

Exhibit D

Test Report
Sec. 2.1033(b)(6)

ELITE ELECTRONIC ENGINEERING INC.
1516 CENTRE CIRCLE
DOWNERS GROVE, ILLINOIS 60515-1082

ELITE PROJECT: 27518

DATES TESTED: April 19 and 20, 1999

TEST PERSONNEL: Daniel E. Crowder

TEST SPECIFICATION: FCC "Code of Federal Regulations" Title 47 Part
15, Subpart C, Section 15.247 for Frequency
Hopping Spread Spectrum Intentional Radiators
Operating within the 2400-2483.5MHz band

ENGINEERING TEST REPORT NO. 21650


MEASUREMENTS OF RF EMISSIONS

FROM THE MODEL RVLU TRANSMITTER

FOR: Rockwell ILG Div.
Cedar Rapids, IA

PURCHASE ORDER NO.:9-624286

Report By: 
Daniel E. Crowder

Approved By: 
Raymond J. Klouda
Registered Professional
Engineer of Illinois - 44894



ENGINEERING TEST REPORT NO. 21650

ADMINISTRATIVE DATA AND SUMMARY OF TESTS

DESCRIPTION OF TEST ITEM: Frequency Hopping Spread Spectrum
Transmitter

MODEL NO. : RVLU **SERIAL NO.:** ENG005

FCC ID NO. : ONIRVLU

MANUFACTURER: Rockwell ILG Div.

APPLICABLE

SPECIFICATION: FCC "Code of Federal Regulations", Title 47, Part 15,
Subpart C, Sec. 15.247

TEST PERFORMED BY: ELITE ELECTRONIC ENGINEERING INC.
Downers Grove, Illinois 60515

DATES TESTED: April 19 and 20, 1999

PERSONNEL (OPERATORS, OBSERVERS, AND CO-ORDINATORS):

WITNESS: Jack Andrews

ELITE ELECTRONIC: Dan Crowder

ELITE JOB NO.: 27518

ABSTRACT: The Model RVLU Transmitter meets the requirements of the FCC "Code of Federal Regulations", Title 47, Part 15, Subpart C, Section 15.247 for frequency hopping spread spectrum transmitters. The RF power, minimum occupied bandwidth, and spurious emissions were measured and found to comply with the requirements.

See the test results and data pages for more details.

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
1.1 Description of Test Item	1
1.2 Purpose	1
1.3 Deviations, Additions and Exclusions	1
1.4 Applicable Documents	1
1.5 Subcontractor Identification	1
2.0 TEST ITEM SETUP AND OPERATION	2
3.0 TEST SITE AND INSTRUMENTATION	2
3.1 Test Site	2
3.2 Test Instrumentation	2
4.0 REQUIREMENTS, PROCEDURES AND RESULTS	3
4.1 Power Line Conducted Emissions	3
4.2 Occupied Bandwidth	3
4.3 Maximum Peak Output Power	4
4.4 Spurious Emissions	6
5.0 CONCLUSION	10
6.0 CERTIFICATION	10

MEASUREMENT OF RF EMISSIONS
FROM A MODEL RVLU TRANSMITTER

1.0 INTRODUCTION:

1.1 DESCRIPTION OF TEST ITEM: This report presents the results of the RF emissions measurements performed for the Model RVLU spread spectrum transmitter, (hereinafter referred to as the test item). The tests were performed for Rockwell ILG Div. located in Cedar Rapids, Iowa.

The test item is a frequency hopping spread spectrum transceiver used for data transmissions. It operates in the frequency band 2400 to 2483.5MHz.

1.2 PURPOSE: The test series was performed to determine if the test item meets the requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.247 for intentional radiators.

1.3 DEVIATIONS, ADDITIONS AND EXCLUSIONS: There were no deviations from the test requirements.

1.4 APPLICABLE DOCUMENTS: The following documents of the exact issue designated form part of this document to the extent specified herein:

Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, dated 1 October 1997

1.5 SUBCONTRACTOR IDENTIFICATION: This series of tests was performed by the Elite Electronic Engineering Inc., of Downers Grove,

Illinois.

2.0 TEST ITEM SETUP AND OPERATION:

For all tests the test item was placed on a 0.8 meter high non-conductive table. The 12.0 VDC was supplied to the test item from an external battery. The supplied external antenna was connected to the test item.

3.0 TEST SITE AND INSTRUMENTATION:

3.1 TEST SITE: All tests were performed at Elite's facility in Downers Grove, Illinois. The conducted emission tests were performed in a shielded enclosure. Open field radiated emission tests were performed in Elites 3 meter anechoic test site.

3.2 TEST INSTRUMENTATION: A list of the test equipment used can be found on Table I. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

4.0 REQUIREMENTS, PROCEDURES AND RESULTS:

4.1 POWER LINE CONDUCTED EMISSIONS:

4.1.1 REQUIREMENT: This requirement does not apply since the test item is battery operated. There are no operation modes where the transmitter can be connected to the AC power public utilities, and therefore, the conducted emissions test is not required.

4.2 OCCUPIED BANDWIDTH:

4.2.1 REQUIREMENTS: Per section 15.247(a)(1)(ii), the maximum 20dB bandwidth of the hopping channel is 1MHz. In addition per section 15.247(c), the emissions outside the authorized band must be at least 20dB below the highest level measured within the band.

4.2.2 PROCEDURES: The test item was setup inside the shielded enclosure and allowed to transmit continuously. The test item was connected to a spectrum analyzer through a 20 dB pad. The frequency hopping channel was set separately to low, middle, and high hopping channels. The resolution bandwidth (RBW) was set to 100kHz. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was plotted using a 'screen dump' utility. The 20 dB bandwidth was measured from the plot.

The spectrum analyzer was set to measure the frequency separation of the hopping channels. Again, the "Max Hold" function was engaged to capture the hopping characteristics of the transmitted signal. This display was plotted. The emissions inside and near the authorized band was analyzed.

4.2.3 RESULTS: The plots of the bandwidth are presented on data pages following this report.

The first three bandwidth plots show that the 20 dB bandwidth was less than the 1MHz maximum requirement. Since the 20 dB bandwidth was less than the maximum requirement, the test item complies with the requirements detailed in Section 15.247(a)(1)(ii).

The last bandwidth plot shows the hopping channel carrier frequencies separated by the 20 dB bandwidth of the hopping channel or 1MHz. The test item also complies with this requirement.

4.3 MAXIMUM PEAK OUTPUT POWER:

4.3.1 REQUIREMENTS: This requirement applies only to the

transmit mode of operation. Per section 15.247(b) the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.3.2 PROCEDURES: The antenna output was connected to the input of the spectrum analyzer through 20 dB pad. The spectrum analyzer bandwidth was set to 3 MHz which is greater than the 20dB bandwidth of the transmitter. The peak power was measured. No cable loss factor was added to compensate for the coaxial adapter cable (minimal length of 15 cm) required to connect the antenna terminal to the spectrum analyzer.

4.3.3 RESULTS: The results follow the bandwidth plots. The maximum peak output power directly at the output of the transmitter measured 17.7 dBm or 59mW. Therefore, the transmitter meets the 1 Watt limit. However, in additional, the power output may be limited by the gain of the antenna.

The requirement allows for a maximum antenna gain of 6 dBi at the maximum power of 1 Watt or 30 dBm. If the gain is greater than 6dBi, the maximum allowed power is decreased by the difference between the antenna gain and 6 dBi so that the sum of the power and the antenna gain is no greater than 36 dBm.

The gain of the supplied antenna was 2 dBi. This added to the maximum peak output power of the test item is well within the 36 dBm limit.

4.4 SPURIOUS EMISSIONS:

4.4.1 SPURIOUS EMISSIONS AT THE ANTENNA TERMINAL:

4.4.1.1 REQUIREMENTS: Per Section 15.247(c), for any 100kHz bandwidth outside the frequency band from 2400 to 2483.5MHz, the spurious emissions shall be attenuated at least 20dB below any 100kHz bandwidth emission within the band.

4.4.1.2 PROCEDURES: The output of the transmitter was connected to the input of the spectrum analyzer through a 20 dB pad. The receiver bandwidth was set to 100 kHz for these measurements.

With the test item transmitting, the antenna conducted emissions were measured and plotted over the frequency range from 30 MHz up to 2 GHz and then from 2GHz to 10GHz (up through the 10th harmonic). Below 2 GHz, the preselector was used to guard against input saturation. Above 2 GHz the analyzer includes a high pass filter in its design.

4.4.1.3 RESULTS: The spurious and harmonic emissions, up through 10th harmonic, were found to be at least 20 dB below the level of the in-band emissions. Therefore, the test item complies with this requirement as detailed in 15.247(c). This data follows the results of maximum peak output power.

4.4.2 OPEN FIELD RADIATED EMISSIONS:

4.4.2.1 REQUIREMENTS: The radiated harmonic or spurious emissions that fall in the "restricted" bands per Section 15.205 are required to meet the requirements of 15.209.

4.4.2.2 PROCEDURES: The radiated tests were performed in a

32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI 63.4 and CISPR 16 requirements for site attenuation.

Preliminary radiated measurements are performed to determine the frequencies where the significant emissions might be found. With the test item at one set position and the measurement antenna at a set height (i.e. without maximizing), the radiated emissions were measured using peak detection. This data was then automatically plotted. The frequencies where significant emission levels found were remeasured taking the extra pains to maximize the emission levels. Any significant signals in the restricted bands were noted. The purpose of this test is to determine the frequency and relative amplitude of the emissions so that these signals can be examined during the open field test.

For the open field test, the test item was setup on the 80 cm high non-conductive turntable at the open field test site. The test distance was 3 meters.

To ensure that maximum emission levels were measured the following steps were taken:

- (a) The test item was rotated so that all of its sides were exposed to the receiving antenna.
- (b) Since the measuring antennas are linearly polarized, both

horizontal and vertical field components were measured.

- (c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

The harmonic or spurious emissions falling in the restricted bands were measured up through the 10th harmonic.

For all measurements, the measurement bandwidth was set to 1 MHz and video BW to 10 Hz. A special high pass filter and preamplifier were used to increase the receiver sensitivity. The high pass filter has 70 dB insertion loss in the stopband which protects the preamplifier from saturating.

4.4.2.3 RESULTS: The preliminary emissions levels were plotted. This plot follows the spurious emissions test results. This plot shows that the emissions were at least 20 dB below the level of the fundamental. The harmonics and any other emissions that fall in the restricted frequency bands were then measured at the open field site. The last three pages of this Exhibit show this data. The field intensities levels for the harmonics in the restricted band were within the limit.

A block diagram of the test item orientation position is shown in Figure 1.

5.0 CONCLUSION:

The Rockwell ILG Div. Model RVLU, complies with the limits imposed by the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.247 for frequency hopping spread spectrum transmitters.

6.0 CERTIFICATION:

Elite Electronic Engineering Inc. certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specification.

The data presented in this test report pertains to the test item at the test date. Any electrical or mechanical modification made to the test item subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product endorsement by NVLAP or any agency of the US Government.

ENGINEERING TEST REPORT NO. 21650

TABLE I: TEST EQUIPMENT LIST

ELITE ELECTRONIC ENG. INC.

Page: 1

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Cal Inv	Due Date
Equipment Type: ACCESSORIES, MISCELLANEOUS								
XPR0	HIGHPASS FILTER	K&L MICROWAVE	11SH10-4800/	001	4.8-20GHZ	03/06/99	12	03/06/00
XZG0	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	3439A02724	---	01/29/99	12	01/29/00
Equipment Type: AMPLIFIERS								
APK0	PRE-AMPLIFIER	HEWLETT PACKARD	8449B	3008A00662	1-26.5GHZ	01/29/99	12	01/29/00
Equipment Type: ANTENNAS								
WN10	DOUBLE RIDGED WAVEGUIDE	AEL	H1498	153	2-18GHZ	08/26/98	12	08/26/99
Equipment Type: CONTROLLERS								
CEA1	HANDHELD PERSONAL COMPUTER	SHARP ELECTRONI	ZAURUS 5700	---	---			N/A
CMA0	MULTI-DEVICE CONTROLLER	EMCO	2090	9701-1213	---			N/A
Equipment Type: METERS								
MSN0	DIGITAL OSCILLOSCOPE	LECROY CORP.	LEC/9354AL	2537	DC-500MHZ	03/23/99	12	03/23/00
Equipment Type: PROBES; CLAMP-ON & LISNS								
PSN6	10X OSCILLOSCOPE PROBE	LECROY	PP002	---	DC-350MHZ			NOTE 1
Equipment Type: PRINTERS AND PLOTTERS								
HRD2	DESKJET 500 PRINTER	HEWLETT PACKARD	2106A	US38H1S0Q2	---			DAMAGED
Equipment Type: RECEIVERS								
RAC1	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3407A08369	100HZ-22GHZ	01/26/99	12	01/26/00
RACB	RF PRESELECTOR	HEWLETT PACKARD	85685A	3506A01491	20HZ-2GHZ	01/28/99	12	01/28/00
RAF3	QUASIPeAK ADAPTER	HEWLETT PACKARD	85650A	3303A01775	0.01-1000MHZ	01/28/99	12	01/28/00
Equipment Type: SIGNAL GENERATORS								
GLA0	INDUCTIVE LOAD DUMP SIMULA	SCHAFFNER	NSG 500C	290 9305				NOTE 1
GLAA	LOAD DUMP/FIELD DECAY SIMU	SCHAFFNER	NSG 506C-1	2156 9326				NOTE 1
GLAB	CAPACITOR UNIT	SCHAFFNER	NSG 506C-2	2156 9326				NOTE 1

Cal. Interval: Listed in Months I/O: Initial Only N/A: Not Applicable
 Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

