Measurement of RF Interference from a Wireless Stat-Station Display Transciever

For : DeAmertek Corporation
Oak Brook, IL

P.O. No. : P23534
Date Received : April 6, 2006
Date Tested : April 10-14, 2006
Test Personnel : Richard E. King
Specification : FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B for receivers and Subpart C, Section 15.247 for Frequency Hopping Spread Spectrum Intentional Radiators Operating within the 902-928MHz band.

Test Report By : Richard E. King

Richard E. King
EMC Engineer

Approved By : Raymond J. Klouda

Raymond J. Klouda
Registered Professional Engineer of Illinois - 44894

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REVISION HISTORY

Revision	Date	Description
—	05/16/2006	Initial release

Measurement of RF Interference from a Wireless Statstation Display Transciever

1.0 INTRODUCTION:

1.1 Description of Test Item - This document represents the results of the series of radio interference measurements performed on Wireless Stat-Station Display transceiver, no serial number was assigned, (hereinafter referred to as the test item).

The test item is a frequency hopping spread spectrum transceiver used with a standby generator to provide power in the event of a power outage. The transmitter was designed to transmit in the 902-928 MHz ISM band and uses an integral antenna. The receiver is a super heterodyne type.

The test item was manufactured and submitted for testing by DeAmertek Corporation located in Oak Brook, IL.

1.2 Purpose - The test series was performed to determine if the test item meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.247 for Intentional Radiators. Testing was performed in accordance with ANSI C63.4-2003.

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 15, Subpart C, dated 1 October 2005
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- ANSI C63.4-2003, "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 23^{o}C and the relative humidity was 23%.

2.0 TEST ITEM SETUP AND OPERATION:

The test item is a frequency hopping spread spectrum transceiver, model wireless statstation display. A block diagram of the test item setup is shown as Figure 1.

2.1 Power Input - The test item obtained 5VDC power through 2 leads from the secondary of a AC/DC Adaptor step-down transformer, Model No. OH-35078DT. The primary of this transformer received 115V 60Hz power through lowpass powerline filters on the wall of the shielded enclosure. The 115VAC power from the secondary of the transformer was provided to the test item through a 2 wire, 2 meter long unshielded cord.

2.2 Grounding - Since only two wires were used to provide the input power, the test item was ungrounded during the tests.

2.3 Support Equipment - The test item does not require support equipment.

2.4 Interconnect Cables - The following interconnect cables were submitted with the test item:

Item	Description
RS232 Cable	Used for programming only - Unterminated for radiated tests and connected to computer during conducted tests

2.5 Operational Mode - As required for the test, the test item was set in a normal hopping mode or with the hopping function disabled. When the hopping was stopped, the test item was tuned to frequencies of 902.792 MHz, 914.947 MHz or 927.094 MHz and set to receive or to transmit as needed.

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 Powerline Conducted Emissions

4.1.1 Requirements – All radio frequency voltages on the power lines of an intentional radiator or a receiver shall be below the values shown below when using a quasi-peak detector:

CONDUCTED LIMITS FOR RECEIVERS and INTENTIONAL RADIATORS

Frequency MHz	RFI Voltage dBuV(QP)	RFI Voltage dBuV(Average)
0.15-0.5	66 decreasing with logarithm of frequency to 56	56 decreasing with logarithm of frequency to 46
0.5-5	56	46
5-30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: If the levels measured using the QP detector meet both the QP and the Average limits, the test item is considered to have met both requirements and measurements do not need to be performed using the Average detector.

4.1.2 Procedures - The interference on each power lead was measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. The meter terminal of the LISN not under test was terminated with 50 ohm. Measurements were first made over the entire frequency range from 150kHz through 30MHz with a peak detector and the results were automatically plotted. The data thus obtained was then searched by the computer for the highest levels. Quasi-peak measurements were automatically performed at the frequencies selected from the highest peak measurements, and the results printed.

4.1.3 Results - The conducted emissions for the test item's receiver comply with the specification limit. The plots of the peak preliminary conducted voltage levels on each power line are presented on pages 17 and 18. The conducted limit is shown as a reference. The final quasi-peak results are presented on pages 19 and 20. The conducted emissions for the test item's transmitter comply with the specification limit. The plots of the peak preliminary conducted voltage levels on each power line are presented on pages 21 and 22. The conducted limit is shown as a reference. The final quasi-peak results are presented on pages 23 and 24. A photograph of the conducted emission test setup is shown as Figure 2.

4.2 Radiated Measurements

4.2.1 Receiver

4.2.1.1 Requirements - All emanations from a receiver shall be below the levels shown on the following table:

RADIATIED EMISSION LIMITS FOR RECEIVER

Frequency MHz	Test Distance in Meters	Field Strength uV/m	Field Strength dBuV/m
30-88	3	100	40
88-216	3	150	43.5
216-960	3	200	46
Above 960	3	500	54

Note: The tighter limit shall apply at the edge between the two frequency bands.

4.2.1.2 Procedures - All 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 2003 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.

Since quasi-peak and average measurements require long integration times, it is not practical to automatically sweep through the quasi-peak or average levels. Therefore, radiated emissions from the test item were first scanned using a peak detector and automatically plotted. The frequencies where significant emission levels were noted were then remeasured using the quasi-peak or average detectors.

For preliminary radiated emissions sweeps from 30MHz to 5GHz, the broadband measuring antenna was positioned at a 3 meter distance from the test item. The frequency range from 30MHz to 5GHz was investigated using a peak detector function with the bilog antenna below 1GHz and the double-ridged waveguide antenna above 1GHz. The maximum levels were plotted.

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the preliminary sweeps using the following methods:

1) Measurements below 1GHz were made using a quasi-peak detector and a bilog antenna. Measurements above 1GHz were made using an average detector and a double ridged waveguide antenna.

2) To ensure that maximum or worst case, 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 antenna is 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.

4.2.1.3 Results - The preliminary plots are presented on pages 25 through 36. The plots are presented for a reference only, and are not used to determine compliance. The final radiated levels are presented on pages 37 through 39. As can be seen from the data, all emissions measured from the test item were within the specification limits for receivers.

4.2.2 Transmitter

4.2.2.1 Requirement – Per section 15.247(c), the radiated emissions which fall in the restricted bands must meet the general limits of 15.209.

4.2.2.2 Procedures – The radiated tests were performed in a 32ft. x 20ft. x 18ft. hybrid absorber lined semi-anechoic 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. 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 with 100 kHz BW. This data was then automatically plotted up through 9 GHz.

Next, the harmonic or spurious emissions falling in the restricted bands were measured up through the 10th harmonic. For the measurements above 1GHz, the measurement bandwidth was set to 1 MHz RBW. The analyzer was set to **linear mode** with 10 Hz VBW in order to simulate an average detector. A pre-amplifier was used to increase the receiver sensitivity.

4.2.2.3 Results - The preliminary emissions levels were plotted. These plots are presented on pages 40 through 51. These plots indicate that the radiated spurious emissions were below the general limit.

The harmonics and any other emissions that fall in the restricted frequency bands were then re-

measured manually. This data is shown in the tables on pages 52 through 54. The field intensities levels for the harmonics in the restricted band were within the limit.

4.3 Carrier Frequency Separation

4.3.1 Requirements - Per section 15.247 (a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

4.3.2 Procedures - The test item was setup inside the chamber. With the hopping function enabled, the test item was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to ≥ to 1% of the span. The peak detector and 'Max-Hold' function were engaged. The span was set wide enough to capture the peaks of at least two adjacent channels.

When the trace had stabilized after multiple scans, the marker-delta function was used to determine the separation between the peaks of the adjacent channels. The analyzer's display was plotted using a 'screen dump' utility.

4.3.3 Results - Page 55 shows the carrier frequency separation. As can be seen from this plot, the separation is 512 kHz which is greater than the 20dB bandwidth (294 kHz).

4.4 Number of Hopping Frequencies

4.4.1 Requirements - Per section 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928MHz band, the frequency hopping systems shall use at least 25 non-overlapping channels.

4.4.2 Procedures - The test item was setup inside the chamber. With the hopping function enabled, the test item was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to ≥ to 1% of the span. The peak detector and 'Max-Hold' function were engaged. The span was set wide enough to capture the entire frequency band of operation.

The test item’s signal was allowed to stabilize after multiple scans. The number of hopping frequencies was counted. The analyzer's display was plotted using a 'screen dump' utility.

4.4.3 Results - Page 56 shows the number of hopping frequencies. As can be seen from this plot, the number of frequencies is 25 which equals the minimum required frequencies.

4.5 Time of Occupancy

4.5.1 Requirement - Per section 15.247(a)(1)(i), for frequency hopping systems

operating in the 902-928MHz band, the average time of occupancy shall not be greater than 0.4 seconds within a 10 second period multiplied by the number of hopping channels employed.

4.5.2 Procedures - The test item was setup inside the chamber. With the hopping function enabled, the test item was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to 100 kHz. The peak detector and 'Max-Hold' function were engaged. With the span set to 0Hz, the sweep time was adjusted to capture a single event in order to measure the dwell time per hop. Then, the sweep time was expanded to capture the average time between hops. When the trace had stabilized after multiple scans, the time between hops was measured. The analyzer's display was plotted using a 'screen dump' utility.

The dwell time in a 10 second period was then calculated from dwell time per hop multiplied by the number of hops.

4.5.3 Results - Pages 57 and 58 show the plots for the time of occupancy (dwell time). As can be seen from the plots, the time of occupancy can be determined by a 171.5msec pulse multiplied by 1 hop. This calculated value is equal to .171 seconds which is less than the 0.4 seconds maximum allowed.

4.6 20dB Bandwidth

4.6.1 Requirement - Per section 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928MHz band, the 20dB bandwidth shall be measured for determination of the carrier frequency separation limits and must not exceed 500 kHz.

4.6.2 Procedures - The test item was setup inside the chamber. With the hopping function disabled, the test item was allowed to transmit continuously. The frequency hopping channel was set separately to low, middle, and high hopping channels. The resolution bandwidth (RBW) was set to $\geq$ to 1% of the 20 dB BW.

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.

4.6.3 Results - The plots on pages 59 through 61 show that the maximum 20 dB bandwidth was 294 kHz.

4.7 Peak Output Power

4.7.1 Requirement - Per section 15.247(b)(2), For frequency hopping systems operating in the 902-928MHz band and employing at least 25 hopping channels. The peak output power shall not be greater than 250milliwatts.

4.7.2 Procedures - The test item was placed on the non-conductive stand and set to transmit. A broadband measuring antenna was placed at a test distance of 3 meters from the test item. The test item was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low, middle and high hopping frequencies.

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 then 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 then corrected to compensate for cable loss, as required. The peak power output was calculated for the low, middle and high hopping frequencies.

4.7.3 Results - The results are presented on page 27. The maximum EIRP measured from the transmitter was -6.1 dBm which meets the 24dBm (250mW) limit.

4.8 Bandedge Compliance

4.8.1 Requirement - Per section 15.247(c), the emissions at the band-edges must be at least 20dB below the highest level measured within the band. In addition, the radiated emissions which fall in the restricted band beginning at 2483.5 MHz, must meet the general limits of 15.209

4.8.2 Procedures - The test item was setup inside the chamber. With the hopping function disabled, the test item was allowed to transmit continuously. The frequency hopping channel was set separately to low and high hopping channels. The resolution bandwidth (RBW) was set to 100 kHz.

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 measurement was repeated with the frequency hopping function enabled.

For the emissions which fall in the restricted band the "marker-delta" method described in Public Notice DA 00-705 was used. Initially radiated measurements were performed at the fundamentals of the highest hopping frequencies using 1 MHz bandwidth. For the measurements the "delta" required to meet the general limit was calculated.

Next, the band-edge emissions were plotted using peak detector and 100 kHz bandwidth. The "delta" limit was applied to this plot to determine compliance at the band-edge.

The test item was placed on the non-conductive stand and set to transmit. A broadband

measuring antenna was placed at a test distance of 3 meters from the test item. The test item was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded.

4.8.3 Results - Pages 63 through 66 show the radiated band-edge compliance results using the marker-delta method. As can be seen from these plots, the emissions at the band-edge and in the restricted band are within the general limits.

5.0 CONCLUSIONS:

It was determined that the DeAmertek Corporation Wireless Statstation Display Transceiver, did fully meet the conducted and radiated emission requirements of 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 Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

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.

7.0 ENDORSEMENT DISCLAIMER:

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

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								
XLJW	5W,50 OHM TERMINATION	JFW INDUSTRIES	50T-052	31	DC-2GHZ	10/10/05	12	10/10/06
XPQ0	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T	001	1.8-10GHZ	07/27/05	12	07/27/06
XZG2	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	2223A01751	---		N/A	
XZG3	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	2421A03059	---		N/A	
Equipment Type: AMPLIFIERS								
APK2	PREAMPLIFIER	AGILENT TECHNOL	8449B	3008A01595	1-26.5GHZ	04/10/06	12	04/10/07
APK3	PREAMPLIFIER	AGILENT TECHNOL	8449B	3008A01593	1-26.5GHZ	06/03/05	12	06/03/06
Equipment Type: ANTENNAS								
NTA0	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2057	0.03-2GHZ	08/15/05	12	08/15/06
NWF0	RIDGED WAVE GUIDE	EMCO	3105	2035	1-12.4GHZ	10/01/05	12	10/01/06
Equipment Type: ATTENUATORS								
T1D2	10DB, 20W ATTENUATOR	NARDA	768-10	6	DC-11GHZ	07/27/05	12	07/27/06
T1N1	10DB 20W ATTENUATOR	NARDA	766-10		DC-4GHZ	09/07/05	12	09/07/06
Equipment Type: CONTROLLERS								
CDS1	COMPUTER	GATEWAY	MFATXPNT NMZ	0028483110	1.8GHZ		N/A	
Equipment Type: PROBES; CLAMP-ON & LISNS								
PLL9	50UH LISN 462D	ELITE	462D/70A	010	0.01-400MHZ	03/06/06	12	03/06/07
PLLA	50UH LISN 462D	ELITE	462D/70A	011	0.01-400MHZ	03/06/06	12	03/06/07
PLLC	50UH LISN 462D	ELITE	462D/70A	013	0.01-400MHZ	08/11/05	12	08/11/06
PLLD	50UH LISN 462D	ELITE	462D/70A	014	0.01-400MHZ	01/19/06	12	01/19/07
Equipment Type: POWER SUPPLIES								
SJA0	DC POWER SUPPLY	HEWLETT PACKARD	6033A	3430A07741	0-20V/0-30A		NOTE 1	
Equipment Type: PRINTERS AND PLOTTERS								
HRL1	PRINTER LASERJET 2200D	HEWLETT PACKARD	C7058A	CNGRG90023	---		N/A	
Equipment Type: RECEIVERS								
RAC0	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	2449A01117	100HZ-22GHZ	02/11/06	12	02/11/07
RAC2	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3638A08770	100HZ-22GHZ	02/10/06	12	02/10/07
RACD	RF PRESELECTOR	HEWLETT PACKARD	85685A	3010A01205	20HZ-2GHZ	12/23/05	12	12/23/06
RACE	RF PRESELECTOR W/ RECEIVER	HEWLETT PACKARD	85685A	3010A01194	20HZ-2GHZ	08/26/05	12	08/26/06
RAF1	QUASIPEAK ADAPTER	HEWLETT PACKARD	85650A	2043A00271	0.01-1000MHZ	02/13/06	12	02/13/07

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.

