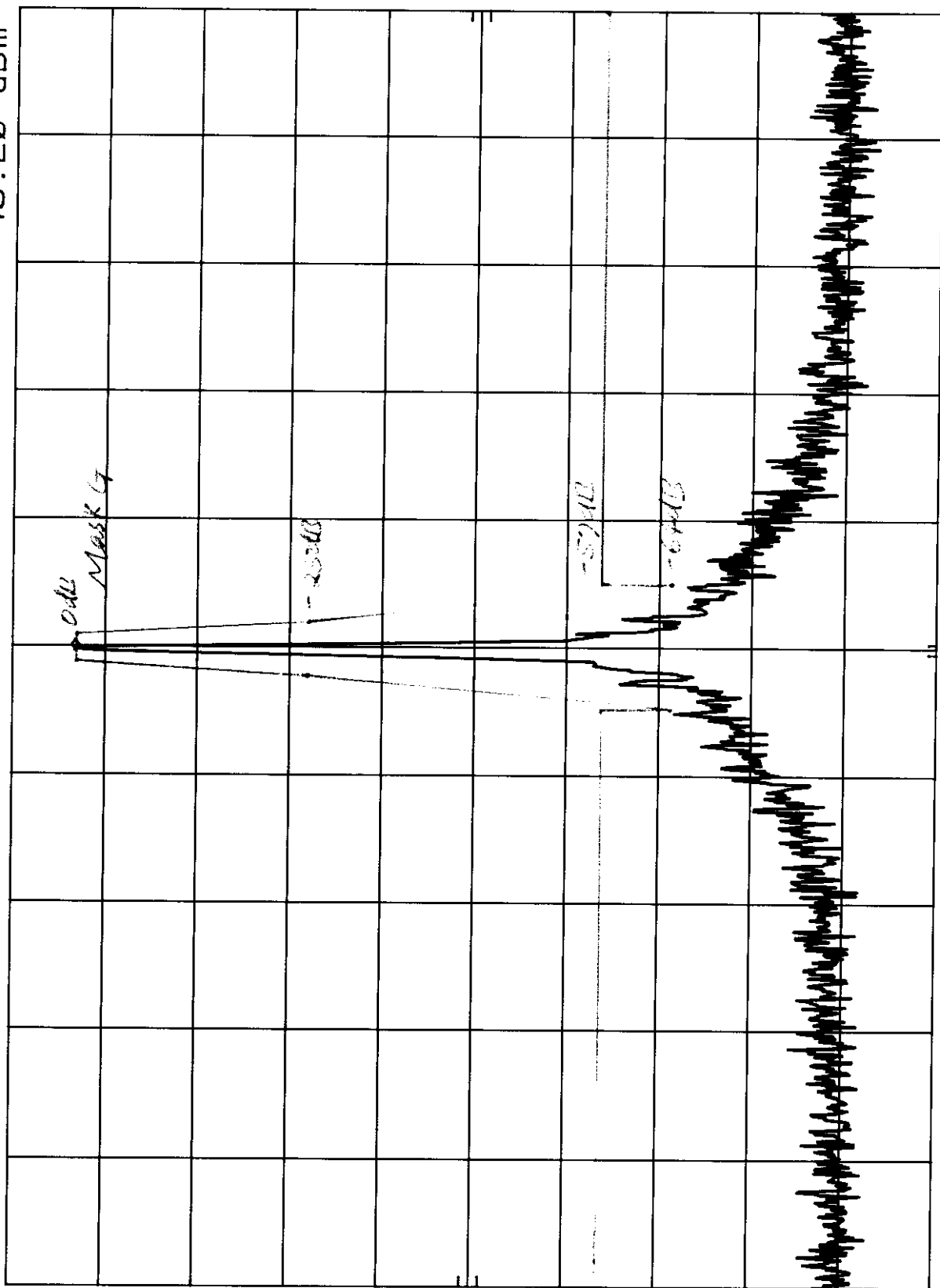
10 dB/
POS PK
OFFSET
50.0
dB

CORR'D

CENTER 821.00 MHz
RES BW 100 KHz
SPAN 5.00 MHz
SWP 20.0 msec
VBW 100 KHz

hp ELECTROCOM DT800 MODULATION MKR 806.000 0 MHz
REF 50.0 dBm ATTEN 10 dB 43.20 dBm

10 dB/
POS PK
OFFSET
50.0
dB



CORR'D

CENTER 806.000 MHz RES BW 1 KHZ VBW 1 KHZ SPAN 500 KHZ SWP 1.50 sec

h_p MKR 814.000 0 MHz
43.20 dBm

ELECTROCOM DT800 MODULATION
REF 50.0 dBm ATTEN 10 dB

10 dB/

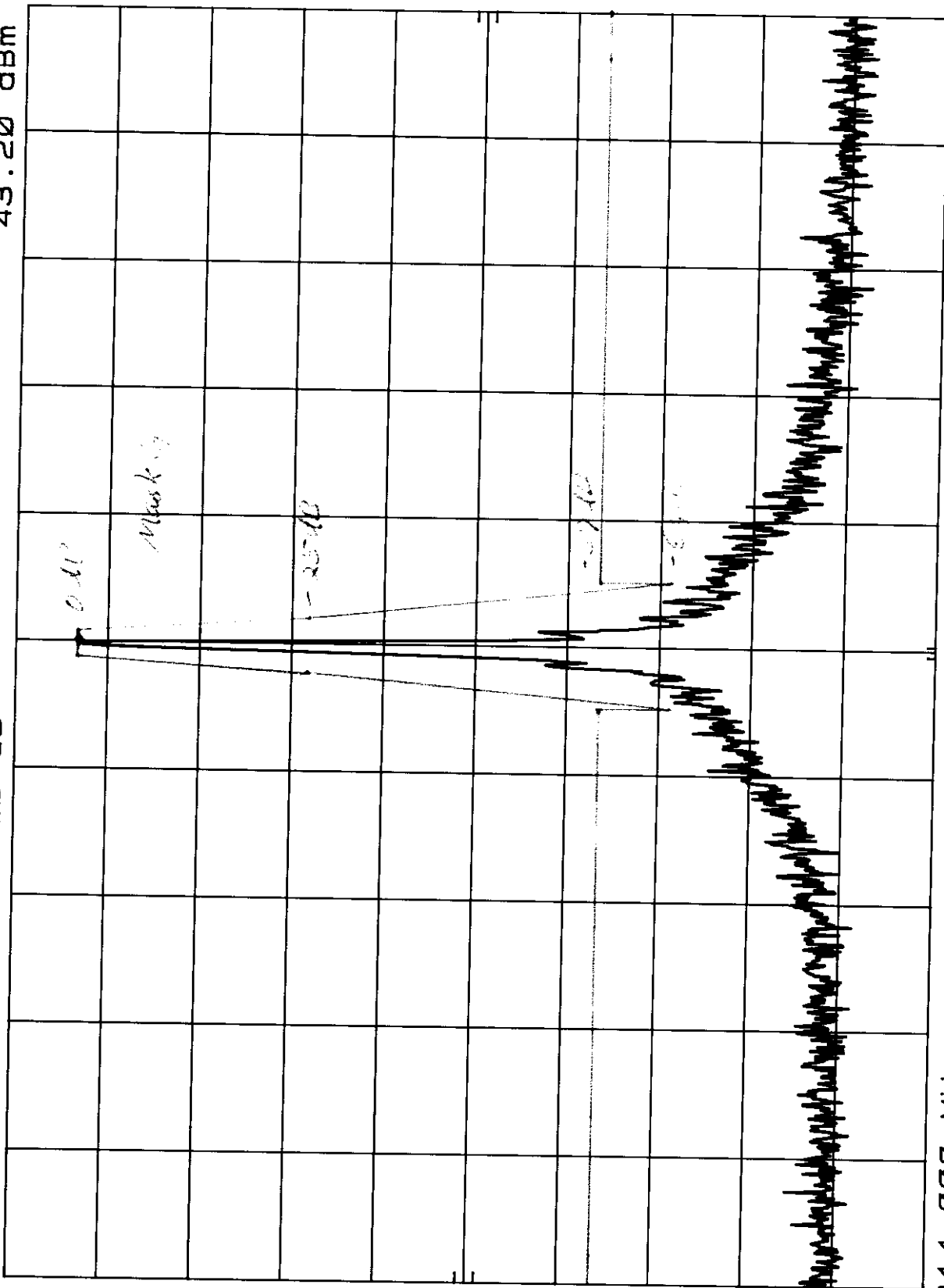
POS PK

OFFSET

50.0

dB

CORR'D



CENTER 814.000 MHz

RES BW 1 KHZ

VBW 1 KHZ

SPAN 500 KHZ

SWP 1.50 sec

ELECTROCOM DT800 MODULATION
REF 50.0 dBm ATTEN 10 dB

MKR 821.000 0 MHz
43.20 dBm

hp

10 dB/

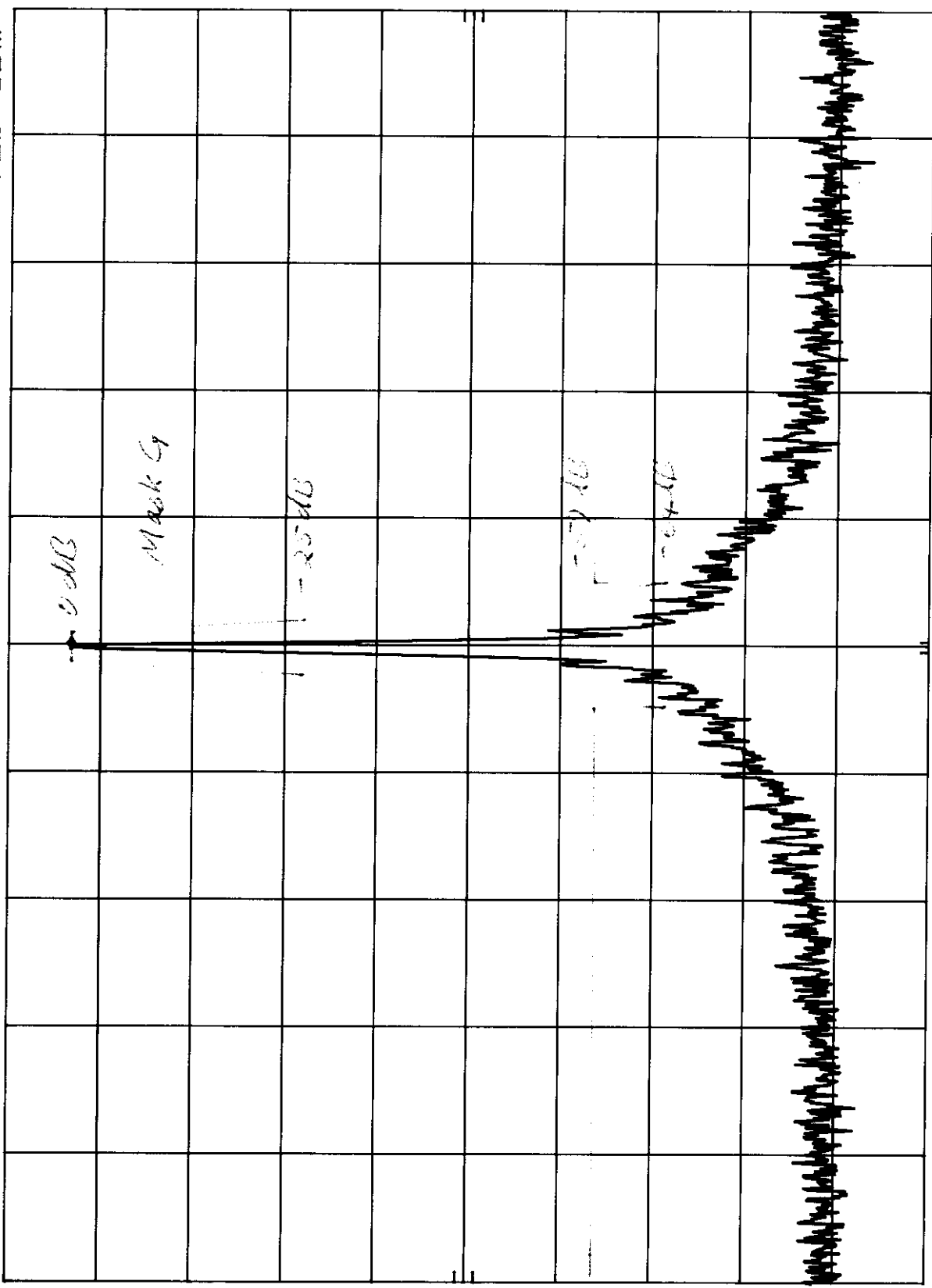
POS PK

OFFSET

50.0

dB

CORR'D



CENTER 821.000 MHz