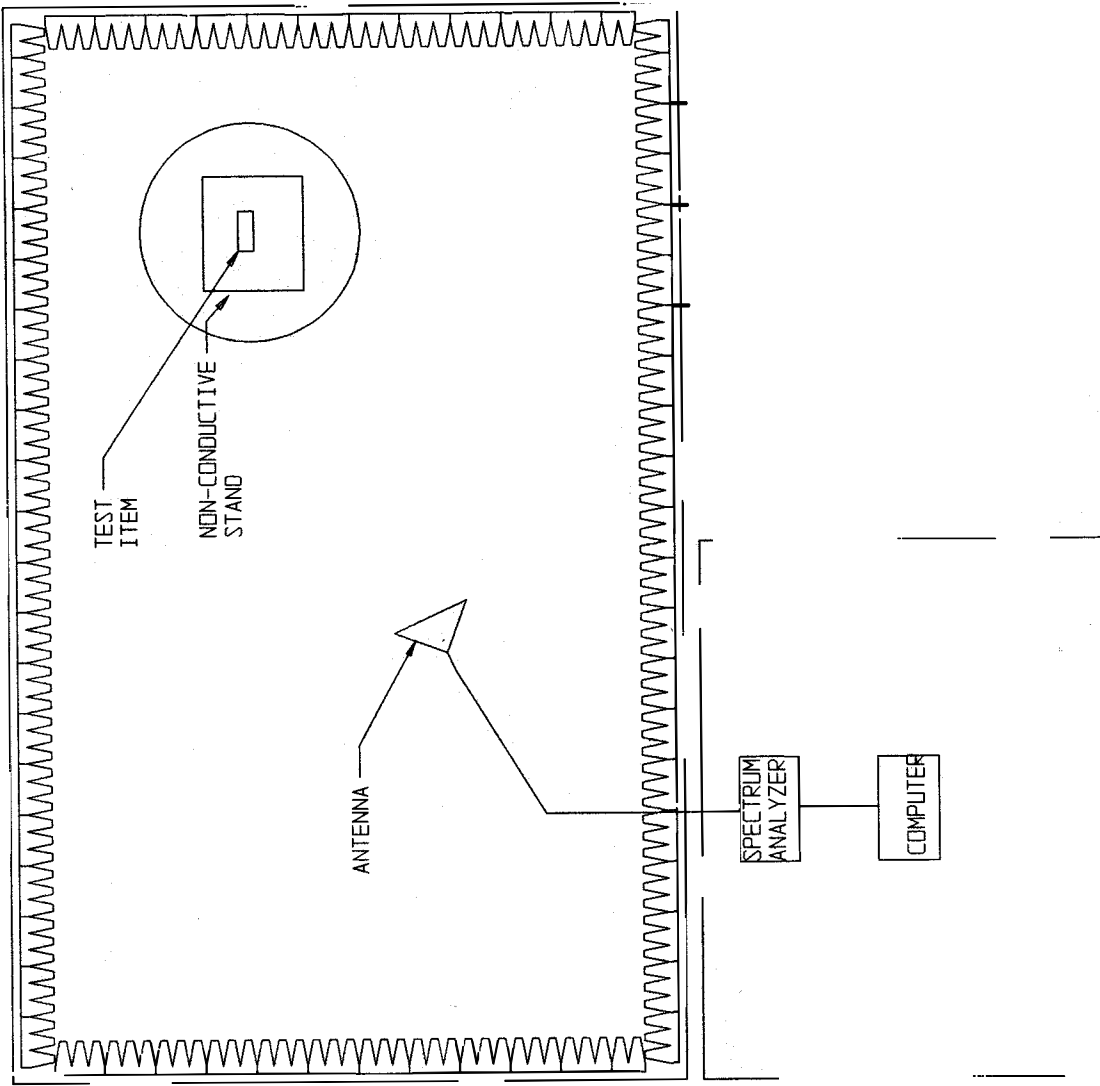


FIGURE 1 TEST EQUIPMENT SETUP FOR WORST CASE RADIATED EMISSIONS

ELITE ELECTRONIC ENGINEERING CO

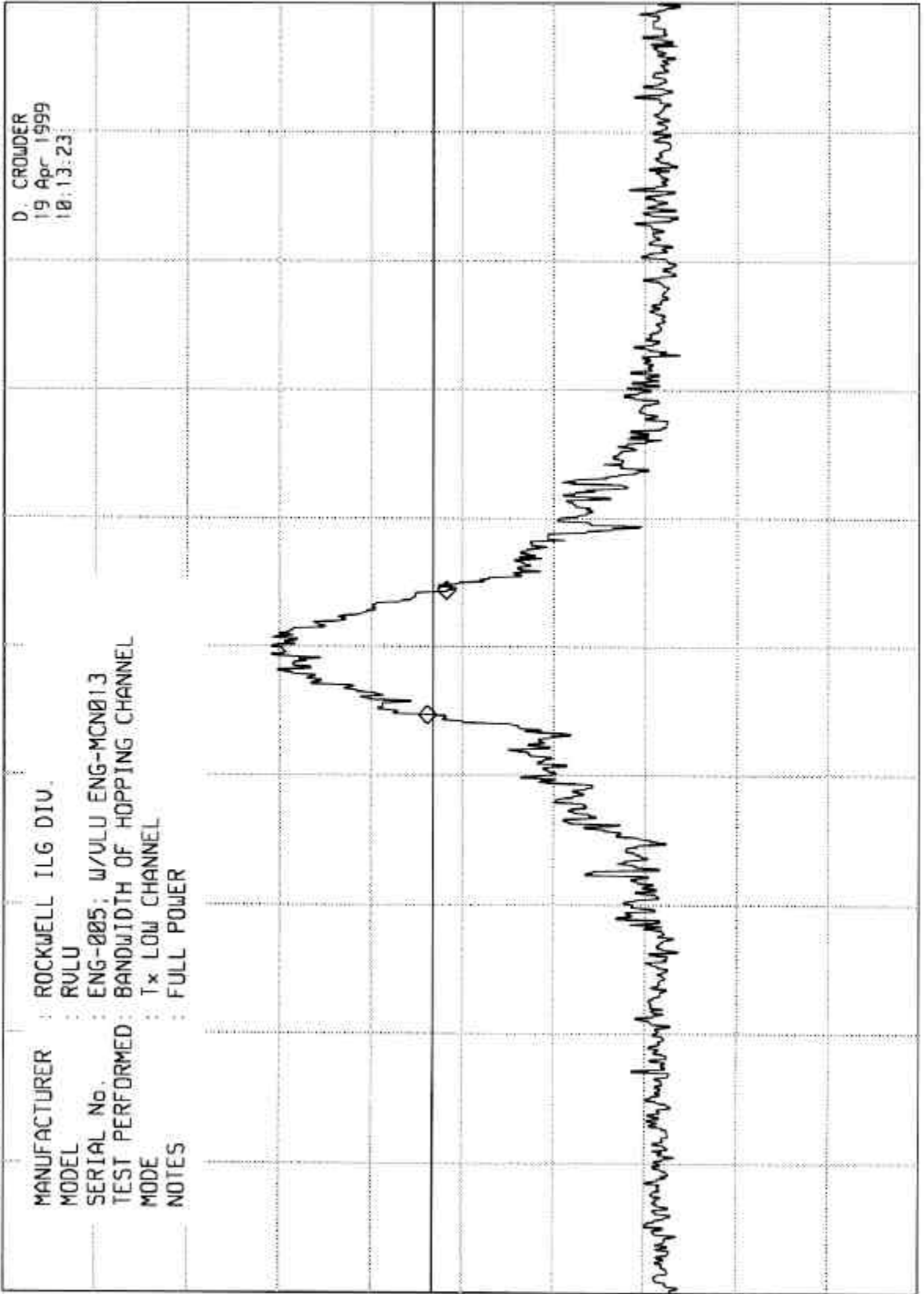
MKR ~ 970 kHz
-2.10 dB

REF 23.2 dBm ATTEN 40 dB

1 dB/

-23.6 dBm

DATA PAGE



SPAN 10.0 MHz
SWP 20.0 msec

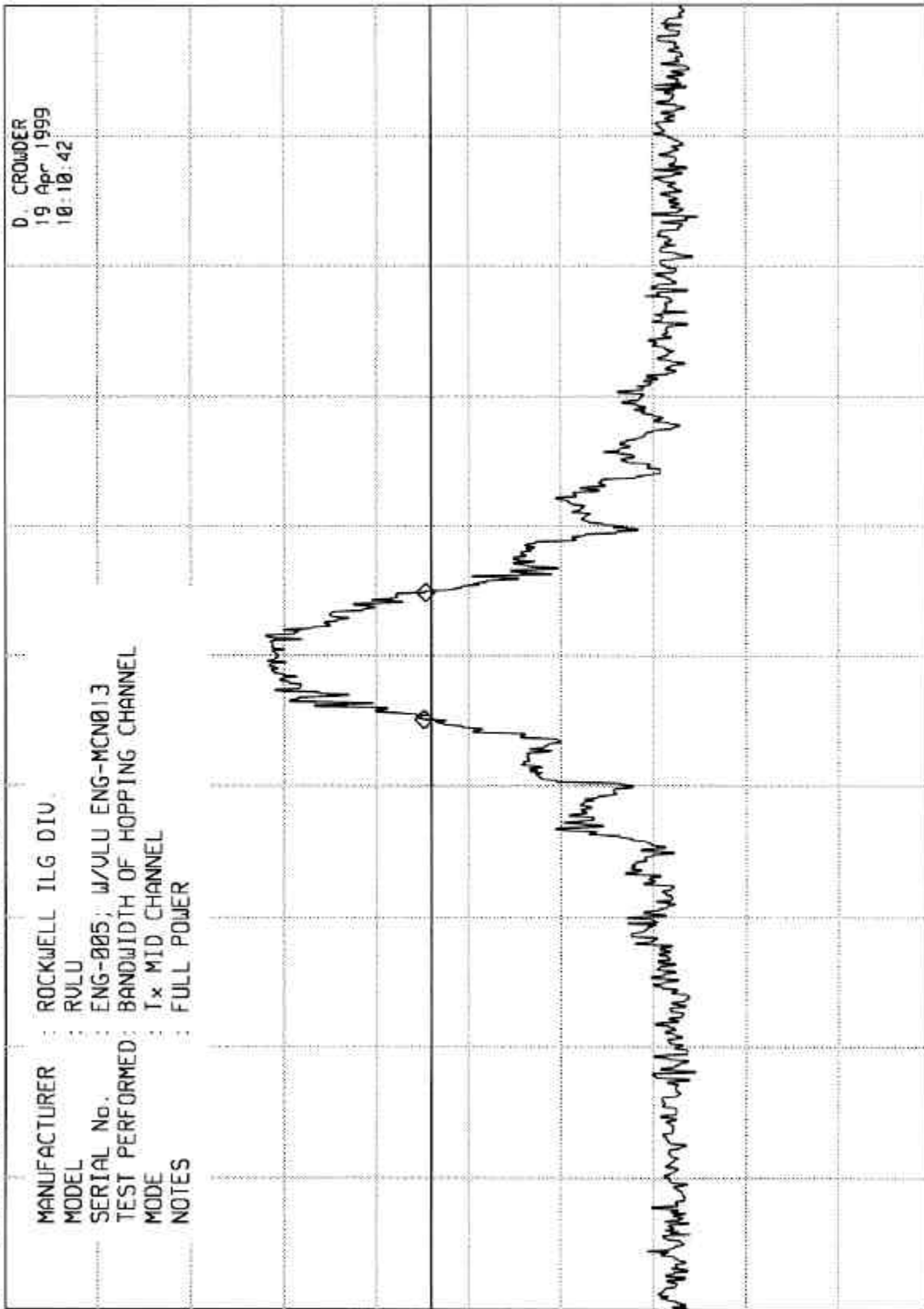
UBW 1 MHz

ENTER 2.402 0 GHz
RES BW 100 kHz (1)

