

APPLICANT: MOTOROLA, INC.

FCC ID: IHDT56CN1

**FCC PART 24 TRANSMITTER**

The test report for the FCC Part 24 transmitter follows:

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

ELITE PROJECT: 31898            DATES TESTED: January 27 through 31, 2003

TEST PERSONNEL: Daniel E. Crowder

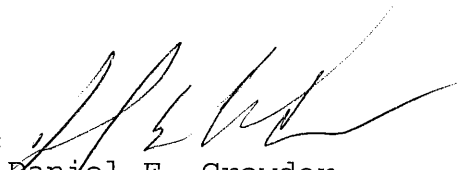
TEST SPECIFICATION: Federal Communication Commission (FCC) Part 24

ENGINEERING TEST REPORT NO. 31898-02  
MEASUREMENT OF RF INTERFERENCE FROM  
A MODEL A920 CELLULAR HANDSET

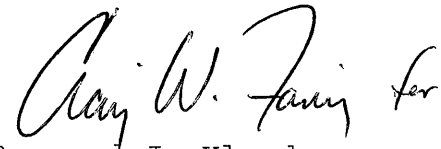
FOR: Motorola Cellular  
Libertyville, IL

PURCHASE ORDER NO: NP672510

Report By:

  
Daniel E. Crowder

Approved By:

  
Raymond J. Klouda  
Registered Professional  
Engineer of Illinois - 44894

ENGINEERING TEST REPORT NO. 31898-02  
ADMINISTRATIVE DATA AND SUMMARY OF TESTS

**DESCRIPTION OF TEST ITEM:** Cellular Handset

**MODEL NO:** A920

**SERIAL NO:** None Assigned

**MANUFACTURER:** Motorola Cellular

**APPLICABLE SPECIFICATIONS:** FCC Part 24

**QUANTITY OF ITEMS TESTED:** One (1)

**TEST PERFORMED BY:** ELITE ELECTRONIC ENGINEERING INCORPORATED  
Radio Interference Consultants  
Downers Grove, Illinois 60515

**DATE RECEIVED:** January 27, 2003

**DATES TESTED:** January 27 through 31, 2003

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

**CUSTOMER:** No Motorola Cellular personal were present.

**ELITE ELECTRONIC:** Daniel E. Crowder

**ELITE JOB NO.:** 31898

**ABSTRACT:** The model A920 Cellular Handset complies with the technical requirements in FCC Part 24. See test results and data pages for more details.

ENGINEERING TEST REPORT NO. 31898-02

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TOTAL NUMBER OF PAGES IN THIS DOCUMENT,  
(INCLUDING DATA SHEETS): 63

THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE  
WRITTEN APPROVAL OF ELITE ELECTRONIC ENGINEERING INCORPORATED.

ENGINEERING TEST REPORT NO. 31898-02  
MEASUREMENT OF RF INTERFERENCE FROM  
A MODEL A920 CELLULAR HANDSET

**1.0 INTRODUCTION:**

**1.1 DESCRIPTION OF TEST ITEM:** During the period January 27 through 31, 2003, a series of radio interference measurements were performed on a model A920 Cellular Handset, (hereinafter referred to as the test item). No serial number was assigned to the test item. The tests were performed for Motorola Cellular of Libertyville, IL.

The test item is a cellular handset that operates in the PCS band, 1850 through 1910.

The test item is designed to operate in the following frequency ranges:

<u>Block</u>	<u>Uplink Frequency (MHz)</u>
A	1850-1865
D	1865-1870
B	1870-1885
E	1885-1890
F	1890-1895
C	1895-1910

**1.2 PURPOSE:** The test series was performed to determine if the test item meets the technical requirements of the FCC Part 24 for broadband PCS.

**1.3 DEVIATIONS, ADDITIONS AND EXCLUSIONS:** There were no deviations, additions to, or exclusions from the test specification during this test series.

**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 24, dated 1 October 2001
- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 2, dated 1 October 2001
- ANSI C63.4-1992, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"

**1.5 SUBCONTRACTOR IDENTIFICATION:** This series of tests was performed by Elite Electronic Engineering Incorporated, of Downers Grove, Illinois. The laboratory is accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP Lab Code: 100278-0.

**1.6 LABORATORY CONDITIONS:** The temperature at the time of the test was 20°C and the relative humidity was 18%.

**2.0 TEST ITEM SETUP AND OPERATION:**

**2.1 POWER INPUT:** The test item obtained 3.6VDC from a internal battery.

**2.2 GROUNDING:** Since the test item was powered from a battery, it was ungrounded during the tests.

**2.3 PERIPHERAL EQUIPMENT:** There was no peripheral equipment supplied with the test item.

**2.4 MODULATION:** All tests were performed with the test item transmitting with GSM modulation.

**2.5 FREQUENCY SELECTION:** Three test frequencies, one at the low edge, one in the middle and one at the high edge, were selected for each frequency block pair. The frequencies were one channel spacing from the low or high edge of the frequency range edge. The specified channel spacings used for each modulation type are shown below:

<u>Modulation</u>	<u>Channel Spacing</u>
GSM	200kHz

The specific test frequencies are designated as follows:

<u>Block</u>	<u>Modulation Type</u>	<u>Low Edge Frequency (MHz)</u>	<u>Middle Frequency (MHz)</u>	<u>High Edge Frequency (MHz)</u>
A	GSM	1850.2	1857.6	1864.8
B	GSM	1870.2	1877.6	1884.8
C	GSM	1895.2	1902.6	1909.8
D	GSM	1865.2	1867.6	1869.8
E	GSM	1885.2	1887.6	1889.8
F	GSM	1890.2	1892.6	1894.8

**2.6 RF POWER OUTPUT:** The measured power output is shown below:

<u>Modulation</u>	<u>Rated Power (dBm)</u>	<u>Rated Power (Watts)</u>
GSM	27	0.5

**3.0 TEST EQUIPMENT:**

**3.1 TEST EQUIPMENT LIST:** 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.

**3.2 CALIBRATION TRACEABILITY:** Test equipment is maintained and calibrated on a regular basis. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

**4.0 REQUIREMENTS, PROCEDURES AND RESULTS:**

**4.1 RF POWER OUTPUT MEASUREMENTS:**

**4.1.1 REQUIREMENTS:** In accordance with paragraph 24.323, mobile/portable stations are limited to 2 Watts e.i.r.p. peak power and the equipment must employ means to limit the power of the minimum necessary for successful communications.

**4.1.2 PROCEDURES:** The test item was operated to measure the output power.

- a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
- b) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
- c) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization.
- d) The maximum meter reading was recorded. Measurement BW was 1 MHz and Video of 3MHz. Peak reading were recorded. No averaging methods or corrections were applied.
- e) Measurements were performed separately at each frequency used during the preliminary measurements.

The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power another double ridged waveguide antenna

was set in place of test item and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was corrected to compensate for cable loss, as required, and when the ridged waveguide antenna was used increased by the difference in gain between the dipole and the waveguide antenna.

**4.1.3 RESULTS:** The output power measurements are presented on page 15. The power output at the antenna port was 0.5 watts. The EIRP was measured to be 1.9 watts.

#### **4.2 BANDEDGE COMPLIANCE MEASUREMENTS:**

**4.2.1 REQUIREMENTS:** In accordance with Paragraph 24.238, on any frequency outside the authorized frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. For a rated power level of 0.5W, the emissions outside of the emission bandwidth shall be attenuated at least 40dB below the transmitter power.

In the 1MHz bands immediately outside and adjacent to the frequency range a resolution of at least one percent of the emission bandwidth shall be used. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency where the emissions are 26dB down.

#### **4.2.2 PROCEDURES:**

The test was performed using each of the modulation type listed in paragraph 2.2 (GSM).

(a) A spectrum analyzer was connected to the output of the test item. With a bandwidth of the spectrum analyzer set to 3kHz, the output of the test item was measured and recorded.

(b) Step (a) was repeated separately with the test item set to 1850.2MHz, 1864.8MHz, 1870.2MHz, 1884.8MHz, 1895.2MHz, 1909.8MHz, 1865.2MHz, 1869.8MHz, 1885.2MHz, 1889.8MHz, 1890.2MHz and 1894.8MHz.

**4.2.3 RESULTS:** The plots of the bandedge compliance measured are presented on pages 16 through 27. The limits, shown on the plots, are referenced to the power measured from the unmodulated carrier.

As can be seen from the data, the test item met the bandedge compliance requirements.

**4.3 SPURIOUS EMISSIONS AT ANTENNA TERMINAL:**

**4.3.1 REQUIREMENTS:** This test determines whether the test item produces excessive spurious emissions.

In accordance with Paragraph FCC 24.238, the spurious emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. FCC requirements apply only to frequencies outside the authorized frequency block. For 0.5W, the spurious emissions shall be attenuated by a minimum of 40 dB. This requirement translates to a limit of -13dBm. The peak power of the emissions shall be measured at the antenna terminal from 30MHz up to the 10th harmonic of the fundamental frequency.

**4.3.2 PROCEDURES:** In general, this test will measure spurious emissions at the antenna terminals.

(a) A spectrum analyzer was connected to the output of the test item. The frequency span was adjusted to cover 30 MHz up to 1 GHz. With a bandwidth of the spectrum analyzer set to 100 kHz, the output of the test item was measured and recorded.

(b) The frequency span was adjusted to cover 1 GHz up to 2 GHz. With a bandwidth of the spectrum analyzer set to 1 MHz, the output of

the test item was measured and recorded.

(c) The frequency span was adjusted to cover 2 GHz up to 18 GHz. With a bandwidth of the spectrum analyzer set to 1 MHz, the output of the test item was measured and recorded.

(d) Steps (a) through (c) were repeated separately with the test item transmitting at 1857.6MHz, 1877.6MHz, 1902.6MHz, 1867.6MHz, 1887.6MHz and 1892.6MHz.

**4.3.3 RESULTS:** The plots of the antenna conducted output measurements are presented on pages 28 through 45. As can be seen from the data, the test item did not produce spurious emissions in excess of the -13 dBm limit.

**4.4 FIELD STRENGTH OF SPURIOUS EMISSIONS:**

**4.4.1 PRELIMINARY RADIATED MEASUREMENTS:**

**4.4.1.1 REQUIREMENTS:** Because emission levels in the open field may be masked by interference from sources other than the test item, preliminary radiated measurements are first performed in the low ambient environment of a shielded enclosure. The radiated emissions from the test item were first measured using peak detection. This data was then automatically plotted. The frequencies with significant emission levels were measured in the open field.

**4.4.1.2 PROCEDURES:** All preliminary tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. 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 C63.4 1992 for site

attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

(a) The preliminary measurements were performed with the test item operating separately at 1857.6MHz, 1877.6MHz, 1902.6MHz, 1867.6MHz, 1887.6MHz and 1892.6MHz. The broadband measuring antennas were positioned at a 3 meter distance from the test item. The frequency range from 30MHz to 18GHz was investigated. The readings were taken with a peak detector function and recorded.

**4.4.1.3 RESULTS:** The preliminary plots are presented on pages 46 through 57. Factors for the antennas and cables were added to the data before it was plotted.

This data is only presented for a reference, and is not used as official data. All significant radiated emissions were subsequently measured at an open field test site.

#### **4.4.2 FINAL RADIATED EMISSIONS:**

**4.4.2.1 REQUIREMENTS:** In accordance with paragraph 24.238, on any frequency twice or more than twice the fundamental frequency, the emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. This requirement translates to a limit of -13dBm. The peak power of the emissions shall be measured from 30MHz up to the 10th harmonic of the fundamental frequency.

**4.4.2.2 PROCEDURES:** Final open field measurements were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. 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 C63.4 1992 for site attenuation.

The final open field emission test procedure is as follows:

- a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
- b) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
- c) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization.
- d) The maximum meter reading was recorded. Measurement BW was 1 MHz and Video of 3MHz. Peak reading were recorded. No averaging methods or corrections were applied.
- e) Measurements were performed separately at each frequency used during the preliminary measurements.

The equivalent power into a dipole antenna was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power another tuned dipole antenna or double ridged waveguide antenna was set in place of test item and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was corrected to compensate for cable loss, as required, and when the ridged waveguide antenna was used increased by the difference in gain between the dipole and the waveguide antenna.

**4.4.2.3 RESULTS OF OPEN FIELD RADIATED TEST:** The

final open field radiated levels are presented on pages 58 through 63. The radiated emissions were measured through the 10th harmonic. All emissions measured from the test item were within the specification limits.

**4.5 FREQUENCY STABILITY:**

**4.5.1 REQUIREMENTS:** The frequency stability test is to be performed by Motorola Cellular.

**5.0 CONCLUSION:**

It was found that the Motorola Cellular model A920 Cellular Handset, complies with the RF Power Output, the Bandedge Compliance, the Spurious Emissions at Antenna Terminal and the Field Strength of Spurious Emissions requirements of the FCC Part 24. The Frequency Stability requirements shall be determined by Motorola Cellular.

**6.0 CERTIFICATION:**

Elite Electronic Engineering Incorporated 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 only to the test item at the test date as operated by Motorola Cellular personnel. 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.

**7.0 ENDORSEMENT DISCLAIMER:**

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

ENGINEERING TEST REPORT NO. 31898-02

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								
XZG3	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	2421A03059	---			N/A
Equipment Type: AMPLIFIERS								
APH0	POWER AMPLIFIER	HEWLETT PACKARD	11975A	2304A00322	2-8GHZ		NOTE 1	
APK3	PREAMPLIFIER	AGILENT TECHNOL	8449B	3008A01593	1-26.5GHZ	05/09/02	12	05/09/03
Equipment Type: ANTENNAS								
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ		NOTE 1	
NTA0	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2057	0.03-2GHZ	06/25/02	12	06/25/03
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	08/25/02	12	08/25/03
NW10	RIDGED WAVE GUIDE	AEL	H1498	153	2-18GHZ	08/09/02	12	08/09/03
Equipment Type: CONTROLLERS								
CDD2	COMPUTER	HEWLETT PACKARD	D4171A#ABA	US61654645	---			N/A
CDN3	COMPUTER	GATEWAY	PRO700C	0022368722	700MHZ			N/A
Equipment Type: PRINTERS AND PLOTTERS								
HRE1	LASER JET 5P	HEWLETT PACKARD	C3150A	USHB061052	---			N/A
HRG7	LASERJET 2100	HEWLETT PACKARD	C1470A	USGG109762	---			N/A
Equipment Type: RECEIVERS								
RAC2	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3638A08770	100HZ-22GHZ	02/21/02	12	02/21/03
RACD	RF PRESELECTOR	HEWLETT PACKARD	85685A	3010A01205	20HZ-2GHZ	02/21/02	12	02/21/03
RAE1	SPECTRUM ANALYZER (DCC-CEM)	HEWLETT PACKARD	85660A	2209A01336	100HZ-22GHZ	02/14/02	12	02/14/03
RAF4	QUASIPeAK ADAPTER	HEWLETT PACKARD	85650A	2043A00320	0.01-1000MHZ	06/13/02	12	06/13/03
RAH0	FREQUENCY MIXER	HEWLETT PACKARD	11970K	2332A00270	18-26GHZ			N/A
Equipment Type: TEST CHAMBERS (EMI)								
R21F	3M ANECHOIC CHAMBER MEETS	EMC TEST SYSTEM	3M ANECHOIC		30MHZ-18GHZ	06/07/02	12	06/07/03

Cal. Interval: Listed in Months I/O: Initial Only N/A: Not Applicable

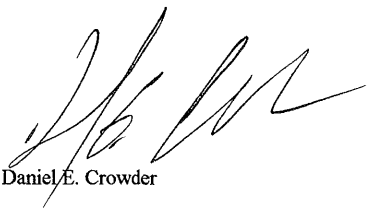
Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.



ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 POWER OUTPUT  
DATE : JANUARY 28, 2003

FREQUENCY (MHz)	POWER READING			
	POWER AT ANT PORT (dBm)	WATTS	EIRP (dBm)	WATTS
1857.6 GSM Modulation	27	0.5	32.8	1.9
1877.6 GSM Modulation	27	0.5	32.8	1.9
1902.6 GSM Modulation	27	0.5	32.8	1.9
1867.6 GSM Modulation	27	0.5	32.8	1.9
1887.6 GSM Modulation	27	0.5	32.8	1.9
1892.6 GSM Modulation	27	0.5	32.8	1.9

CHECKED BY:   
Daniel E. Crowder

ELITE ELECTRONIC ENGINEERING Inc.

MKR 1.850 020 GHz  
-54.80 dBm

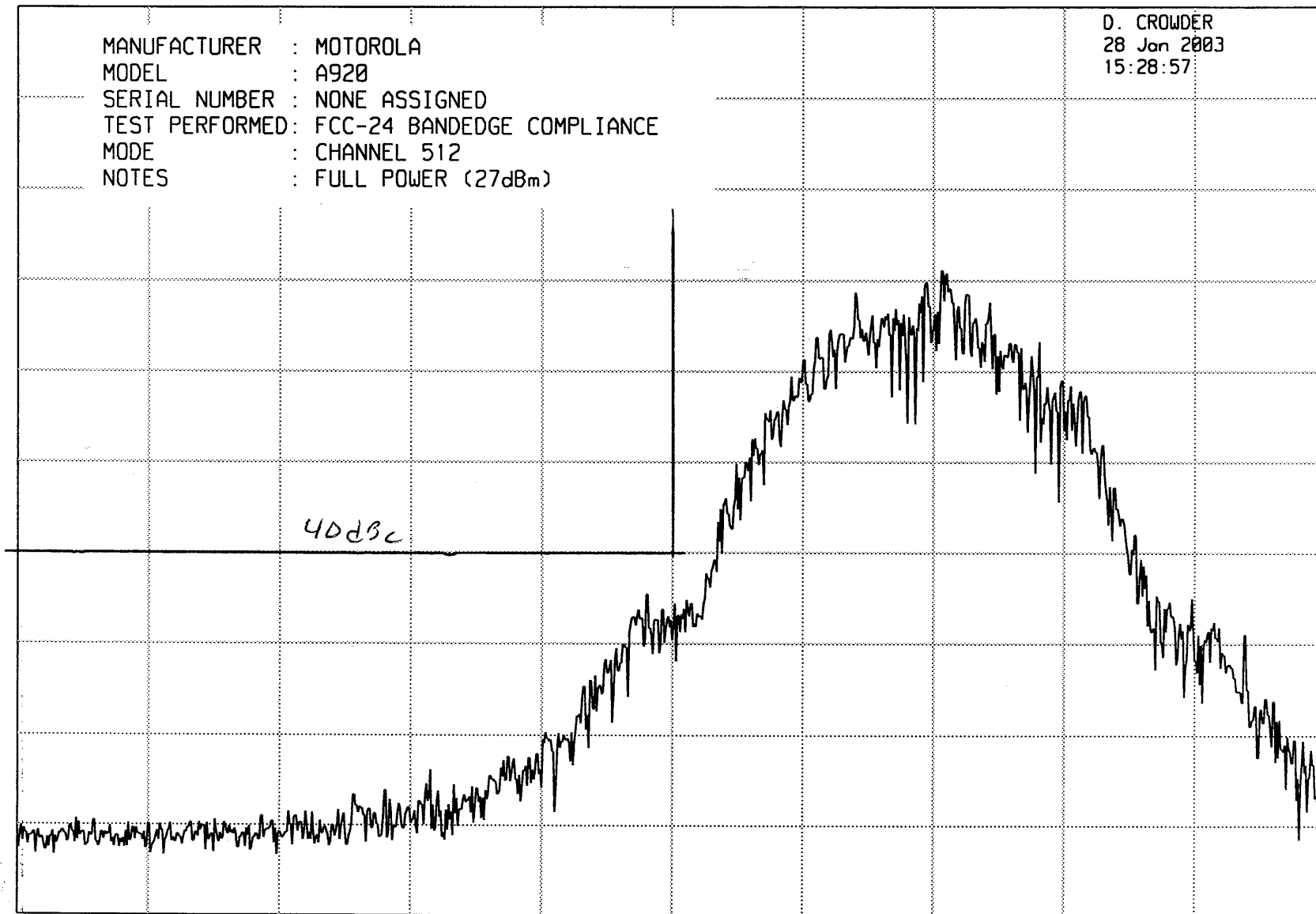
REF 17.0 dBm      ATTEN 30 dB + 30 dB EXT

hp

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 512  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:28:57



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CENTER 1.850 00 GHz  
RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz  
SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