RES BW 1 KHZ

VBW 1 KHZ

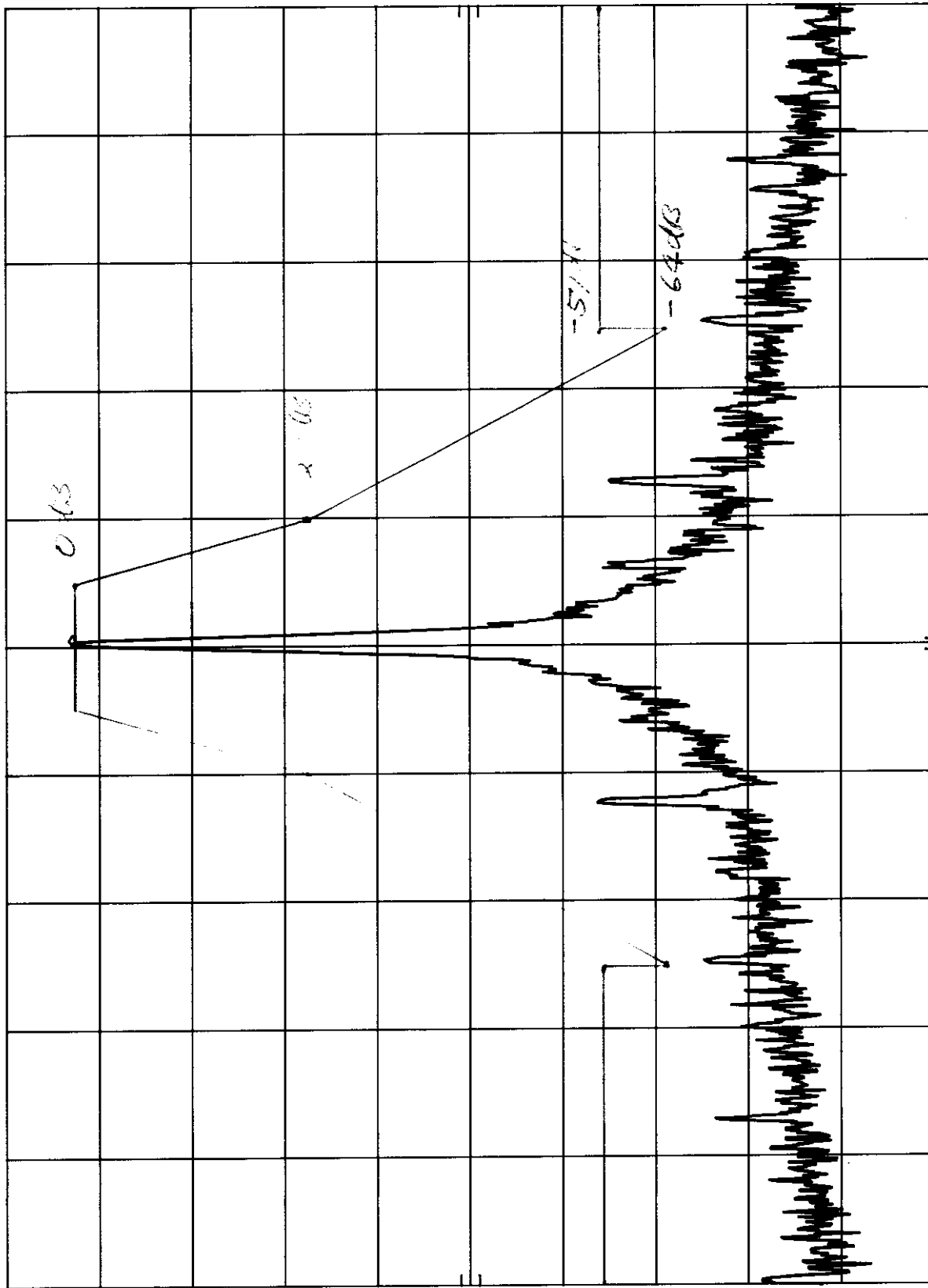
SPAN 500 KHZ

SWP 1.50 sec

ELECTROCOM DT800 OCCUPIED BANDWIDTH MKR 806.000 4 MHz
 REF 50.0 dBm ATTEN 10 dB 42.90 dBm

HP

10 dB/
 POS PK
 OFFSET
 50.0
 dB



CORR'D

CENTER 806.000 MHz RES BW 300 Hz VBW 300 Hz SPAN 100 KHz SWP 3.00 sec

ELECTROCOM DT800 OCCUPIED BANDWIDTH MKR 814.000 4 MHZ
 REF 50.0 dBm ATTN 10 dB 42.90 dBm

hp

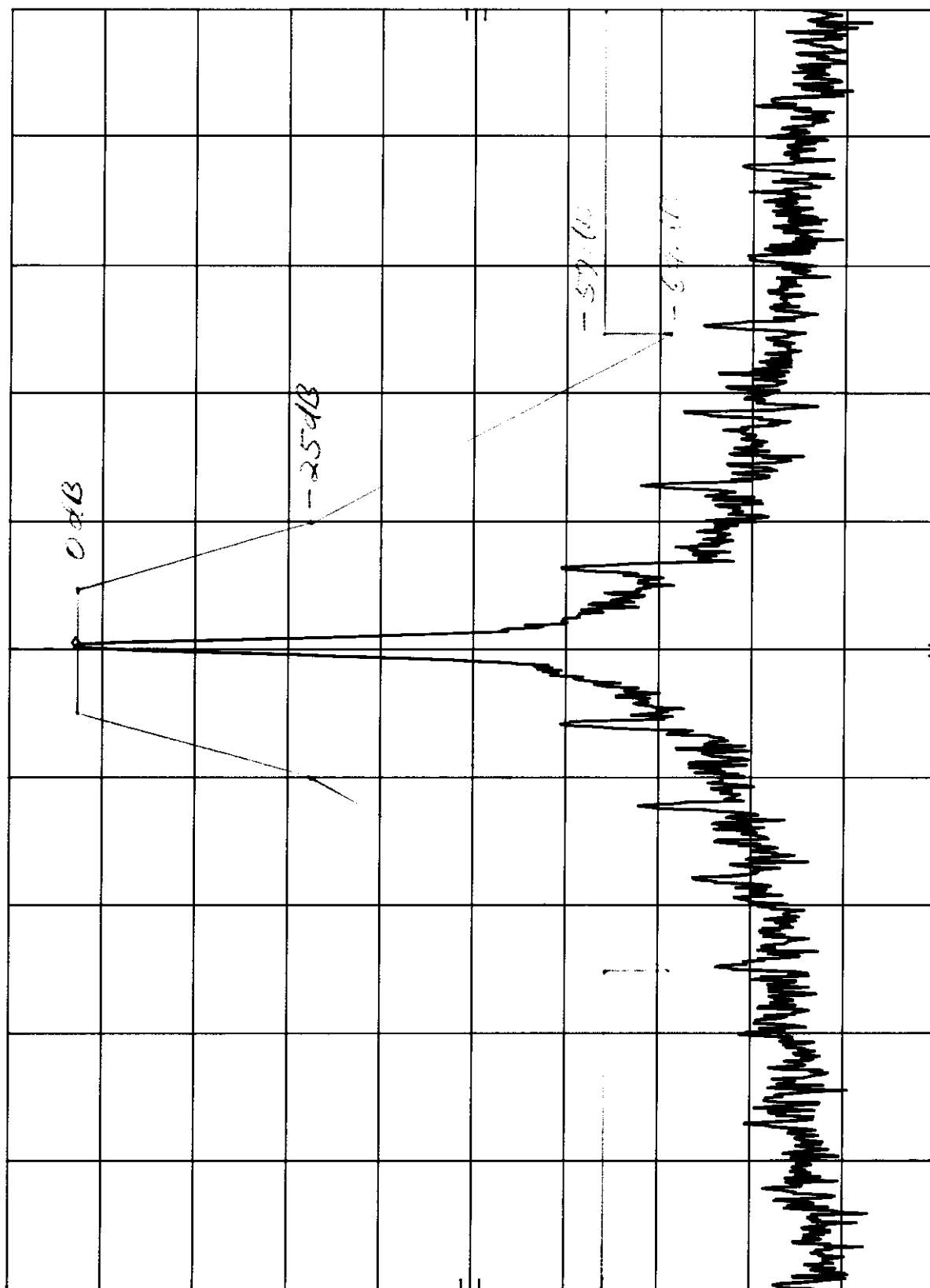
10 dB/

POS PK

OFFSET

50.0

dB



CORR'D

CENTER 814.000 MHz RES BW 300 Hz VBW 300 Hz SPAN 100 kHz SWP 3.00 sec

ELECTROCOM DT800 OCCUPIED BANDWIDTH
 REF 50.0 dBm ATTEN 10 dB MKR 821.000 4 MHz
 42.80 dBm

hp

10 dB/

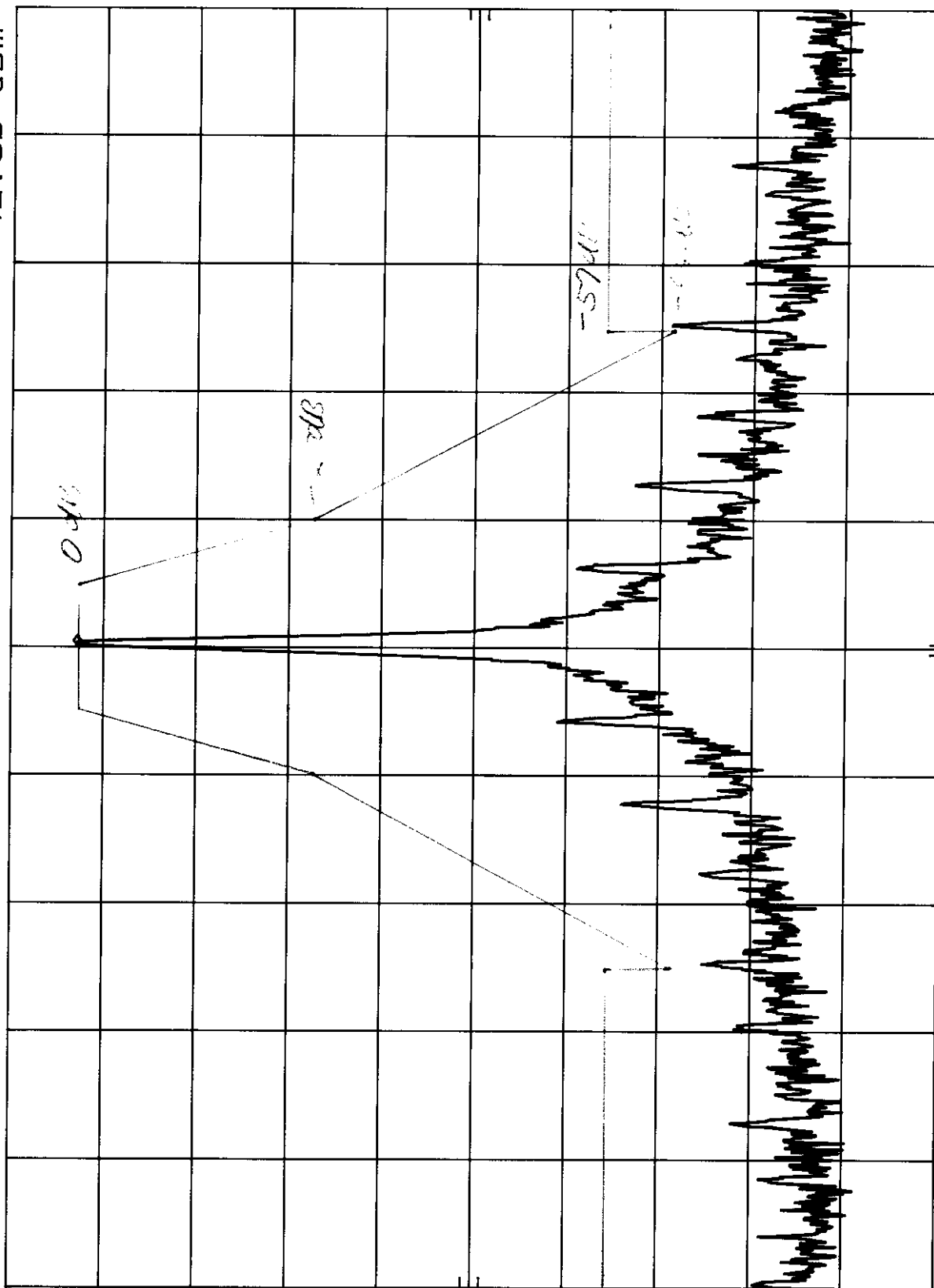
POS PK

OFFSET

50.0

dB

CORR'D



CENTER 821.000 MHz

RES BW 300 Hz

Hz

Hz

VBW 300

SPAN 100 KHz