ELITE ELECTRONIC ENGINEERING INC.

Radiated Emissions Test Setup Anechoic Ferrite Chamber

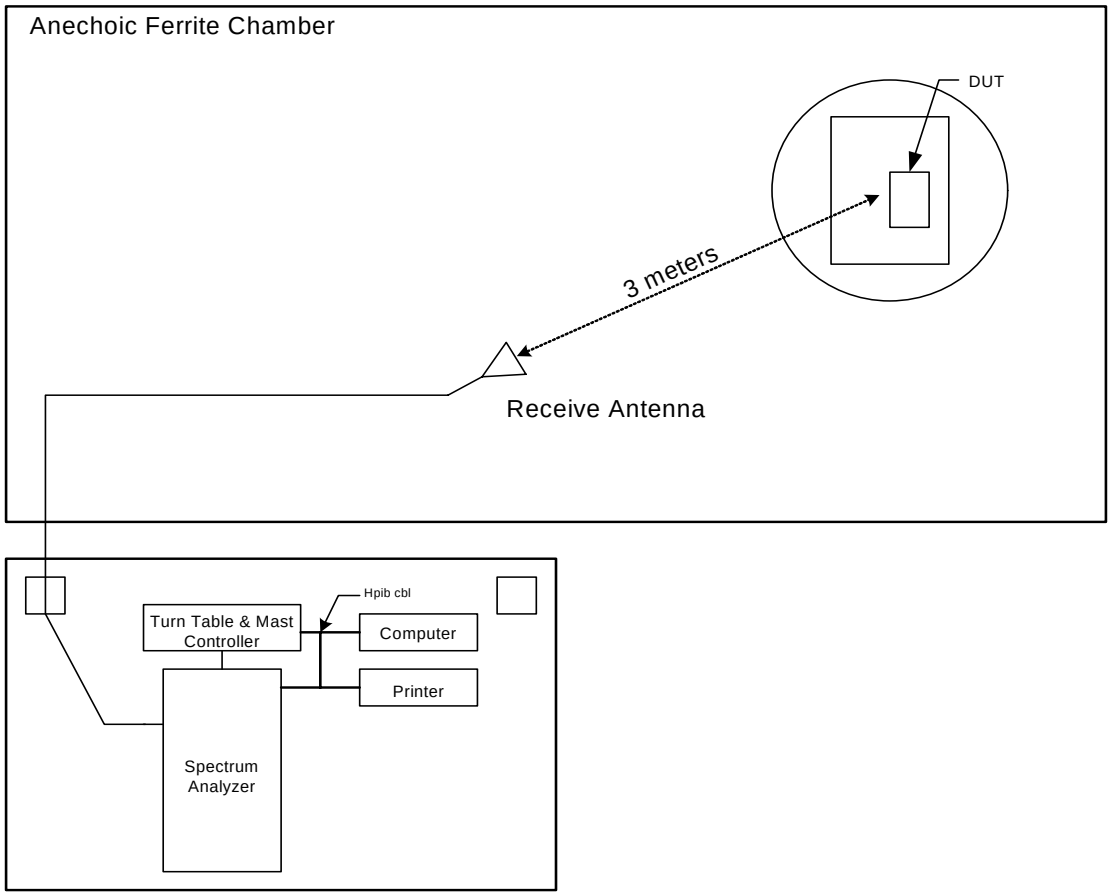
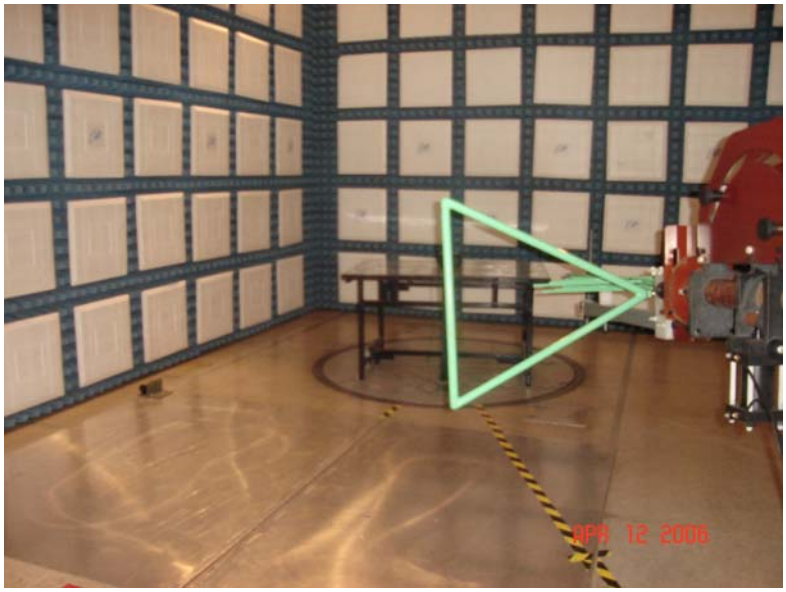


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

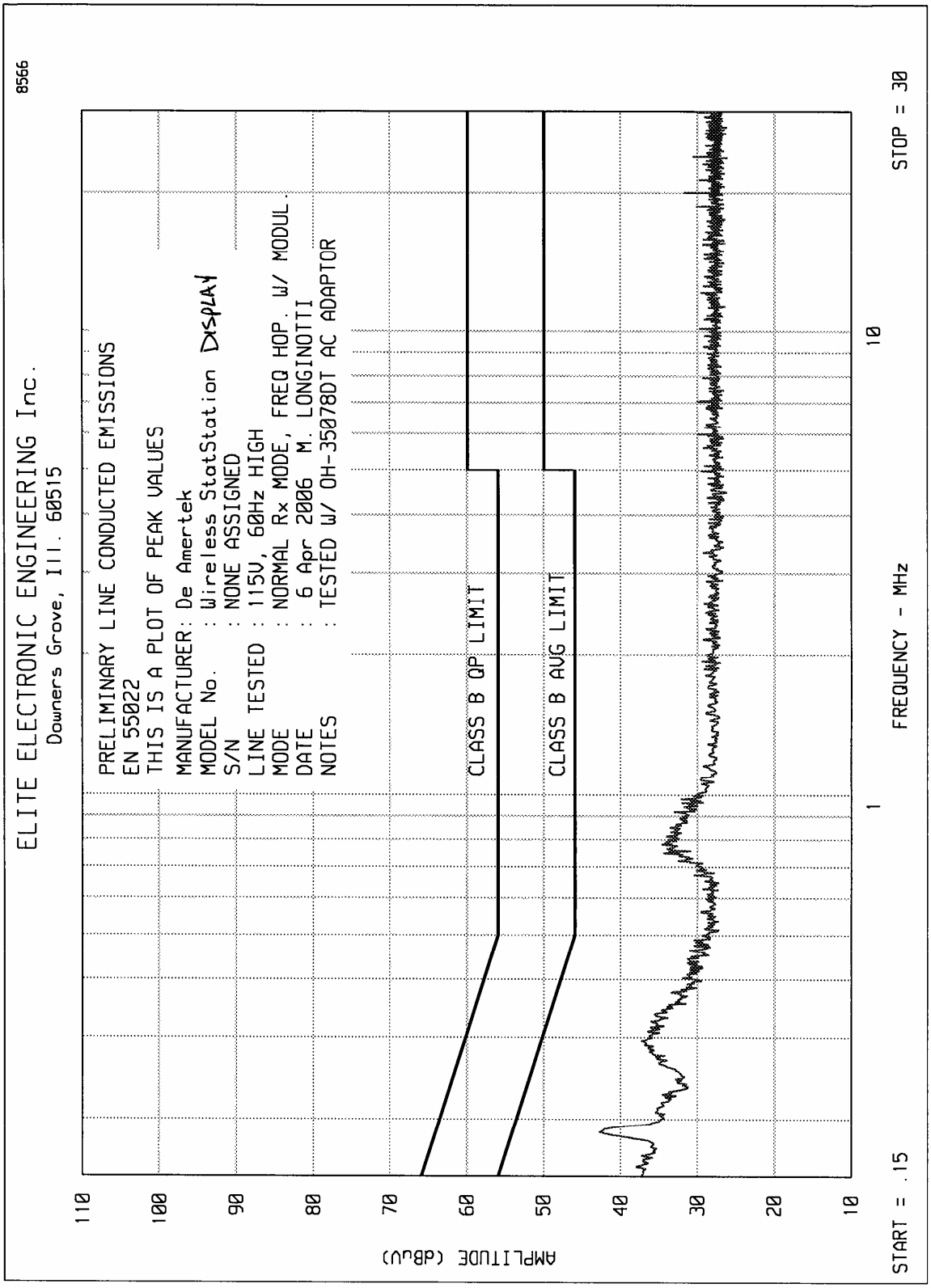
Powerline Conducted Emissions 150kHz – 30MHz

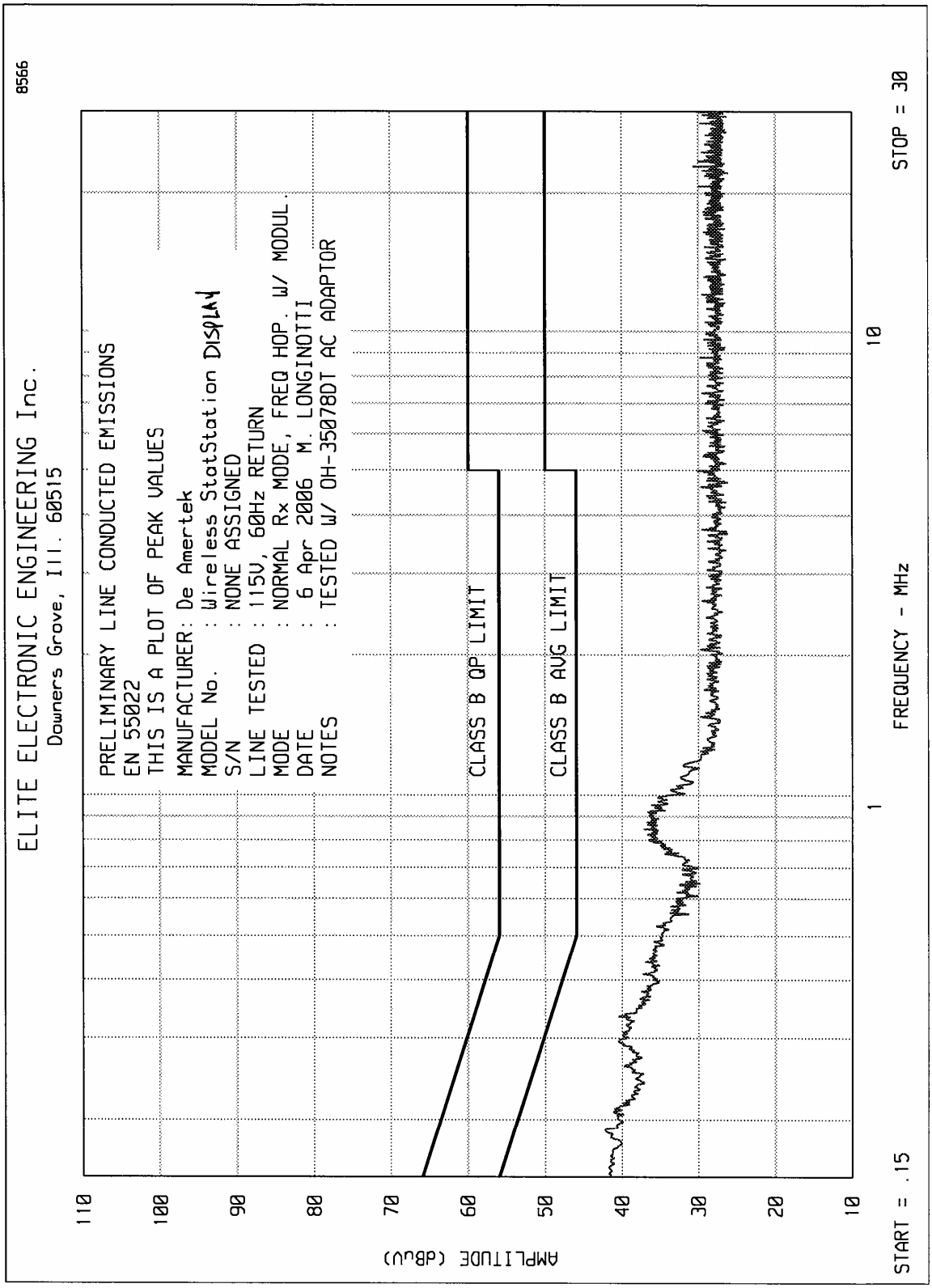
Figure 3



Radiated Emissions – Horizontal Polarization

Radiated Emissions – Vertical Polarization


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: De Amertek
MODEL No. : Wireless StatStation Display
S/N : NONE ASSIGNED
LINE TESTED : 115V, 60Hz HIGH
MODE : NORMAL Rx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006 M. LONGINOTTI
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: De Amertek
MODEL No. : Wireless StatStation DISPLAY
S/N : NONE ASSIGNED
LINE TESTED : 115V, 60Hz RETURN
MODE : NORMAL Rx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006 M. LONGINOTTI
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz

ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : De Amertek
MODEL : Wireless StatStation DISPLAY
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 115V, 60Hz HIGH
MODE : NORMAL Rx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.168	29.6	65.1		55.1	
.188	36.6	64.1		54.1	
.336	28.1	59.3		49.3	
.667	25.4	56.0		46.0	
.773	26.0	56.0		46.0	
.840	25.8	56.0		46.0	
1.940	25.2	56.0		46.0	
3.355	25.1	56.0		46.0	
5.251	23.8	60.0		50.0	
7.007	23.8	60.0		50.0	
9.227	24.0	60.0		50.0	
12.105	24.0	60.0		50.0	
15.194	23.8	60.0		50.0	
18.071	24.1	60.0		50.0	
20.796	24.0	60.0		50.0	
23.937	23.8	60.0		50.0	
26.883	23.8	60.0		50.0	