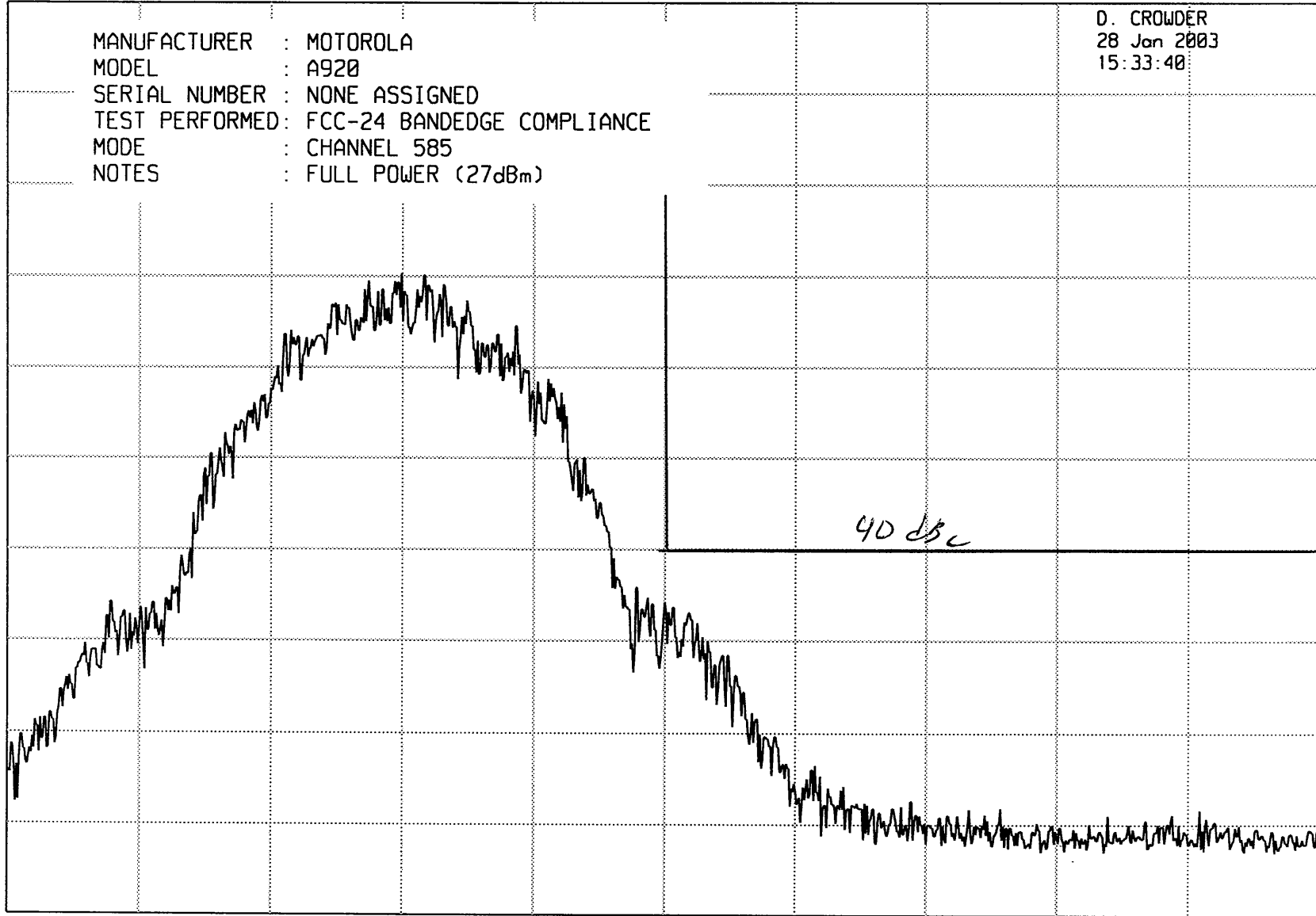
hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED : FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 585  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:33:40



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CENTER 1.865 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

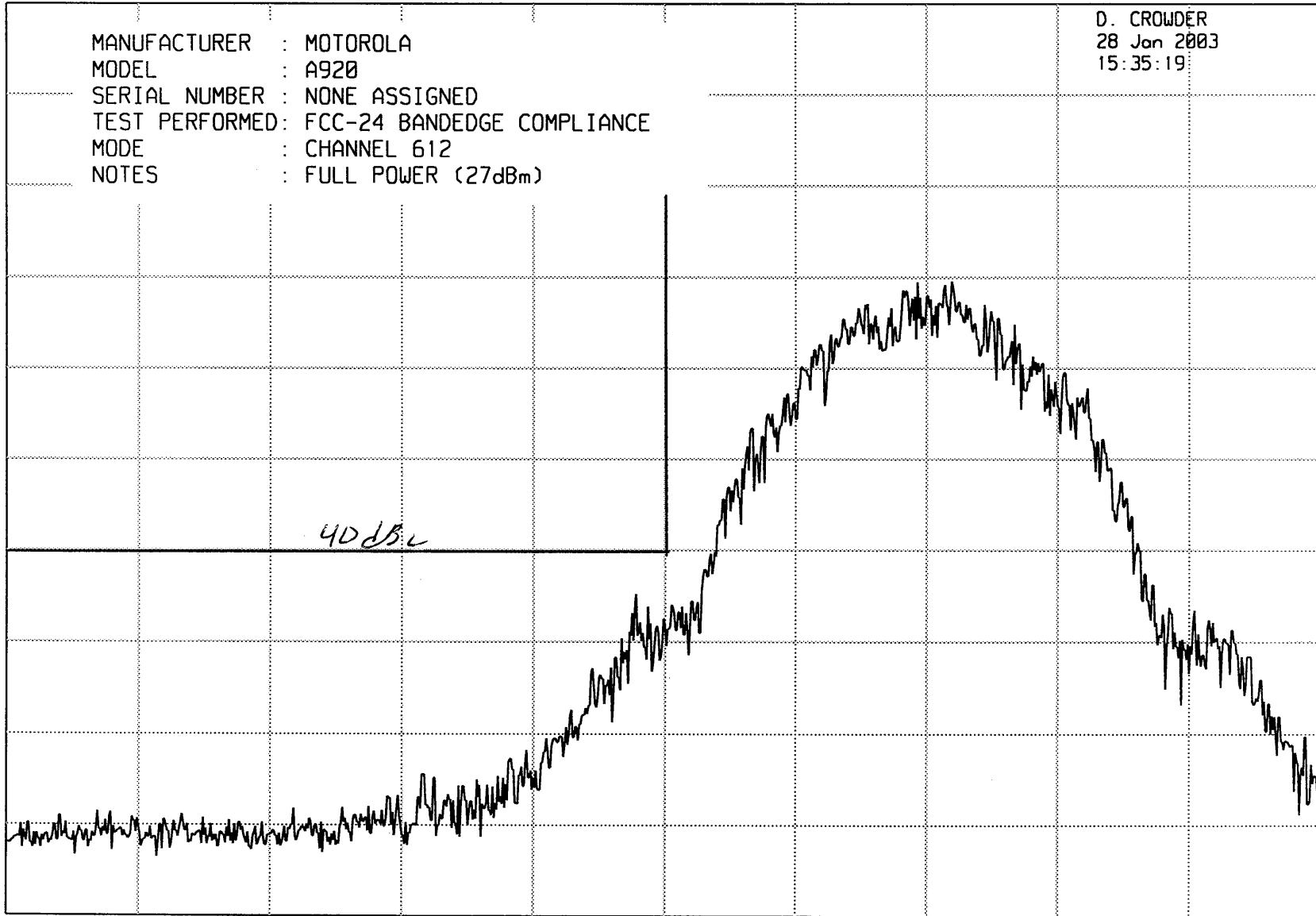
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 612  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:35:19

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CENTER 1.870 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

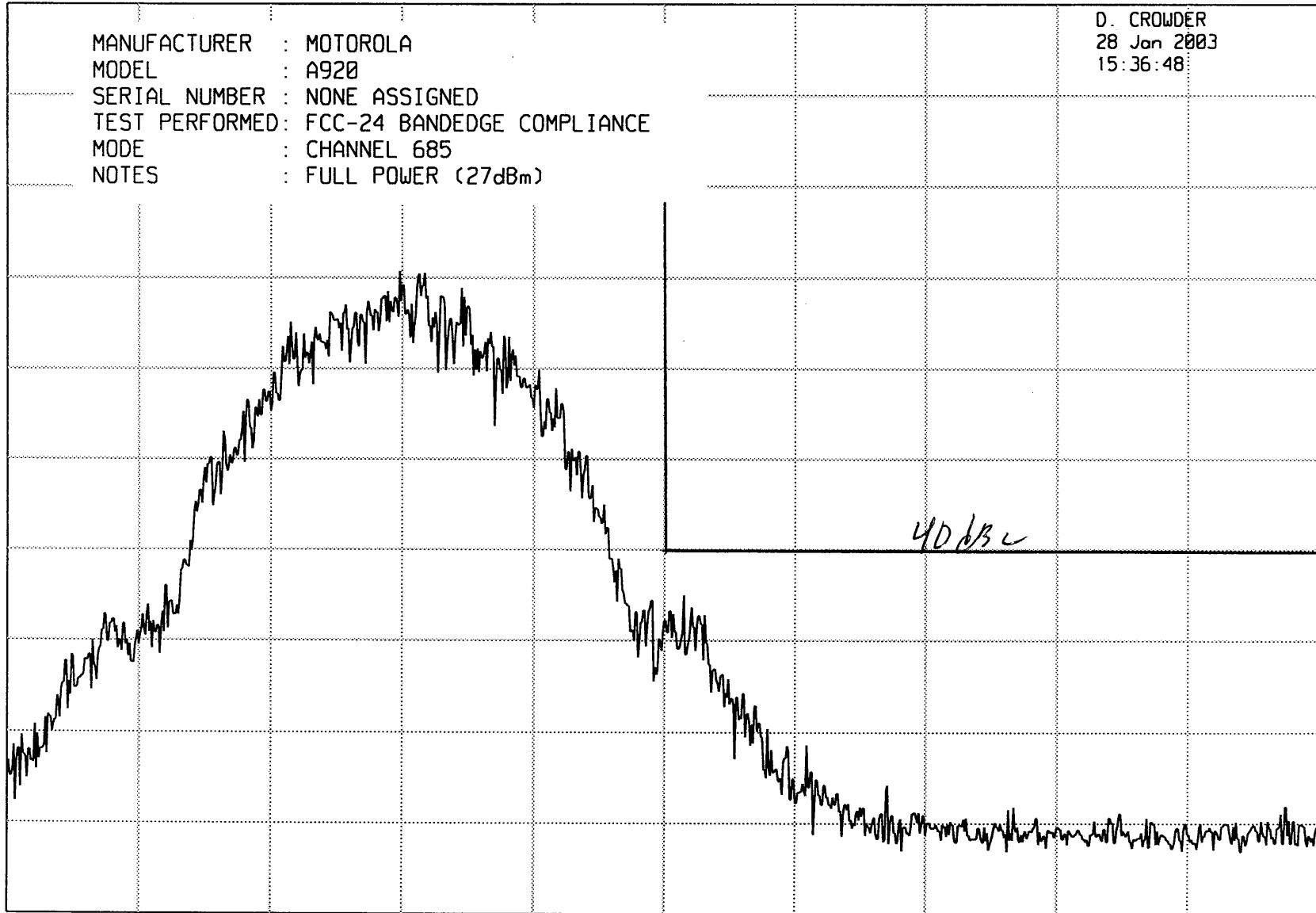
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 685  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:36:48

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CENTER 1.885 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

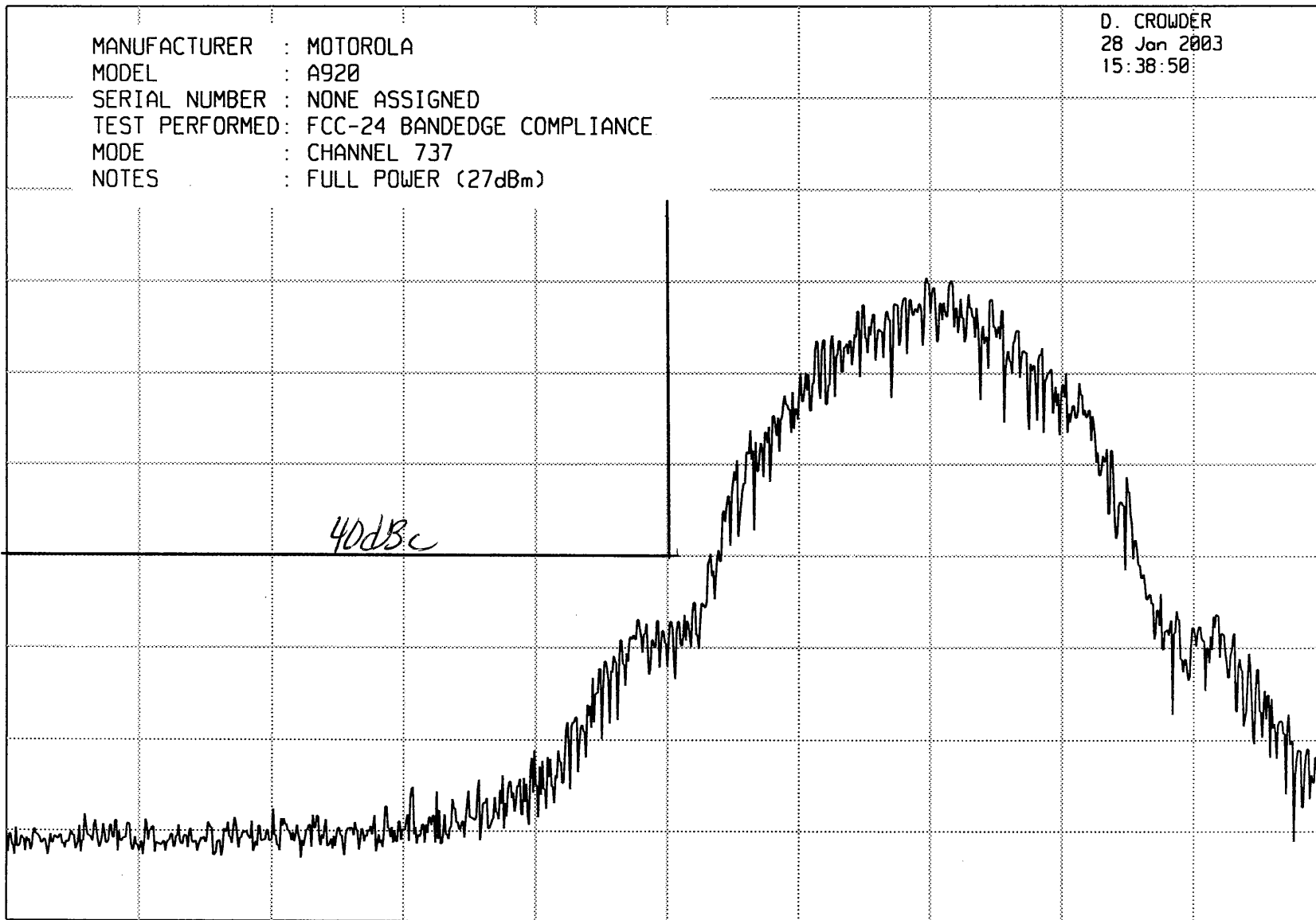
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 737  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:38:50

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ETR 31898-02



CENTER 1.895 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

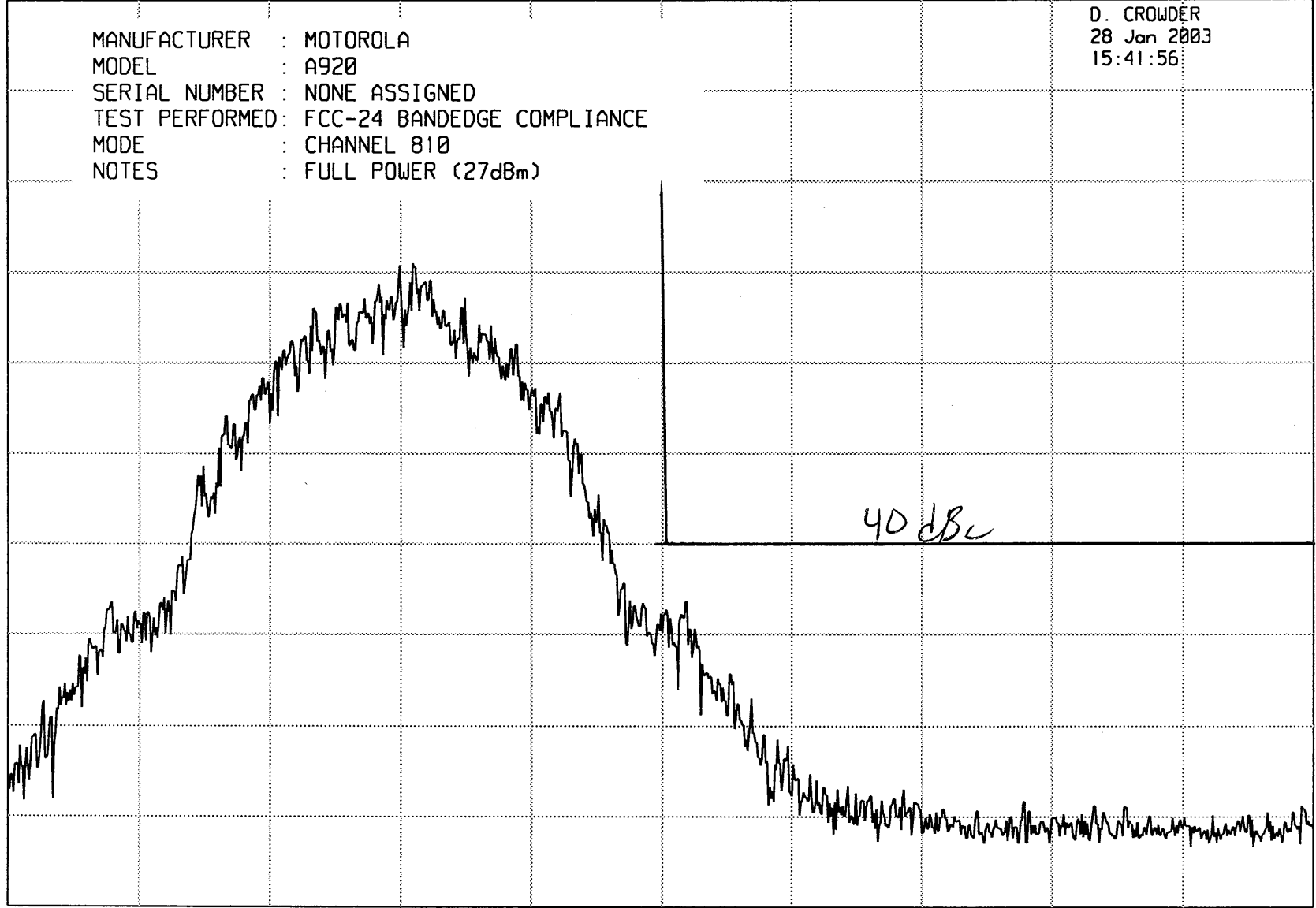
REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 810  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:41:56



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ETR 31898-02

CENTER 1.910 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

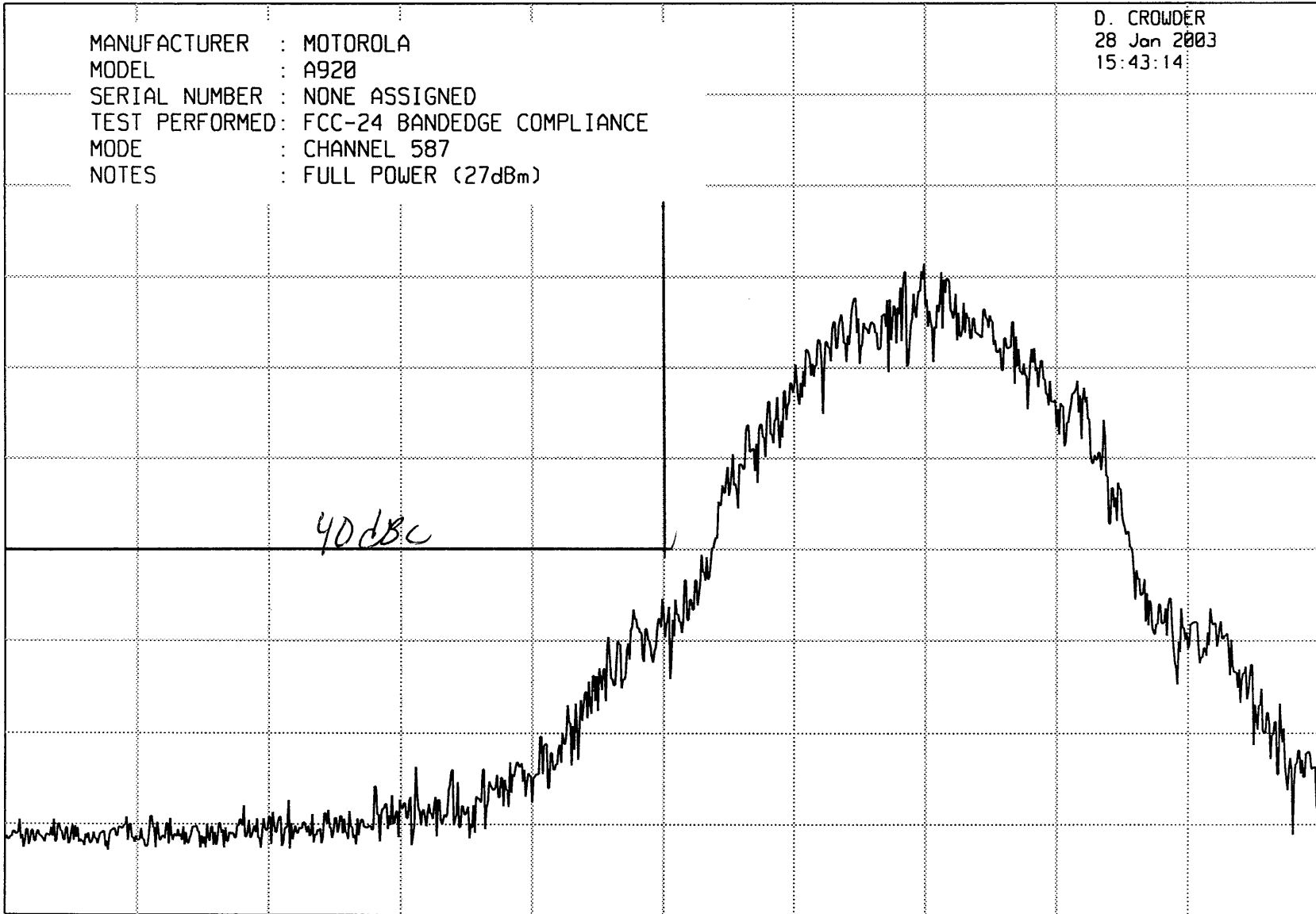
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 587  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:43:14