ELITE ELECTRONIC ENGINEERING CO

MKR ~ 980 kHz
-0.20 dB

REF 23.2 dBm ATTEN 40 dB



ETR 21650
DATA PAGE

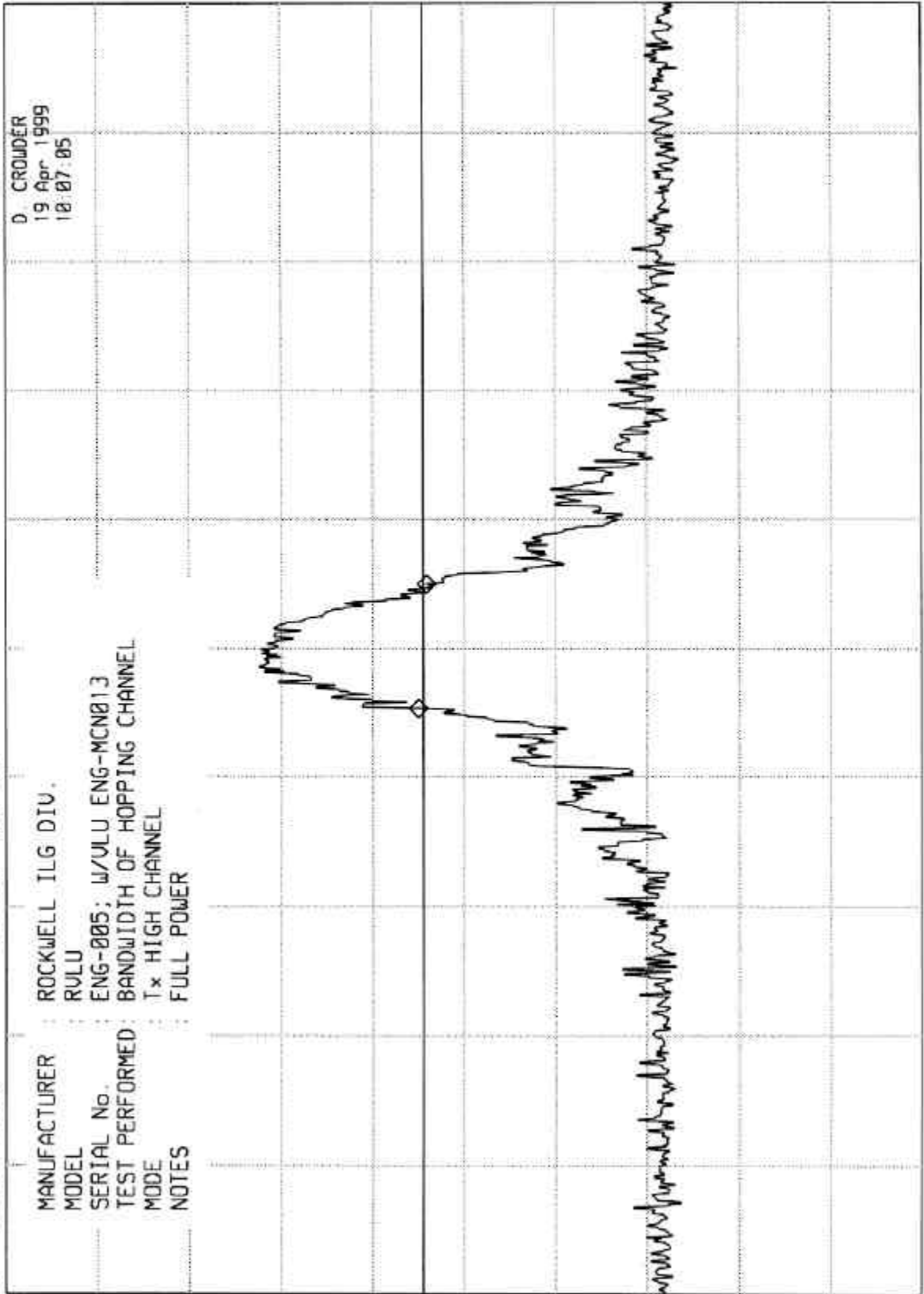
DATA PAGE

ENTER 2.441 1 GHz RES BW 100 kHz(i) UBW 1 MHz SPAN 10.0 MHz
SWP 20.0 msec

ELITE ELECTRONIC ENGINEERING CO

MKR \sim 970 kHz
-0.90 dB

REF 23.2 dBm ATTN 40 dB



1 dB/

22.3
dBm

DATA PAGE

ETR 21650

SPAN 10.0 MHz
SWP 20.0 msec

UBW 1 MHz

RES BW 100 kHz (1)

CENTER 2.479 0 GHz

ELITE ELECTRONIC ENGINEERING CO

MKR ^ 2.05 MHz
-28.70 dB

REF 23.2 dBm ATTEN 40 dB

1 dB/

23.6 dBm

DATA PAGE



ETR 21650

SPAN 10.0 MHz
SWP 20.0 msec

VBW 1 MHz

RES BW 100 kHz (i)

CENTER 2.441 1 GHz

ENGINEERING TEST REPORT NO. 21650

DATA SHEET

MANUFACTURER : Rockwell ILG Div.
 MODEL : RVLU
 SERIAL NUMBER : ENG005
 SPECIFICATION : FCC Part 15 Subpart C, Intentional Radiators
 TEST PERFORMED : Occupied Bandwidth
 DATE TESTED : 04/20/99

FREQUENCY MHz	METER READING dBuV	(PAD)	TOTAL dBm	TOTAL WATTS
2401.6	-3.6	20	16.4	.044
2441.1	-2.8	20	17.2	.052
2478.7	-2.3	20	17.7	.059

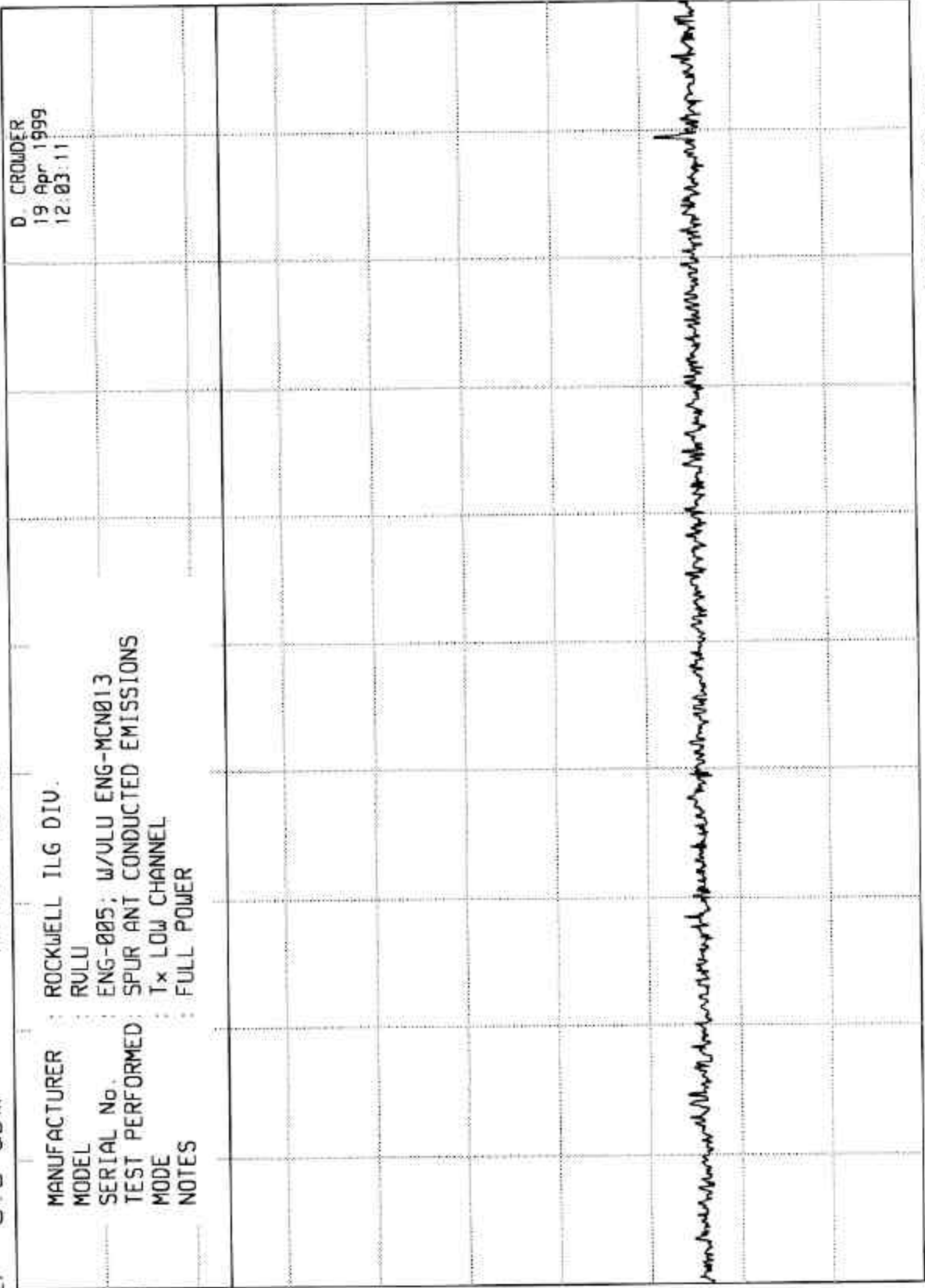
Checked By:  _____

ETR 21650

ELITE ELECTRONIC ENGINEERING CO

MKR ^ 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTEN 10 dB



MANUFACTURER : ROCKWELL ILG DIV.
 MODEL : RULU
 SERIAL No. : ENG-005; W/ULU ENG-MCN013
 TEST PERFORMED : SPUR ANT CONDUCTED EMISSIONS
 MODE : Tx LOW CHANNEL
 NOTES : FULL POWER