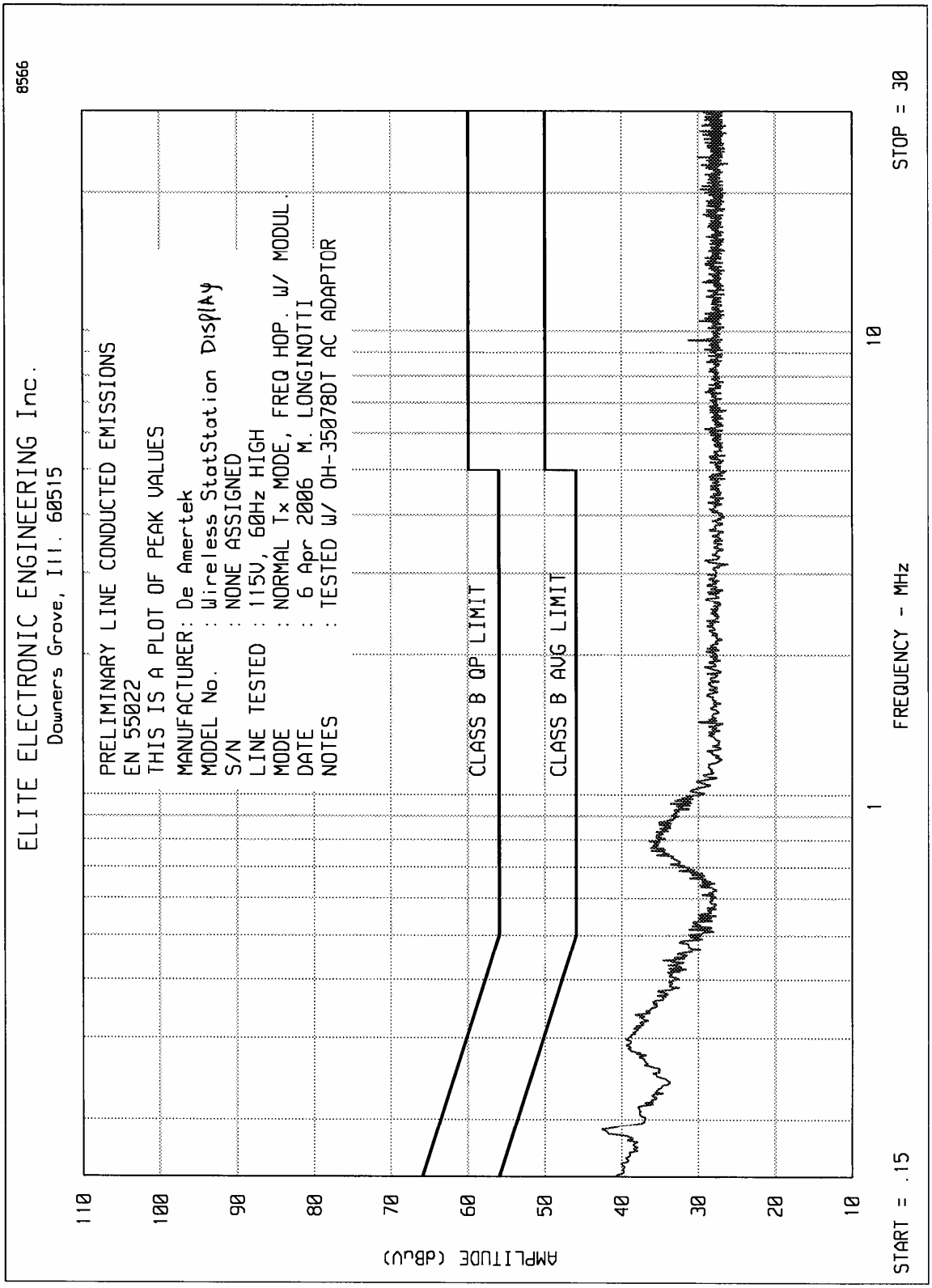
CHECKED BY: Richard King for
M. LONGINOTTI

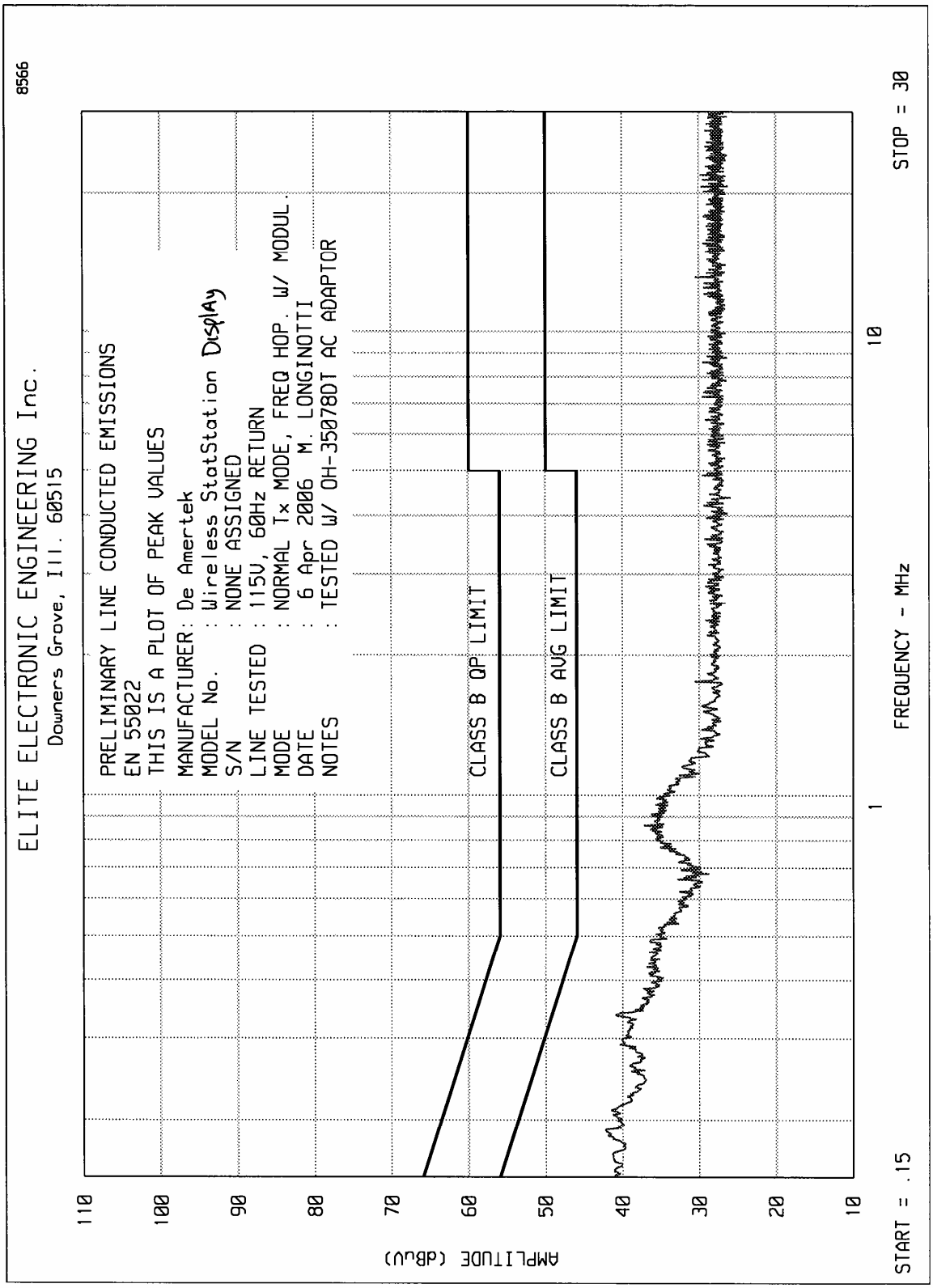
ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : De Amertek
MODEL : Wireless StatStation DISPLAY
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 115V, 60Hz RETURN
MODE : NORMAL Rx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.199	38.5	63.7		53.7	
.297	29.6	60.3		50.3	
.344	27.3	59.1		49.1	
.446	26.2	56.9		46.9	
.525	29.2	56.0		46.0	
.798	26.2	56.0		46.0	
.833	26.5	56.0		46.0	
1.027	33.4	56.0		46.0	
2.624	27.8	56.0		46.0	
4.992	25.2	56.0		46.0	
6.068	24.0	60.0		50.0	
8.808	24.0	60.0		50.0	
10.667	24.0	60.0		50.0	
14.405	24.0	60.0		50.0	
18.130	24.0	60.0		50.0	
20.642	23.8	60.0		50.0	
23.358	23.8	60.0		50.0	
25.424	24.1	60.0		50.0	

CHECKED BY: Richard King for
M. LONGINOTTI


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: De Amertek
MODEL No. : Wireless StatStation Display
S/N : NONE ASSIGNED
LINE TESTED : 115V, 60Hz HIGH
MODE : NORMAL Tx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006 M. LONGINOTTI
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: De Amertek
MODEL No. : Wireless StatStation Display
S/N : NONE ASSIGNED
LINE TESTED : 115V, 60Hz RETURN
MODE : NORMAL Tx MODE, FREQ HOP. W/ MODUL
DATE : 6 Apr 2006 M. LONGINOTTI
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz

ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : De Amertek
MODEL : Wireless StatStation DISPLAY
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 115V, 60Hz HIGH
MODE : NORMAL Tx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.166	30.6	65.2		55.2	
.199	38.8	63.6		53.6	
.297	31.4	60.3		50.3	
.321	29.8	59.7		49.7	
.350	27.3	59.0		49.0	
.527	33.9	56.0		46.0	
.795	27.6	56.0		46.0	
.827	27.4	56.0		46.0	
1.026	31.4	56.0		46.0	
2.301	25.0	56.0		46.0	
4.225	25.1	56.0		46.0	
6.095	23.8	60.0		50.0	
8.550	24.0	60.0		50.0	
11.047	24.0	60.0		50.0	
13.921	24.0	60.0		50.0	
17.740	25.0	60.0		50.0	
20.001	25.3	60.0		50.0	
23.823	23.8	60.0		50.0	
27.137	24.0	60.0		50.0	

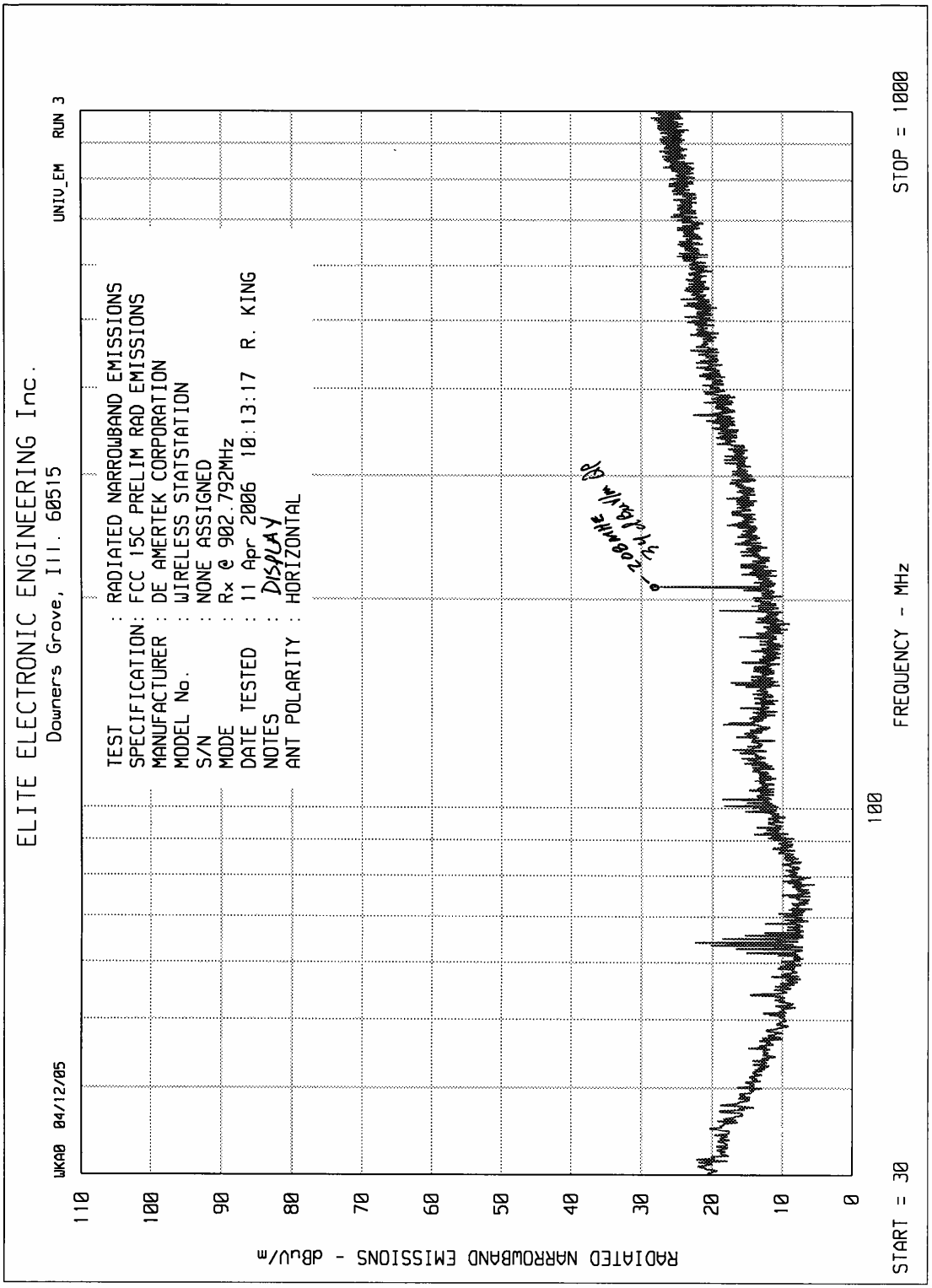
CHECKED BY: Richard King for
M. LONGINOTTI