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ETR 31898-02



CENTER 1.865 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30dB EXT

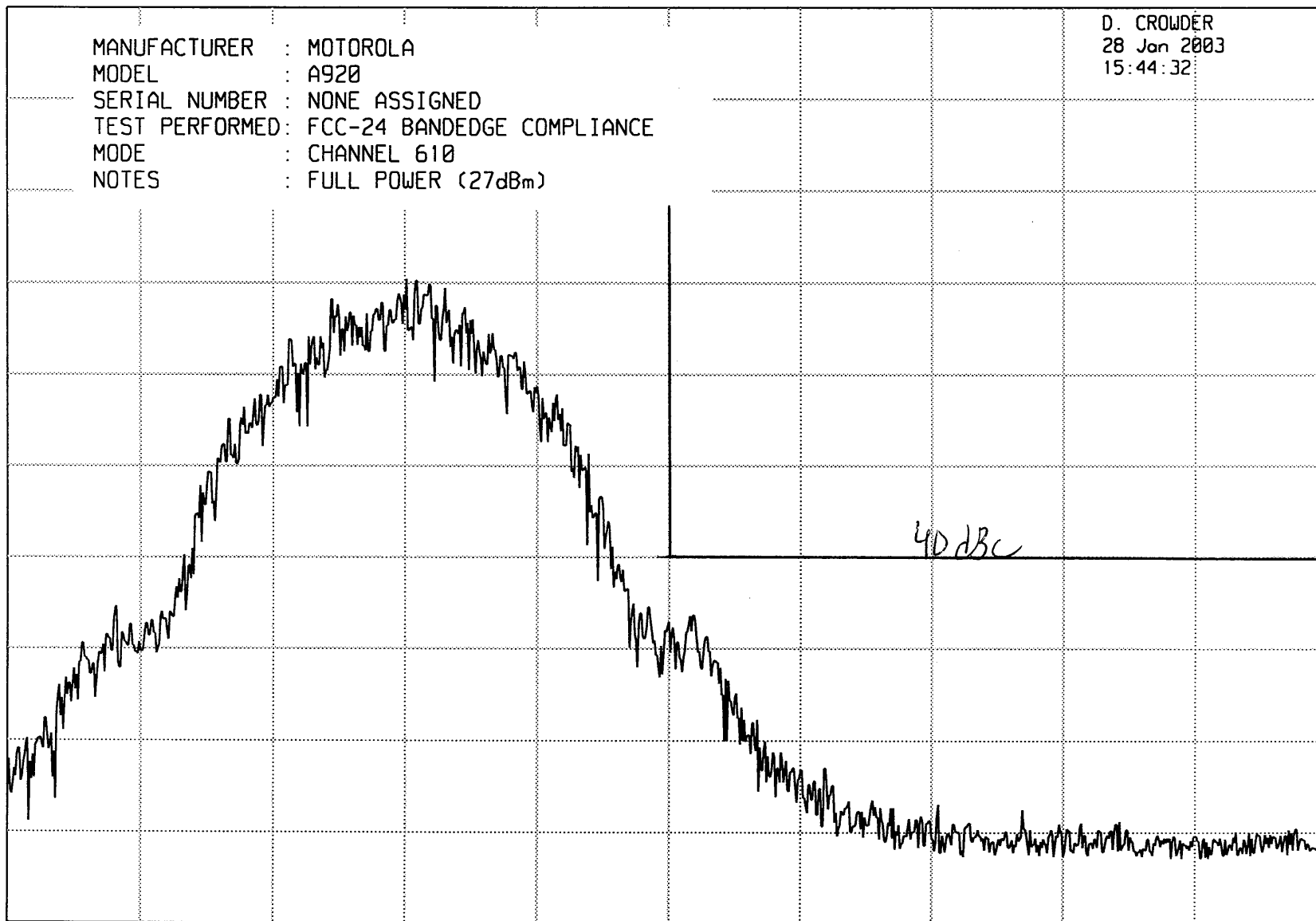
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 610  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:44:32

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ETR 31898-02



CENTER 1.870 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 300<sup>3</sup> EXT

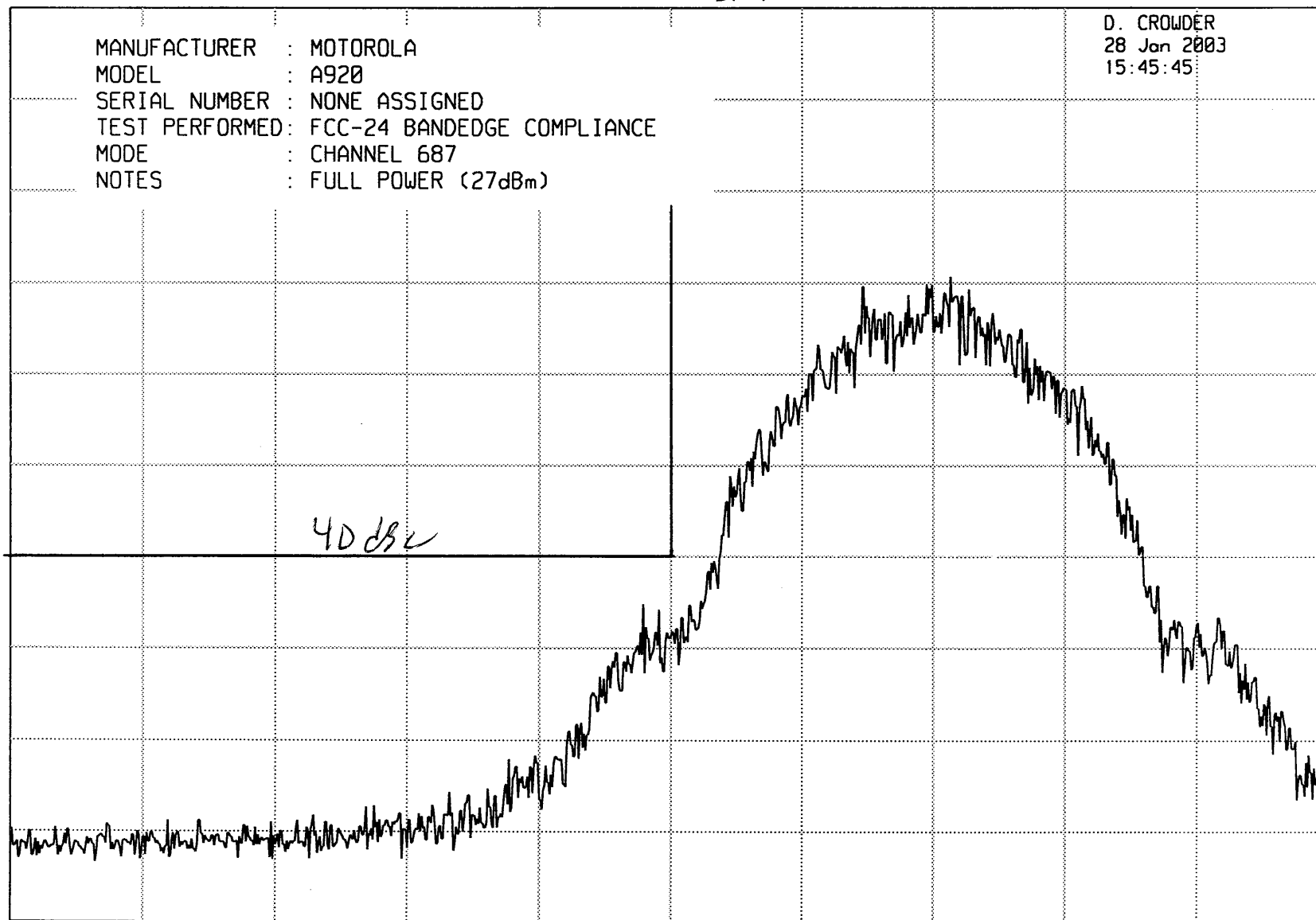
10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 687  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:45:45

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ETR 31898-02



CENTER 1.885 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

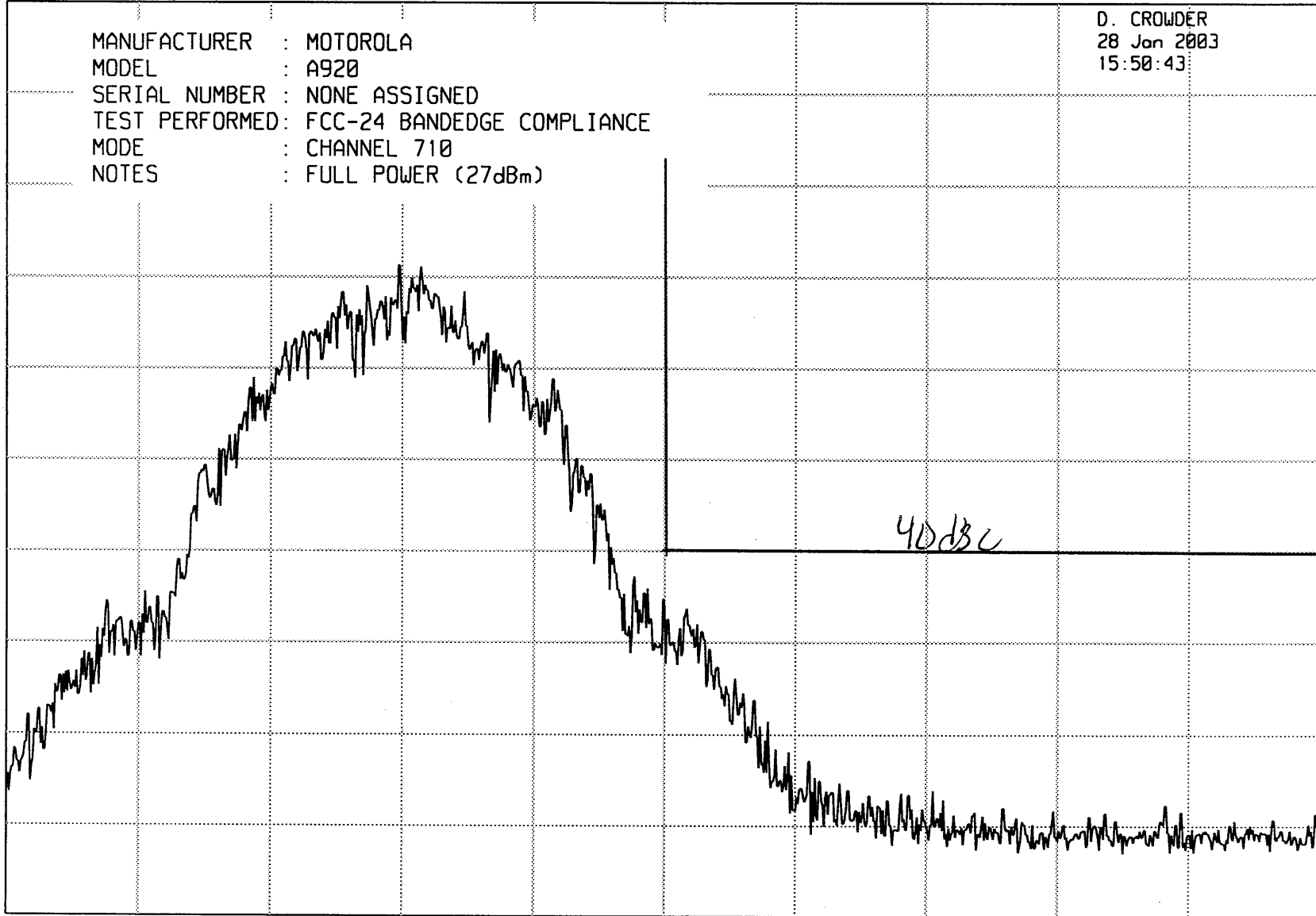
REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED : FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 710  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:50:43



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ETR 31898-02

CENTER 1.890 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

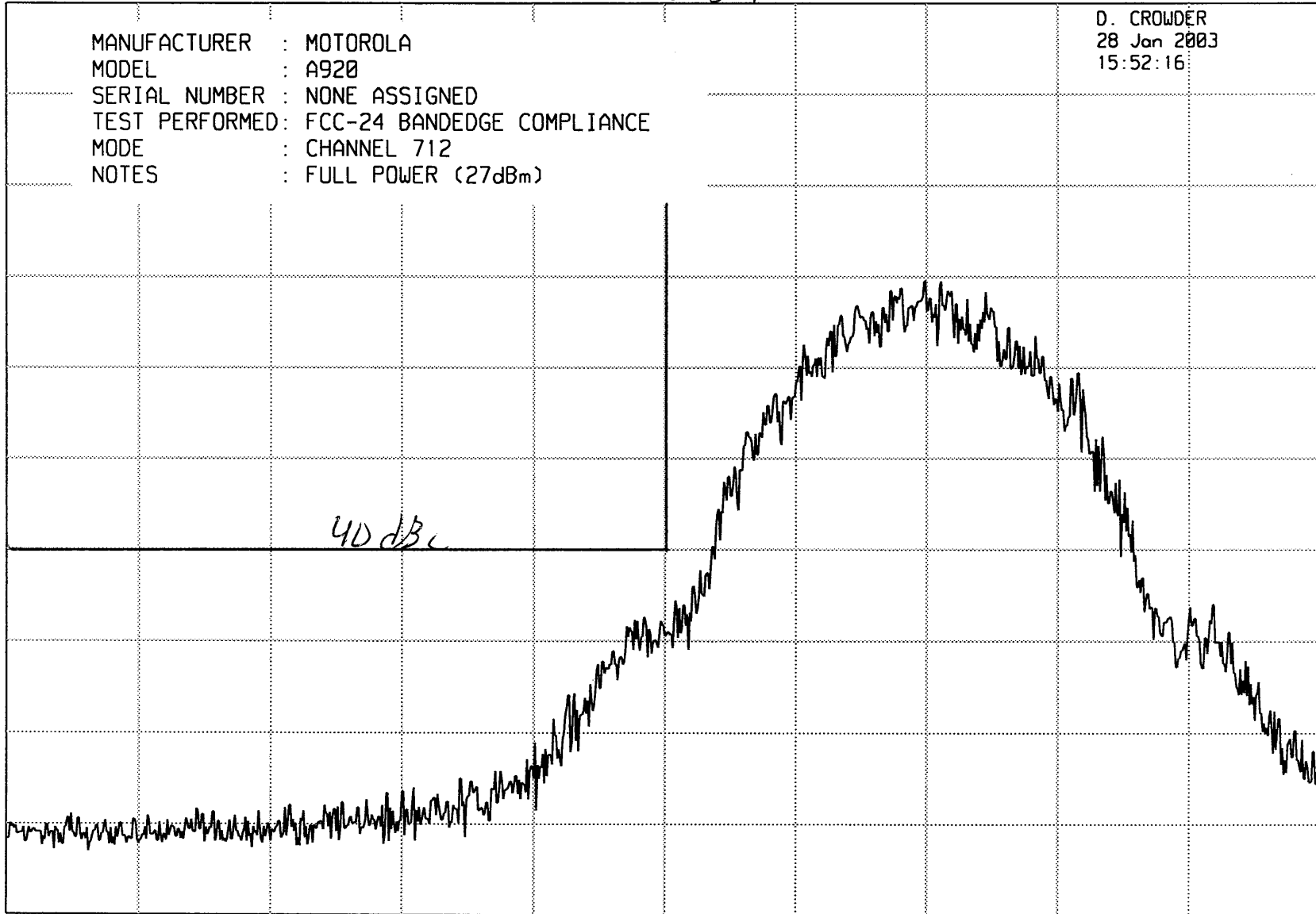
REF 17.0 dBm

ATTEN 30 dB + 30 dB FAT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED: FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 712  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:52:16



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ETR 31898-02

CENTER 1.890 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

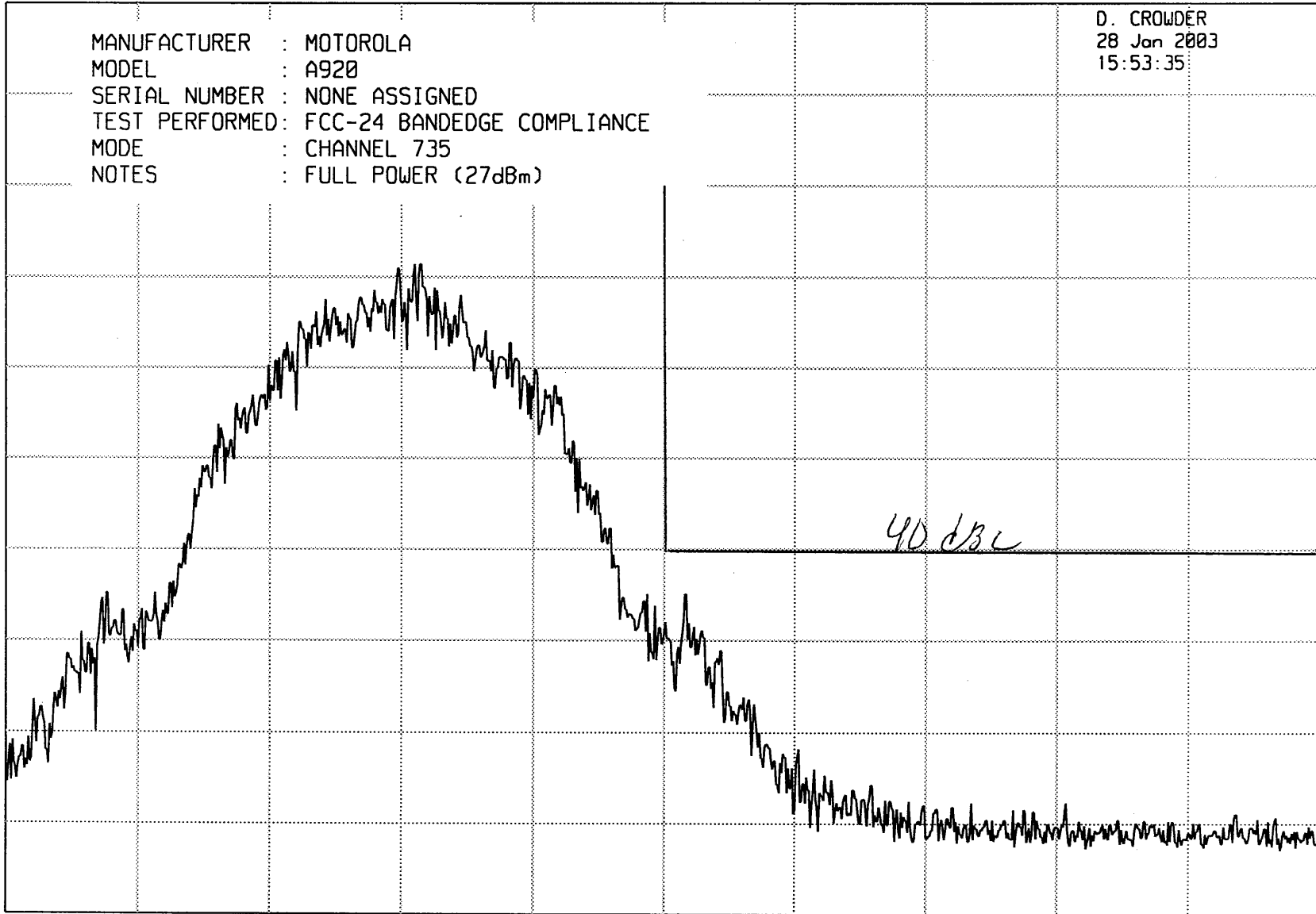
REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NUMBER : NONE ASSIGNED  
TEST PERFORMED : FCC-24 BANDEDGE COMPLIANCE  
MODE : CHANNEL 735  
NOTES : FULL POWER (27dBm)

D. CROWDER  
28 Jan 2003  
15:53:35



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ETR 31898-02

CENTER 1.895 00 GHz

RES BW 3 kHz(i)

VBW 30 kHz

SPAN 1.00 MHz

SWP 750 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB Ext

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 549  
NOTES : FULL POWER

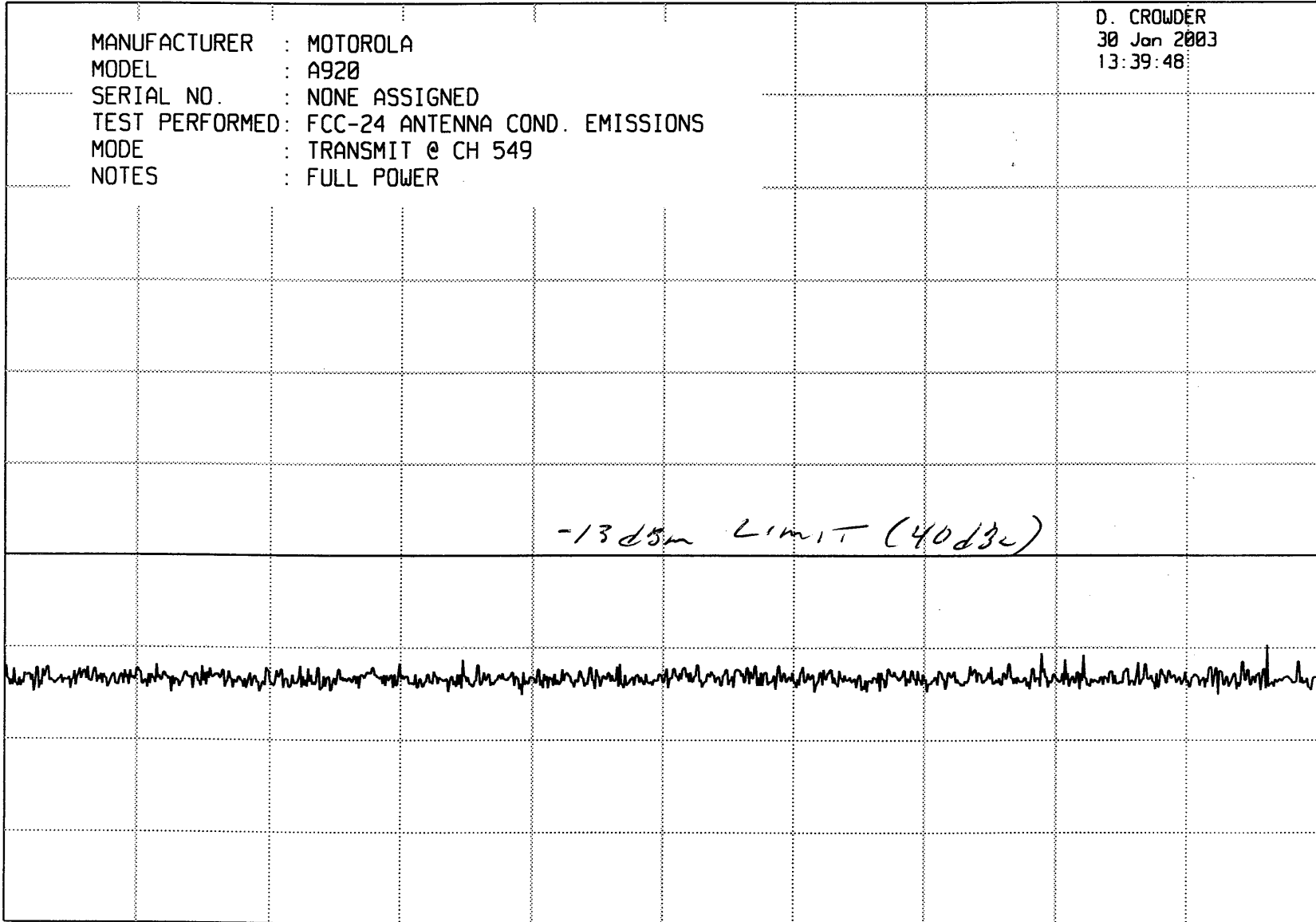
D. CROWDER  
30 Jan 2003  
13:39:48

OFFSET  
-10.0  
dB

DL  
-43.0  
dBm

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-13 dBm Limit (40 dBc)