SWP 3.00 sec

ELECTROCOM DT800 ANTENNA COND. SPUR.
REF 50.0 dBm ATTEN 10 dB MKR 804 MHz
41.70 dBm

hp

10 dB/

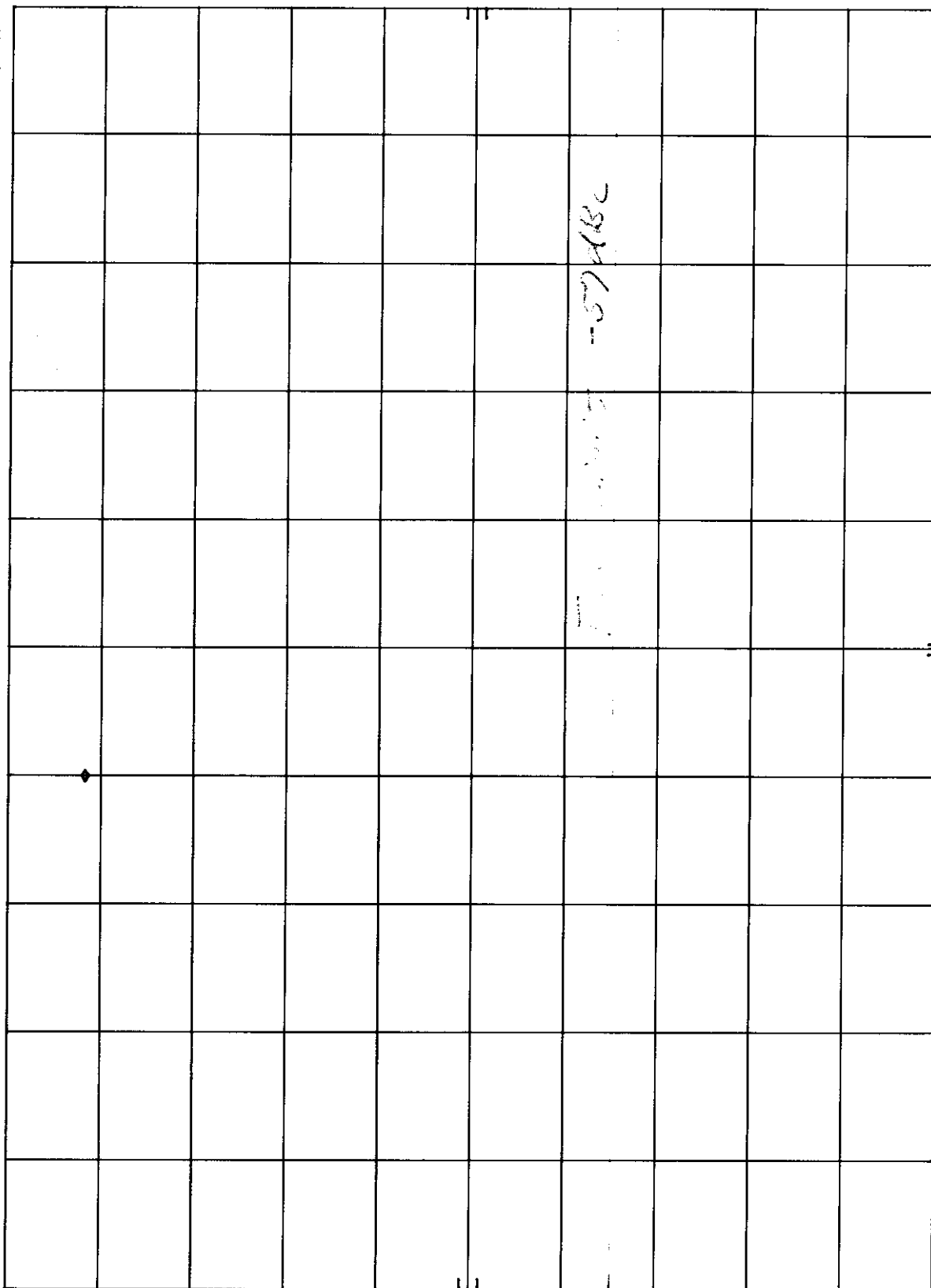
POS PK

OFFSET

50.0

dB

CORR'D



START 10 MHz RES BW 100 kHz VBW 100 kHz STOP 2.00 GHz SWP 597 msec

ELECTROCOM DT800 ANTENNA COND. SPUR.
REF 50.0 dBm ATTEN 30 dB MKR 2.413 GHz
-20.90 dBm

HP

10 dB/

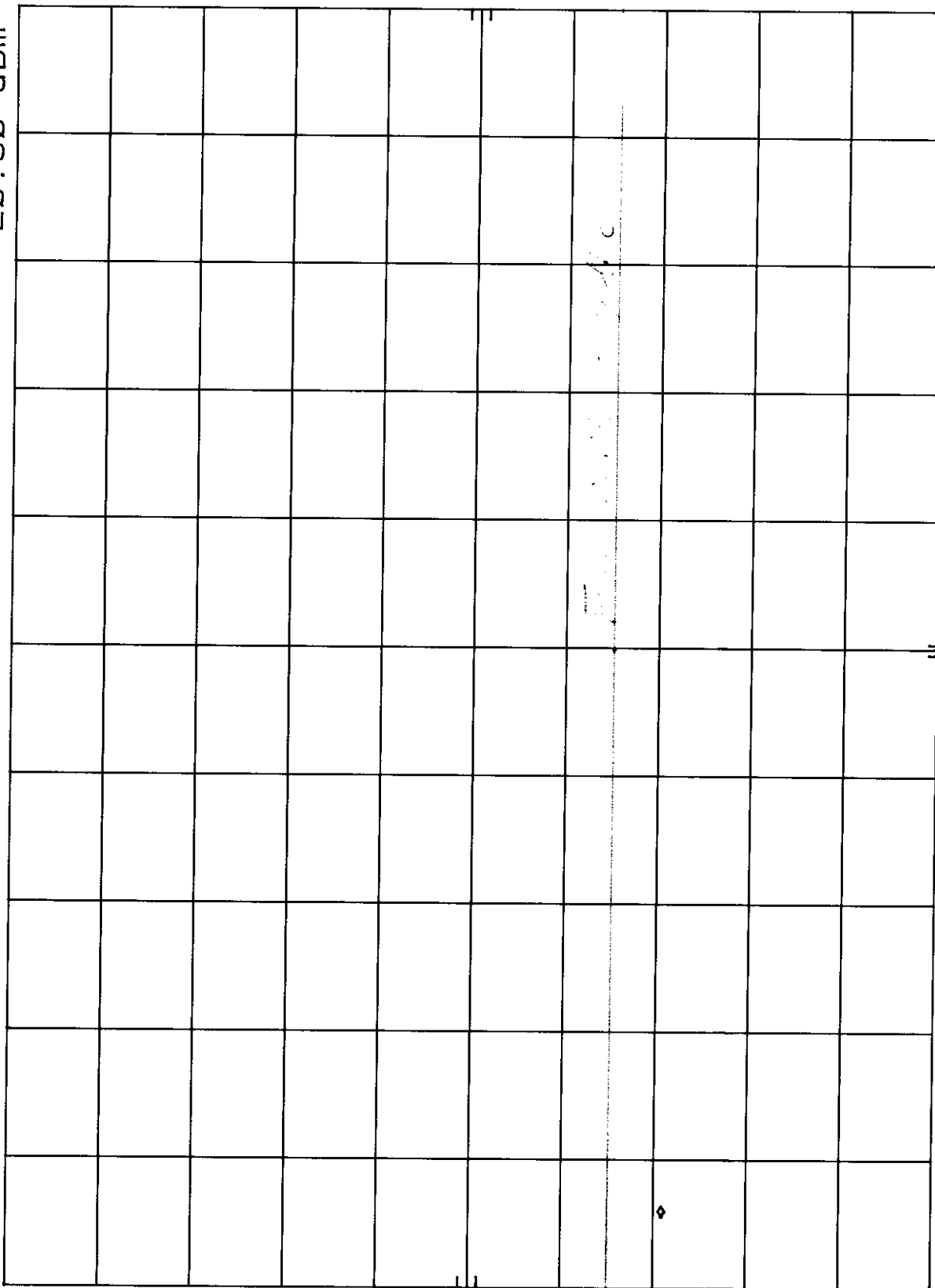
POS PK

OFFSET

30.0

dB

CORR'D



START 2.00 GHz RES BW 100 KHz STOP 9.00 GHz
VBW 100 KHz SWP 2.10 sec

ELECTROCOM DT800 ANTENNA COND. SPUR.
REF 50.0 dBm ATTEN 10 dB MKR 812 MHz
41.90 dBm

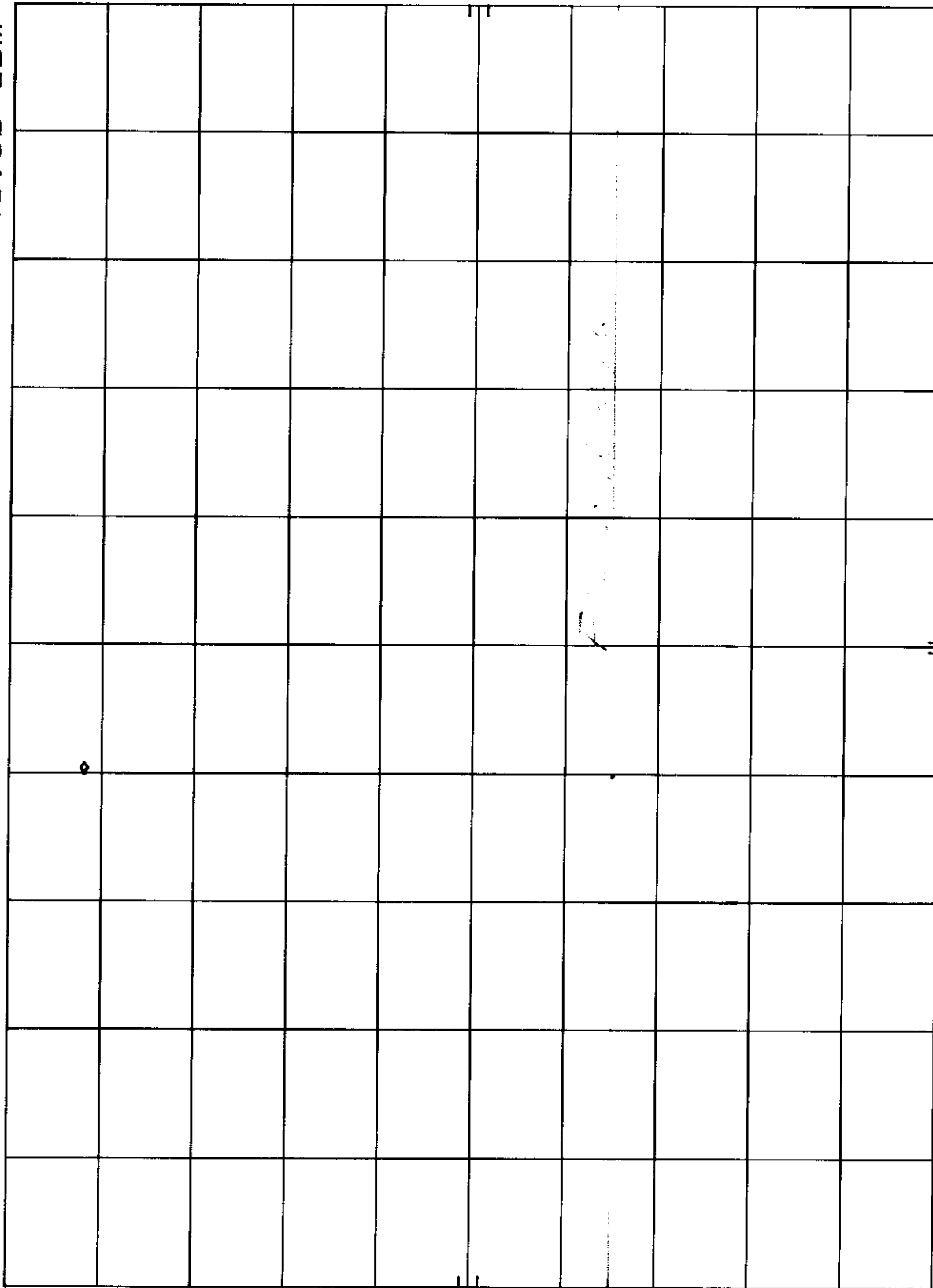
hp

10 dB/

POS PK

OFFSET
50.0
dB

CORR'D



START 10 MHz RES BW 100 KHZ VBW 100 KHZ STOP 2.00 GHZ
SWP 597 msec

ELECTROCOM	DT800	ANTENNA COND.	SPUR.	MKR 2.434 GHz