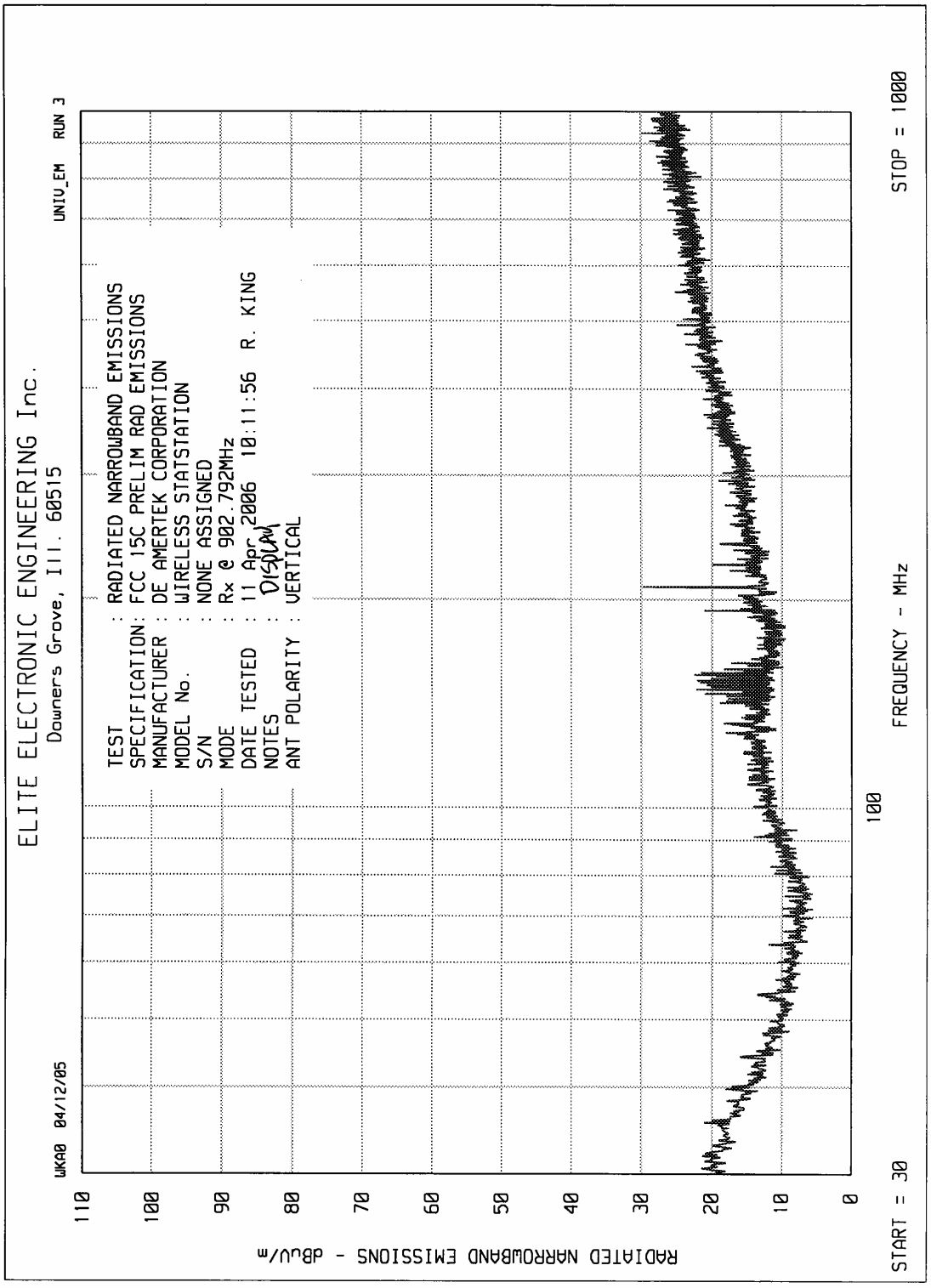
ETR No.
ELITE ELECTRONIC ENGINEERING CO.

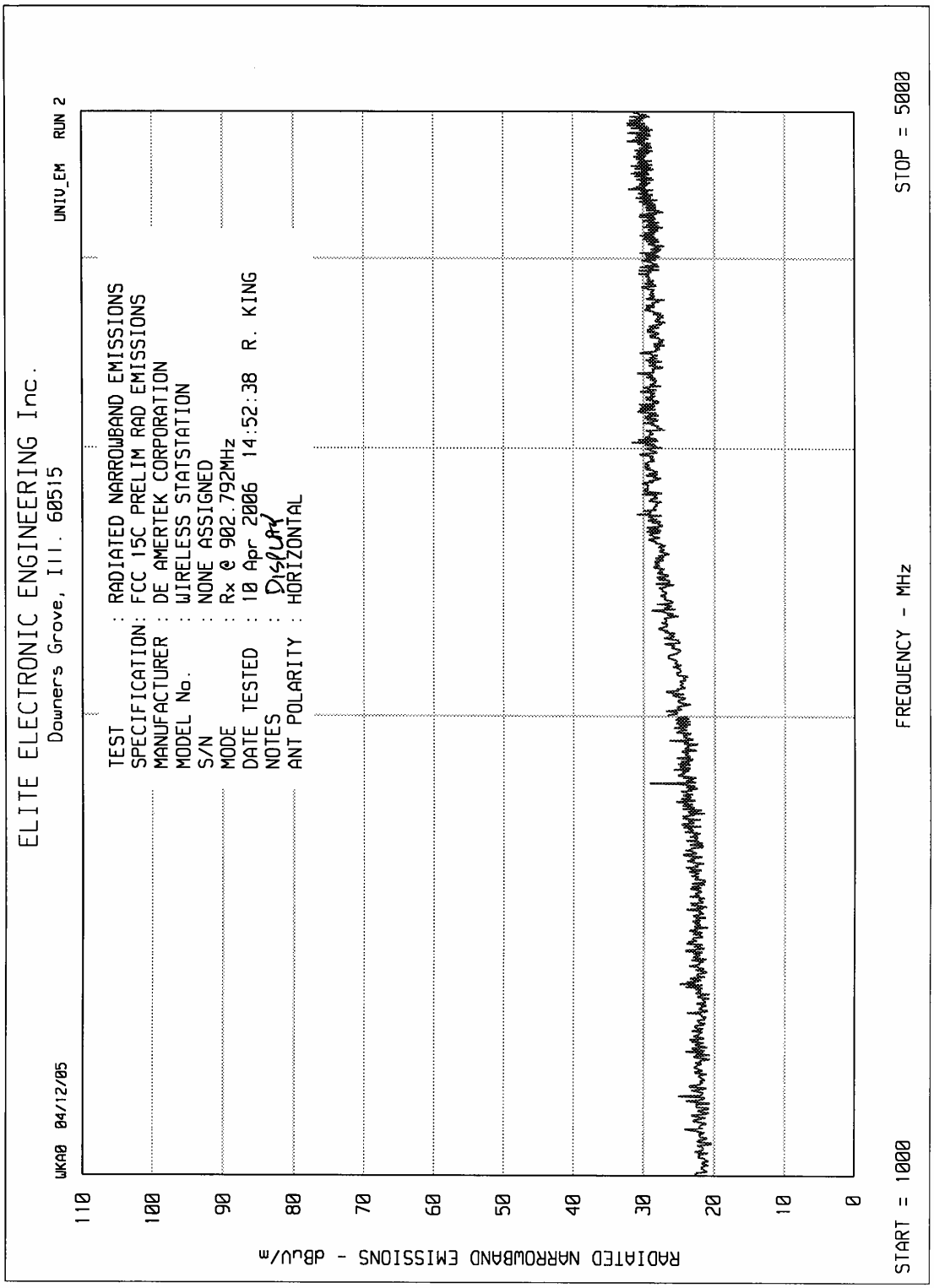
MANUFACTURER : De Amertek
MODEL : Wireless StatStation DISPLAY
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 115V, 60Hz RETURN
MODE : NORMAL Tx MODE, FREQ HOP. W/ MODUL.
DATE : 6 Apr 2006
NOTES : TESTED W/ OH-35078DT AC ADAPTOR
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

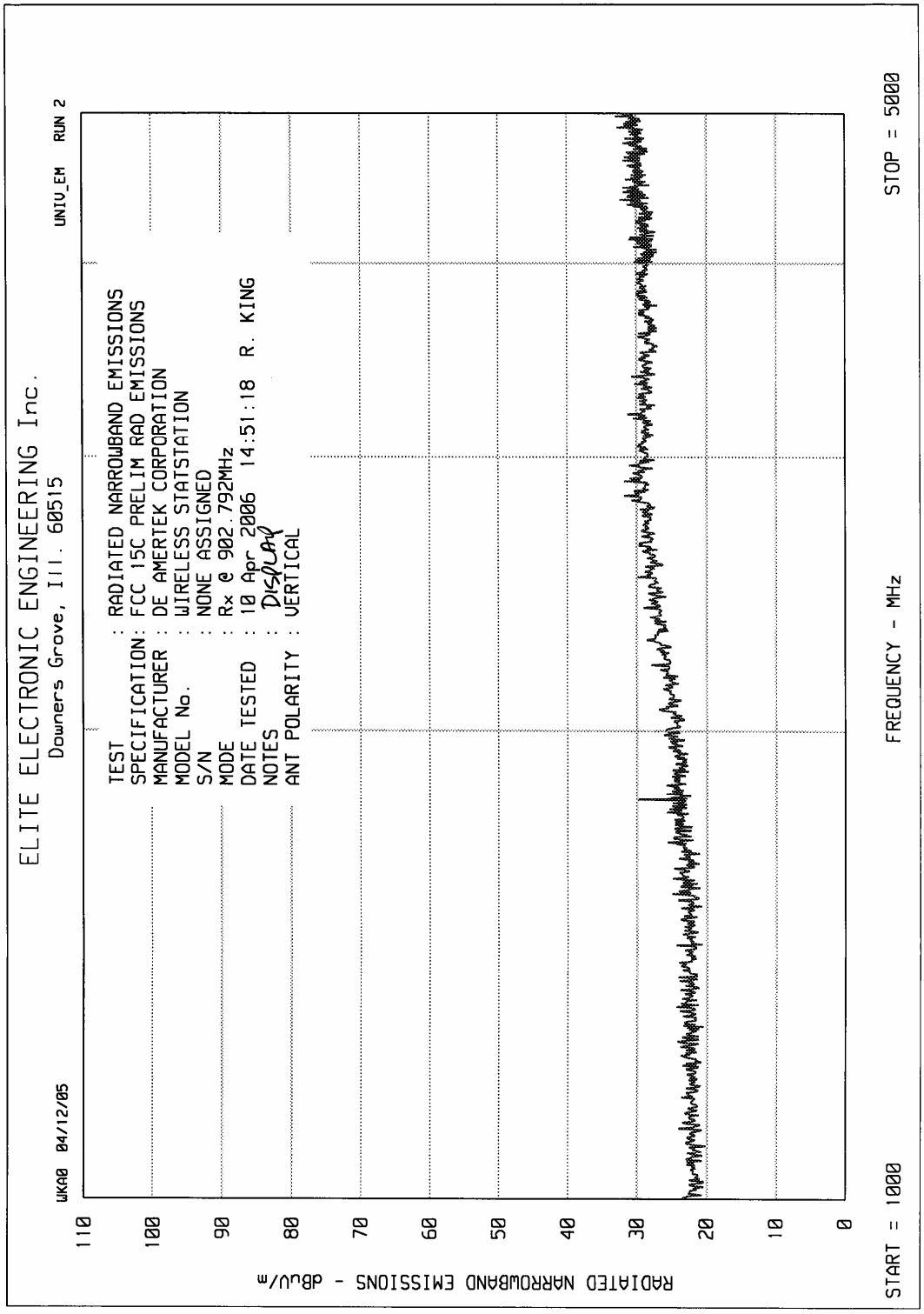
FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.199	39.1	63.7		53.7	
.336	32.0	59.3		49.3	
.347	29.3	59.0		49.0	
.456	27.6	56.8		46.8	
.801	27.2	56.0		46.0	
.854	27.5	56.0		46.0	
.924	27.1	56.0		46.0	
.997	26.5	56.0		46.0	
1.748	25.2	56.0		46.0	
3.536	25.2	56.0		46.0	
5.655	23.8	60.0		50.0	
7.842	24.0	60.0		50.0	
8.803	23.8	60.0		50.0	
13.079	23.8	60.0		50.0	
15.540	24.0	60.0		50.0	
17.845	24.0	60.0		50.0	
20.965	24.1	60.0		50.0	
23.795	23.8	60.0		50.0	
27.272	24.0	60.0		50.0	

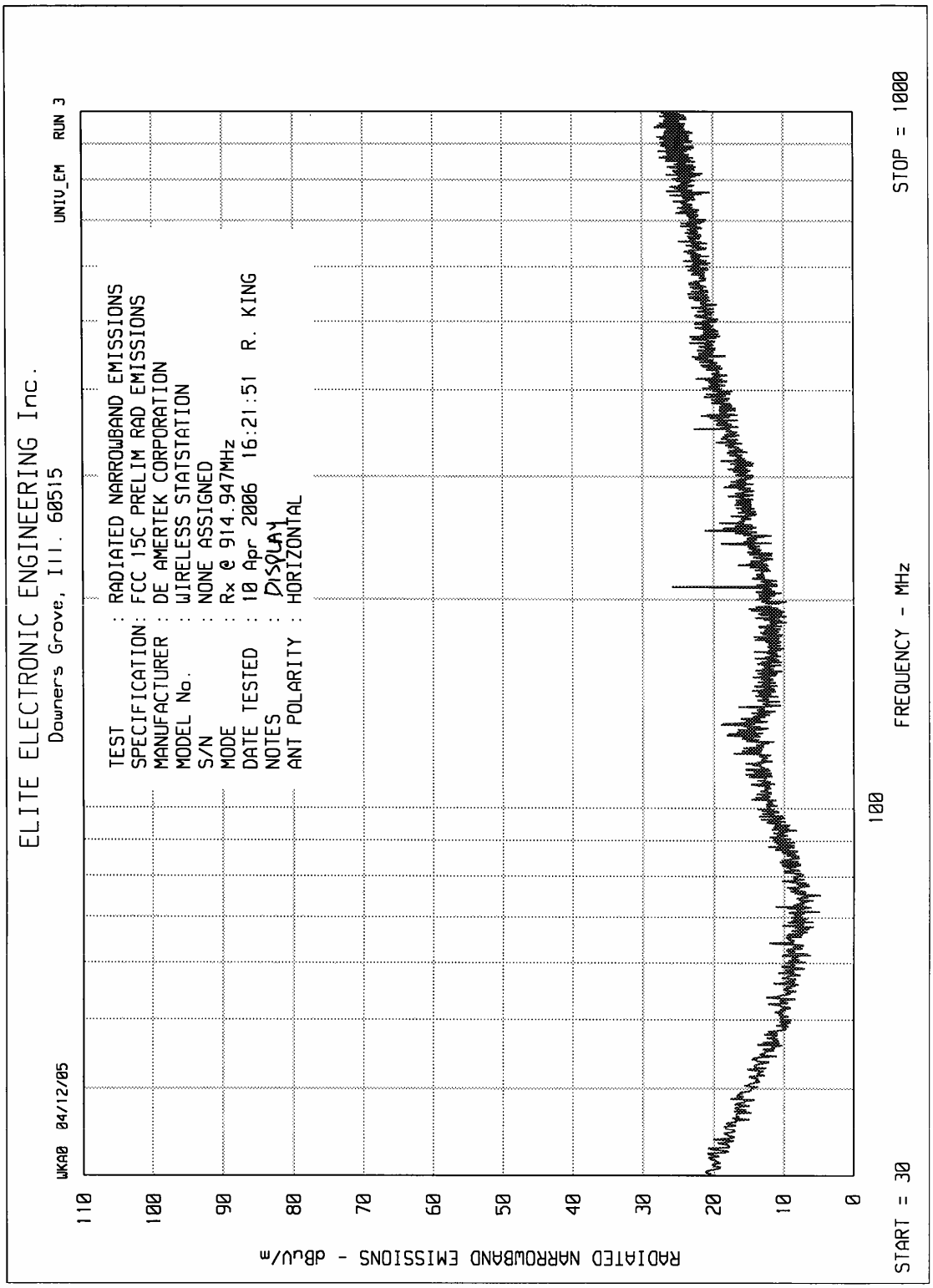
CHECKED BY: Richard King for
M. LONGINOTTI