START 30 MHz

RES BW 100 kHz(i)

UBW 1 MHz

STOP 1.000 GHz

SWP 728 msec

ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

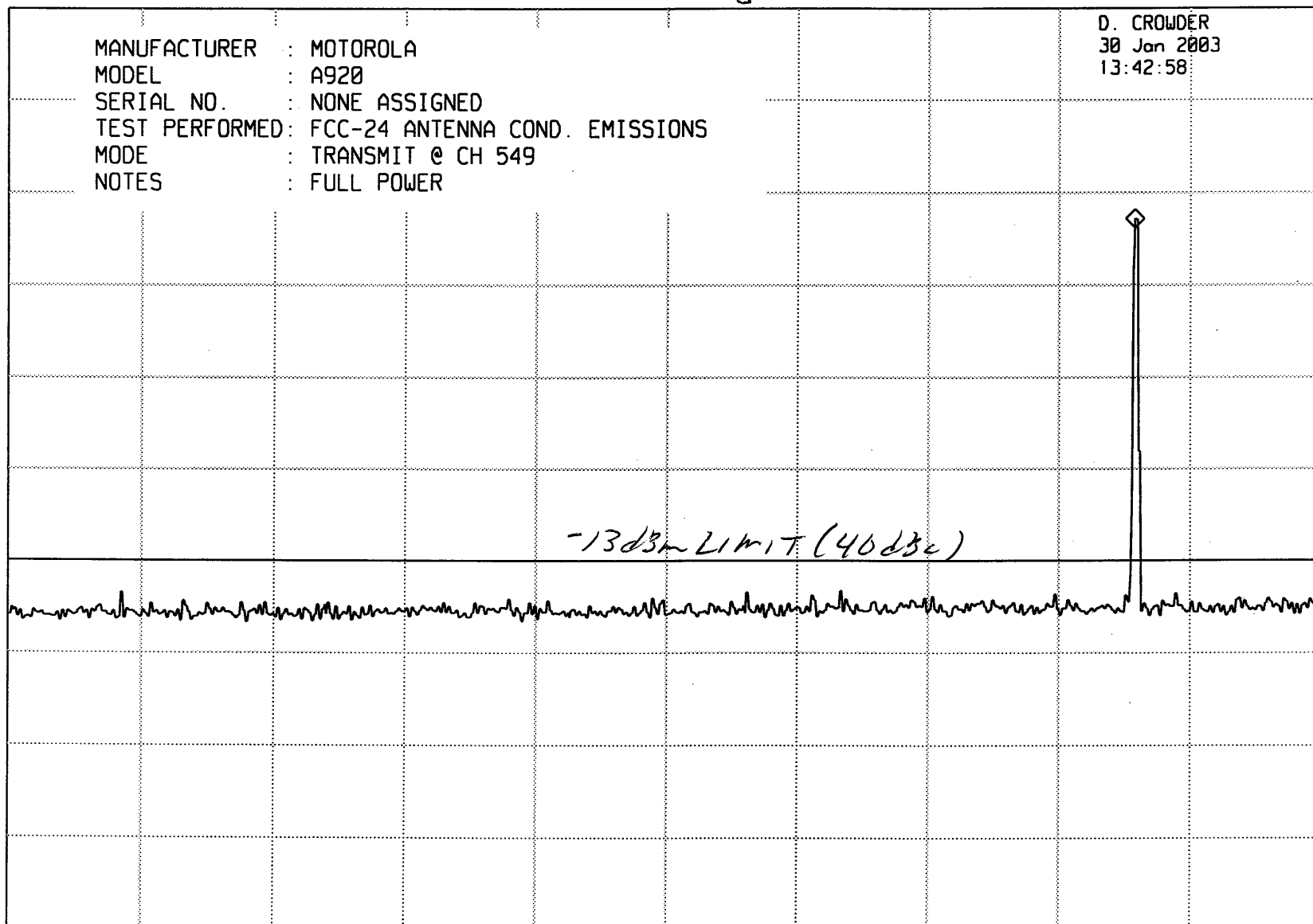
MKR 1.857 GHz  
-5.80 dBm

REF 17.0 dBm

ATTEN 30 dB + 30 dB Ext

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 549  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:42:58



10 dB/

DL  
-43.0  
dBm

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START 1.00 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF -3.0 dBm

ATTEN 10 dB + 30 dB EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 549  
NOTES : FULL POWER

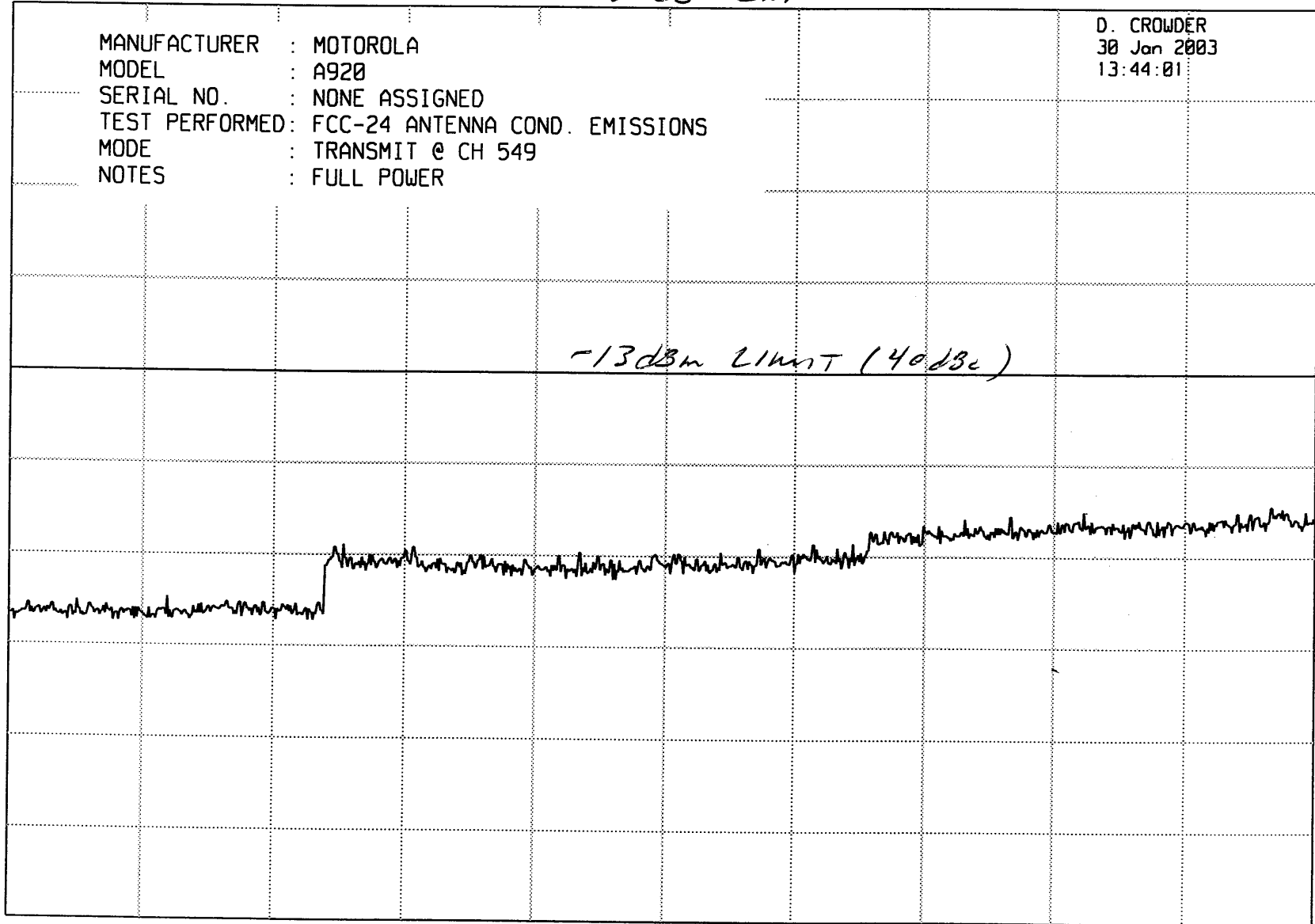
D. CROWDER  
30 Jan 2003  
13:44:01

DL  
-43.0  
dBm

-13 dBm LIMIT (40 dBc)

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ETR 31898-02



START 2.0 GHz

RES BW 1 MHz(i)

UBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB Ext

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 649  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:45:09

DL  
-43.0  
dBm

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-13 dBm Limit (40 dBc)

START 30 MHz

RES BW 100 kHz(i)

UBW 1 MHz

STOP 1.000 GHz

SWP 728 msec

ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

MKR 1.877 GHz

-5.80 dBm

10 dB/

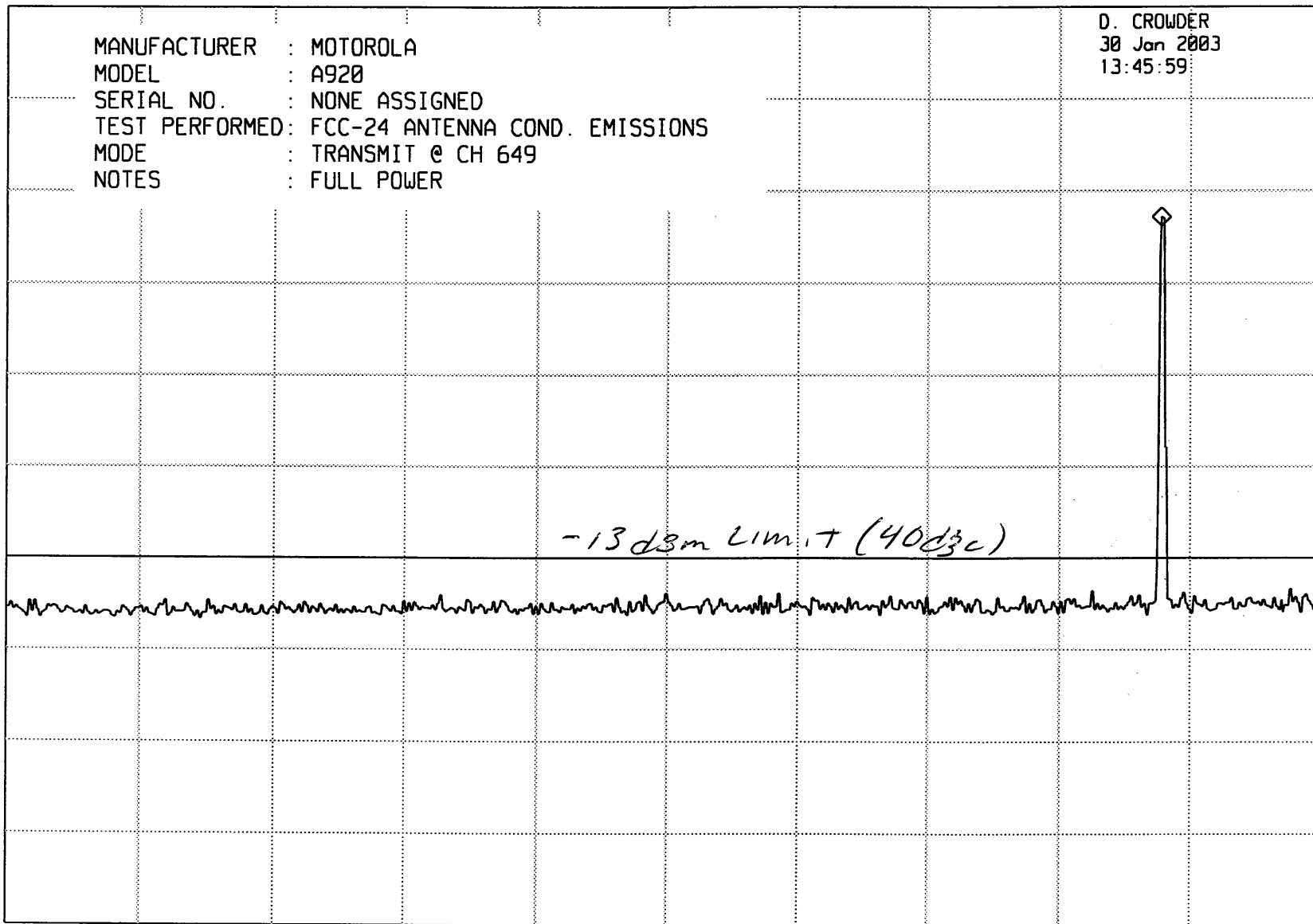
MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 649  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:45:59

DL  
-43.0  
dBm

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ETR 31898-02



START 1.00 GHz

RES BW 1 MHz(i)

UBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

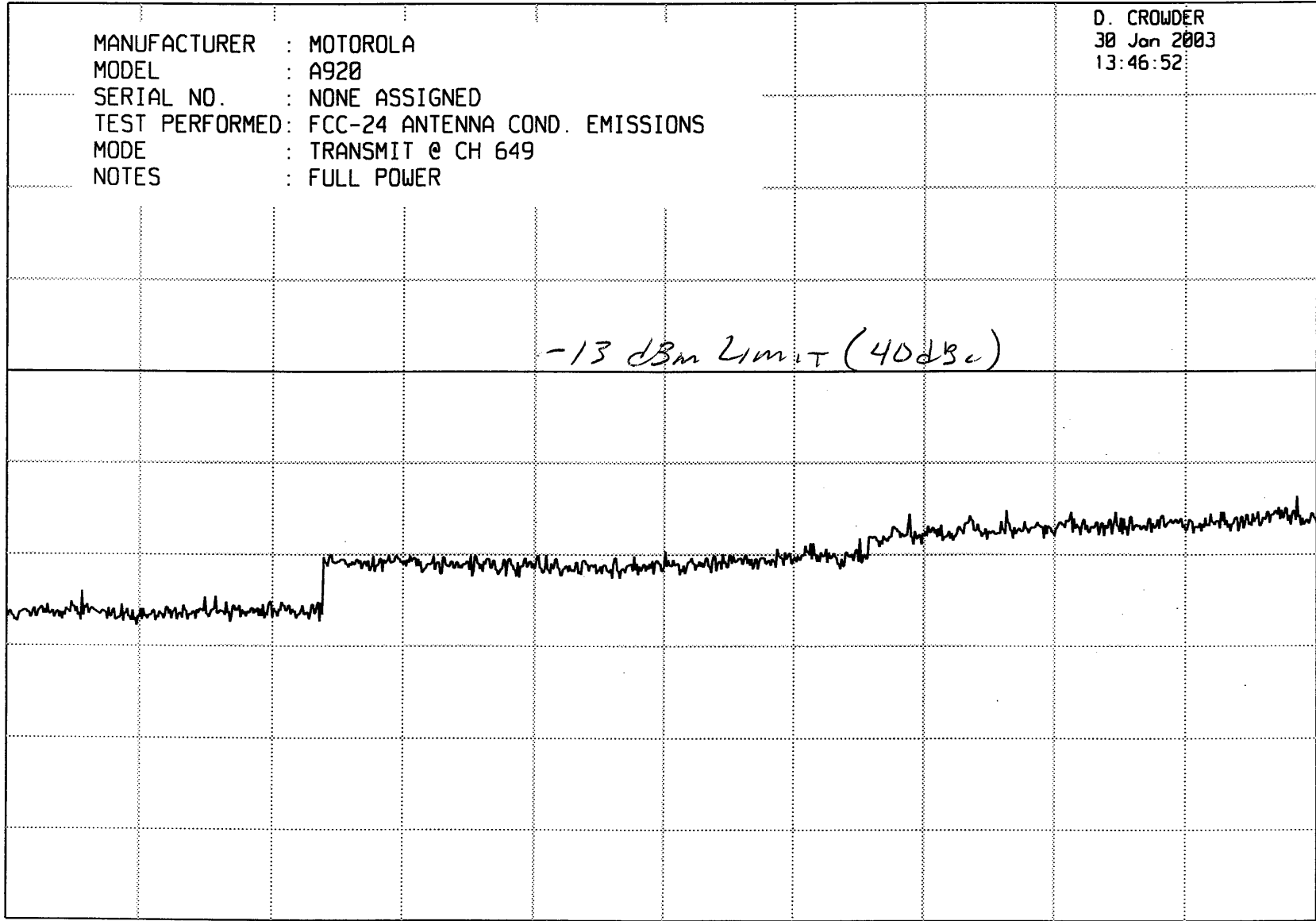
REF -3.0 dBm

ATTEN 10 dB + 30dB EXT

10 dB/

DL  
-43.0  
dBm

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START 2.0 GHz

RES BW 1 MHz(i)

UBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 774  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:48:12

DL

-43.0  
dBm

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-13 dBm Limit (40dBc)

ETR 31898-02

START 30 MHz

RES BW 100 kHz(i)

VBW 1 MHz

STOP 1.000 GHz

SWP 728 msec

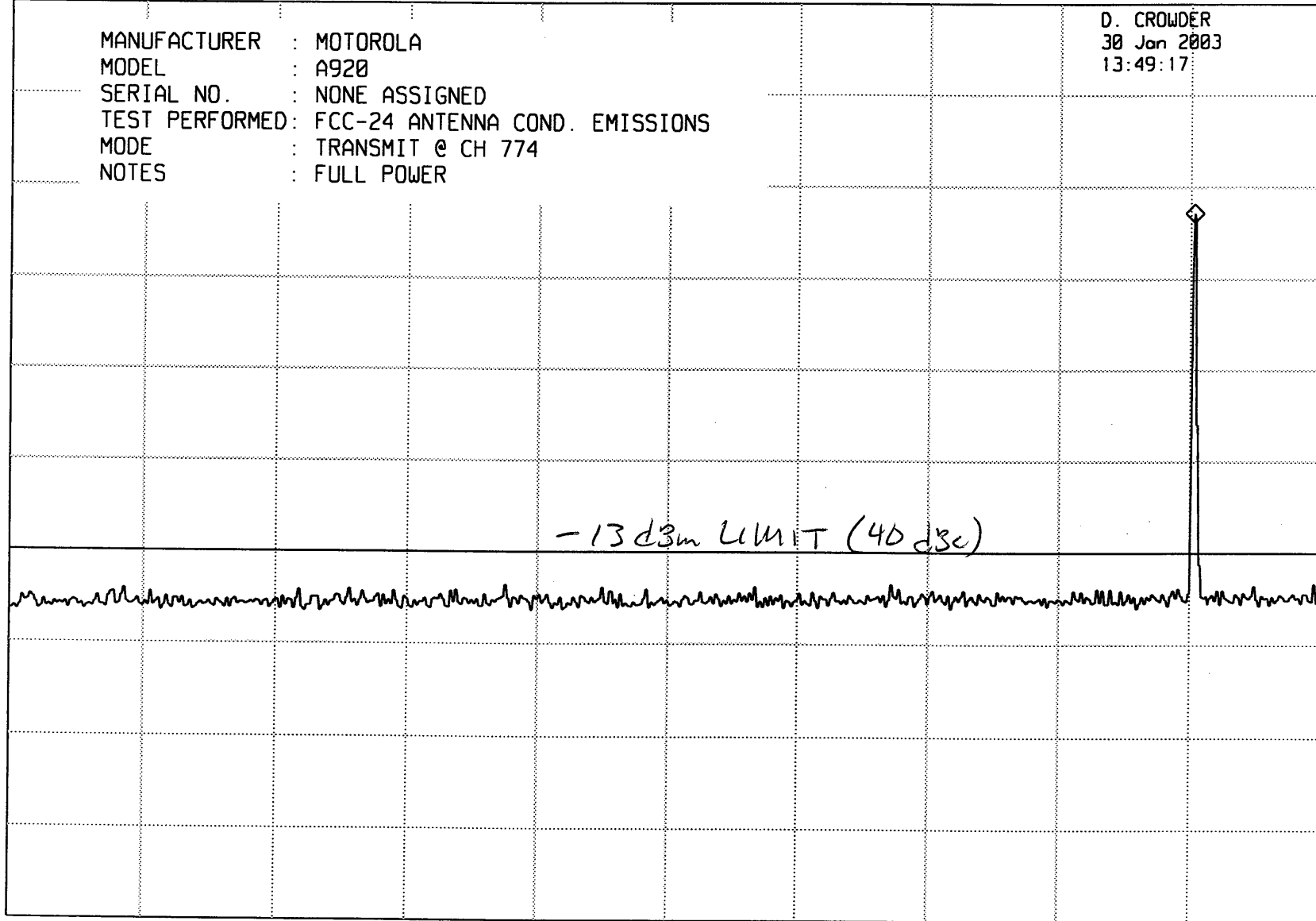
ELITE ELECTRONIC ENGINEERING Inc.