REF	50.0 dBm	ATTEN 30 dB		-16.70 dBm

-16.70 dBm

REF 50.0 dBm

ATTEN 30 dB

79

10 dB/

PK
SOT

TEST

30.0

BB

COOR.D.

START 2.00 GHZ	RES BW 100 KHZ	VBW 100 KHZ	STOP 9.00 GHZ
			SWP 2.10 sec

Feb Unit - 5722

MKR 820 MHz
42.00 dBm

ELECTROCOM DT800 ANTENNA COND. SPUR.

REF 50.0 dBm ATTEN 10 dB

77

10 dB/

Q
S
Y

TEST

Q. 15

18

CORP. D.

START 10 MHz	STOP 2.00 GHz
RES BW 100 kHz	SWP 597 msec
VBW 100 kHz	

Test Results: Spurious Radiated Signal Measurements (Reference: Part 2, Subpart J, §2.993)

Frequency Tuned at: 814.0 MHz

FCC OATS Radiated Emission Data Sheet

Date: 07/22/97

Antenna Polarity (V or H)	Frequency of Emission (MHz)	S. A. Reading (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Gain (dB)	Field Strength @ 3 meter (dB μ V/m)	Field Strength @ 3 meter (dBc)	FCC Limit @ 3 meter (dBc)