D. CROWDER
 19 Apr 1999
 12:03:11

dB/

23.6 dBm

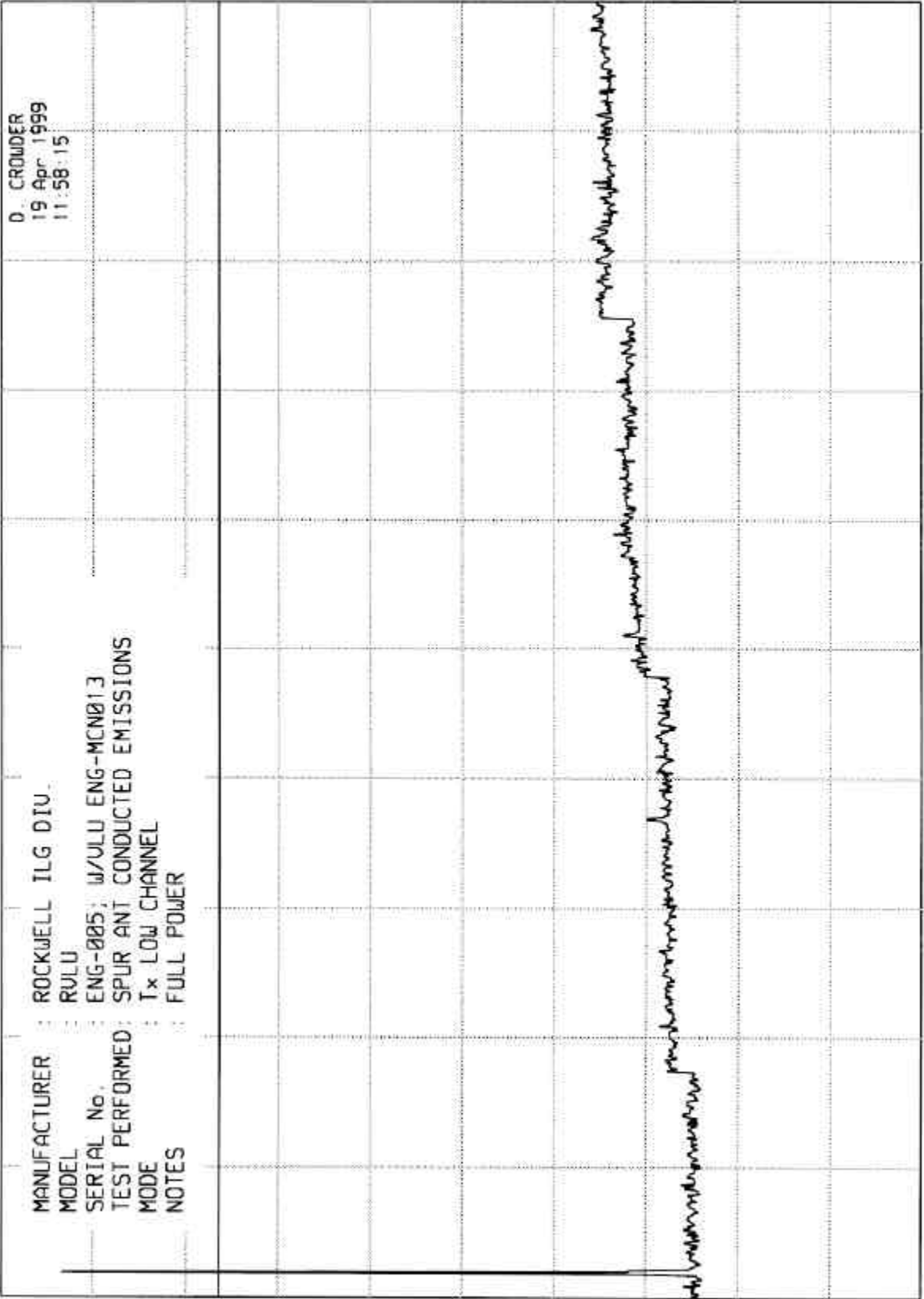
DATA PAGE

ART 30 MHz
 RES BW 100 kHz (i)
 STOP 2.00 GHz
 SWP 1.48 sec
 UBW 1 MHz

ELITE ELECTRONIC ENGINEERING CO

MKR ^ 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTEN 10 dB



1 dB/

23.6 dBm

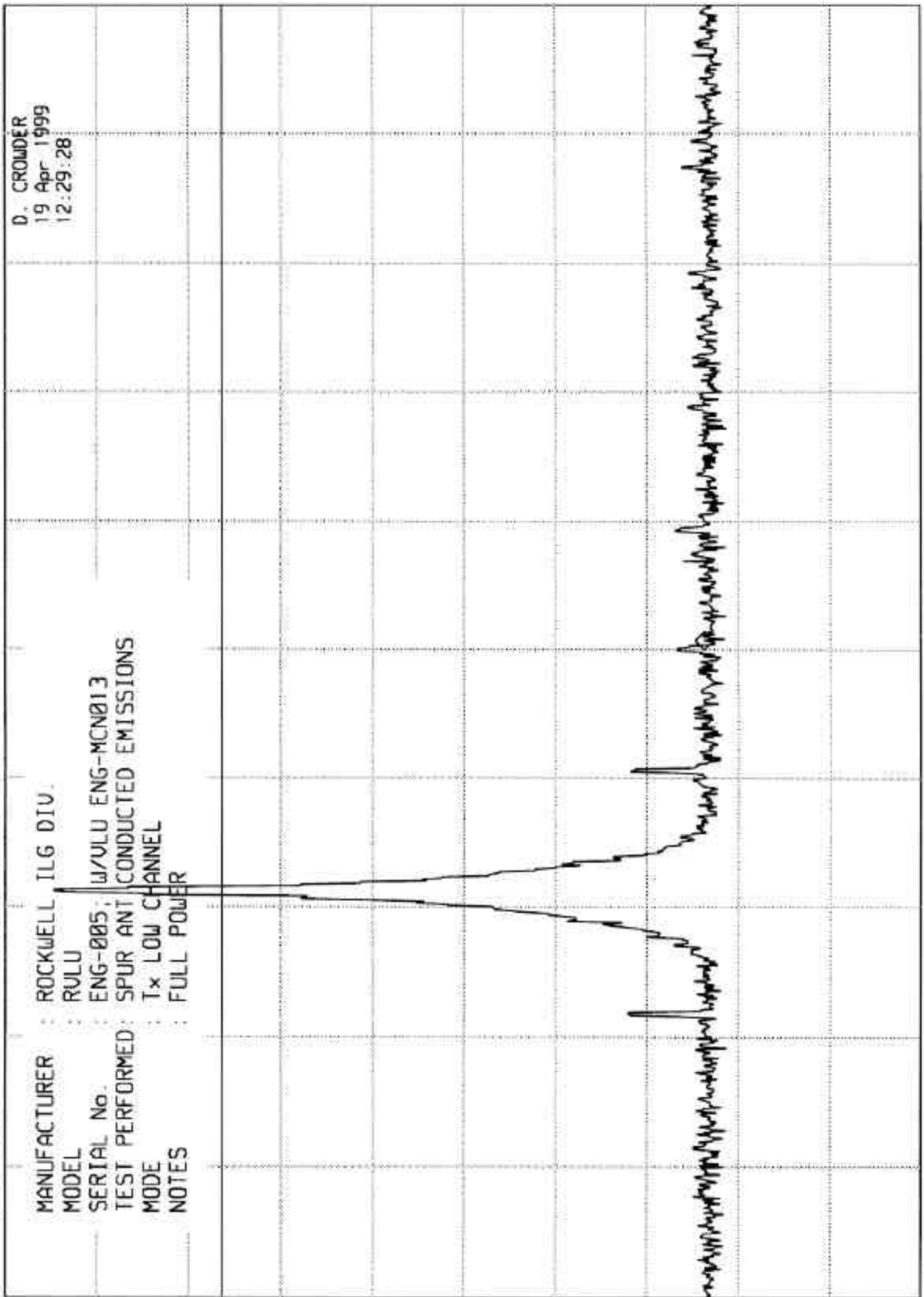
DATA PAGE

ART 2.0 GHz RES BW 100 kHz (i) UBW 1 MHz STOP 24.0 GHz SwP 16.5 sec

ELITE ELECTRONIC ENGINEERING CO

MKR 2.441 2 GHz
-76.30 dBm

REF 0.0 dBm ATTEN 10 dB



D. CROWDER
19 Apr 1999
12:29:28

dB/

23.6
dBm

DATA PAGE

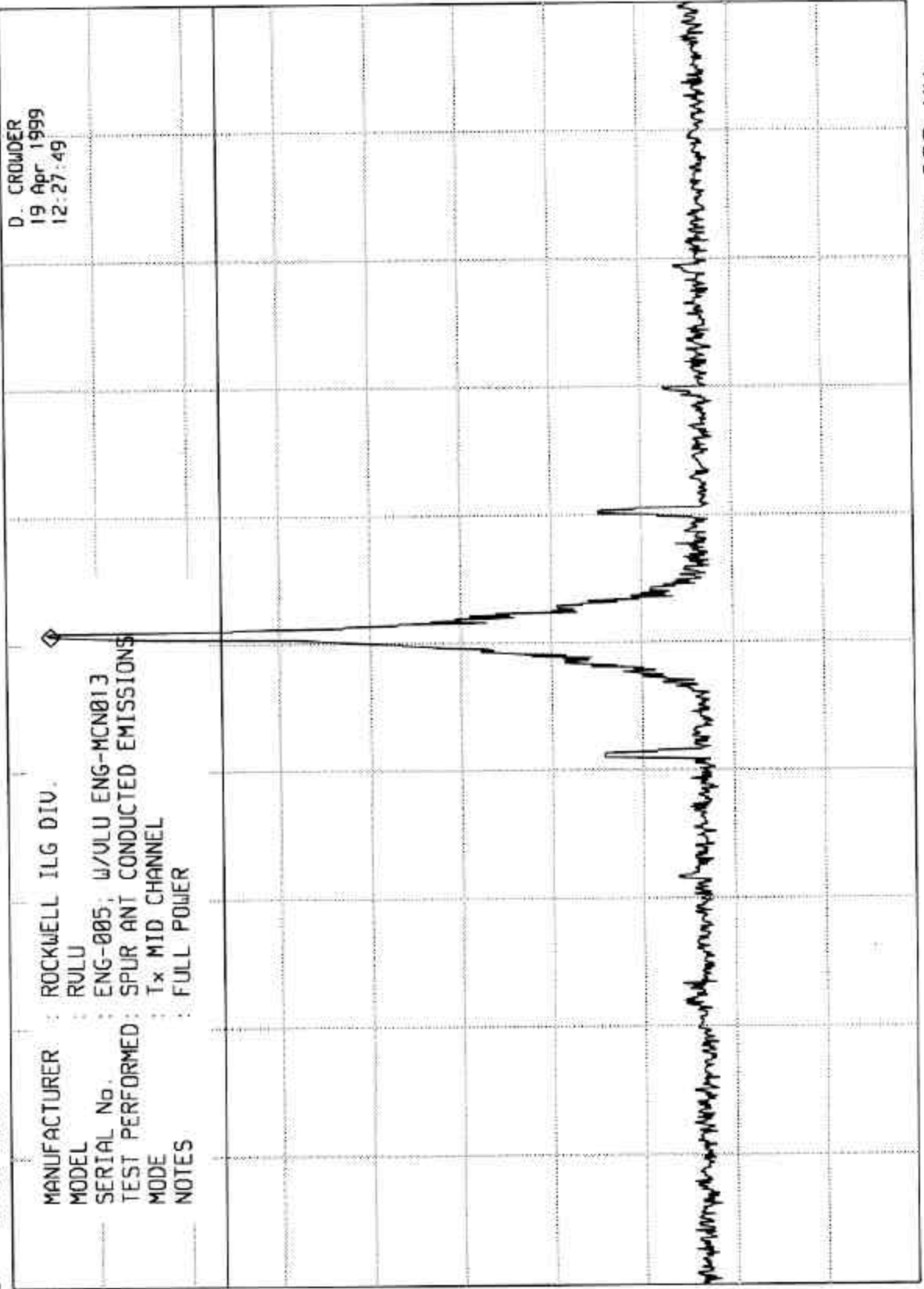
ENTER 2.440 GHz RES BW 100 kHz (1) VBW 1 MHz SPAN 200 MHz
SWP 150 msec

ELITE ELECTRONIC ENGINEERING CO

MKR 2.441 2 GHz
-4.90 dBm

ATTEN 10 dB

REF 0.0 dBm



ETR 21650

SPAN 200 MHz
SWP 150 msec

RES BW 100 kHz(i)
VBW 1 MHz

MKR 2.440 GHz

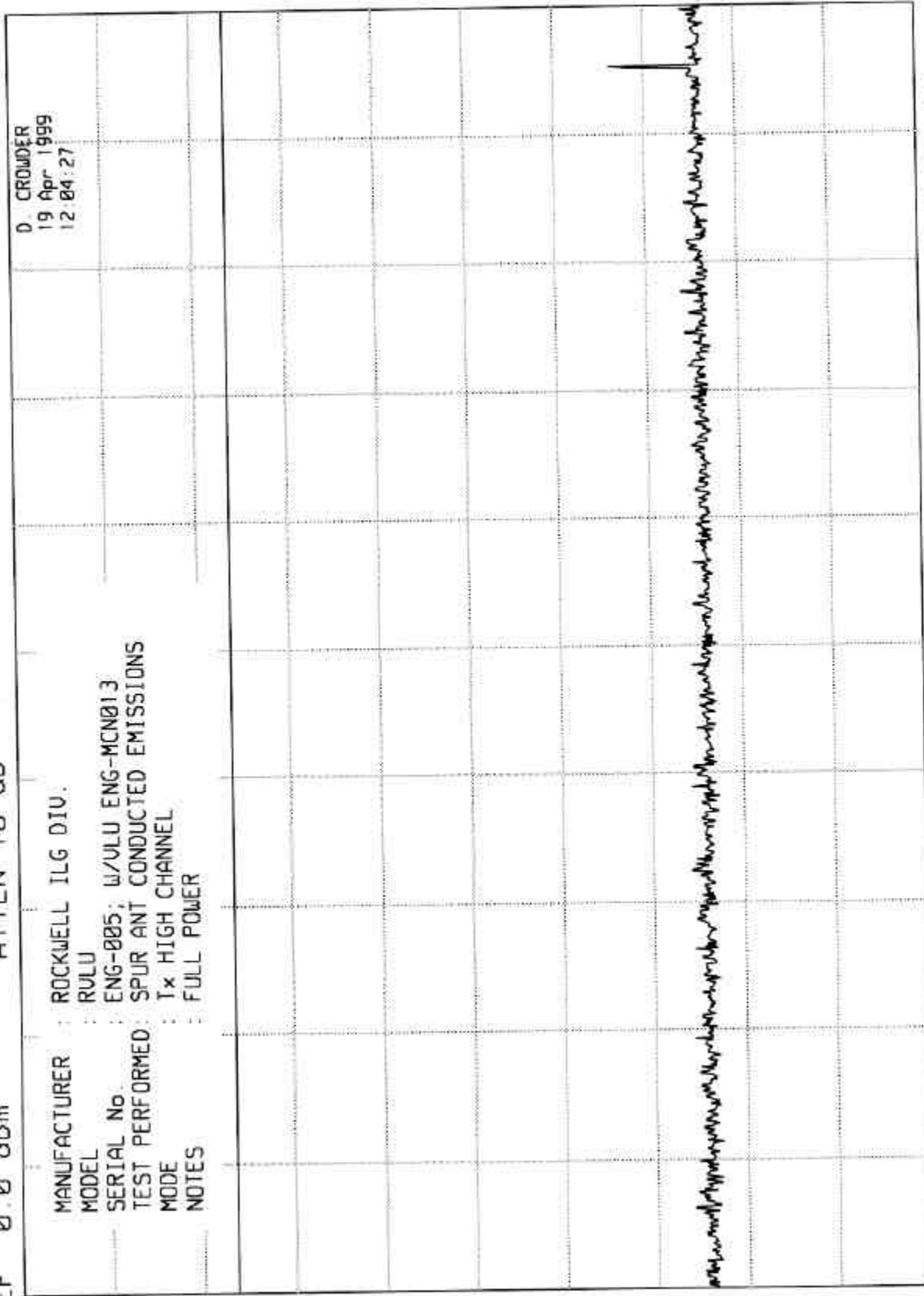
23.6 dBm

ETR 21650

ELITE ELECTRONIC ENGINEERING CO

MKR ^ 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTN 10 dB



dB/

23.6 dBm

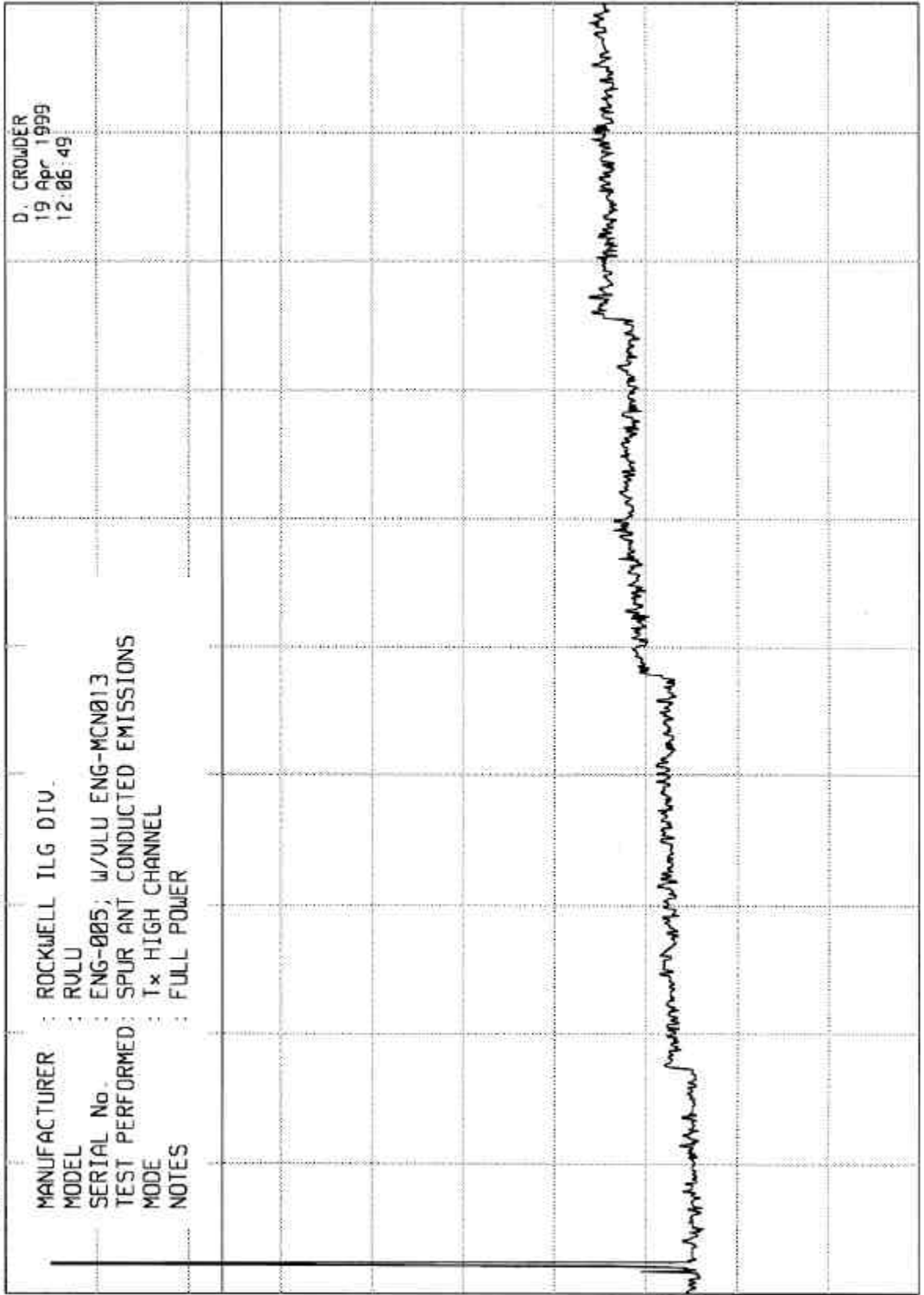
DATA PAGE

117

ELITE ELECTRONIC ENGINEERING CO

MKR ~ 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTN 10 dB



dBm

23.6
dBm

DATA PAGE

ETR 21650

ART 2.0 GHz

RES BW 100 kHz (1)