MKR 1.902 GHz  
-5.80 dBm

REF 17.0 dBm      ATTEN 30 dB + 30dB EXT

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 774  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:49:17



hp

10 dB/

DL

-43.0  
dBm

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ETR 31898-02

START 1.00 GHz

RES BW 1 MHz(i)

UBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF -3.0 dBm

ATTEN 10 dB + 30 dB EXT

10 dB/

DL  
-43.0  
dBm

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MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 774  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:50:08

-13 dBm LIMIT (40 dBc)

ETR 31898-02

START 2.0 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp REF 17.0 dBm ATTEN 30 dB + 30 dB EXT

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 599  
NOTES : FULL POWER

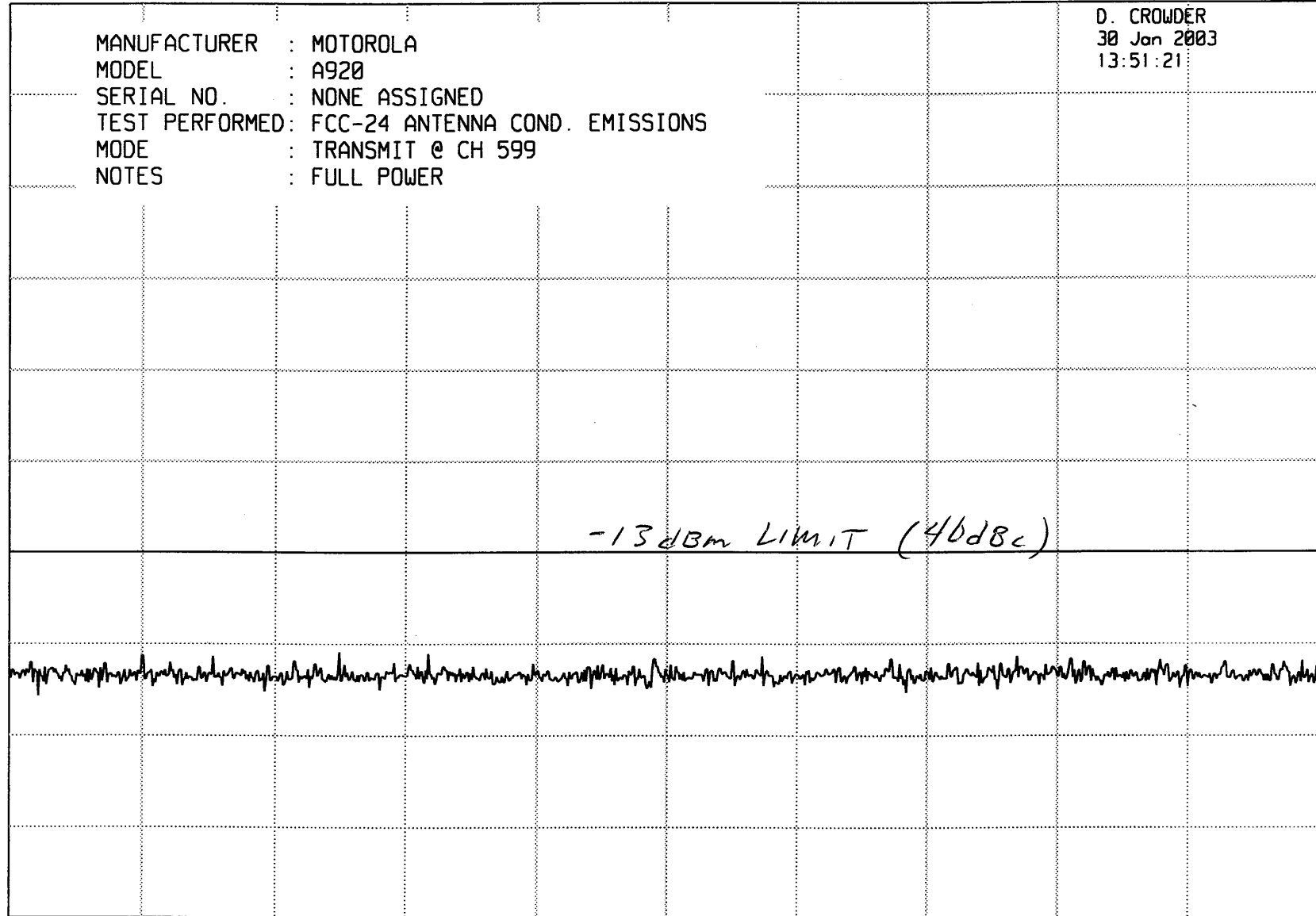
D. CROWDER  
30 Jan 2003  
13:51:21

10 dB/  
DL  
-43.0  
dBm

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ETR 31898-02

-13 dBm LIMIT (40dBc)



START 30 MHz RES BW 100 kHz(i) UBW 1 MHz STOP 1.000 GHz SWP 728 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

MKR 1.867 GHz  
-5.80 dBm

10 dB/

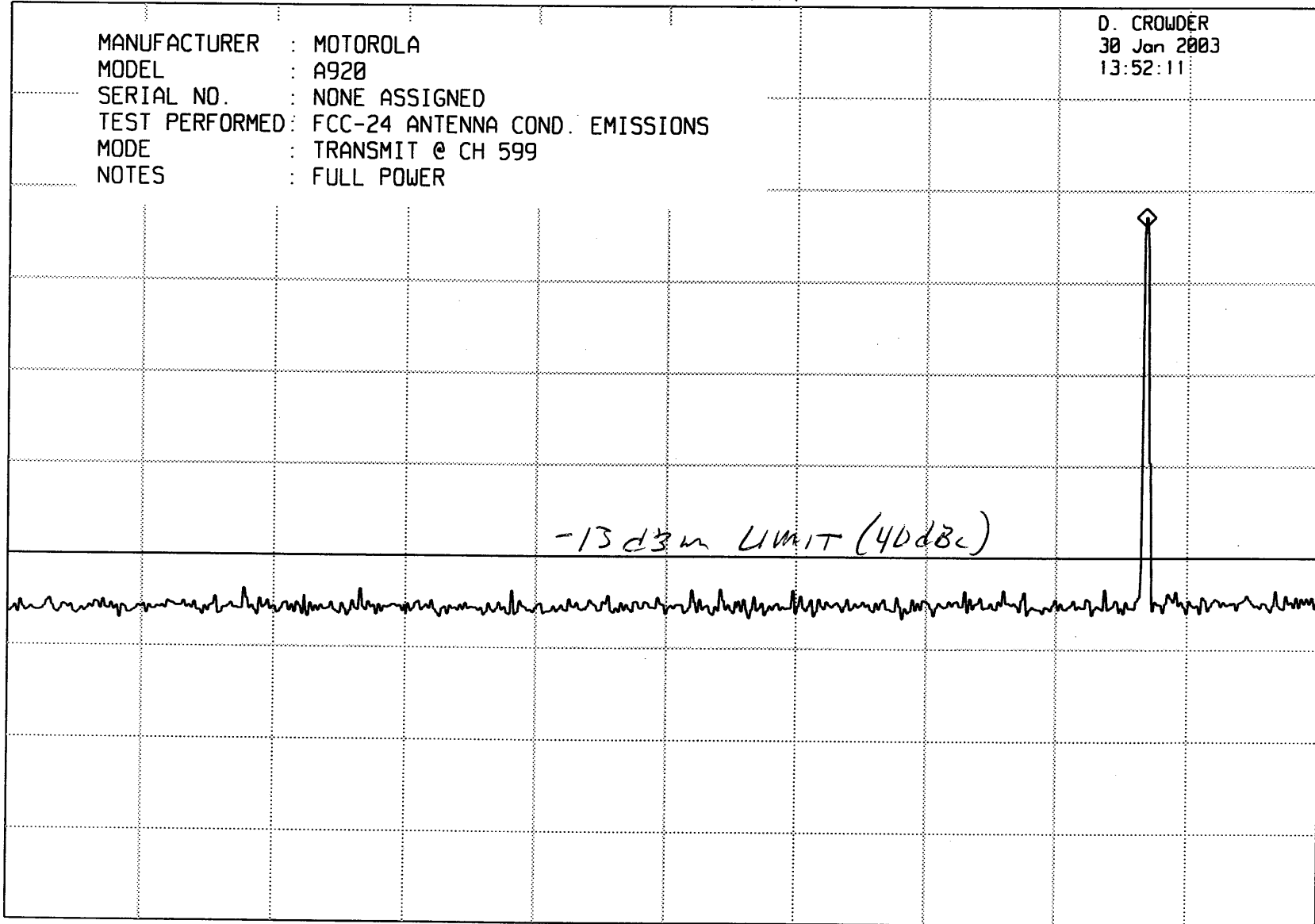
MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 599  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:52:11

DL

-43.0  
dBm

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EPR 31898-02

START 1.00 GHz

RES BW 1 MHz(i)

UBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF -3.0 dBm

ATTEN 10 dB + 30 dB EXT

10 dB/

DL  
-43.0  
dBm

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MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 599  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:53:01

-13 dBm LIMIT (40dBc)

ETR 31898-02

START 2.0 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

10 dB/

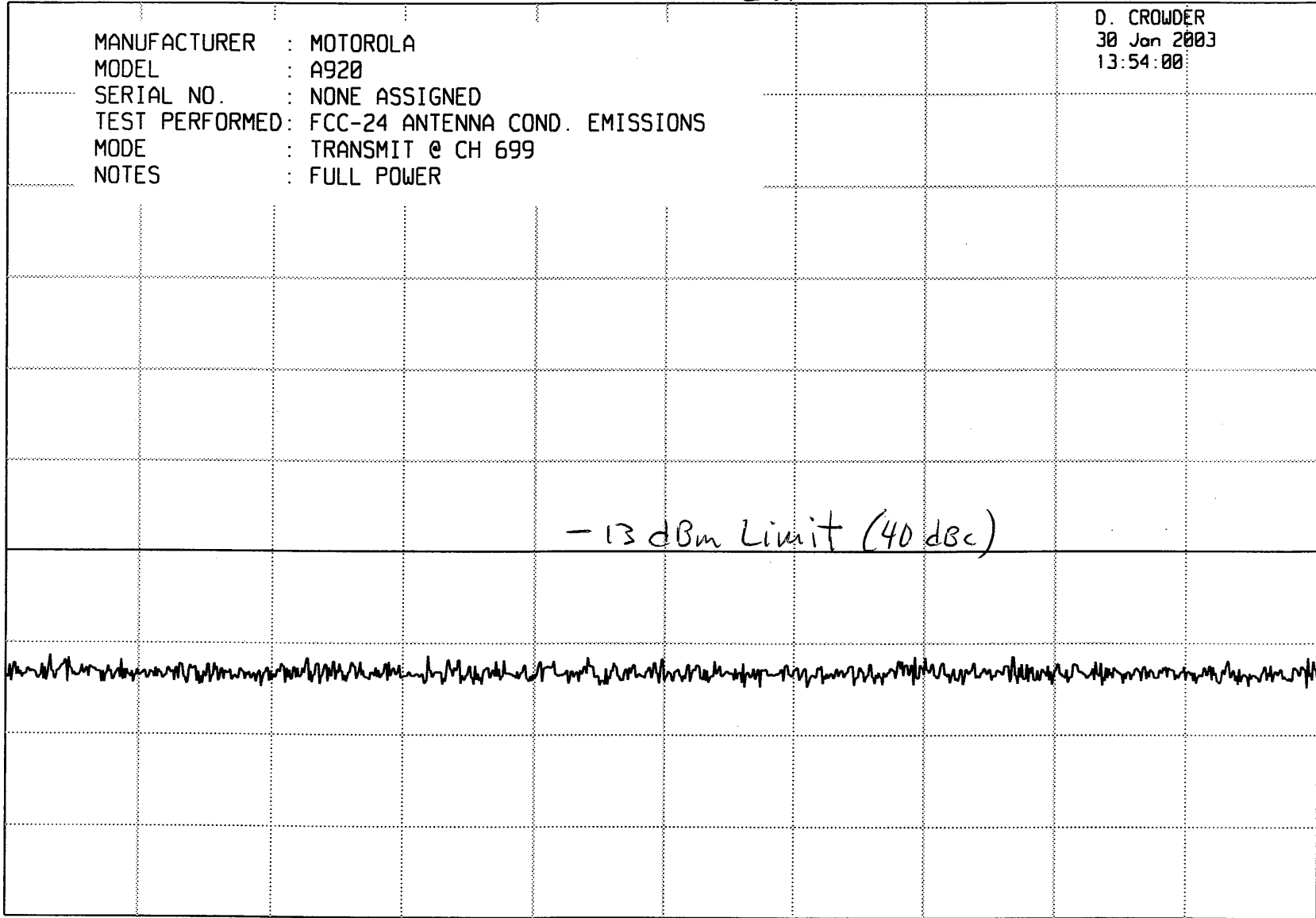
DL  
-43.0  
dBm

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MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 699  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:54:00

-13 dBm Limit (40 dBc)



START 30 MHz

RES BW 100 kHz(i)

VBW 1 MHz

STOP 1.000 GHz

SWP 728 msec

ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB EXT

MKR 1.888 GHz

-5.60 dBm

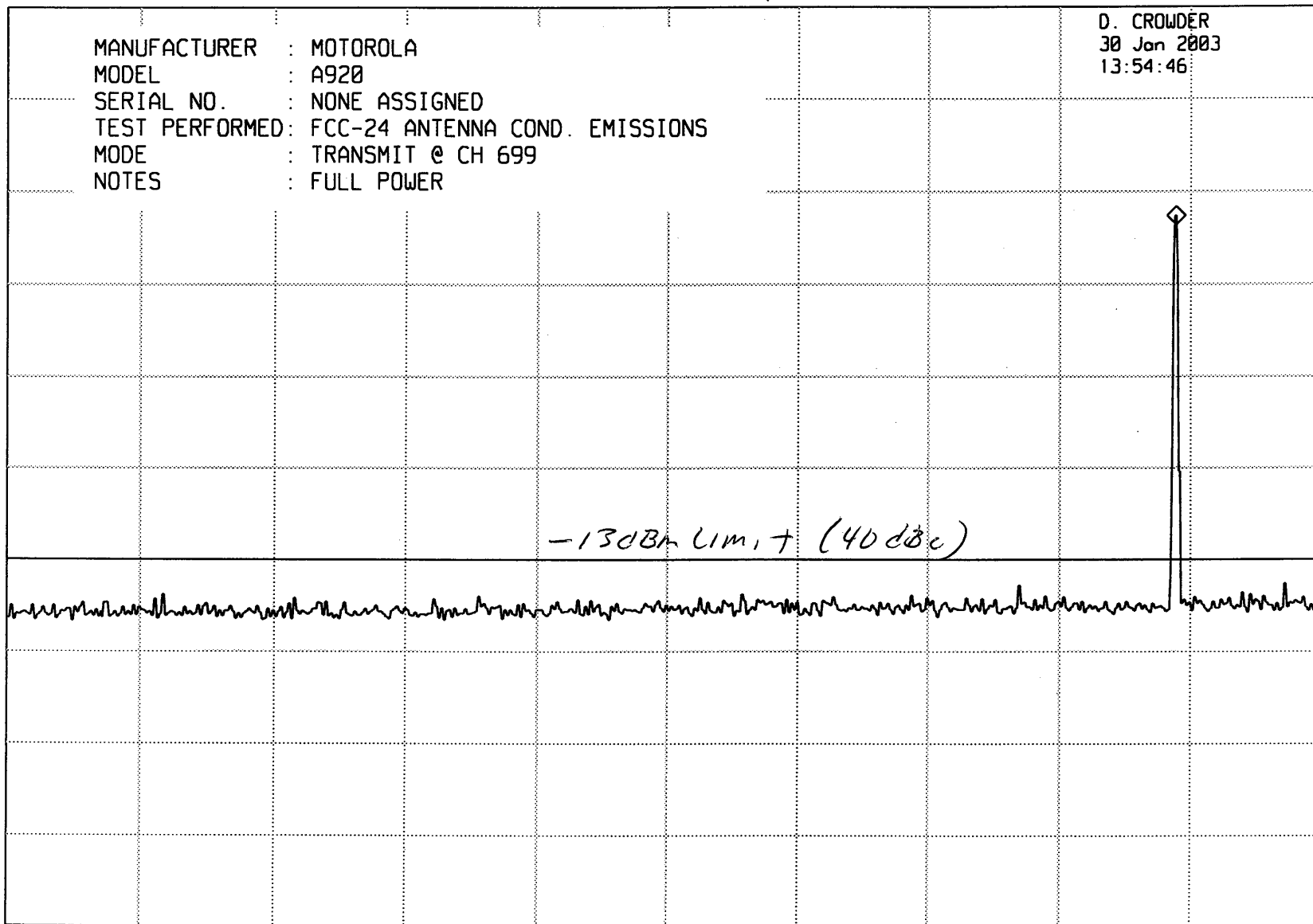
10 dB/

DL  
-43.0  
dBm

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MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 699  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:54:46



FTR 31898-02

START 1.00 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF -3.0 dBm

ATTEN 10 dB + 30 dB EXT

10 dB/

DL  
-43.0  
dBm

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D. CROWDER  
30 Jan 2003  
13:55:41

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 699  
NOTES : FULL POWER

-13 dBm LIMIT (40dBc)

ETR 31898-02

START 2.0 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dBm EXT

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 724  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:56:36

DL

-43.0  
dBm

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-13 dBm Limit (40dBc)

ETR 31898-02

START 30 MHz

RES BW 100 kHz(i)

UBW 1 MHz

STOP 1.000 GHz

SWP 728 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF 17.0 dBm

ATTEN 30 dB + 30 dB Ext

MKR 1.892 GHz

-5.60 dBm

10 dB/

MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED: FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 724  
NOTES : FULL POWER

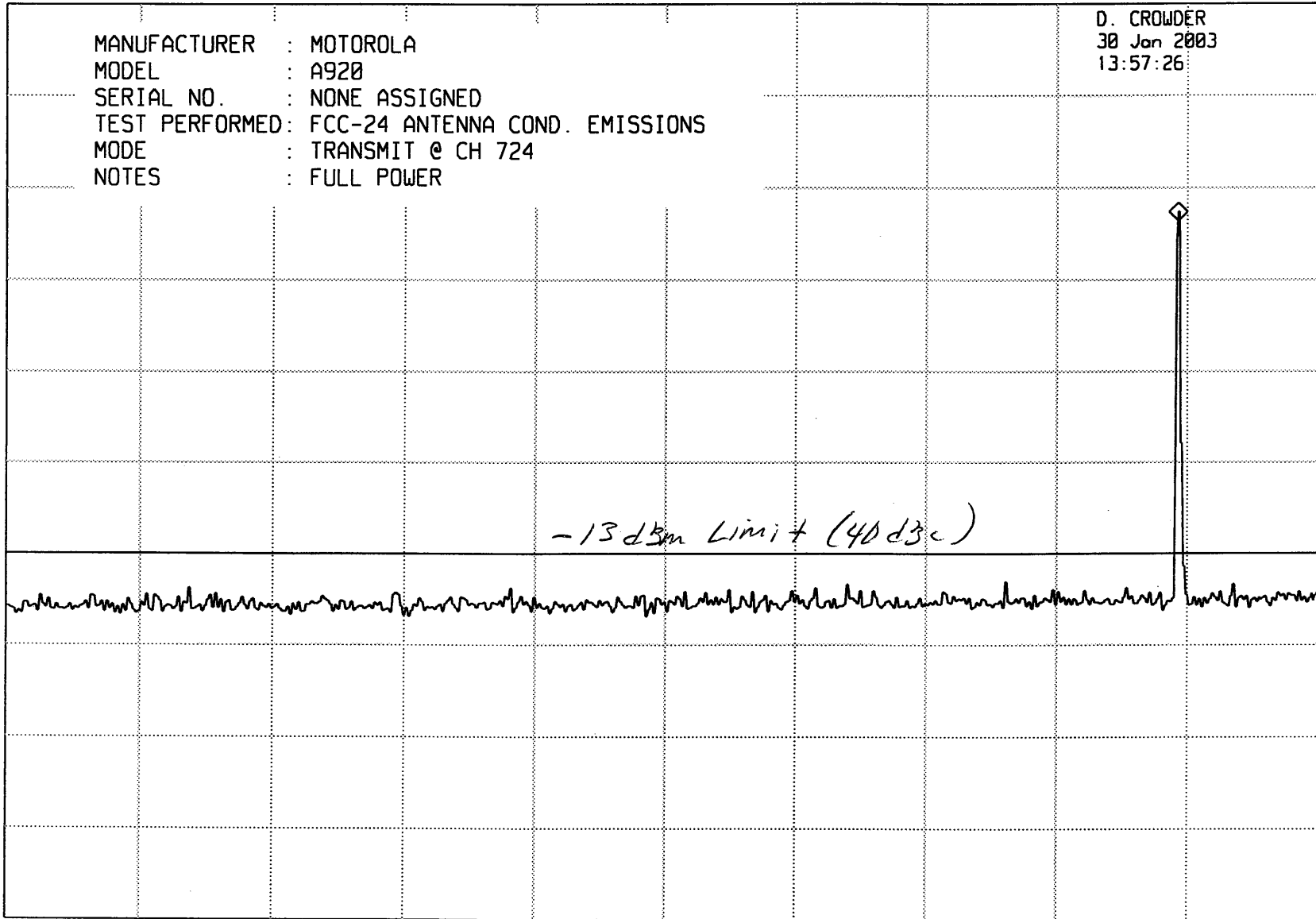
D. CROWDER  
30 Jan 2003  
13:57:26

DL  
-43.0  
dBm

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ETR 31898-02

*-13 dBm Limit (40 dBc)*



START 1.00 GHz

RES BW 1 MHz(i)