	814.0	---	---	---	---	141.5 *	0	**
V	1628.0	36.8	26.5	10.5	36.0	37.8	-103.7	-57.0
H	1628.0	36.9	26.5	10.5	36.0	37.9	-103.6	-57.0
V	2442.0	38.8	29.5	13.0	36.0	45.3	-96.2	-57.0
H	2442.0	42.3	29.5	13.0	36.0	48.8	-92.7	-57.0
V	3256.0	40.6	30.5	15.0	35.0	51.1	-90.4	-57.0
H	3256.0	38.2	30.5	15.0	35.0	48.7	-92.8	-57.0
V	4070.0	42.1	32.1	17.0	35.0	56.2	-85.3	-57.0
H	4070.0	39.3	32.1	17.0	35.0	53.4	-88.1	-57.0
V	4884.0	34.3	32.1	19.5	34.5	51.4	-90.1	-57.0
H	4884.0	36.9	32.1	19.5	34.5	54.0	-87.5	-57.0
V	5698.0	30.6	34.2	21.0	34.0	51.8	-89.7	-57.0
H	5698.0	31.3	34.2	21.0	34.0	52.5	-89.0	-57.0
V	6512.0	***	35.8	23.0	34.0	---	---	-57.0
H	6512.0	***	35.8	23.0	34.0	---	---	-57.0
V	7326.0	***	36.8	25.0	34.0	---	---	-57.0
H	7326.0	***	36.8	25.0	34.0	---	---	-57.0