VBW 1 MHz

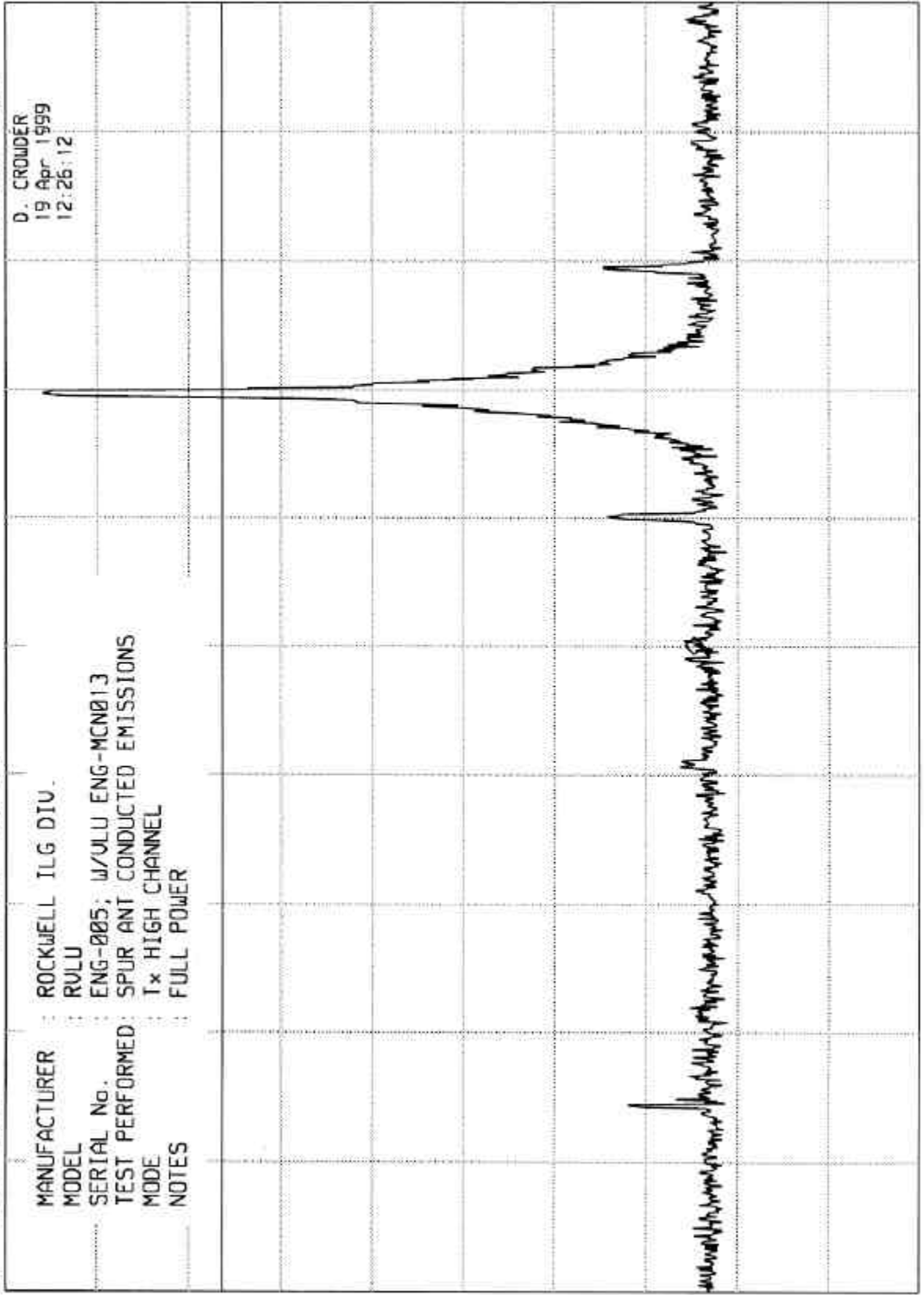
STOP 24.0 GHz

SWP 16.5 sec

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MKR 2.440 0 GHz
-75.30 dBm

REF 0.0 dBm ATTEN 10 dB



1 dB/

23.6
dBm

DATA PAGE

ENTER 2.440 GHz RES BW 100 kHz (1) VBW 1 MHz SPAN 200 MHz SWP 150 msec

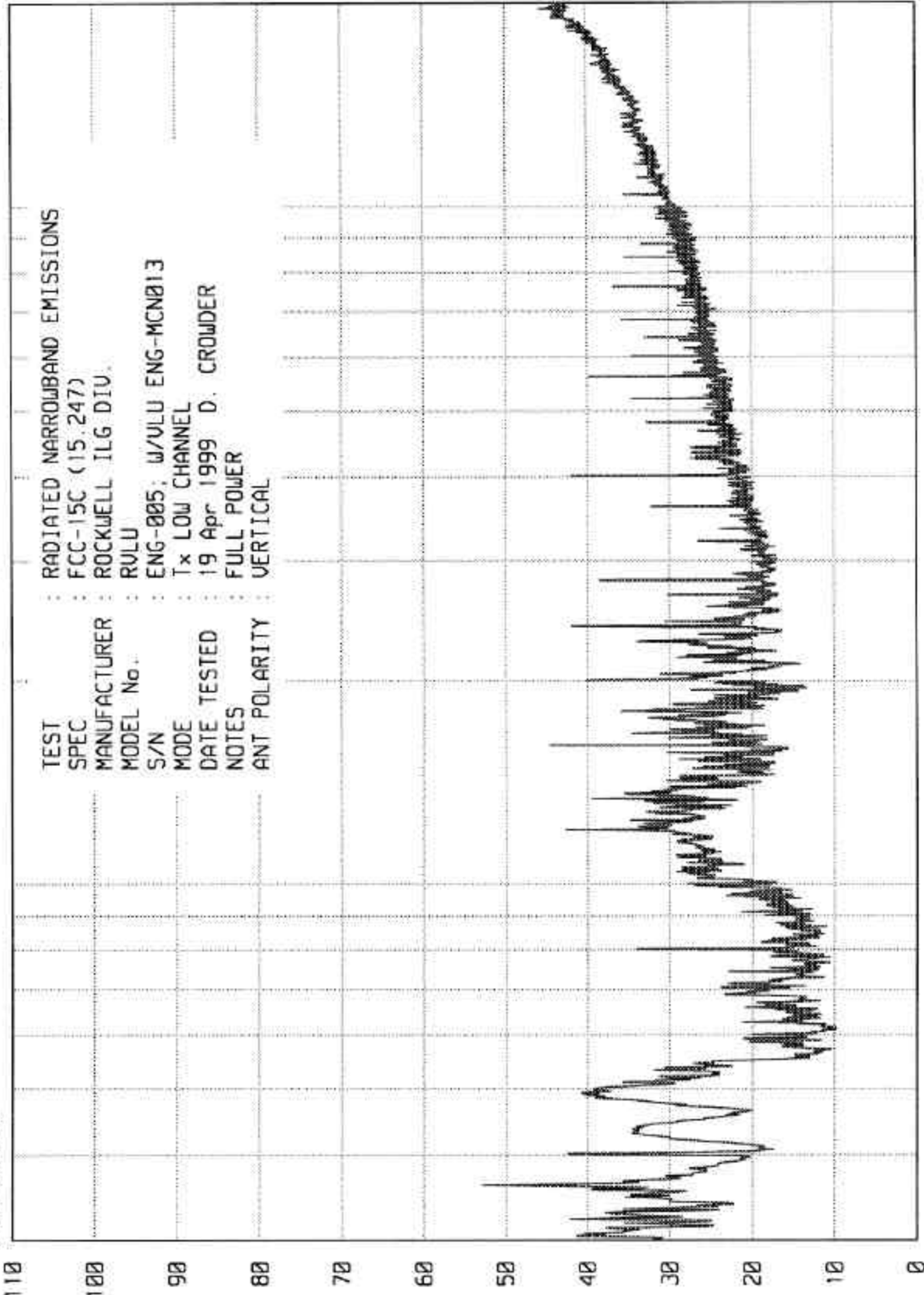
ETR 21650

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UNIU_EM RUN RUN 1

02/24/98



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RVLU
 S/N : ENG-005; W/ULU ENG-MCN013
 MODE : Tx LOW CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

1000

100

ART = 30

FREQUENCY - MHz

STOP = 2000

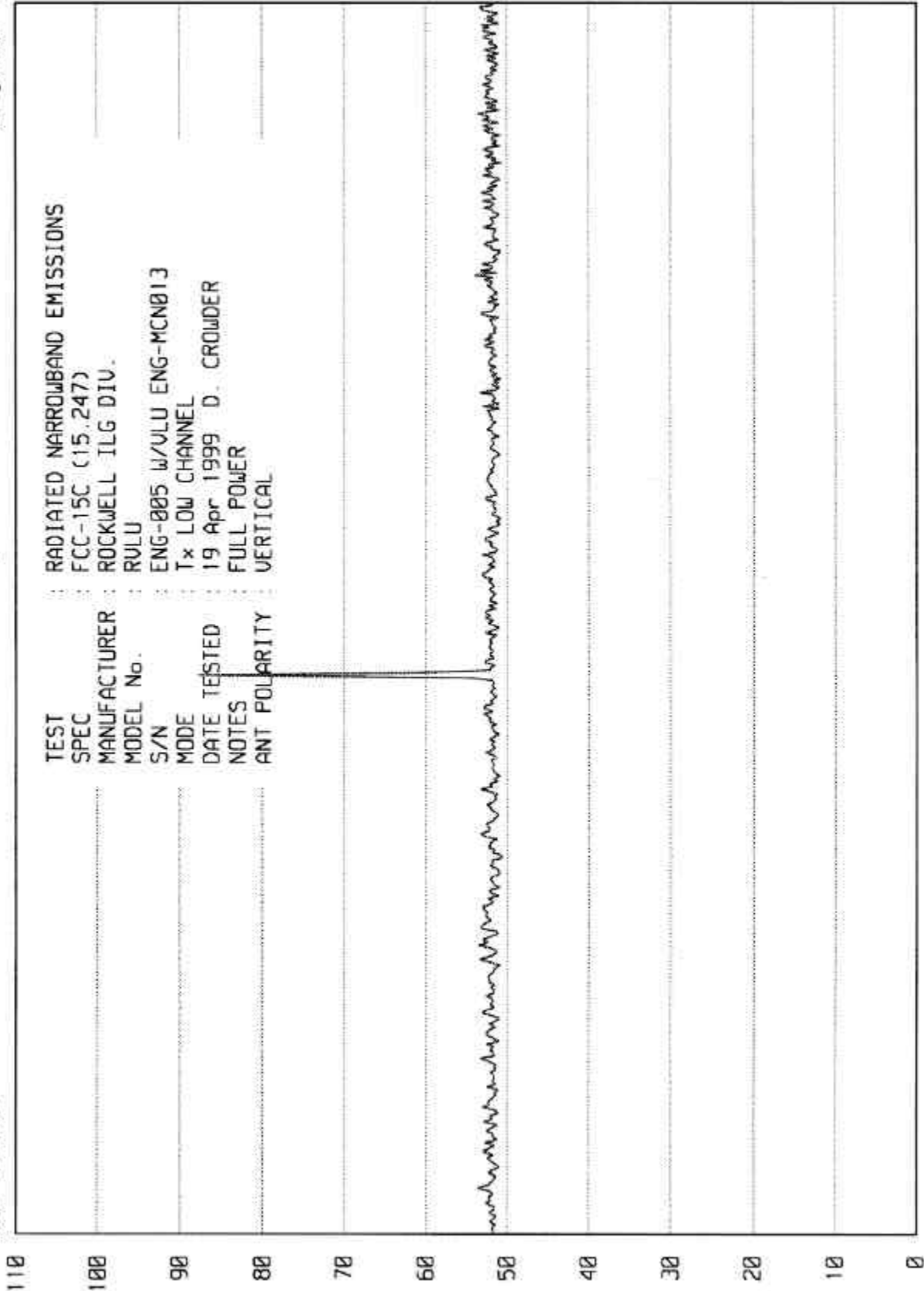
EE

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UK98 02/24/98

UNTU_EM RUN RUN 4



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RULU
 S/N : ENG-005 W/ULU ENG-MCN013
 MODE : Tx LOW CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