VBW 3 MHz

STOP 2.00 GHz

SWP 25.0 msec

ELITE ELECTRONIC ENGINEERING Inc.

hp

REF -3.0 dBm

ATTEN 10 dB + 30 dB EXT

10 dB/

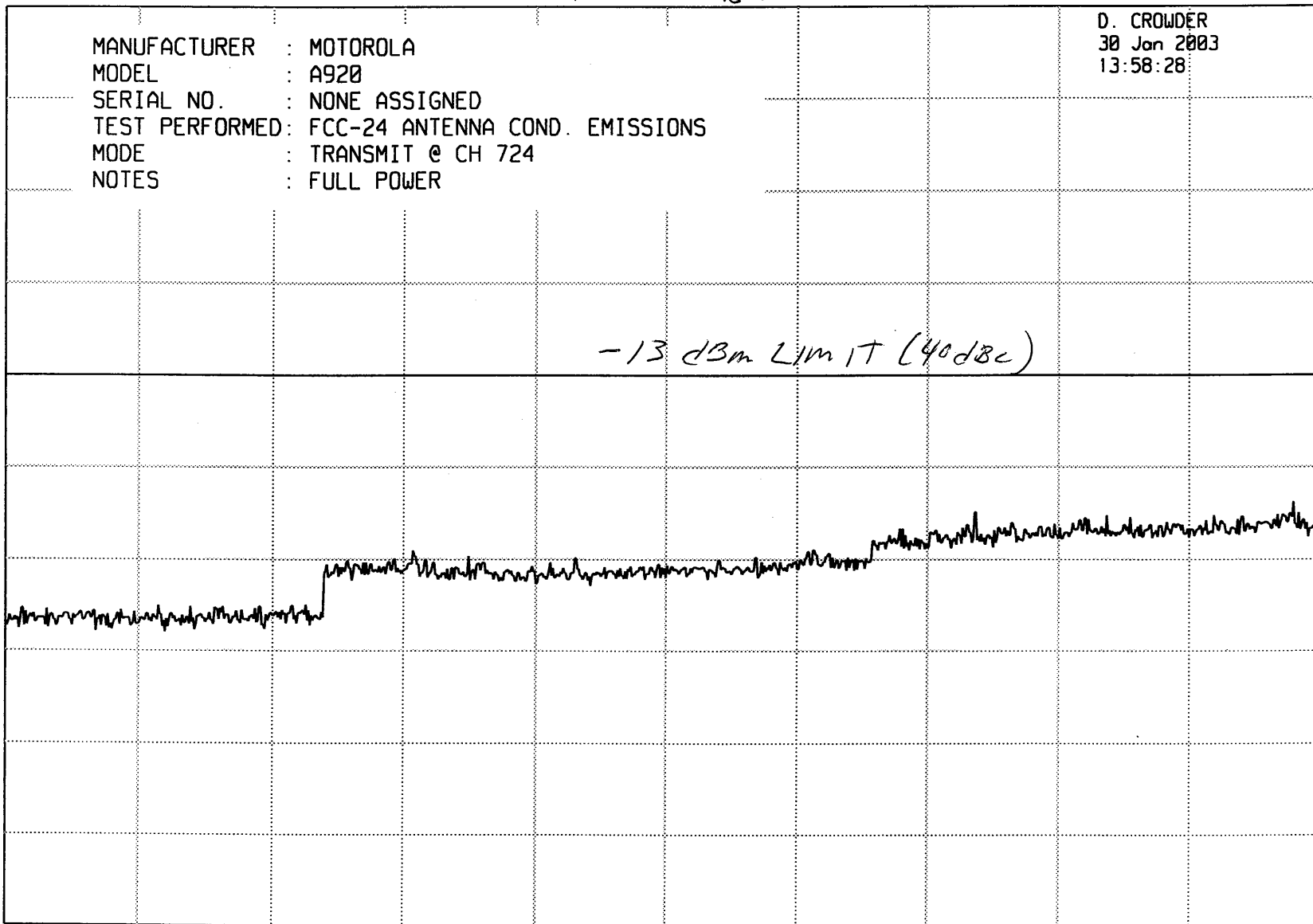
DL  
-43.0  
dBm

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MANUFACTURER : MOTOROLA  
MODEL : A920  
SERIAL NO. : NONE ASSIGNED  
TEST PERFORMED : FCC-24 ANTENNA COND. EMISSIONS  
MODE : TRANSMIT @ CH 724  
NOTES : FULL POWER

D. CROWDER  
30 Jan 2003  
13:58:28

-13 dBm Limit (40dBc)



START 2.0 GHz

RES BW 1 MHz (i)

VBW 3 MHz

STOP 18.0 GHz

SWP 400 msec

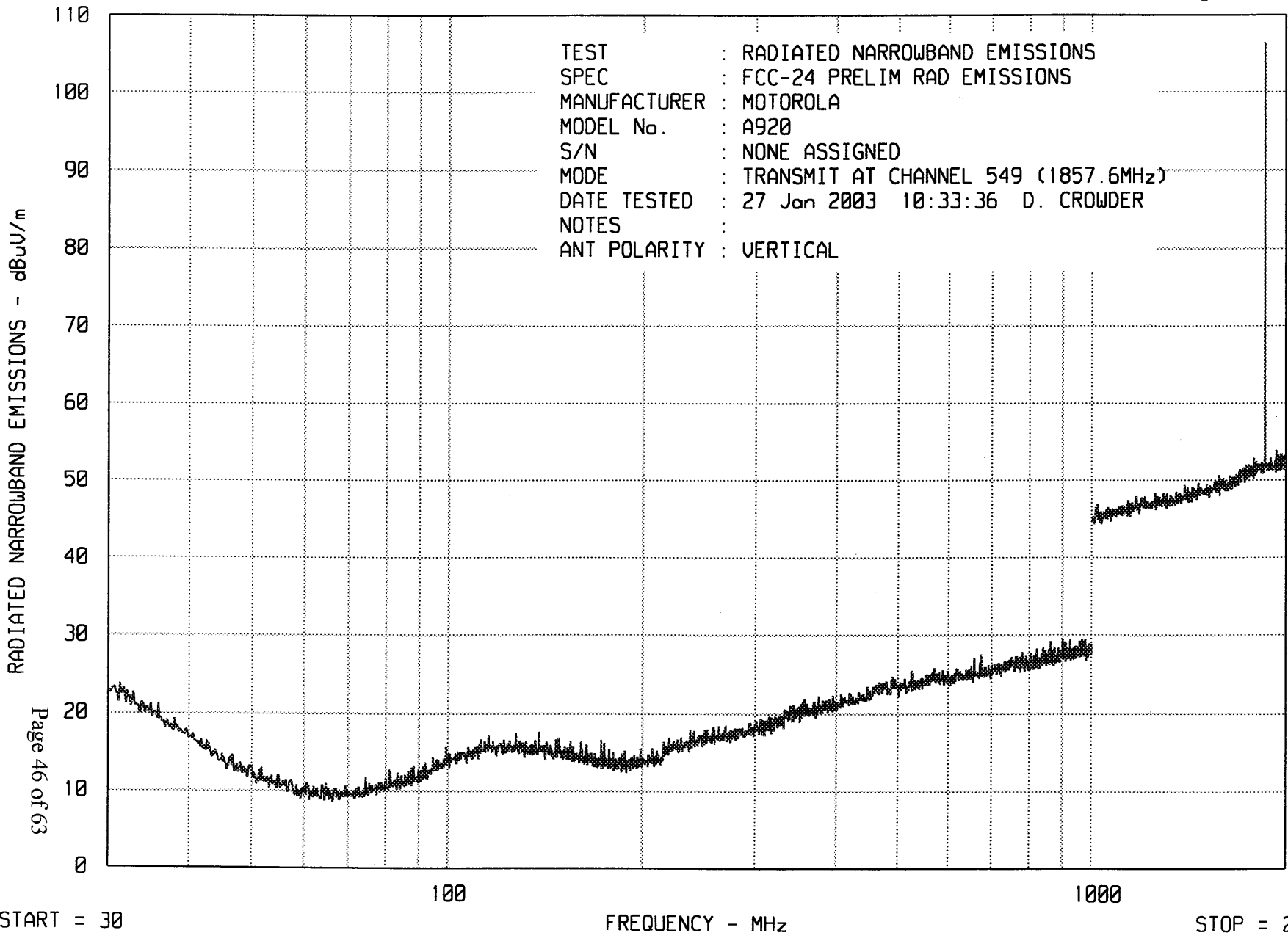
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA0 11/15/02

UNIV\_EM RUN RUN 2



START = 30

FREQUENCY - MHz

STOP = 2000

RADIATED NARROWBAND EMISSIONS - dBµV/m

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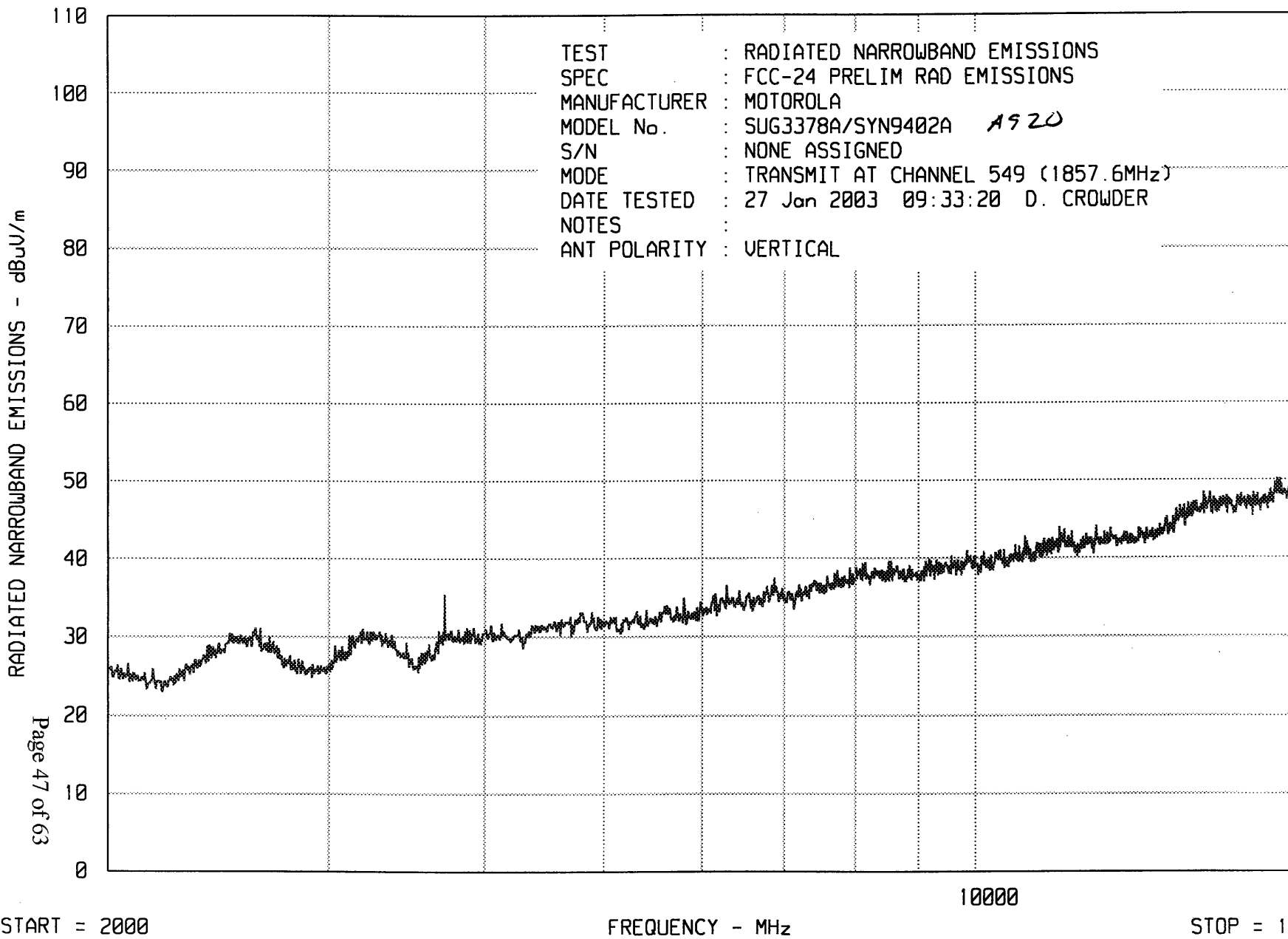
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA0 11/15/02

UNIV\_EM RUN RUN 1



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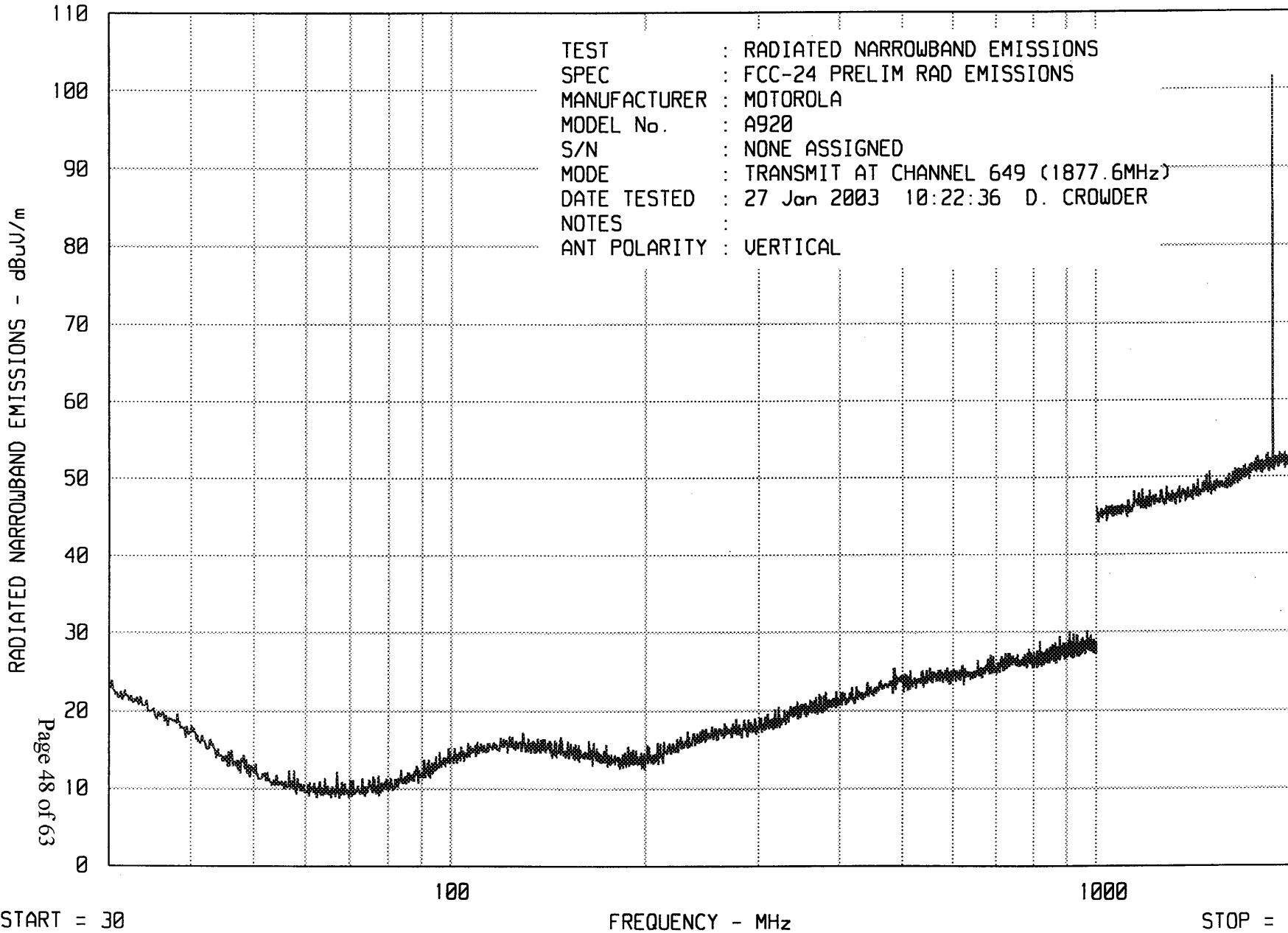
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.  
Downers Grove, Ill. 60515

WKA00 11/15/02

UNIV\_EM RUN RUN 2

TEST : RADIATED NARROWBAND EMISSIONS  
SPEC : FCC-24 PRELIM RAD EMISSIONS  
MANUFACTURER : MOTOROLA  
MODEL No. : A920  
S/N : NONE ASSIGNED  
MODE : TRANSMIT AT CHANNEL 649 (1877.6MHz)  
DATE TESTED : 27 Jan 2003 10:22:36 D. CROWDER  
NOTES :  
ANT POLARITY : VERTICAL



START = 30

FREQUENCY - MHz

STOP = 2000

RADIATED NARROWBAND EMISSIONS - dBµV/m

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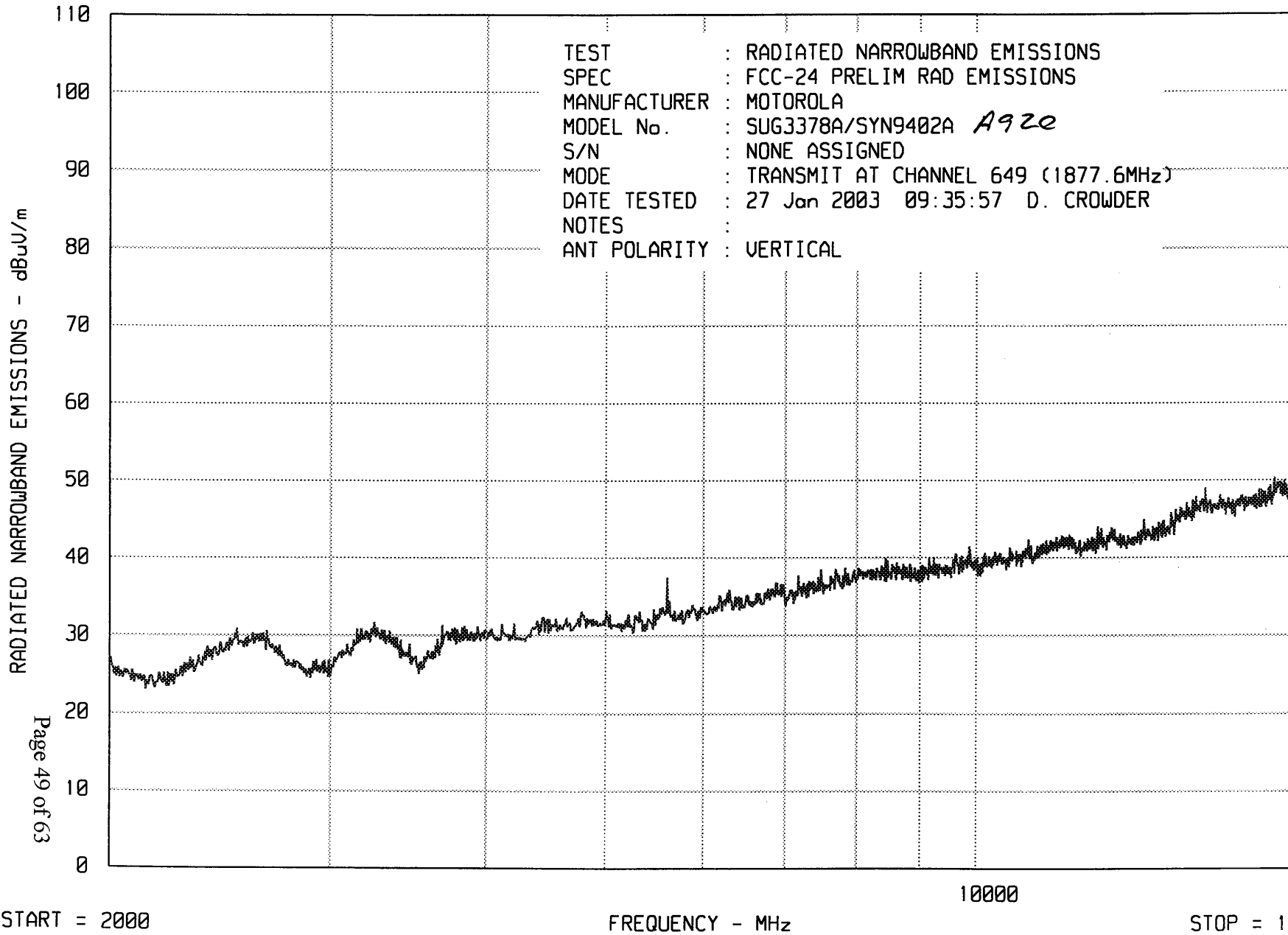
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKAB 11/15/02