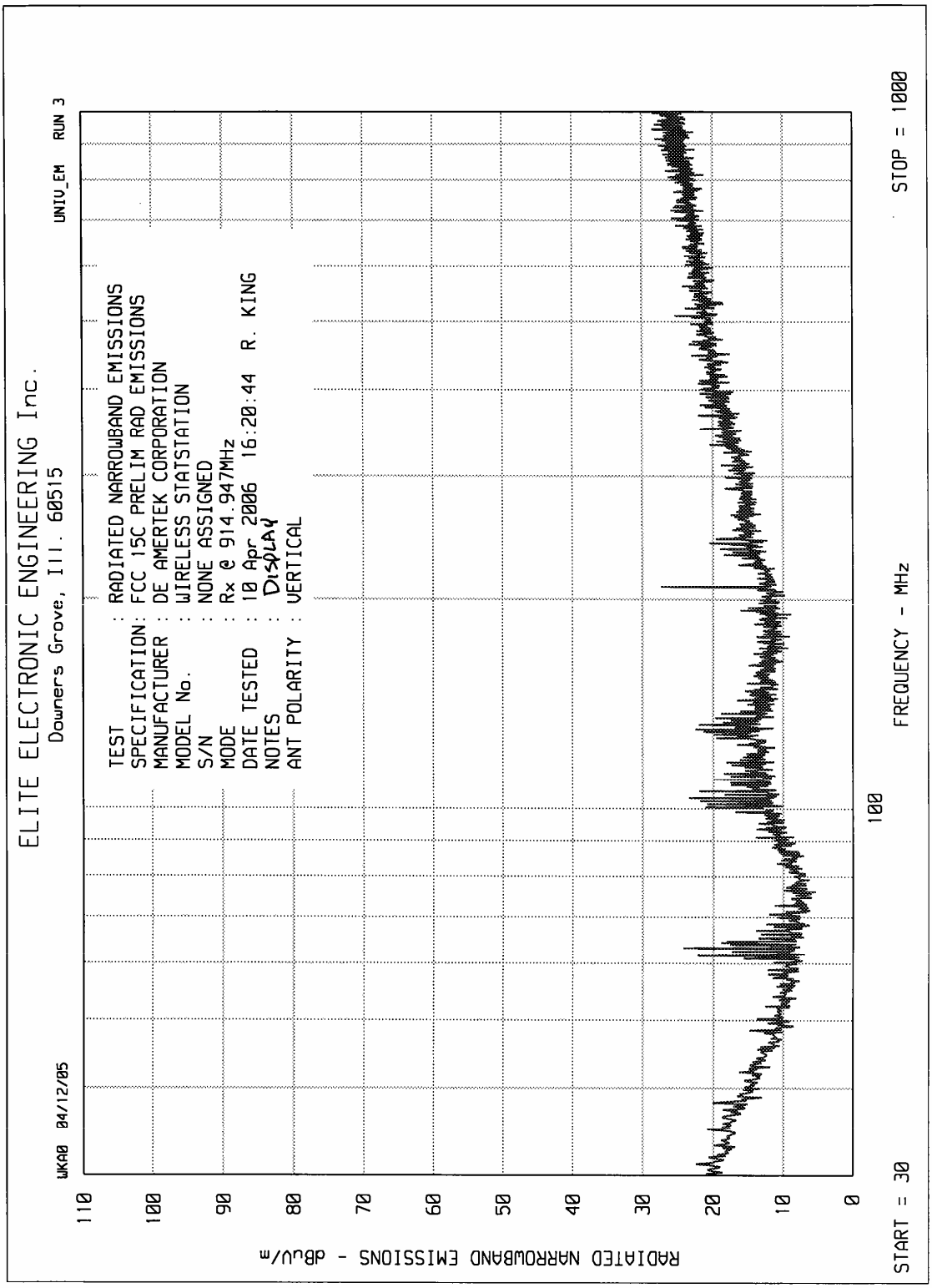

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 902.792MHz
DATE TESTED : 11 Apr 2006 10:13:17 R. KING
NOTES : DISPLAY
ANT POLARITY : HORIZONTAL
2.484 dBuV/m
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

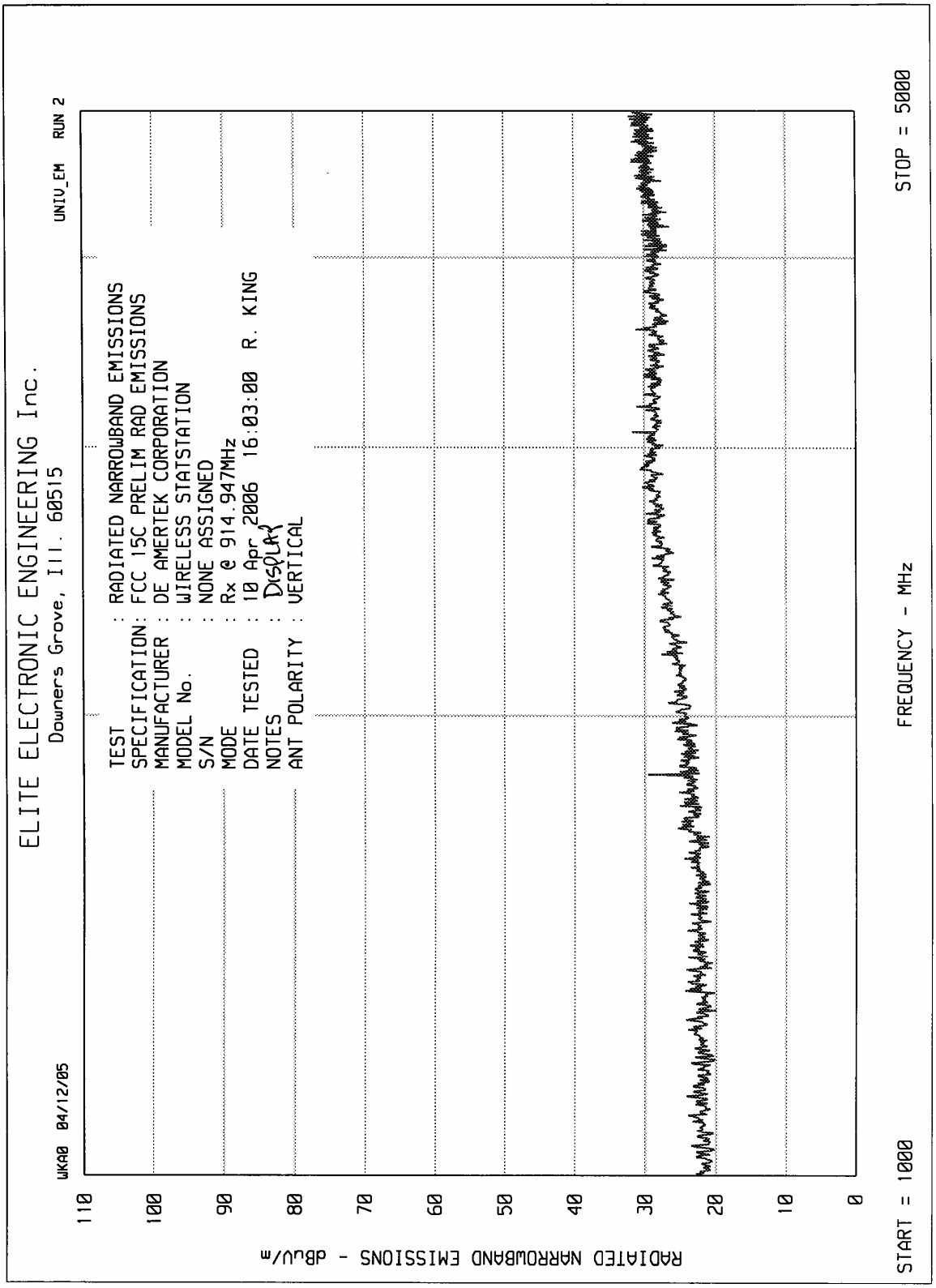

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 902.792MHz
DATE TESTED : 11 Apr 2006 10:11:56 R. KING
NOTES : DISPLAY
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

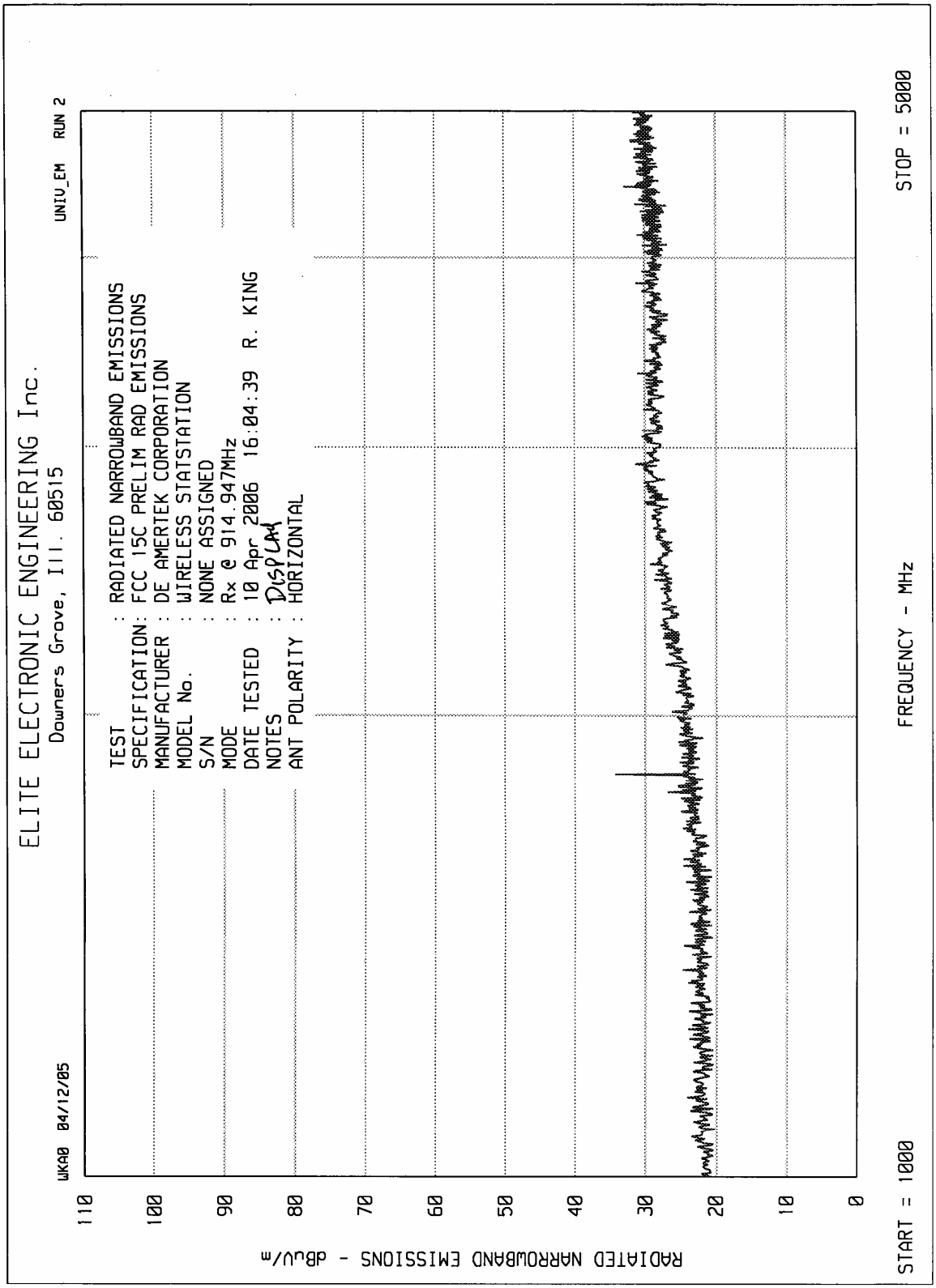

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 902.792MHz
DATE TESTED : 10 Apr 2006 14:52:38 R. KING
NOTES : Display
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000

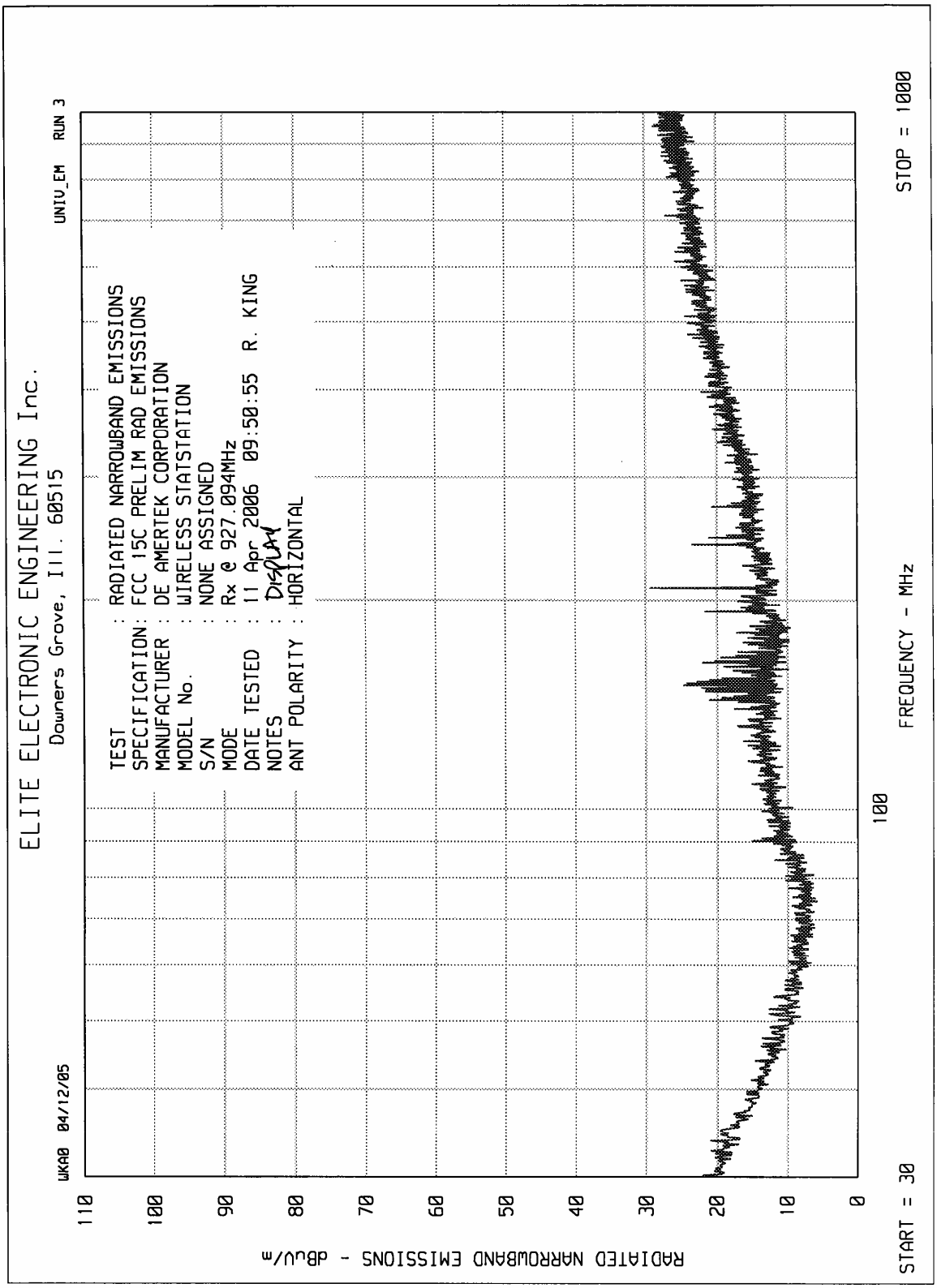

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 902.792MHz
DATE TESTED : 10 Apr 2006 14:51:18 R. KING
NOTES : Display
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000