V	8140.0	***	37.3	26.0	32.0	---	---	-57.0
H	8140.0	***	37.3	26.0	32.0	---	---	-57.0

Test Results: Spurious Radiated Signal Measurements (Reference: Part 2, Subpart J, §2.993)

Frequency Tuned at : 806.0 MHz

FCC OATS Radiated Emission Data Sheet

Date: 07/22/97

Antenna Polarity (V or H)	Frequency of Emission (MHz)	S. A. Reading (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Gain (dB)	Field Strength @ 3 meter (dB μ V/m)	Field Strength @ 3 meter (dBc)	FCC Limit @ 3 meter (dBc)
	806.0	---	---	---	---	141.5 *	0	**
V	1612.0	38.4	26.4	10.5	36.0	39.3	-102.2	-57.0
H	1612.0	38.2	26.4	10.5	36.0	39.1	-102.4	-57.0
V	2418.0	39.1	29.5	13.0	36.0	45.6	-95.9	-57.0
H	2418.0	44.8	29.5	13.0	36.0	51.3	-90.2	-57.0
V	3224.0	35.3	30.4	15.0	35.0	45.7	-95.8	-57.0
H	3224.0	34.8	30.4	15.0	35.0	45.2	-96.3	-57.0
V	4030.0	39.6	32.1	17.0	35.0	53.7	-87.8	-57.0
H	4030.0	40.9	32.1	17.0	35.0	55.0	-86.5	-57.0
V	4836.0	33.7	33.0	19.5	34.5	51.7	-89.8	-57.0
H	4836.0	33.5	33.0	19.5	34.5	51.5	-90.0	-57.0
V	5642.0	31.4	34.1	21.0	34.0	52.5	-89.0	-57.0
H	5642.0	31.4	34.1	21.0	34.0	52.5	-89.0	-57.0
V	6448.0	***	35.7	23.0	34.0	---	---	-57.0
H	6448.0	***	35.7	23.0	34.0	---	---	-57.0
V	7254.0	***	36.7	25.0	34.0	---	---	-57.0
H	7254.0	***	36.7	25.0	34.0	---	---	-57.0
V	8060.0	***	37.3	26.0	32.0	---	---	-57.0
H	8060.0	***	37.3	26.0	32.0	---	---	-57.0

* Field Strength = 141.5dB μ V/m, **FCC Limit = 57dBc, *** No Detectable Signal, Signal Level below S.A. Noise Floor

Test Results: Spurious Radiated Signal Measurements (Reference: Part 2, Subpart J, §2.993)
 Frequency Tuned at : 821.0 MHz