UNIV\_EM RUN RUN 1



RADIATED NARROWBAND EMISSIONS - dBµV/m

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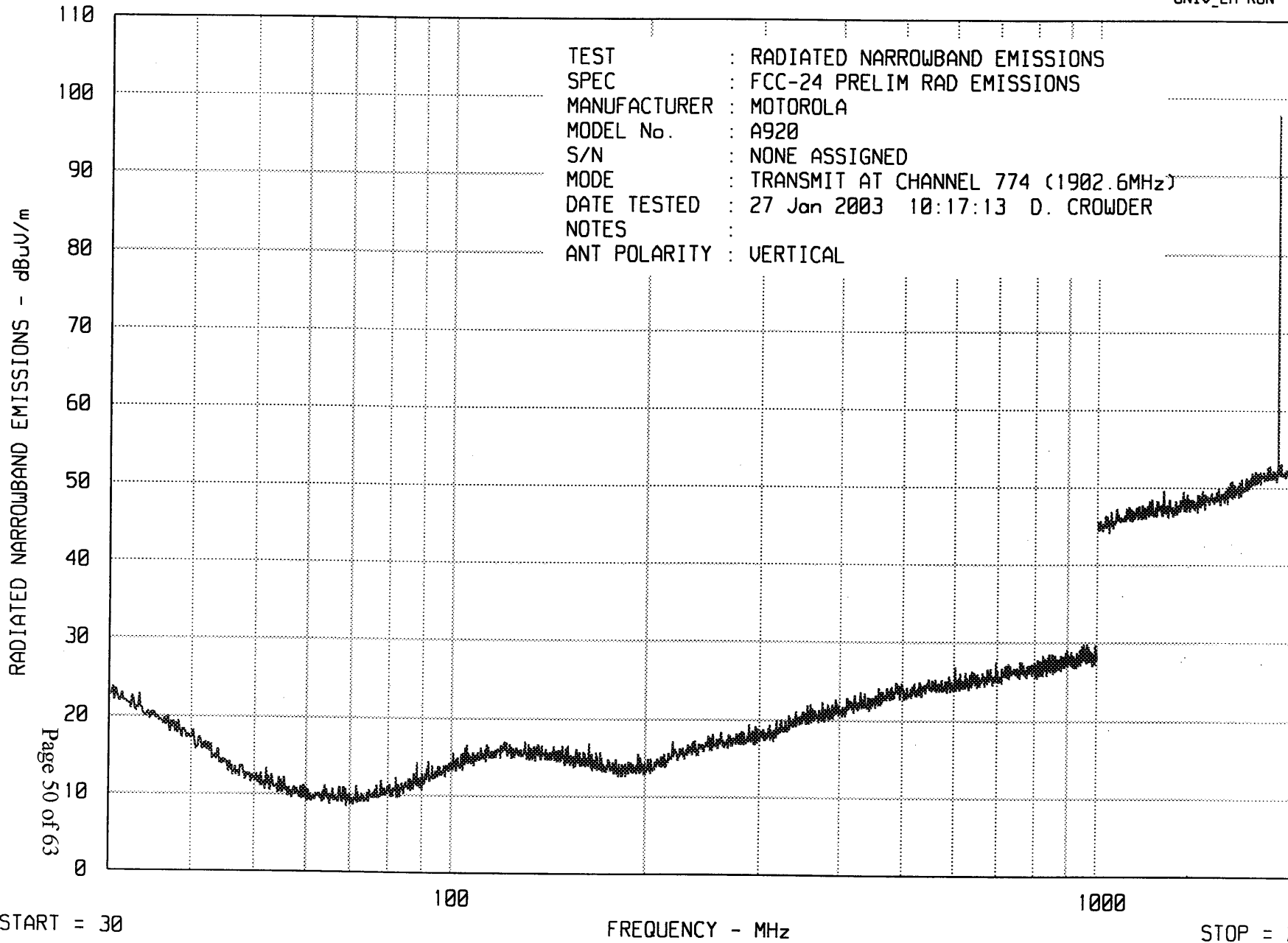
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA00 11/15/02

UNIV\_EM RUN RUN 2

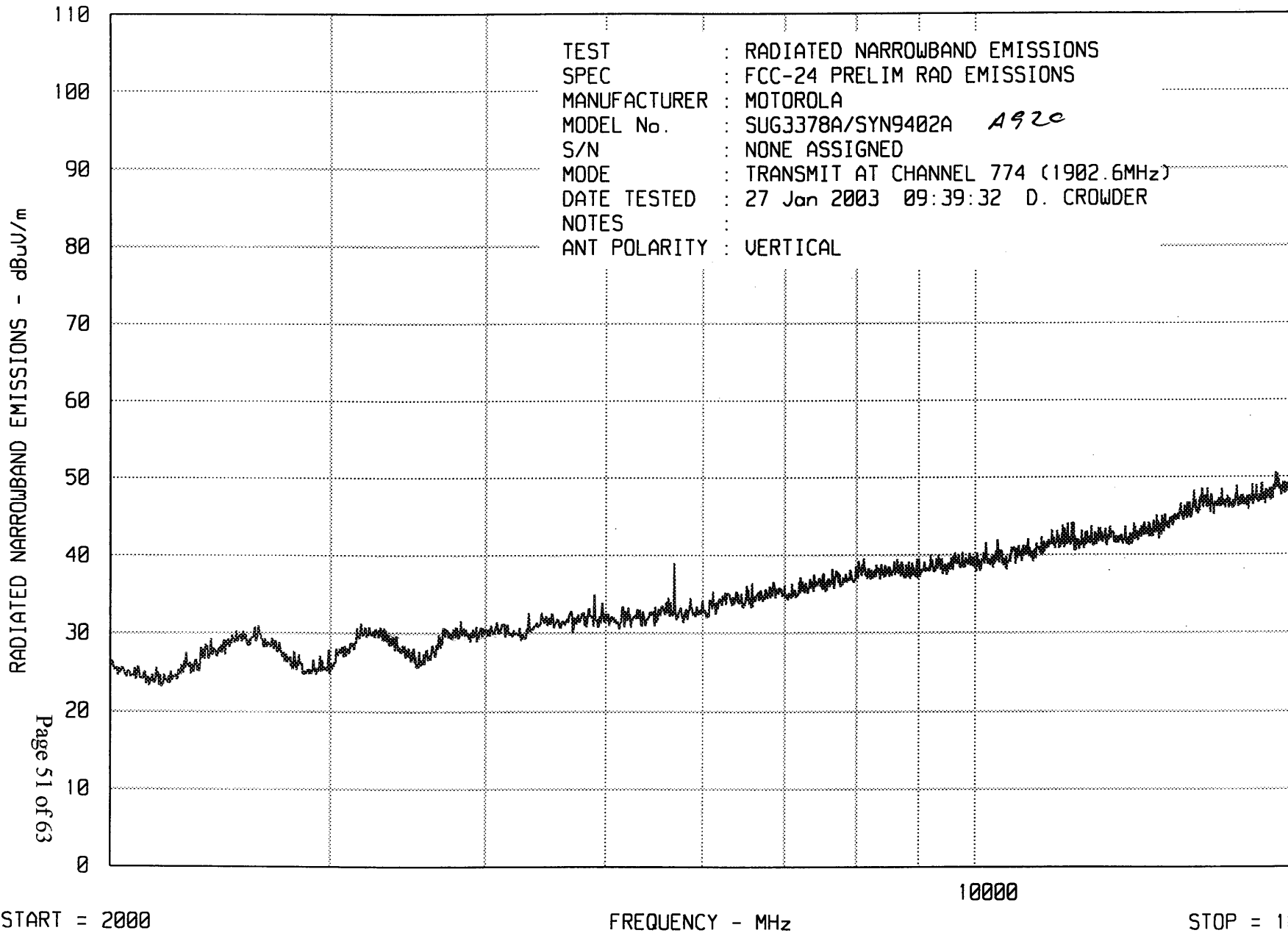


ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA0 11/15/02

UNIV\_EM RUN RUN 1



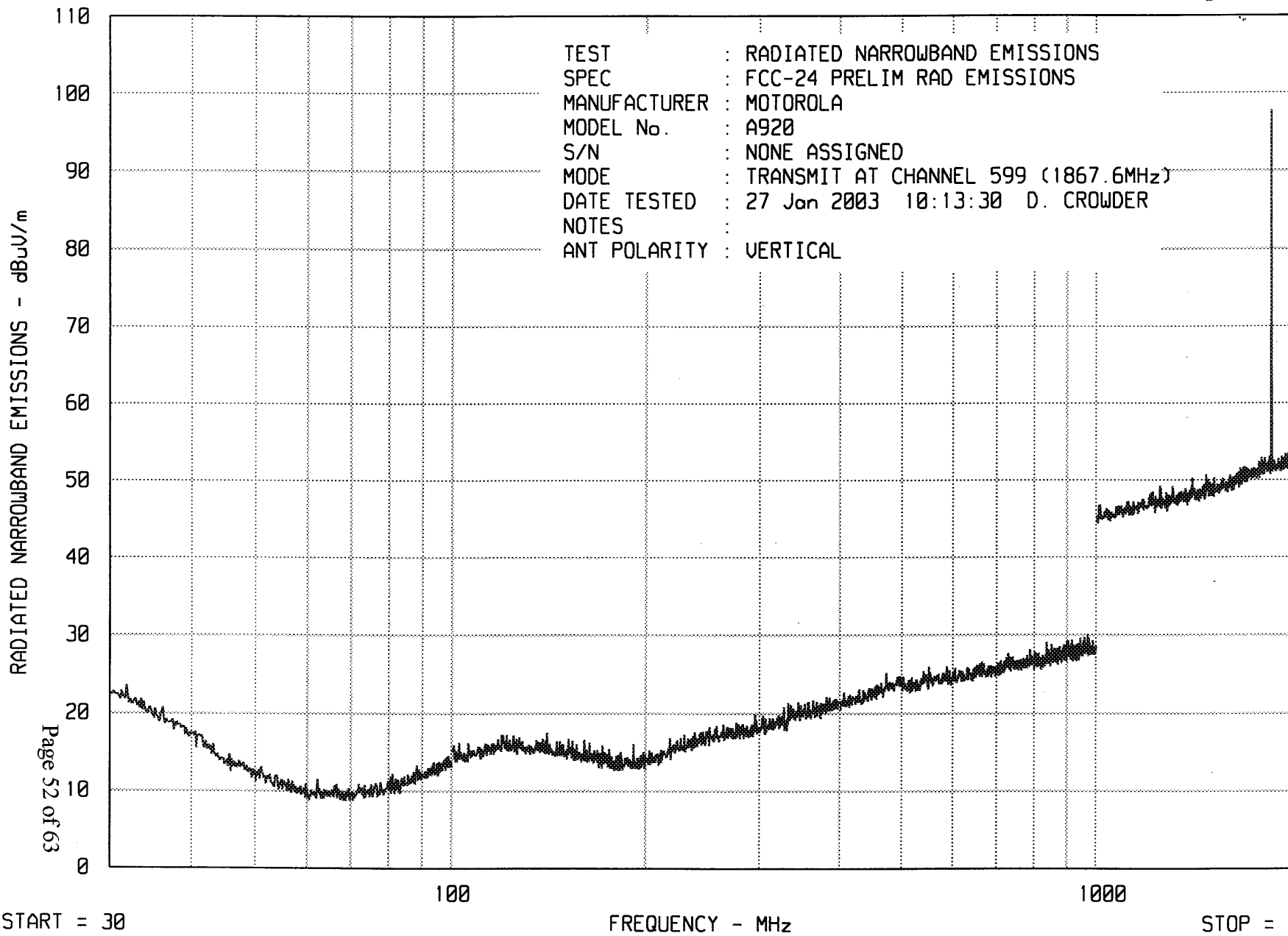
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA00 11/15/02

UNIV\_EM RUN RUN 2



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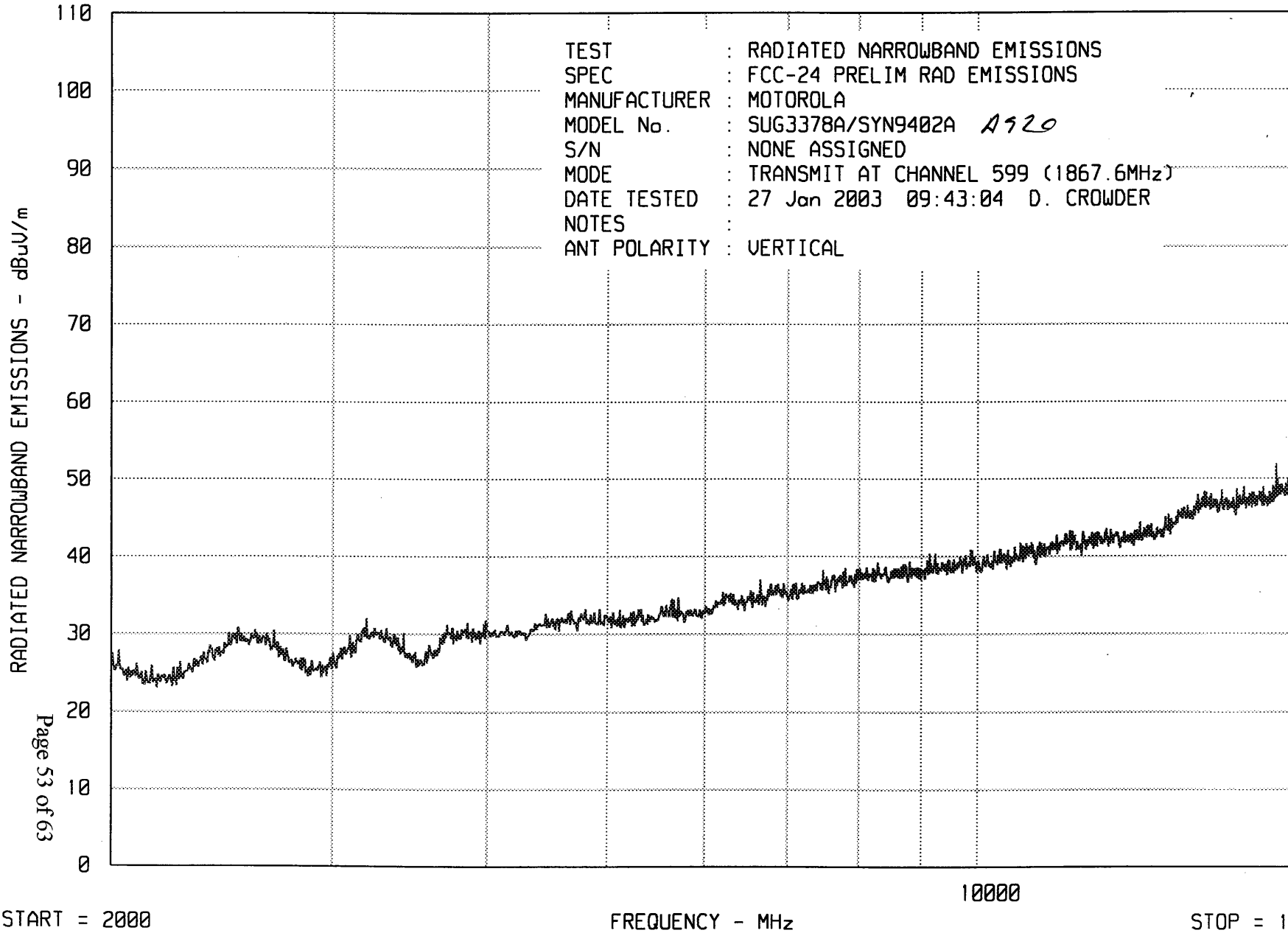
ETR 31898-02

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Downers Grove, Ill. 60515

WKA0 11/15/02

UNIV\_EM RUN RUN 1



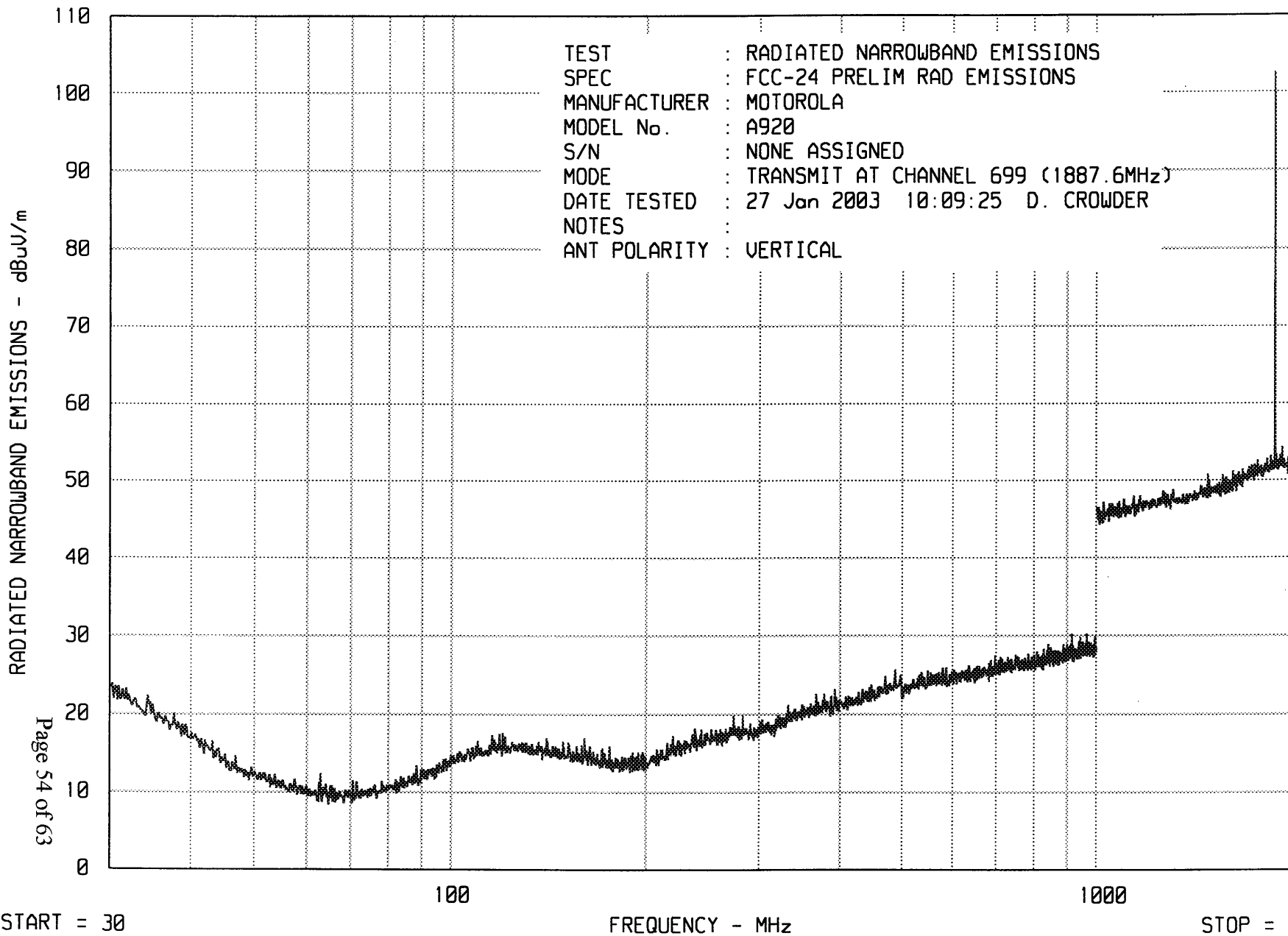
ETR 31898-02

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Downers Grove, Ill. 60515

WKA00 11/15/02

UNIV\_EM RUN RUN 2



RADIATED NARROWBAND EMISSIONS - dBµV/m

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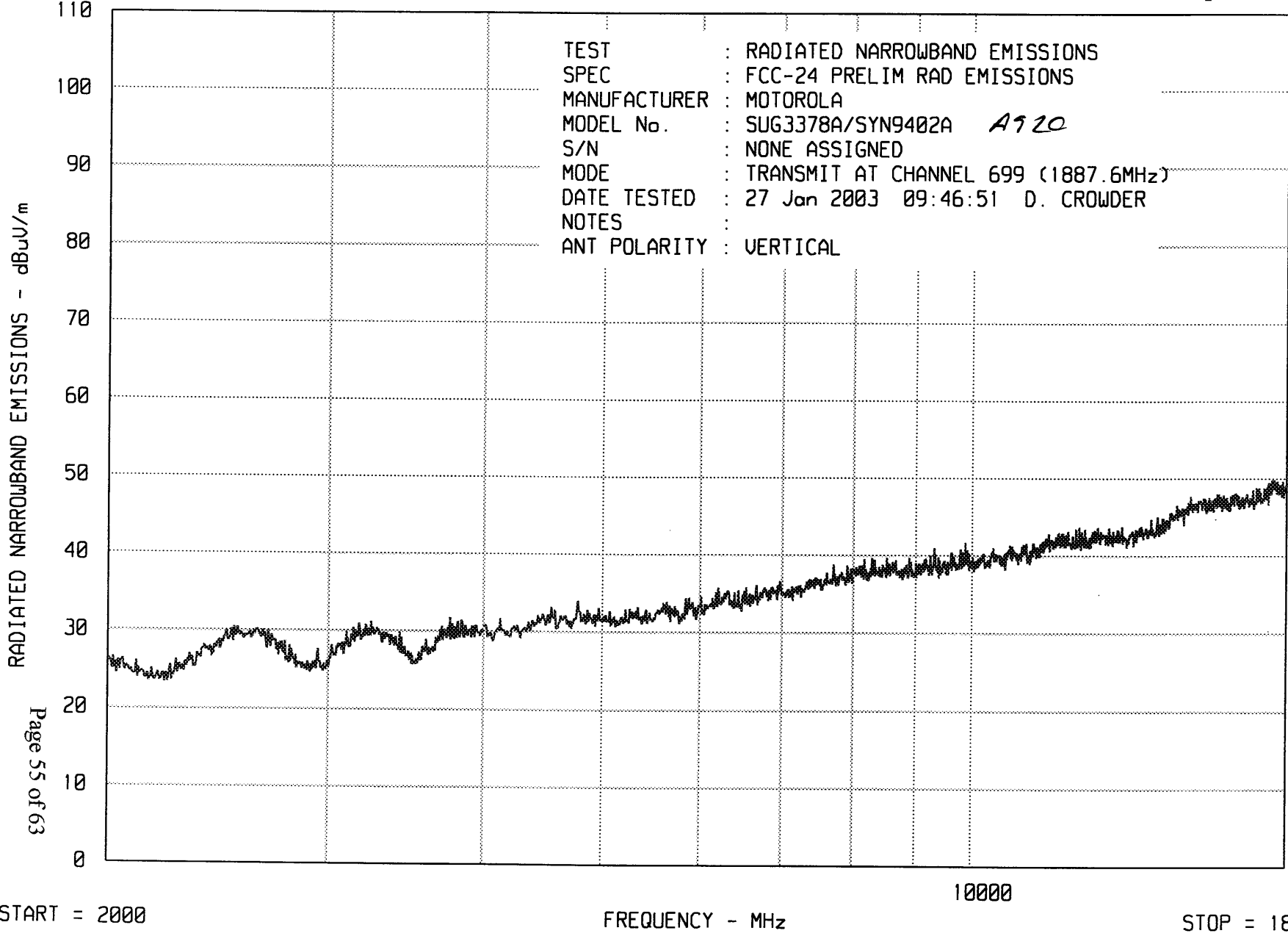
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKA00 11/15/02