ETR 21650

ART = 2000

FREQUENCY - MHz

STOP = 3000

ETR 21650

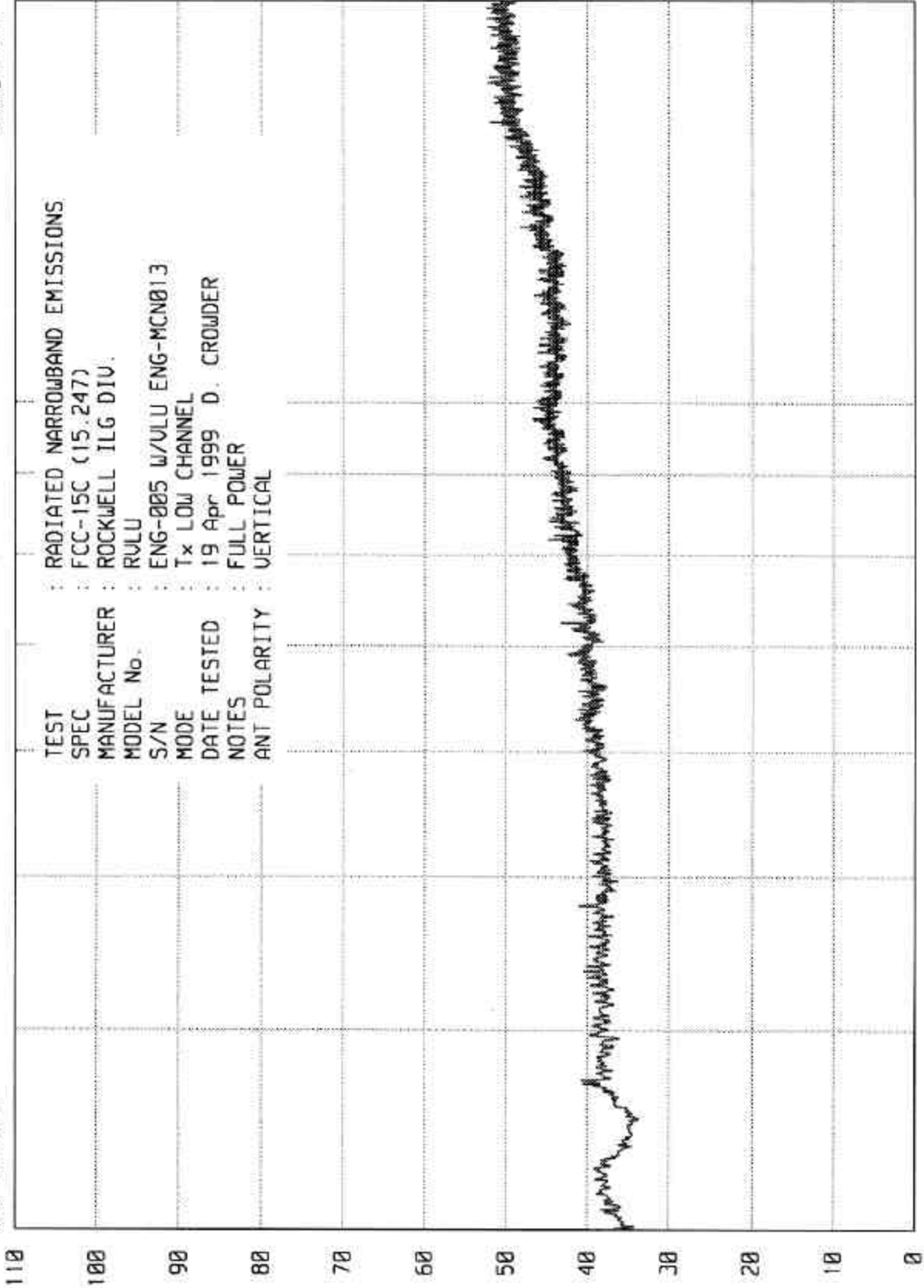
ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Ill. 60515

UKR08 02/24/98

UNIU_EM RUN RUN 5

EE

TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIU.
 MODEL No. : RULU
 S/N : ENG-085 W/ULU ENG-MCN013
 MODE : Tx LOW CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL



ART = 3000

FREQUENCY - MHz

10000

STOP = 100000

ETR 21650

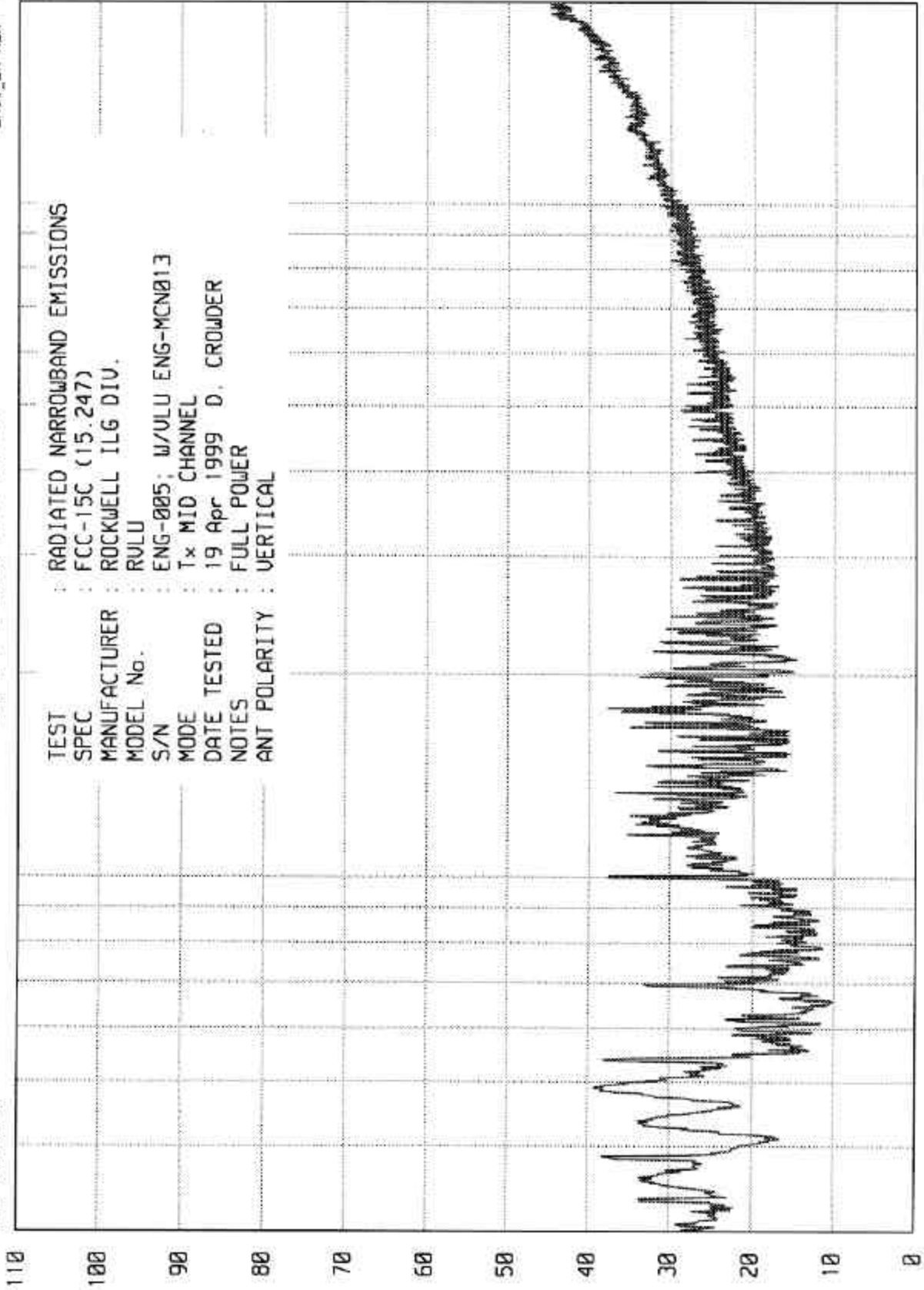
ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UNTU_EM RUN RUN 1

EEE

TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RULU
 S/N : ENG-085; W/ULU ENG-MCN013
 MODE : Tx MID CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL



100

1000

ART = 30

FREQUENCY - MHz

STOP = 2000

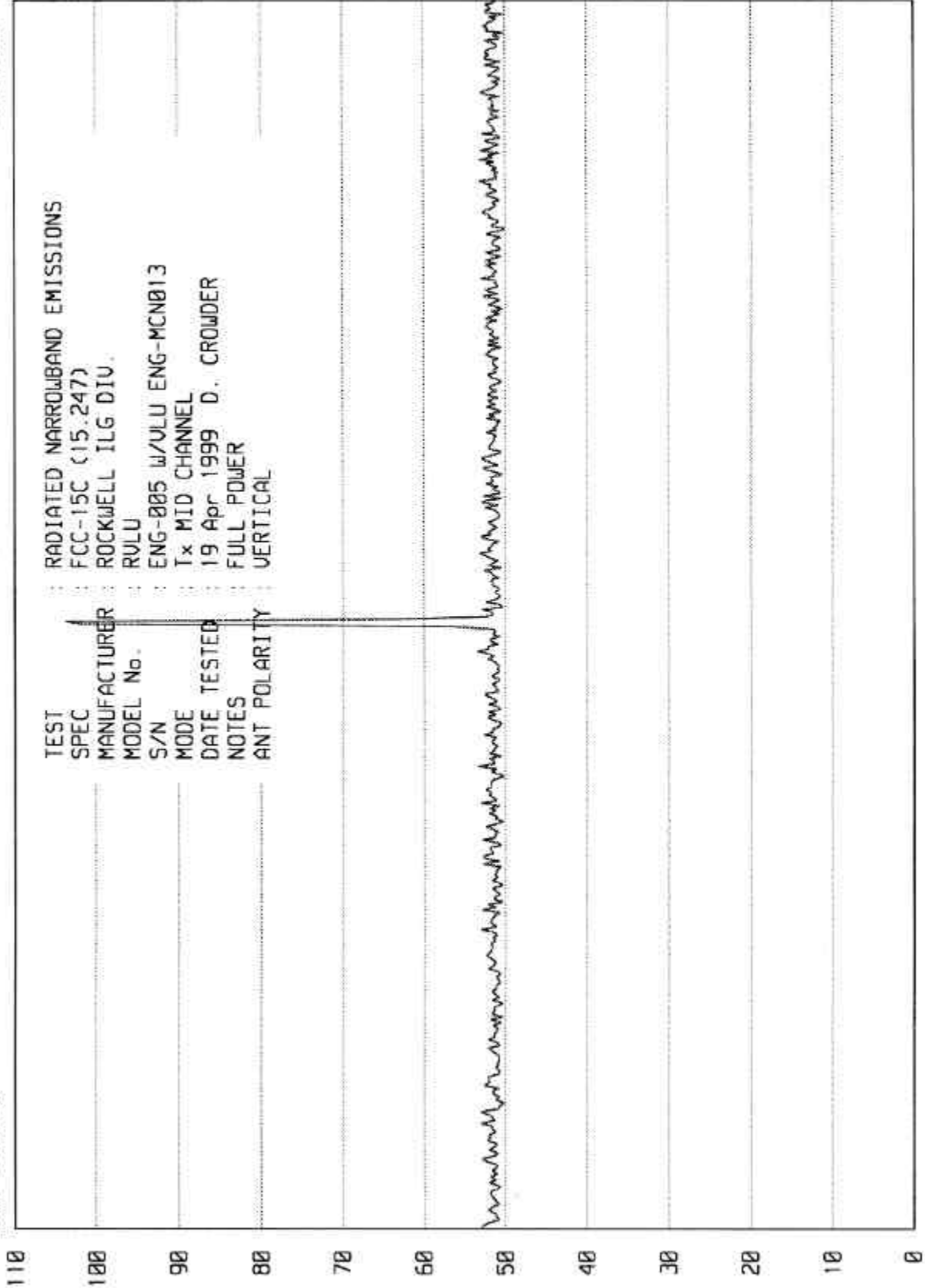
ETR 24650

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UK98 02/24/98

UNI_VEM_RUN RUN 4



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RVLU
 S/N : ENG-005 W/ULU ENG-MCNB13
 MODE : Tx MID CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

ART = 2000

FREQUENCY - MHz

STOP = 3000

ETR 21650

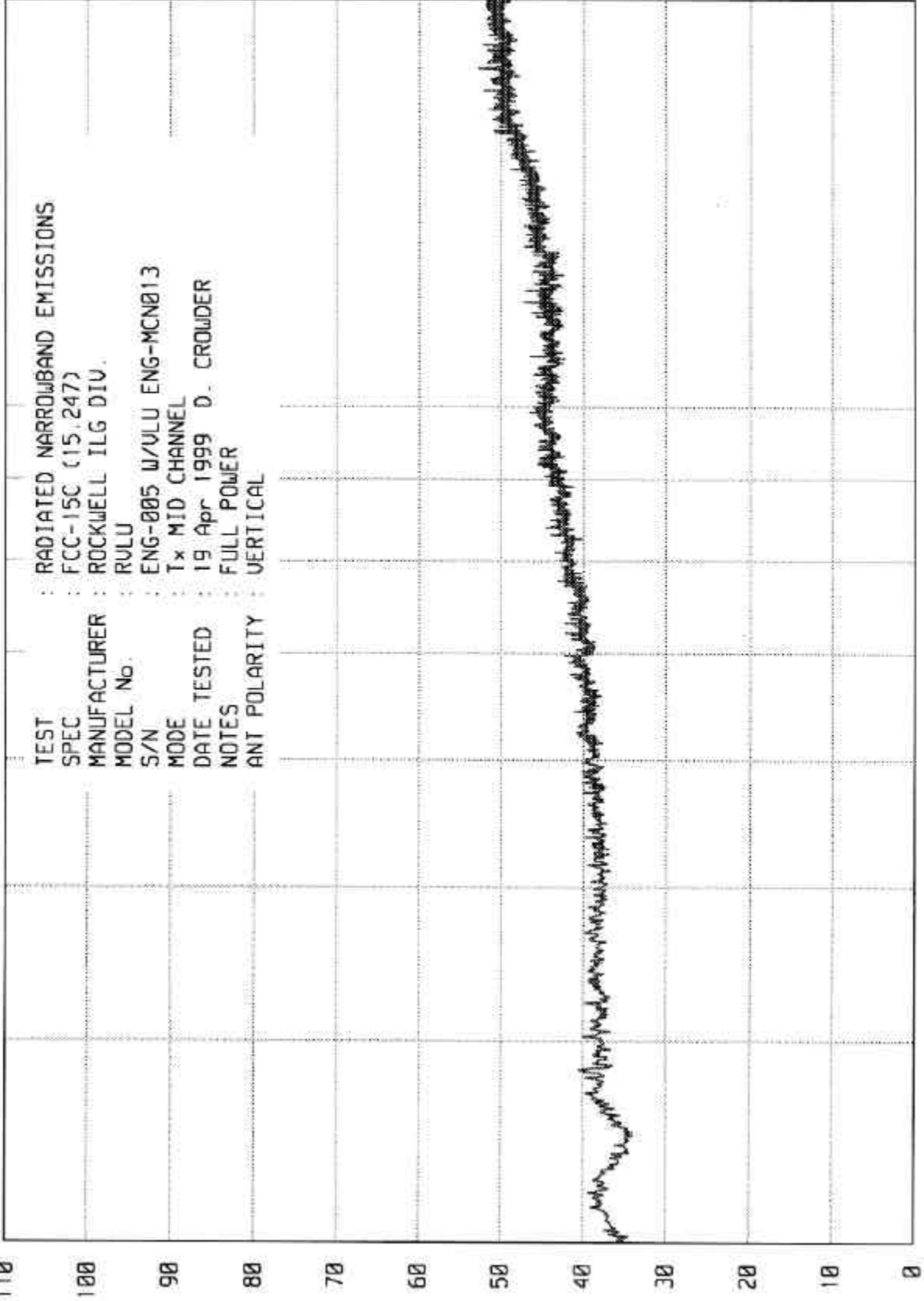
ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UK08 02/24/98