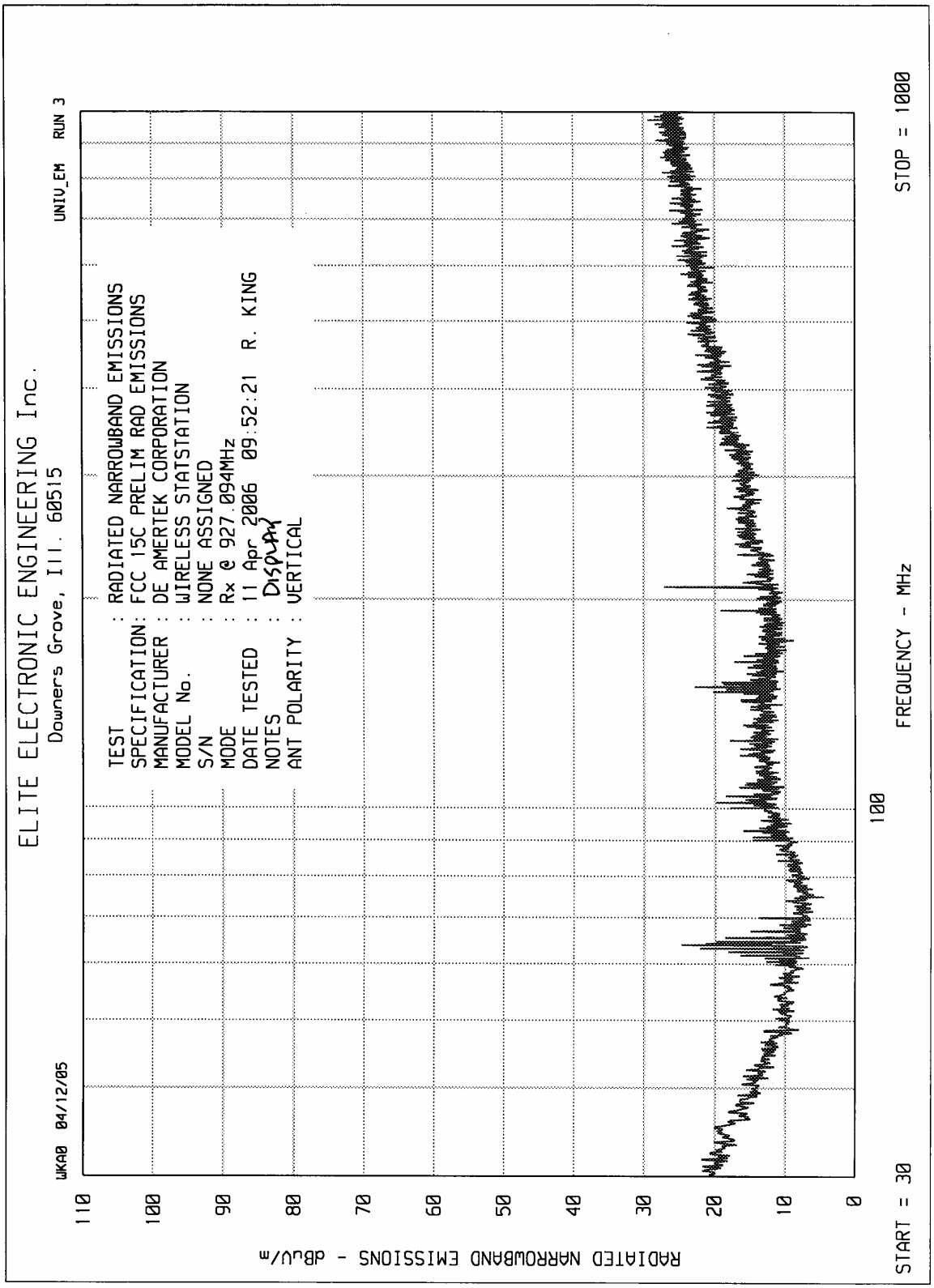

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 914.947MHz
DATE TESTED : 10 Apr 2006 16:21:51 R. KING
NOTES : DISPLAY
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

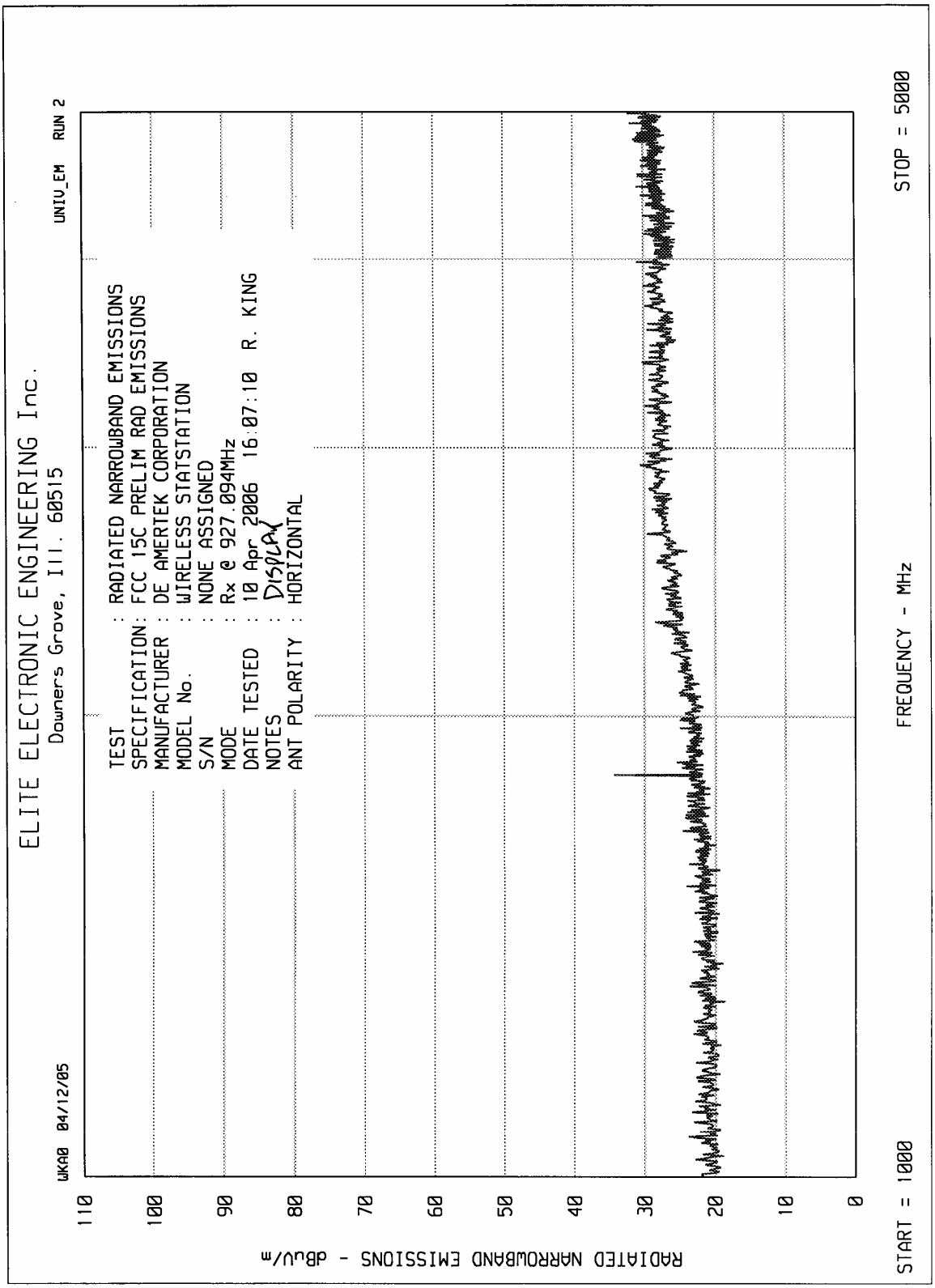

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 914.947MHz
DATE TESTED : 10 Apr 2006 16:20:44 R. KING
NOTES : Display
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

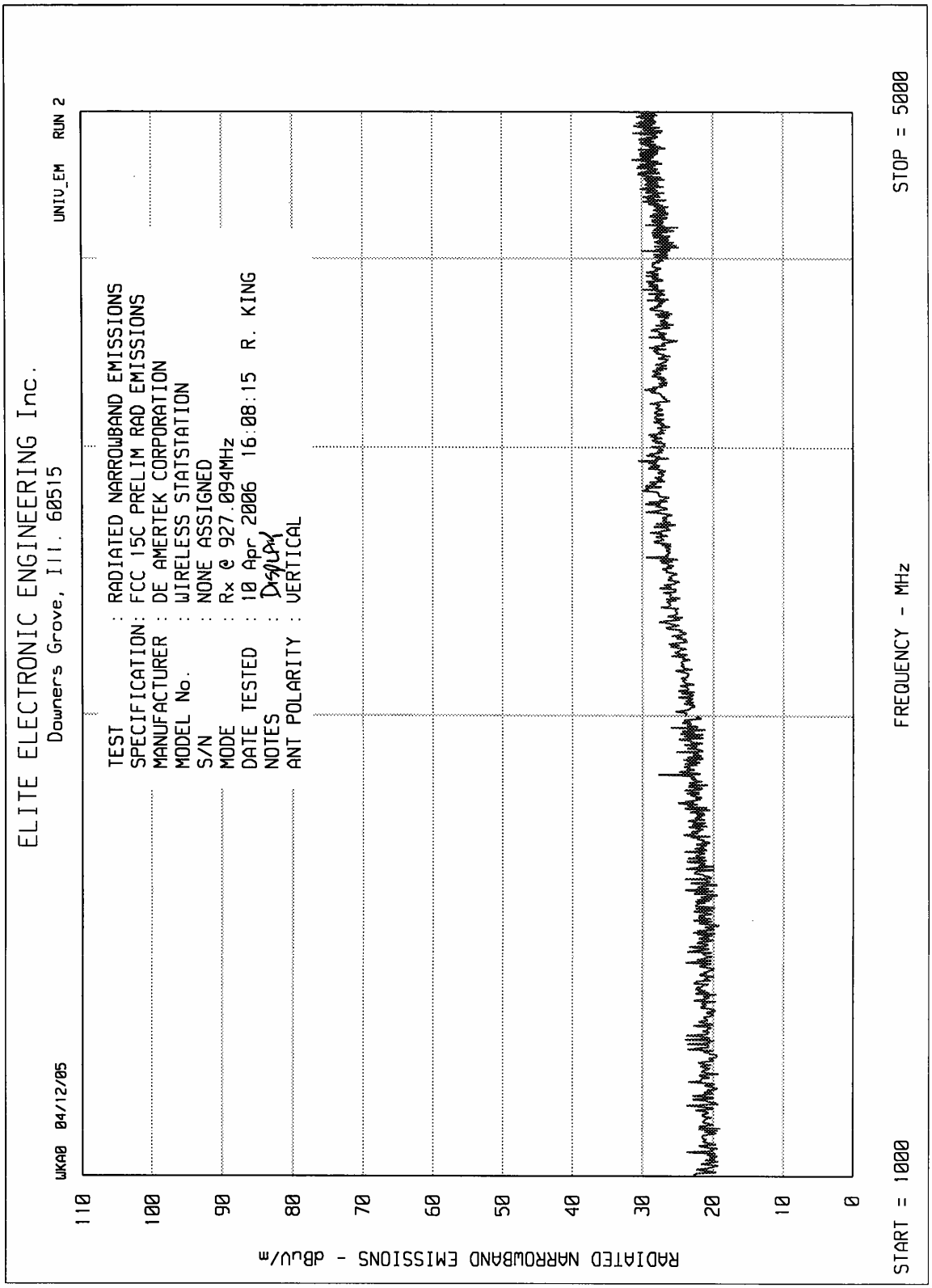

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 914.947MHz
DATE TESTED : 10 Apr 2006 16:03:00 R. KING
NOTES : Display
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 914.947MHz
DATE TESTED : 10 Apr 2006 16:04:39 R. KING
NOTES : Display
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 927.094MHz
DATE TESTED : 11 Apr 2006 09:50:55 R. KING
NOTES : Digital
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 3
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 927.094MHz
DATE TESTED : 11 Apr 2006 09:52:21 R. KING
NOTES : Display
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 927.094MHz
DATE TESTED : 10 Apr 2006 16:07:10 R. KING
NOTES : Display
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 2
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DE AMERTEK CORPORATION
MODEL No. : WIRELESS STATSTATION
S/N : NONE ASSIGNED
MODE : Rx @ 927.094MHz
DATE TESTED : 10 Apr 2006 16:08:15 R. KING
NOTES : Digital
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 5000

Data Sheet

MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart B
Radiated Emissions Measurement
DATE : April 13, 2006
NOTES : Rc at 902.792MHz;
: TEST DISTANCE IS 3 METERS

FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	15.209 Limit uV/m
902.8	H	4.9	*	1.9	22.3	0.0	29.1	28.5	200.0
902.8	V	4.5	*	1.9	22.9	0.0	29.3	29.2	200.0
1805.6	H	48.7		2.9	28.0	-34.5	45.1	179.3	500.0
1805.6	V	46.6		2.9	28.0	-34.5	43.0	140.8	500.0
2708.4	H	42.3	*	3.7	31.4	-34.5	42.9	139.9	500.0
2708.4	V	42.7	*	3.7	31.4	-34.5	43.3	146.5	500.0
3611.2	H	40.5	*	4.4	32.5	-34.6	42.8	137.3	500.0
3611.2	V	40.6	*	4.4	32.5	-34.6	42.9	138.9	500.0
4514.0	H	40.3	*	4.8	32.8	-34.7	43.3	145.5	500.0
4514.0	V	40.5	*	4.8	32.8	-34.7	43.5	148.9	500.0