UNIV\_EM RUN RUN 1

TEST : RADIATED NARROWBAND EMISSIONS  
 SPEC : FCC-24 PRELIM RAD EMISSIONS  
 MANUFACTURER : MOTOROLA  
 MODEL No. : SUG3378A/SYN9402A *A920*  
 S/N : NONE ASSIGNED  
 MODE : TRANSMIT AT CHANNEL 699 (1887.6MHz)  
 DATE TESTED : 27 Jan 2003 09:46:51 D. CROWDER  
 NOTES :  
 ANT POLARITY : VERTICAL



RADIATED NARROWBAND EMISSIONS - dBµV/m  
Page 55 of 63

START = 2000

FREQUENCY - MHz

10000

STOP = 18000

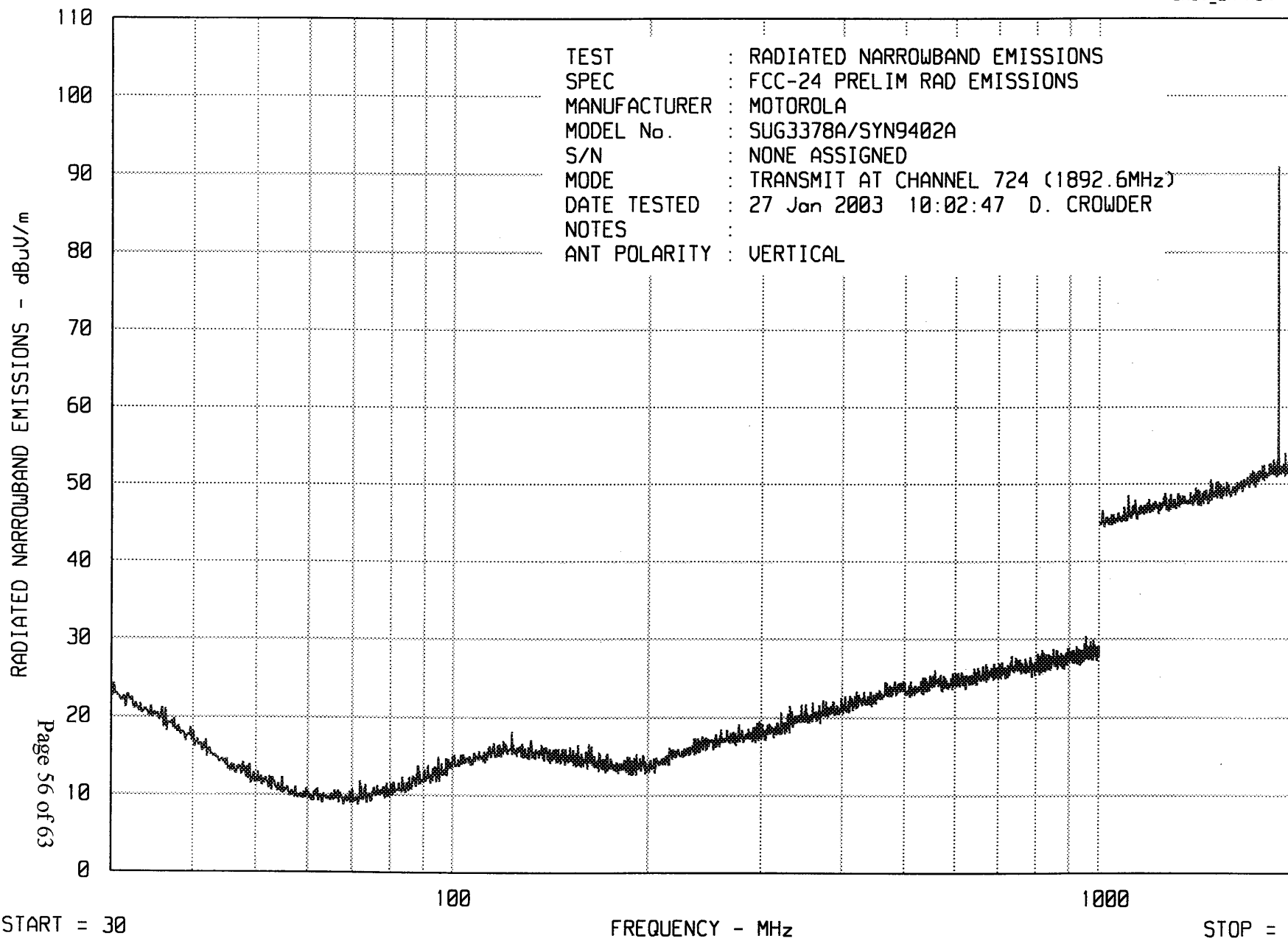
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

WKAB 11/15/02

UNIV\_EM RUN RUN 2



TEST : RADIATED NARROWBAND EMISSIONS  
SPEC : FCC-24 PRELIM RAD EMISSIONS  
MANUFACTURER : MOTOROLA  
MODEL No. : SUG3378A/SYN9402A  
S/N : NONE ASSIGNED  
MODE : TRANSMIT AT CHANNEL 724 (1892.6MHz)  
DATE TESTED : 27 Jan 2003 10:02:47 D. CROWDER  
NOTES :  
ANT POLARITY : VERTICAL

RADIATED NARROWBAND EMISSIONS - dBµV/m

Page 56 of 63

START = 30

FREQUENCY - MHz

STOP = 2000

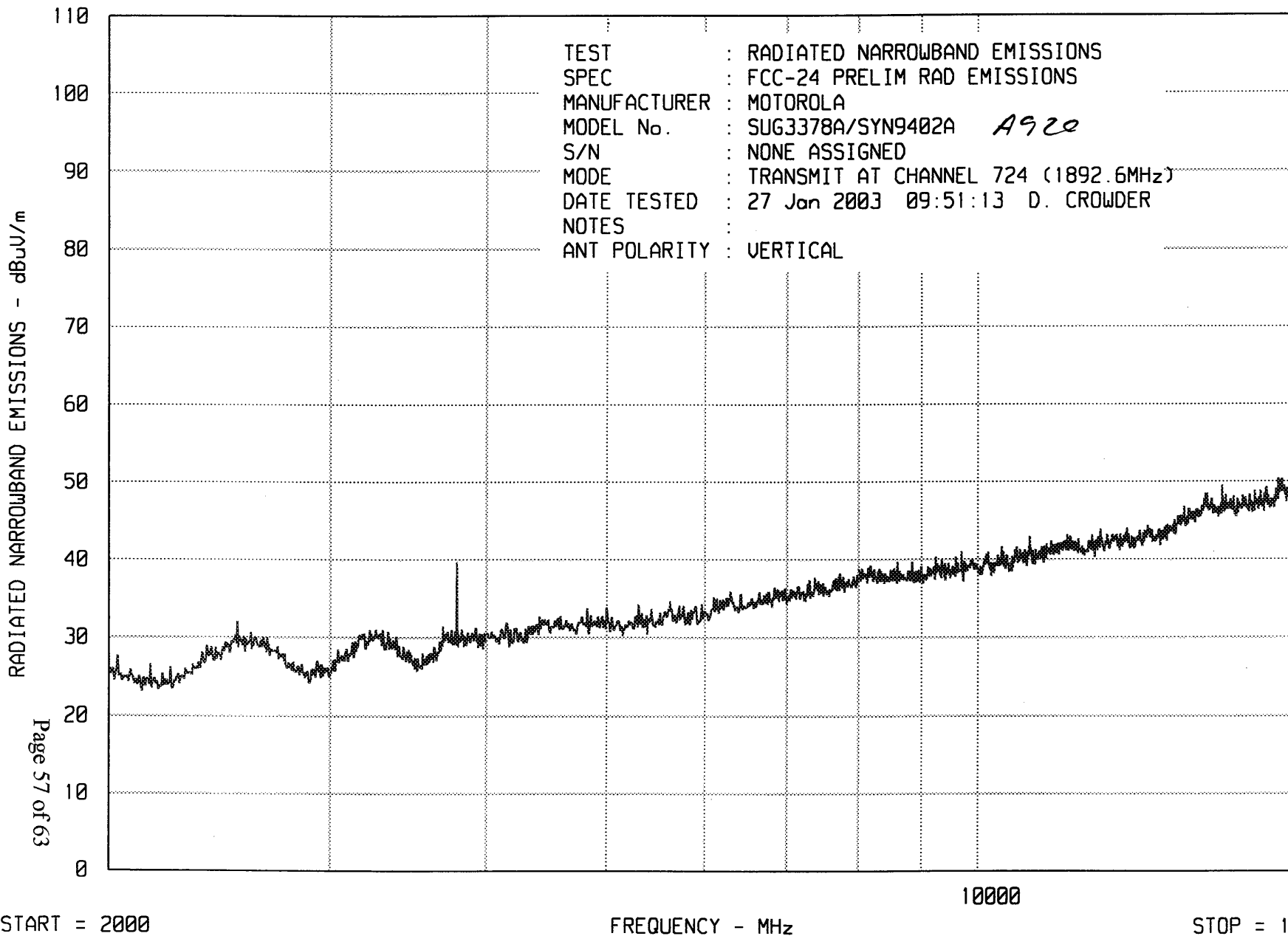
ETR 31898-02

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

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UNIV\_EM RUN RUN 1



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ETR 31898-02

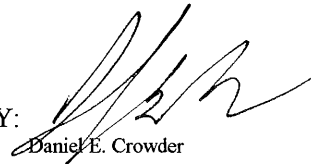


ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
 MODEL : A920  
 S/N : NONE ASSIGNED  
 SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
 DATE : JANUARY 28, 2003  
 NOTES : GSM @ 1857.6MHZ, FULL OUTPUT  
 : TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3715.2	H	43.7	-45.0	7.8	3.6	-40.8	67.8	40
3715.2	V	46.3	-43.8	7.8	3.6	-39.6	66.6	40
5572.8	H	42.5	-44.6	11.4	4.3	-37.5	64.5	40
5572.8	V	43.8	-46.1	11.4	4.3	-39.0	66.0	40
7430.4	H	47.7	-45.5	13.2	5.7	-38.0	65.0	40
7430.4	V	44.5	-37.5	13.2	5.7	-30.0	57.0	40
9288.0	H	41.2	-43.5	12.2	6.3	-37.6	64.6	40
9288.0	V	43.9	-35.0	12.2	6.3	-29.1	56.1	40
11145.6	H	39.3	-39.5	13.9	6.9	-32.5	59.5	40
11145.6	V	42.1	-34.0	13.9	6.9	-27.0	54.0	40
13003.2	H	41.6	-55.0	13.9	7.5	-48.6	75.6	40
13003.2	V	42.6	-51.5	13.9	7.5	-45.1	72.1	40
14860.8	H	42.7	-52.5	14.1	8.1	-46.5	73.5	40
14860.8	V	42.5	-50.0	14.1	8.1	-44.0	71.0	40
16718.4	H	43.9	-47.0	14.2	8.1	-40.9	67.9	40
16718.4	V	43.3	-46.5	14.2	8.1	-40.4	67.4	40
18576.0	H	43.5	-44.5	14.7	9.0	-38.8	65.8	40
18576.0	V	43.1	-42.0	14.8	9.0	-36.2	63.2	40

CHECKED BY:



Daniel E. Crowder




ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
DATE : JANUARY 28, 2003  
NOTES : GSM @ 1877.6MHz, FULL OUTPUT  
: TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3755.2	H	45.6	-43.4	5.7	3.6	-41.3	68.3	40
3755.2	V	46.3	-45.1	5.7	3.6	-43.0	70.0	40
5632.8	H	43.5	-47.0	7.0	4.3	-44.3	71.3	40
5632.8	V	42.2	-55.0	7.0	4.3	-52.3	79.3	40
7510.4	H	46.5	-51.0	7.1	5.7	-49.6	76.6	40
7510.4	V	45.1	-48.0	7.1	5.7	-46.6	73.6	40
9388.0	H	40.3	-49.0	8.4	6.3	-46.9	73.9	40
9388.0	V	42.0	-51.0	8.4	6.3	-48.9	75.9	40
11265.6	H	40.8	-47.0	7.9	6.9	-46.0	73.0	40
11265.6	V	42.5	-49.0	7.9	6.9	-48.0	75.0	40
13143.2	H	42.2	-45.0	8.7	7.5	-43.8	70.8	40
13143.2	V	41.9	-45.0	8.7	7.5	-43.8	70.8	40
15020.8	H	42.8	-36.0	9.1	8.1	-35.0	62.0	40
15020.8	V	42.5	-37.5	9.1	8.1	-36.5	63.5	40
16898.4	H	43.2	-35.0	8.4	8.1	-34.7	61.7	40
16898.4	V	42.8	-36.5	8.4	8.1	-36.2	63.2	40
18776.0	H	45.1	-18.0	7.7	9.0	-19.3	46.3	40
18776.0	V	45.0	-16.8	7.7	9.0	-18.1	45.1	40

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ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
DATE : JANUARY 28, 2003  
NOTES : GSM @ 1902.6MHz, FULL OUTPUT  
: TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3805.2	H	49.2	-39.4	5.8	3.6	-37.2	64.2	40
3805.2	V	47.2	-41.1	5.8	3.6	-38.9	65.9	40
5707.8	H	38.4	-38.0	7.1	4.3	-35.2	62.2	40
5707.8	V	41.6	-42.0	7.1	4.3	-39.2	66.2	40
7610.4	H	45.2	-44.0	7.2	5.7	-42.5	69.5	40
7610.4	V	44.1	-48.0	7.2	5.7	-46.5	73.5	40
9513.0	H	40.7	-47.0	8.5	6.3	-44.8	71.8	40
9513.0	V	42.4	-50.0	8.5	6.3	-47.8	74.8	40
11415.6	H	40.9	-46.0	8.0	6.9	-44.9	71.9	40
11415.6	V	43.3	-49.0	8.0	6.9	-47.9	74.9	40
13318.2	H	41.6	-43.0	8.8	7.5	-41.7	68.7	40
13318.2	V	44.7	-45.0	8.8	7.5	-43.7	70.7	40
15220.8	H	43.0	-37.0	9.2	8.1	-35.9	62.9	40
15220.8	V	43.7	-36.0	9.2	8.1	-34.9	61.9	40
17123.4	H	43.8	-36.0	8.5	8.1	-35.6	62.6	40
17123.4	V	42.0	-36.0	8.5	8.1	-35.6	62.6	40
19026.0	H	45.5	-18.0	7.8	9.0	-19.2	46.2	40
19026.0	V	45.4	-18.0	7.8	9.0	-19.2	46.2	40

CHECKED BY:

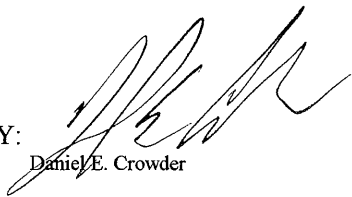
Daniel E. Crowder



ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
DATE : JANUARY 28, 2003  
NOTES : GSM @ 1867.6MHz, FULL OUTPUT  
: TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3735.2	H	47.4	-38.7	5.7	3.6	-36.6	63.6	40
3735.2	V	48.0	-39.0	5.7	3.6	-36.9	63.9	40
5602.8	H	38.0	-51.0	7.0	4.3	-48.3	75.3	40
5602.8	V	43.9	-45.0	7.0	4.3	-42.3	69.3	40
7470.4	H	43.6	-50.0	7.1	5.7	-48.6	75.6	40
7470.4	V	45.5	-47.0	7.1	5.7	-45.6	72.6	40
9338.0	H	43.0	-48.0	8.3	6.3	-46.0	73.0	40
9338.0	V	42.9	-45.0	8.3	6.3	-43.0	70.0	40
11205.6	H	41.3	-44.0	7.8	6.9	-43.1	70.1	40
11205.6	V	41.1	-43.0	7.8	6.9	-42.1	69.1	40
13073.2	H	42.1	-42.0	8.6	7.5	-40.9	67.9	40
13073.2	V	41.6	-39.0	8.6	7.5	-37.9	64.9	40
14940.8	H	42.5	-36.0	9.0	8.1	-35.1	62.1	40
14940.8	V	42.6	-36.0	9.0	8.1	-35.1	62.1	40
16808.4	H	43.6	-32.0	8.3	8.1	-31.8	58.8	40
16808.4	V	43.5	-32.0	8.3	8.1	-31.8	58.8	40
18676.0	H	45.1	-17.0	7.6	9.0	-18.4	45.4	40
18676.0	V	45.1	-18.0	7.6	9.0	-19.4	46.4	40

CHECKED BY:   
Daniel E. Crowder



ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
DATE : JANUARY 28, 2003  
NOTES : GSM @ 1887.6MHz, FULL OUTPUT  
: TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3775.2	H	48.4	-40.1	5.8	3.6	-37.9	64.9	40
3775.2	V	45.3	-42.3	5.8	3.6	-40.1	67.1	40
5662.8	H	41.2	-38.0	7.1	4.3	-35.2	62.2	40
5662.8	V	43.7	-40.0	7.1	4.3	-37.2	64.2	40
7550.4	H	44.6	-49.0	7.2	5.7	-47.5	74.5	40
7550.4	V	44.2	-43.0	7.2	5.7	-41.5	68.5	40
9438.0	H	41.2	-40.0	8.4	6.3	-37.9	64.9	40
9438.0	V	43.7	-40.0	8.4	6.3	-37.9	64.9	40
11325.6	H	40.2	-42.0	7.9	6.9	-41.0	68.0	40
11325.6	V	39.9	-45.0	7.9	6.9	-44.0	71.0	40
13213.2	H	42.3	-42.0	8.7	7.5	-40.8	67.8	40
13213.2	V	41.6	-39.0	8.7	7.5	-37.8	64.8	40
15100.8	H	42.8	-36.0	9.1	8.1	-35.0	62.0	40
15100.8	V	42.6	-36.0	9.1	8.1	-35.0	62.0	40
16988.4	H	43.1	-32.0	8.4	8.1	-31.7	58.7	40
16988.4	V	42.7	-32.0	8.4	8.1	-31.7	58.7	40
18876.0	H	45.9	-17.0	7.7	9.0	-18.3	45.3	40
18876.0	V	45.7	-18.0	7.7	9.0	-19.3	46.3	40

CHECKED BY:

Daniel E. Crowder



ETR 31898-02  
DATA SHEET

MANUFACTURER : MOTOROLA CELLULAR  
MODEL : A920  
S/N : NONE ASSIGNED  
SPECIFICATION : FCC-24 OPEN FIELD SPURIOUS RADIATED EMISSIONS  
DATE : JANUARY 28, 2003  
NOTES : GSM @ 1892.6MHz, FULL OUTPUT  
: TEST DISTANCE IS 3 METERS

FREQ. (MHz)	ANT POL	MTR RDG (dBuV)	MATCHED SIGNAL dBm	ANT GAIN dB	CABLE FAC dB	ERP TOTAL dBm	ATTN dB	MIN ATTN dB
3785.2	H	45.6	-37.9	5.8	3.6	-35.7	62.7	40
3785.2	V	43.0	-37.0	5.8	3.6	-34.8	61.8	40
5677.8	H	41.7	-50.0	7.1	4.3	-47.2	74.2	40
5677.8	V	42.7	-44.0	7.1	4.3	-41.2	68.2	40
7570.4	H	42.5	-48.0	7.2	5.7	-46.5	73.5	40
7570.4	V	43.3	-41.0	7.2	5.7	-39.5	66.5	40
9463.0	H	40.6	-48.0	8.4	6.3	-45.9	72.9	40
9463.0	V	46.3	-45.0	8.4	6.3	-42.9	69.9	40
11355.6	H	40.0	-43.0	7.9	6.9	-42.0	69.0	40
11355.6	V	40.4	-42.0	7.9	6.9	-41.0	68.0	40
13248.2	H	41.8	-39.0	8.8	7.5	-37.7	64.7	40
13248.2	V	41.7	-40.0	8.8	7.5	-38.7	65.7	40
15140.8	H	43.6	-37.0	9.1	8.1	-36.0	63.0	40
15140.8	V	43.3	-35.0	9.1	8.1	-34.0	61.0	40
17033.4	H	43.2	-32.0	8.4	8.1	-31.7	58.7	40
17033.4	V	43.3	-33.0	8.4	8.1	-32.7	59.7	40
18926.0	H	45.5	-18.0	7.8	9.0	-19.2	46.2	40
18926.0	V	45.4	-18.0	7.8	9.0	-19.2	46.2	40

CHECKED BY:

Daniel E. Crowder