UNTU_EM RUN RUN 3

EE



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No : RULU
 S/N : ENG-005 W/VLU ENG-MCN013
 MODE : Tx MID CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

10000

FREQUENCY - MHz

STOP = 18000

ART = 3000

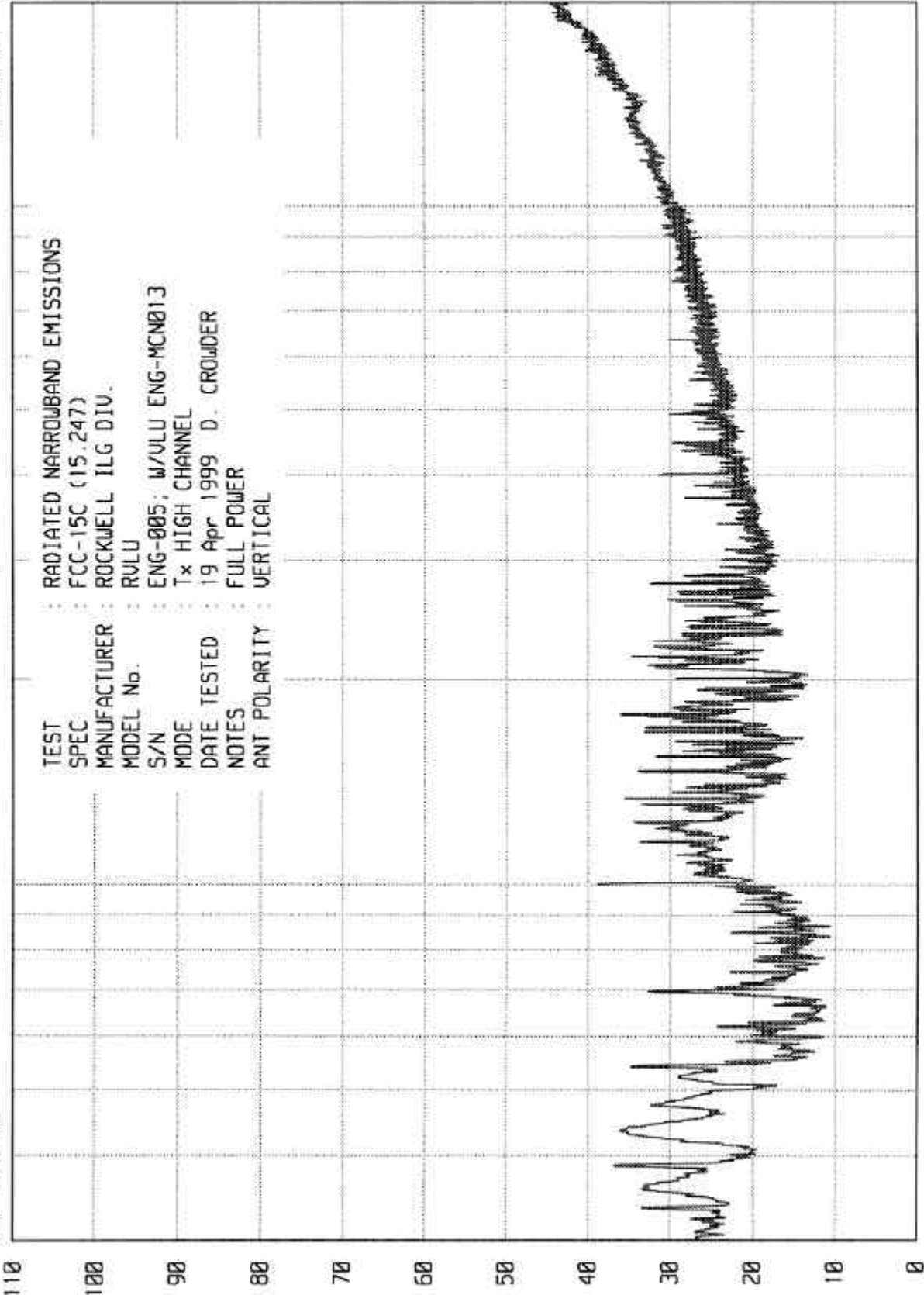
EE

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UK600 02/24/98

UNIT01.EM.RUN RUN 1



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RULU
 S/N : ENG-005; W/VLU ENG-MCN013
 MODE : Tx HIGH CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

ART = 30

FREQUENCY - MHz

1000

STOP = 2000

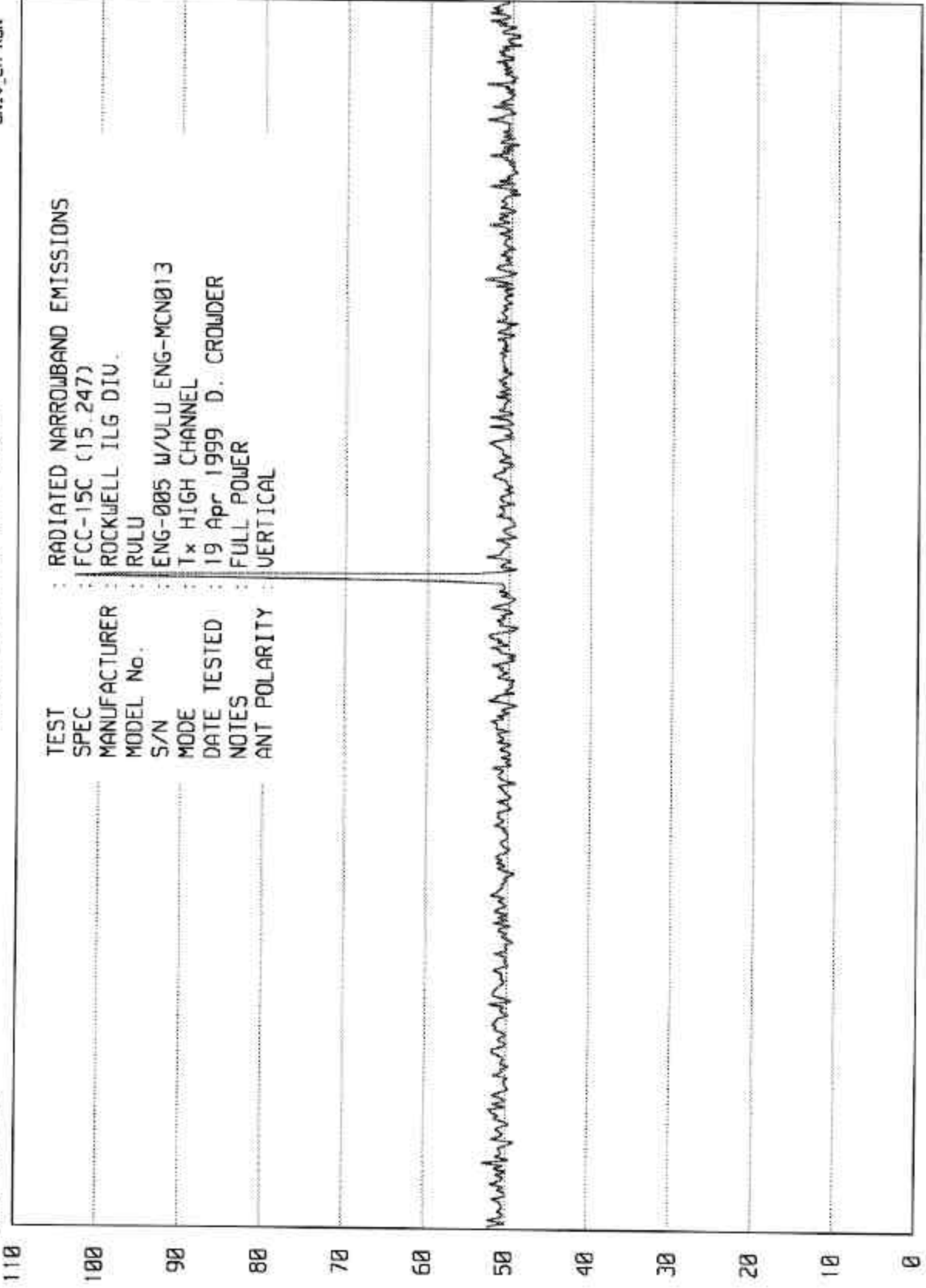
ETR 21650

ETR 21650

ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Ill. 60515

UNIV_EM_RUN RUN 2

UK08 02/24/98



STOP = 3000

FREQUENCY - MHz

ART = 2000

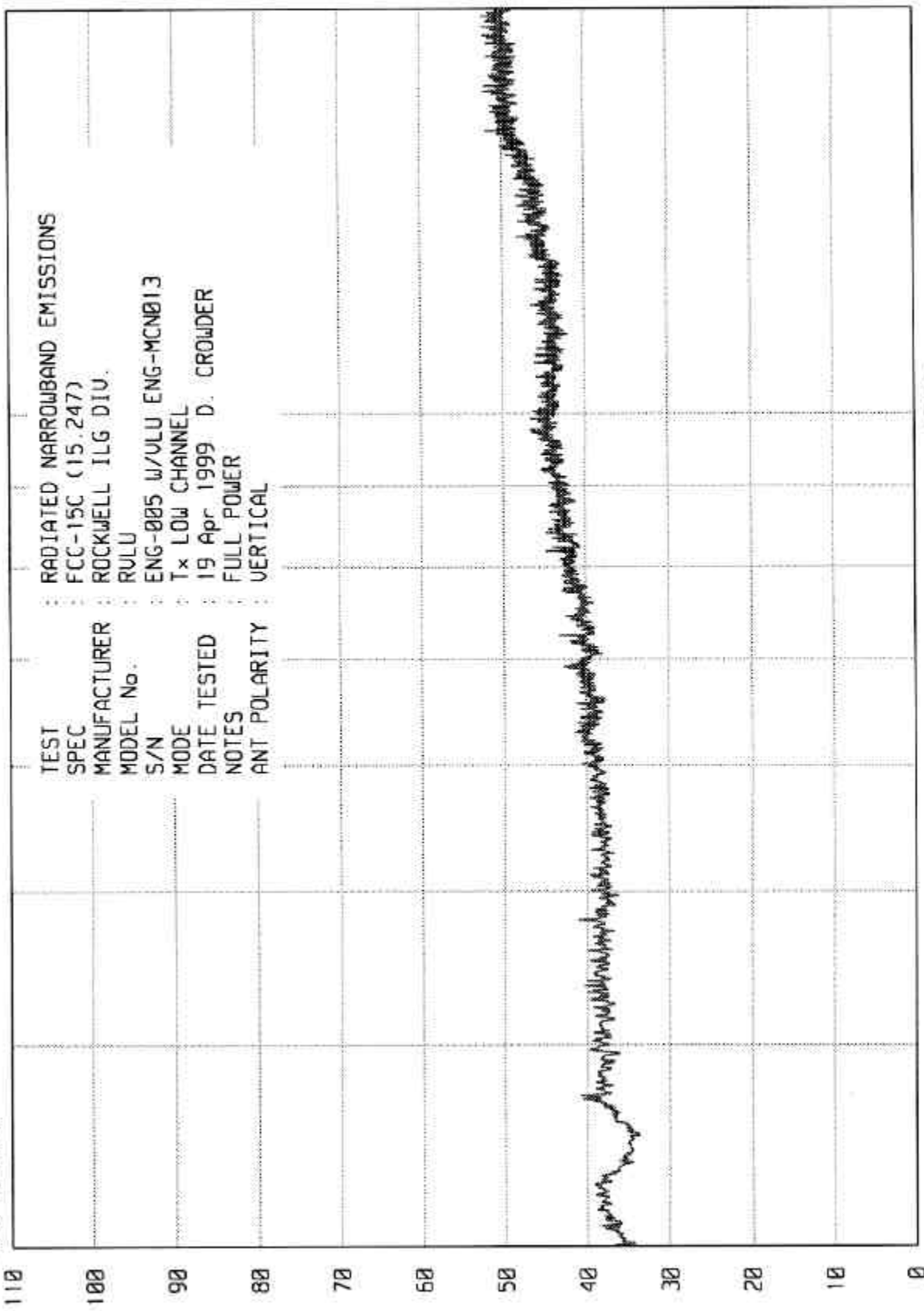
ETR 21650

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UNIV_EM RUN RUN 5

WKAB 02/24/98



TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL No. : RVLU
 S/N : ENG-005 W/VLU ENG-MCN013
 MODE : Tx LOW CHANNEL
 DATE TESTED : 19 Apr 1999 D. CROWDER
 NOTES : FULL POWER
 ANT POLARITY : VERTICAL