Checked BY : Richard E. King

Richard E. King

Data Sheet

MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart B,
Radiated Emissions Measurement
DATE : April 13, 2006
NOTES : Rc at 914.947MHz;
: TEST DISTANCE IS 3 METERS

FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	15.209 Limit uV/m
914.9	H	4.6	*	2.0	22.3	0.0	28.9	27.7	200.0
914.9	V	4.8	*	2.0	23.1	0.0	29.8	31.1	200.0
1829.8	H	49.8		2.9	28.1	-34.5	46.3	206.5	500.0
1829.8	V	46.5		2.9	28.1	-34.5	43.0	141.2	500.0
2744.7	H	42.0	*	3.8	31.5	-34.5	42.8	137.3	500.0
2744.7	V	42.1	*	3.8	31.5	-34.5	42.9	138.9	500.0
3659.6	H	41.2	*	4.4	32.6	-34.6	43.6	151.1	500.0
3659.6	V	41.1	*	4.4	32.6	-34.6	43.5	149.3	500.0
4574.5	H	40.1	*	4.8	33.0	-34.7	43.3	146.1	500.0
4574.5	V	40.8	*	4.8	33.0	-34.7	44.0	158.3	500.0

Checked BY : Richard E. King

Richard E. King

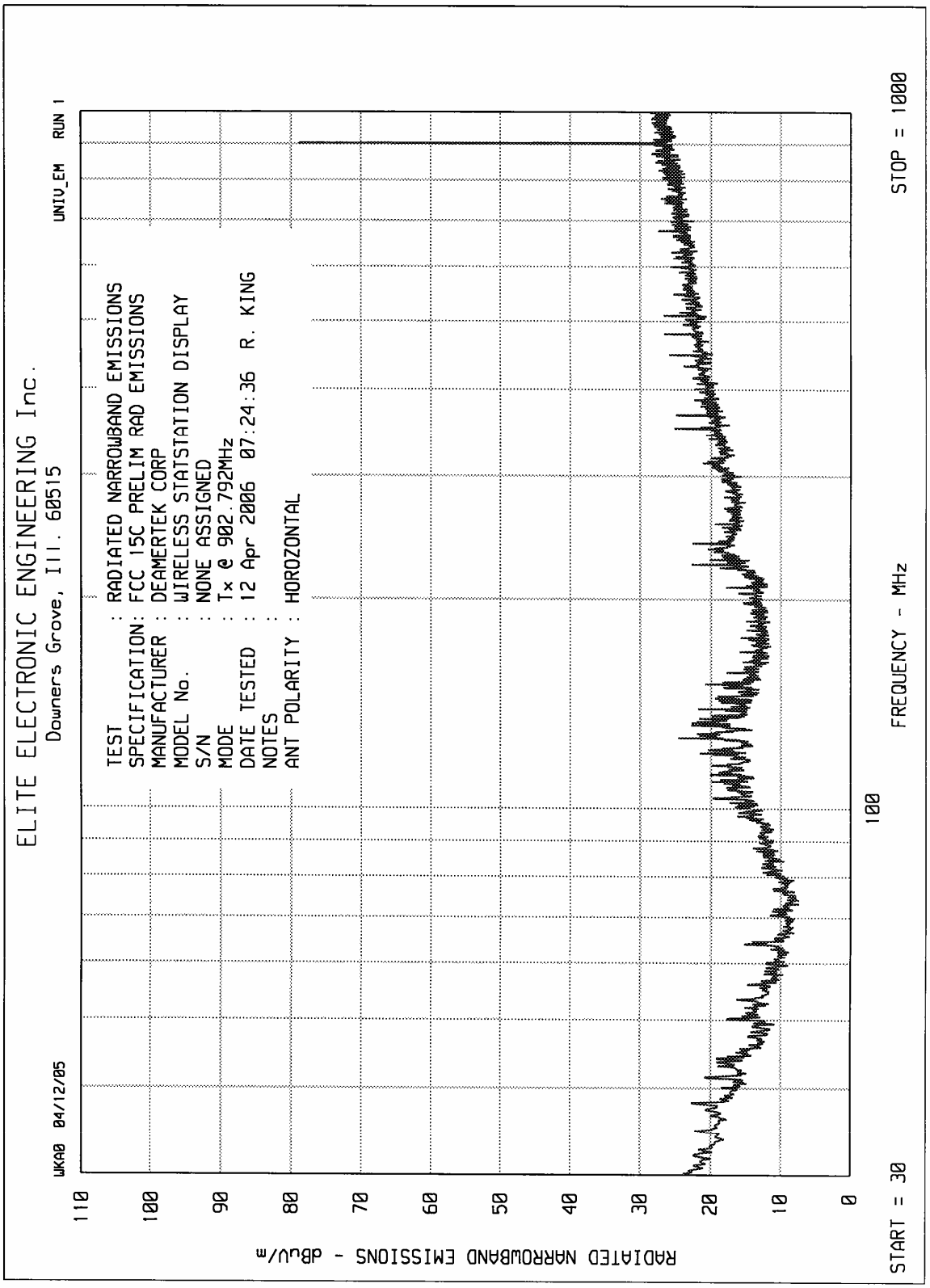
Data Sheet

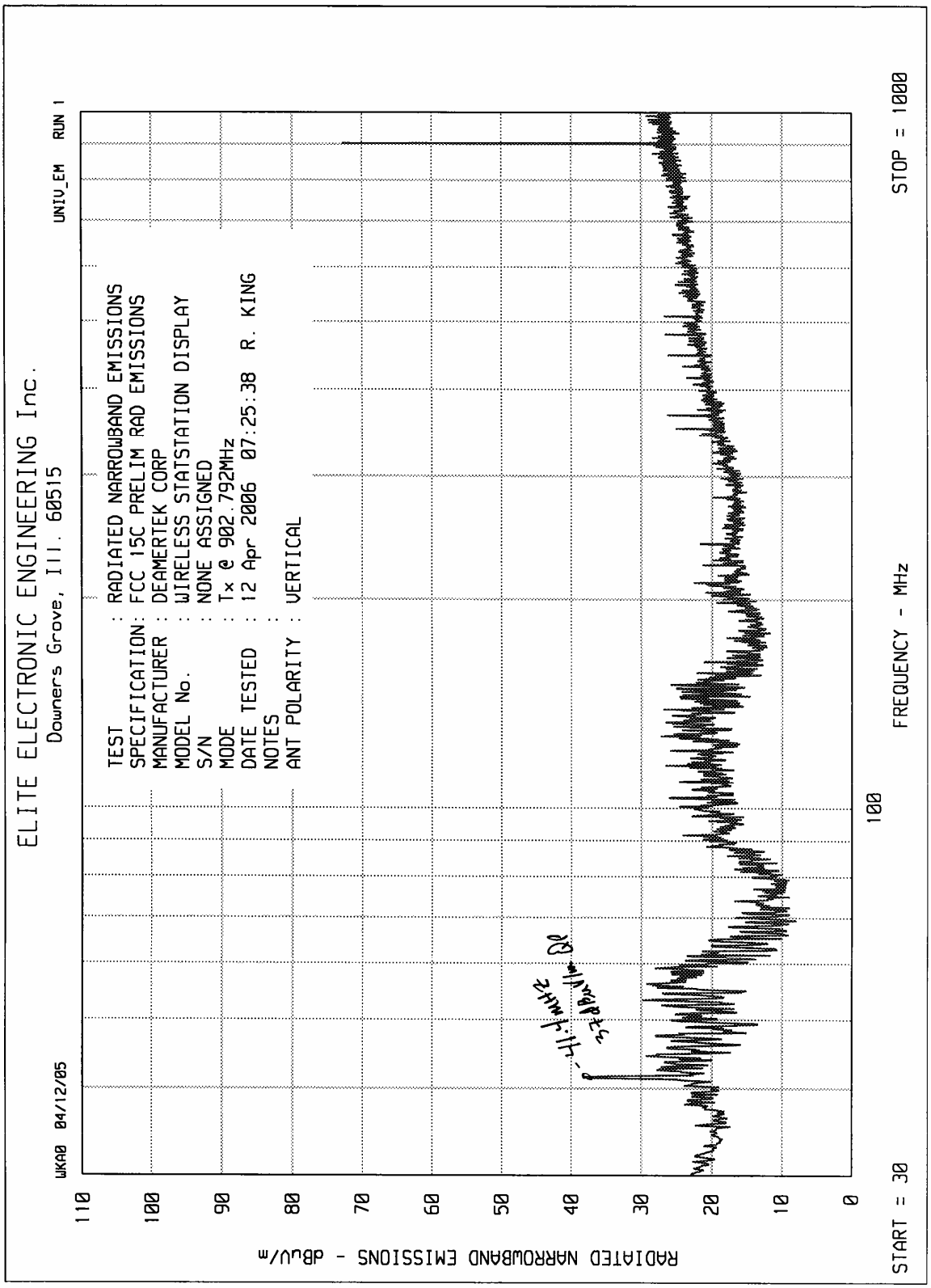
MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart B
Radiated Emissions Measurement
DATE : April 13, 2006
NOTES : Rc at 927.094MHz;
: TEST DISTANCE IS 3 METERS

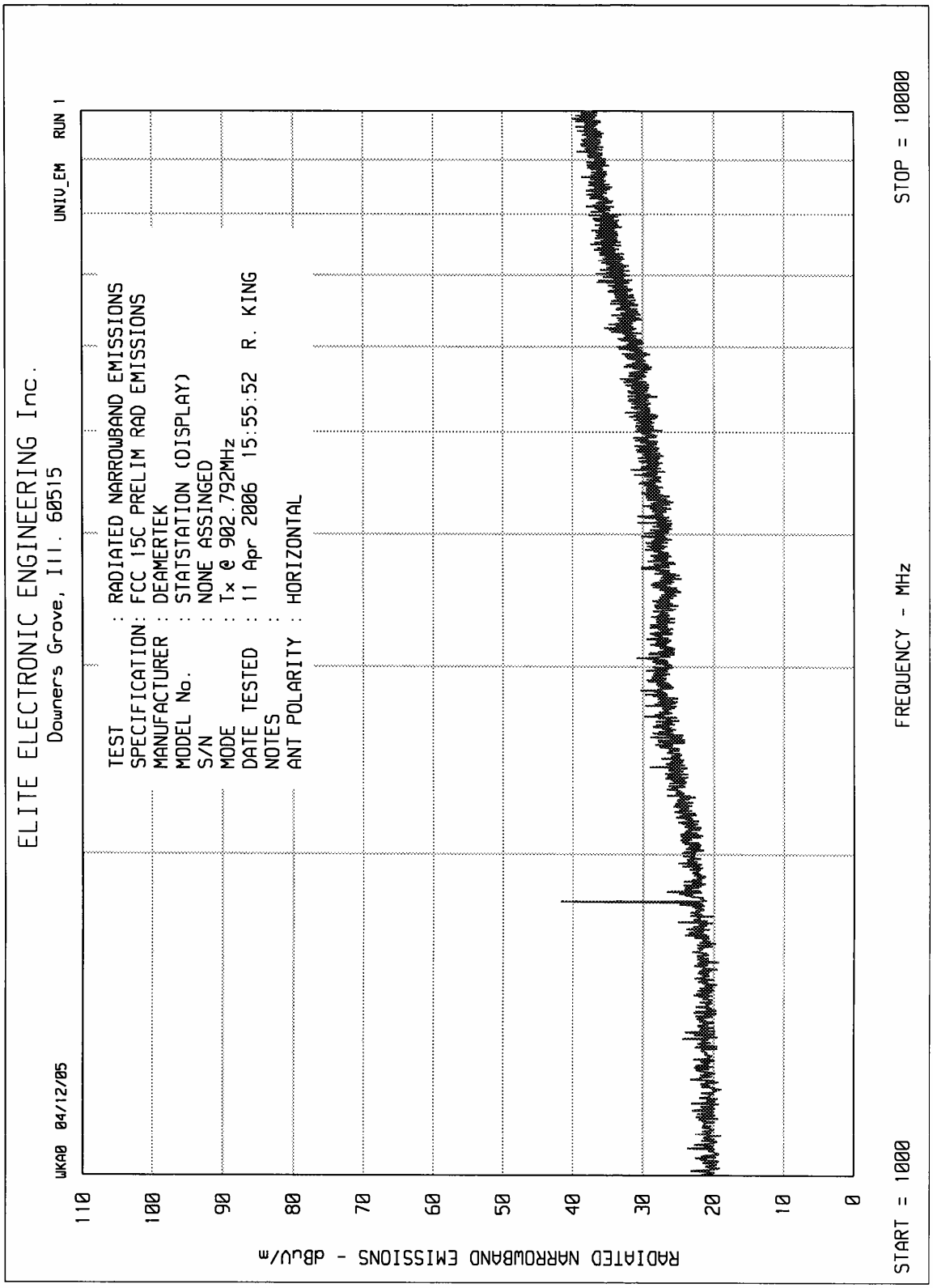
FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	15.209 Limit uV/m
927.1	H	5.9	*	2.0	22.4	0.0	30.3	32.7	200.0
927.1	V	5.2	*	2.0	23.5	0.0	30.6	34.1	200.0
1854.2	H	49.7		2.9	28.2	-34.5	46.3	207.2	500.0
1854.2	V	46.7		2.9	28.2	-34.5	43.3	146.7	500.0
2781.3	H	42.0	*	3.8	31.6	-34.5	42.9	139.5	500.0
2781.3	V	42.1	*	3.8	31.6	-34.5	43.0	141.2	500.0
3708.4	H	41.2	*	4.4	32.6	-34.5	43.7	153.3	500.0
3708.4	V	41.1	*	4.4	32.6	-34.5	43.6	151.6	500.0
4635.5	H	40.1	*	4.9	33.2	-34.6	43.5	150.0	500.0
4635.5	V	40.8	*	4.9	33.2	-34.6	44.2	162.6	500.0