FCC OATS Radiated Emission Data Sheet

Date: 07/22/97

Antenna Polarity (V or H)	Frequency of Emission (MHz)	S. A. Reading (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp. Gain (dB)	Field Strength @ 3 meter (dB μ V/m)	Field Strength @ 3 meter (dBc)	FCC Limit @ 3 meter (dBc)
	821.0	---	---	---	---	141.5 *	0	**
V	1642.0	36.9	26.7	10.5	36.0	38.1	-103.4	-57.0
H	1642.0	36.4	26.7	10.5	36.0	37.6	-103.9	-57.0
V	2463.0	36.1	29.5	13.0	36.0	42.6	- 98.9	-57.0
H	2463.0	39.4	29.5	13.0	36.0	45.9	- 95.6	-57.0
V	3284.0	43.3	30.5	15.0	35.0	53.8	- 87.7	-57.0
H	3284.0	42.9	30.5	15.0	35.0	53.4	- 88.1	-57.0
V	4105.0	46.2	32.1	17.0	35.0	60.3	- 81.2	-57.0
H	4105.0	38.7	32.1	17.0	35.0	52.8	- 88.7	-57.0
V	4926.0	37.1	33.5	19.5	34.5	55.6	- 85.9	-57.0
H	4926.0	38.8	33.5	19.5	34.5	57.3	- 84.2	-57.0
V	5747.0	32.0	34.2	21.0	34.0	53.2	- 88.3	-57.0
H	5747.0	32.4	34.2	21.0	34.0	53.6	- 87.9	-57.0
V	6568.0	***	35.8	23.0	34.0	---	---	-57.0
H	6568.0	***	35.8	23.0	34.0	---	---	-57.0
V	7389.0	***	37.0	25.0	34.0	---	---	-57.0
H	7389.0	***	37.0	25.0	34.0	---	---	-57.0
V	8210.0	***	37.4	26.0	32.0	---	---	-57.0
H	8210.0	***	37.4	26.0	32.0	---	---	-57.0

FREQUENCY STABILITY MEASUREMENT (Reference: FCC Part 2, Subpart J, §2.995)

FREQUENCY TUNED: 806MHz

Date: 07/23/97

TEMPERATURE (°C)	DC POWER SUPPLY VOLTAGE						FCC LIMIT 2.5ppm $\Delta f=0.002015\text{MHz}$
	-15% Nominal Voltage (11.65V)		Nominal Voltage (13.70V)		+15% Nominal Voltage (15.76V)		
	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	
+25°C (Room Temp.)	806.000102	40.7	806.000067	42.4	806.000090	43.4	0.000102
-30°C	805.999568	41.3	805.999588	43.3	805.999629	44.2	0.000432
-20°C	805.999870	41.3	805.999878	43.2	805.999908	44.3	0.000130
-10°C	806.000081	41.2	806.000087	43.0	806.000101	44.0	0.000101
+ 0°C	806.000172	41.1	806.000142	42.9	806.000190	45.0	0.000190
+10°C	806.000231	40.9	806.000130	42.7	806.000228	43.7	0.000231
+20°C	806.000139	40.7	806.000086	42.5	806.000133	43.4	0.000153
+30°C	806.000035	40.6	805.999957	42.3	806.000038	43.2	0.000043
+40°C	805.999935	40.4	805.999878	42.1	805.999925	42.9	0.000122
+50°C	805.999648	40.2	805.999616	41.8	805.999598	42.6	0.000402

FREQUENCY STABILITY MEASUREMENT (Reference: FCC Part 2, Subpart J, §2.995)

FREQUENCY TUNED: 814MHz

Date: 07/23/97

TEMPERATURE (°C)	DC POWER SUPPLY VOLTAGE						FCC LIMIT 2.5ppm $\Delta f=0.002035\text{MHz}$
	-15% Nominal Voltage (11.65V)		Nominal Voltage (13.70V)		+15% Nominal Voltage (15.76V)		
	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	
+25°C (Room Temp.)	814.000107	40.9	814.000086	42.4	814.000086	43.6	0.000107
-30°C	813.999541	41.6	813.999532	43.5	813.999628	44.6	0.000468
-20°C	813.999858	41.5	813.999850	43.3	813.999925	44.5	0.000150
-10°C	814.000079	41.4	814.000080	43.2	814.000098	44.2	0.000098
+ 0°C	814.000168	41.3	814.000148	43.1	814.000196	44.1	0.000196
+10°C	814.000233	41.2	814.000201	42.9	814.000226	43.9	0.000233
+20°C	814.000144	41.0	814.000104	42.7	814.000130	43.7	0.000144
+30°C	814.000033	40.9	813.999992	42.6	814.000036	43.4	0.000036
+40°C	813.999932	40.7	813.999895	42.3	813.999918	43.2	0.000105
+50°C	813.999650	40.5	813.999644	42.1	813.999574	42.9	0.000426

FREQUENCY STABILITY MEASUREMENT (Reference: FCC Part 2, Subpart J, §2.995)

FREQUENCY TUNED: 821MHz

Date: 07/23/97

TEMPERATURE (°C)	DC POWER SUPPLY VOLTAGE						FCC LIMIT 2.5ppm Δf=0.002052MHz
	-15% Nominal Voltage (11.65V)		Nominal Voltage (13.70V)		+15% Nominal Voltage (15.76V)		
	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	Frequency (MHz)	Output (dBm)	
+25°C (Room Temp.)	821.000116	40.7	821.000100	42.3	821.000083	43.0	0.000116
-30°C	820.999504	41.4	820.999487	43.2	820.999626	44.3	0.000513
-20°C	820.999840	41.5	820.999832	43.1	820.999934	43.9	0.000168
-10°C	821.000076	41.3	821.000078	43.0	821.000096	43.8	0.000096
+ 0°C	821.000162	41.2	821.000153	42.8	821.000201	43.5	0.000201
+10°C	821.000230	41.0	821.000217	42.5	821.000225	43.3	0.000230
+20°C	821.000140	40.9	821.000121	42.4	821.000125	43.2	0.000140
+30°C	821.000045	40.7	821.000005	42.2	821.000035	42.8	0.000045
+40°C	820.999927	40.5	820.999907	41.9	820.999910	42.7	0.000093
+50°C	820.999649	40.3	820.999648	41.7	820.999554	42.5	0.000446