10000

FREQUENCY - MHz

STOP = 18000

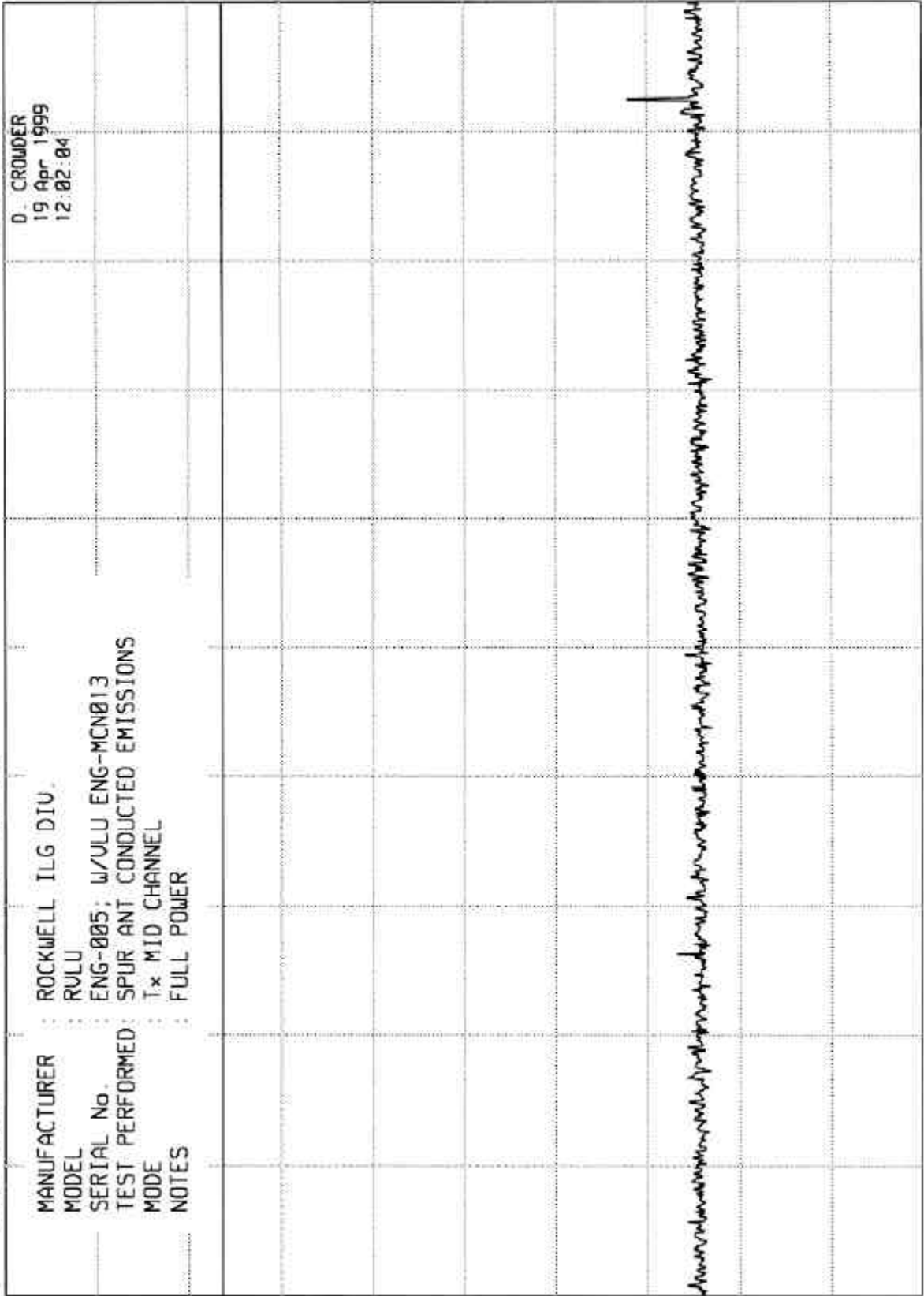
ART = 3000

122

ELITE ELECTRONIC ENGINEERING CO

MKR \sim 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTN 10 dB



dB/

23.6 dBm

DATA PAGE 100

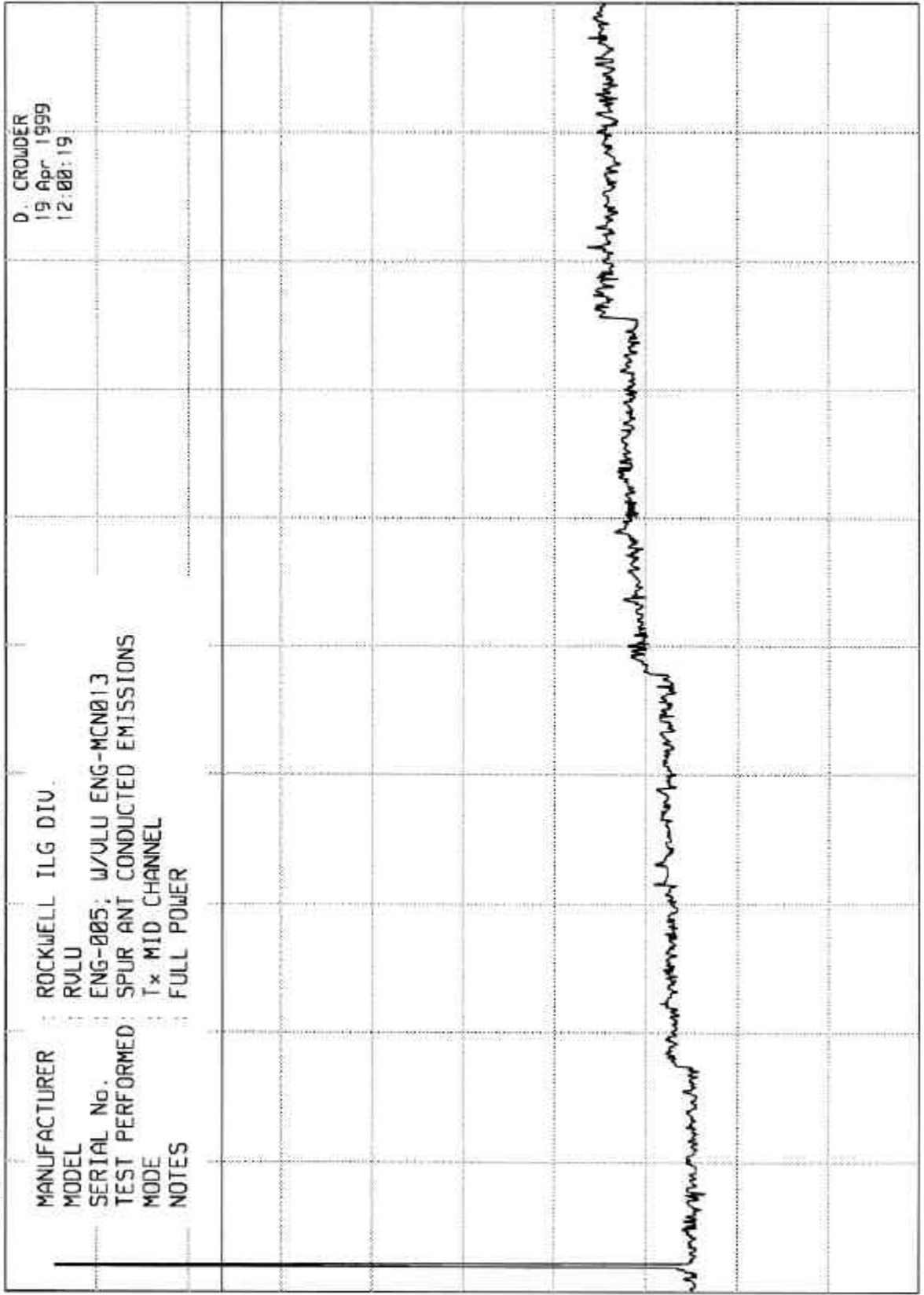
ETR 21650

ART 30 MHz RES BW 100 kHz (i) UBW 1 MHz STOP 2.00 GHz SWP 1.48 sec

ELITE ELECTRONIC ENGINEERING CO

MKR \sim 2.05 MHz
-28.70 dB

REF 0.0 dBm ATTN 10 dB



MANUFACTURER : ROCKWELL ILG DIV.
MODEL : RVLU
SERIAL No. : ENG-005; W/VLU ENG-MCN013
TEST PERFORMED : SPUR ANT CONDUCTED EMISSIONS
MODE : Tx MID CHANNEL
NOTES : FULL POWER

D. CROWDER
19 Apr 1999
12:00:19

dB/

23.6
dBm

DATA PAGE

ART 2.0 GHz RES BW 100 kHz (1) VBW 1 MHz STOP 24.0 GHz
SWP 16.5 sec



ETR No. **21650**
DATA SHEET

RADIATED EMISSION MEASUREMENTS IN A 3m ANECHOIC ROOM

SPECIFICATION : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL NO. : RVLU
 SERIAL NO. : ENG-005
 NOTES : TRANSMIT AT LOW CHANNEL
 TEST DATE : 20 Apr 1999
 TEST DISTANCE : 3m

FREQ (MHz)	ANT POL	MTR RDG dBuV	BW	ANT FAC dB	CBL FAC dB	PRE AMP dB	TOTAL dBuV/m	TOTAL uV/m	LIMIT uV
2401.8	H	81.2	1M/3M	31.8	0.8	---	113.8	489778.8	---
	V	84.8	1M/3M	31.8	0.8	---	117.4	741310.2	---
2401.8	H	69.8	1M/10	31.8	0.8	---	102.4	131825.7	---
	V	71.6	1M/10	31.8	0.8	---	104.2	162181.0	---
4803.7	H	35.5	1M/10	35.2	1.3	35.2	36.8	69.2	500.0
	V	29.5	1M/10	35.2	1.3	35.2	30.8	34.7	500.0
12009.4	H	27.1 AMB	1M/10	41.4	2.0	34.8	35.7	61.0	500.0
	V	27.3 AMB	1M/10	41.4	2.0	34.8	35.9	62.4	500.0
19215.1	H	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0
	V	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0

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page ___ of ___



ETR No. 21650
DATA SHEET

RADIATED EMISSION MEASUREMENTS IN A 3m ANECHOIC ROOM

SPECIFICATION : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL NO. : RVLU
 SERIAL NO. : ENG-005
 NOTES : TRANSMIT AT MID CHANNEL
 TEST DATE : 20 Apr 1999
 TEST DISTANCE : 3m

FREQ (MHz)	ANT POL	MTR RDG dBuV	BW	ANT FAC dB	CBL FAC dB	PRE AMP dB	TOTAL dBuV/m	TOTAL uV/m	LIMIT uV
2440.9	H	82.5	1M/3M	31.8	0.8	---	115.1	568852.9	---
	V	85.9	1M/3M	31.8	0.8	---	118.5	841395.1	---
2440.9	H	68.2	1M/10	31.8	0.8	---	100.8	109647.8	---
	V	71.8	1M/10	31.8	0.8	---	104.4	165958.7	---
4881.8	H	27.8	1M/10	35.2	1.3	35.2	29.1	28.5	500.0
	V	26.2 AMB	1M/10	35.2	1.3	35.2	27.5	23.7	500.0
7322.7	H	28.9 AMB	1M/10	38.0	1.6	35.5	33.0	44.7	500.0
	V	28.9 AMB	1M/10	38.0	1.6	35.5	33.0	44.7	500.0
12204.5	H	26.3 AMB	1M/10	41.4	2.0	34.8	34.9	55.6	500.0
	V	25.7 AMB	1M/10	41.4	2.0	34.8	34.3	51.9	500.0
19527.2	H	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0
	V	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0

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page ____ of ____



ETR No. **21650**
DATA SHEET

RADIATED EMISSION MEASUREMENTS IN A 3m ANECHOIC ROOM

SPECIFICATION : FCC-15C (15.247)
 MANUFACTURER : ROCKWELL ILG DIV.
 MODEL NO. : RVLU
 SERIAL NO. : ENG-005
 NOTES : TRANSMIT AT HIGH CHANNEL
 TEST DATE : 20 Apr 1999
 TEST DISTANCE : 3m

FREQ (MHz)	ANT POL	MTR RDG dBuV	BW	ANT FAC dB	CBL FAC dB	PRE AMP dB	TOTAL dBuV/m	TOTAL uV/m	LIMIT uV
2478.9	H	81.1	1M/3M	31.8	0.8	---	113.7	484172.4	---
	V	84.1	1M/3M	31.8	0.8	---	116.7	683911.6	---
2478.9	H	67.9	1M/10	31.8	0.8	---	100.5	105925.4	---
	V	70.1	1M/10	31.8	0.8	---	102.7	136458.3	---
4957.8	H	36.5	1M/10	35.2	1.3	35.2	37.8	77.6	500.0
	V	29.3	1M/10	35.2	1.3	35.2	30.6	33.9	500.0
7436.7	H	27.7 AMB	1M/10	38.0	1.6	35.5	31.8	38.9	500.0
	V	29.8	1M/10	38.0	1.6	35.5	33.9	49.5	500.0
12394.5	H	25.7 AMB	1M/10	41.4	2.0	34.8	34.3	51.9	500.0
	V	26.0 AMB	1M/10	41.4	2.0	34.8	34.6	53.7	500.0
19831.2	H	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0
	V	12.7 AMB	1M/10	40.3	---	---	53.0	446.7	500.0
22310.1	H	12.5 AMB	1M/10	40.4	---	---	52.9	441.6	500.0
	V	12.5 AMB	1M/10	40.4	---	---	52.9	441.6	500.0

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