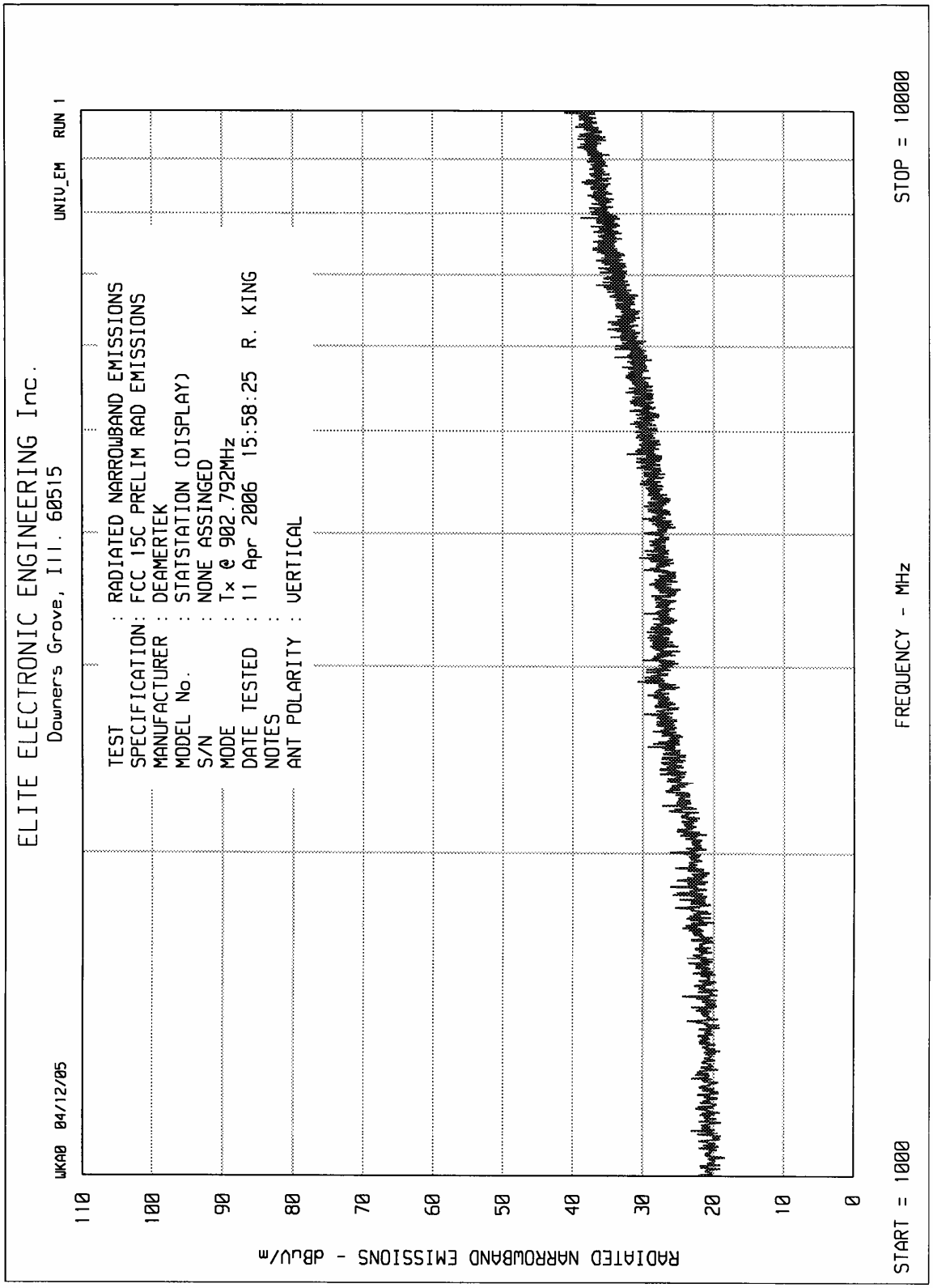
Checked BY : Richard E. King

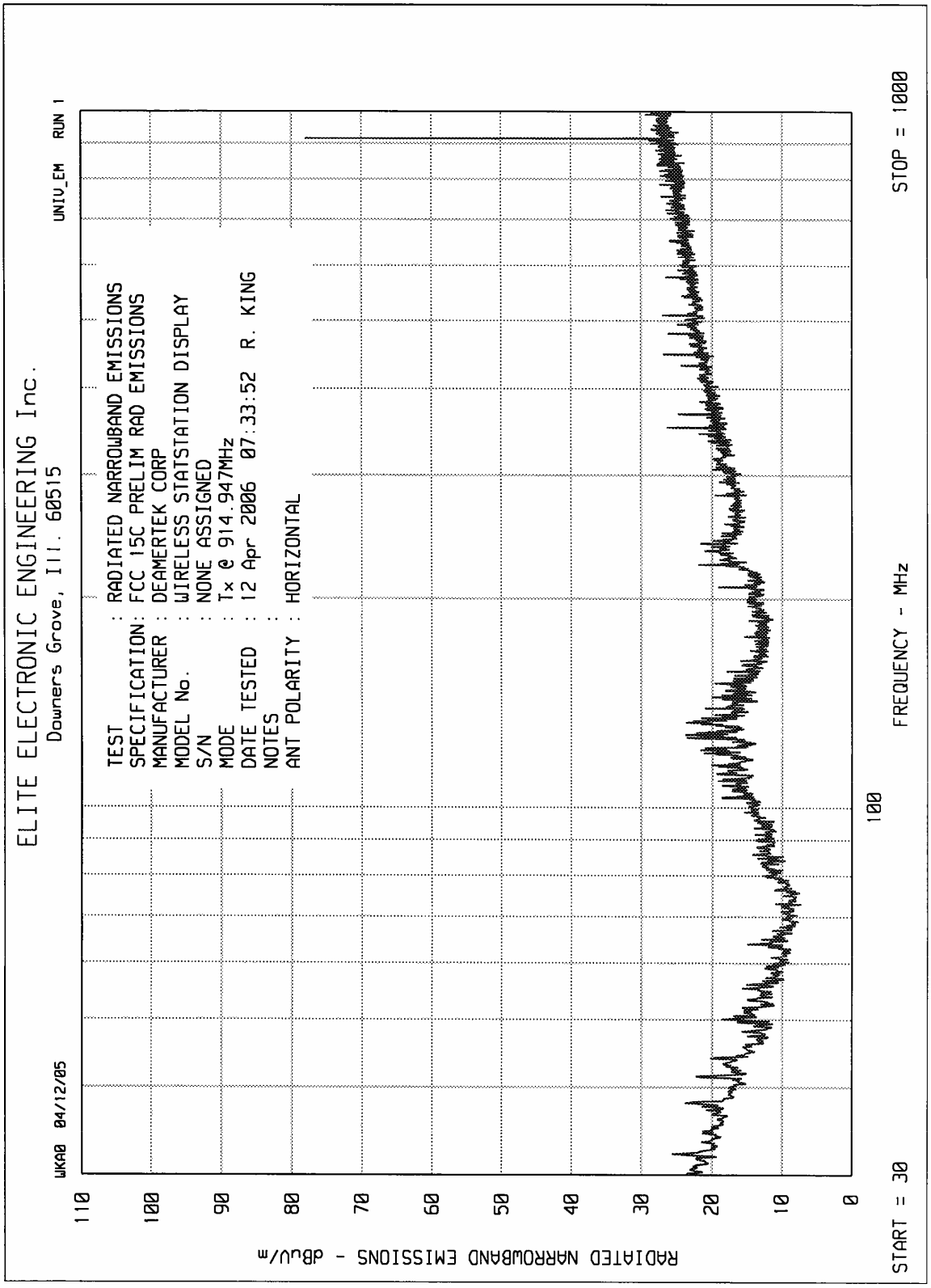
Richard E. King

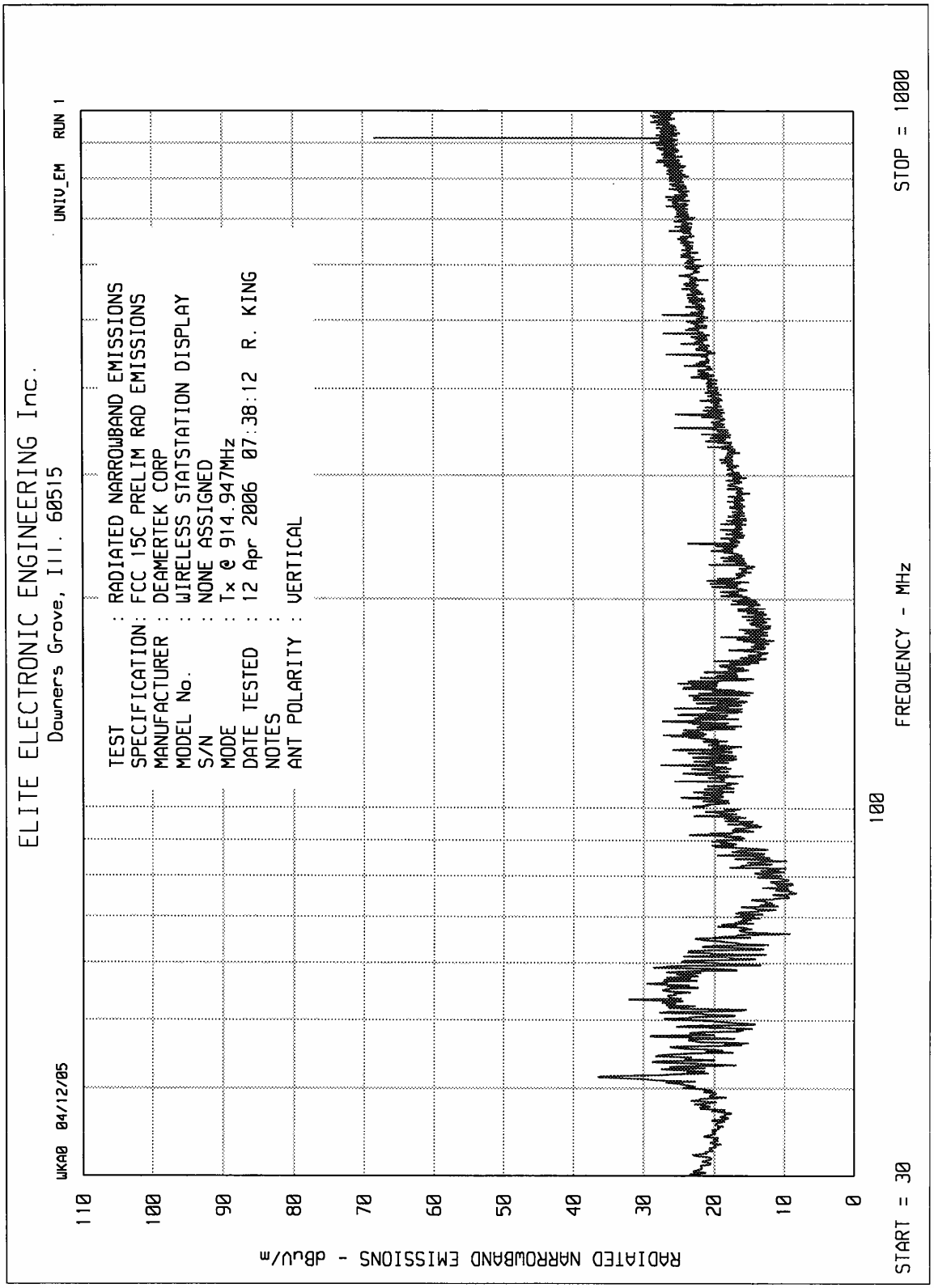

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 902.792MHz
DATE TESTED : 12 Apr 2006 07:24:36 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

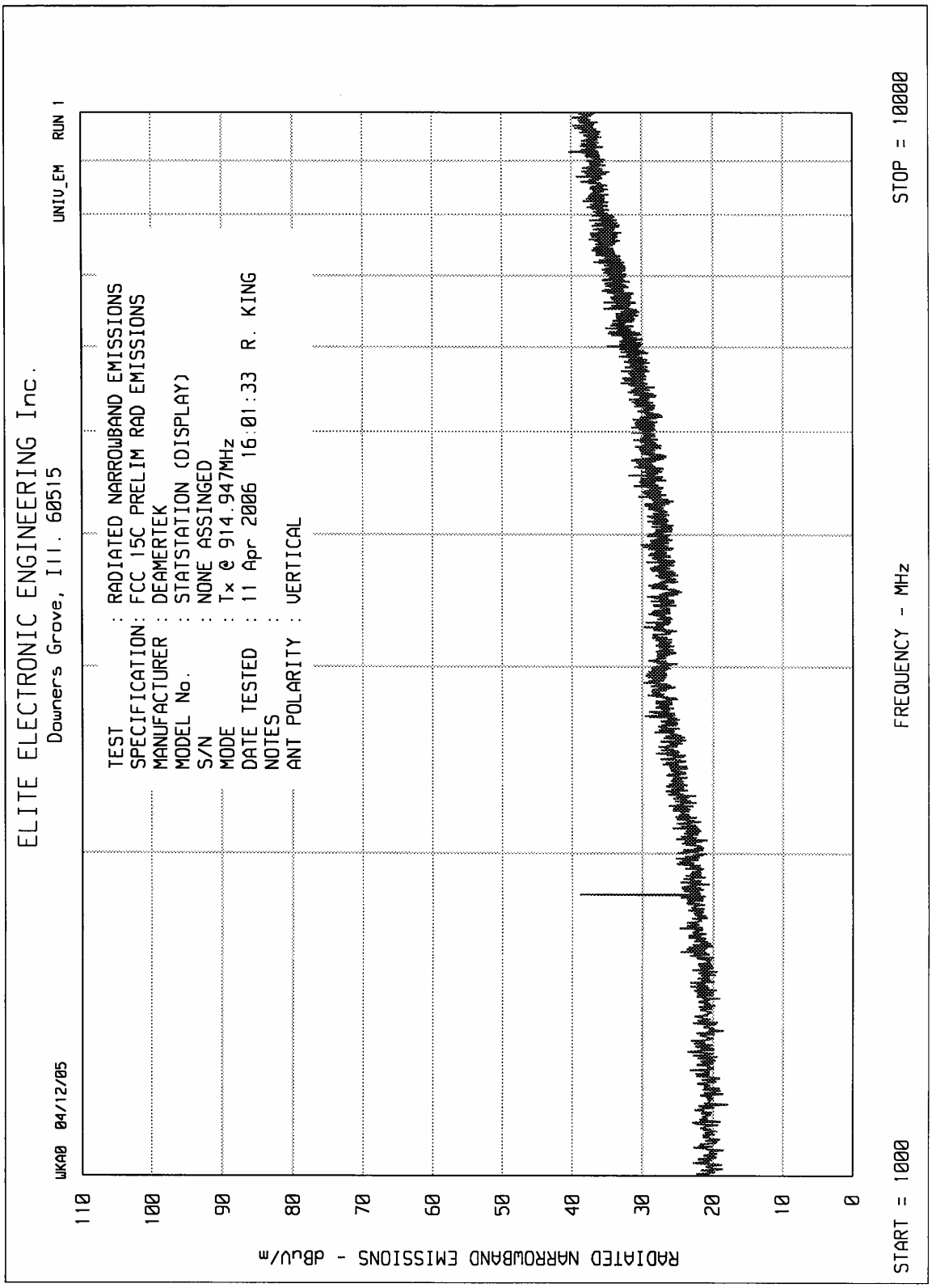

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 902.792MHz
DATE TESTED : 12 Apr 2006 07:25:38 R. KING
NOTES :
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

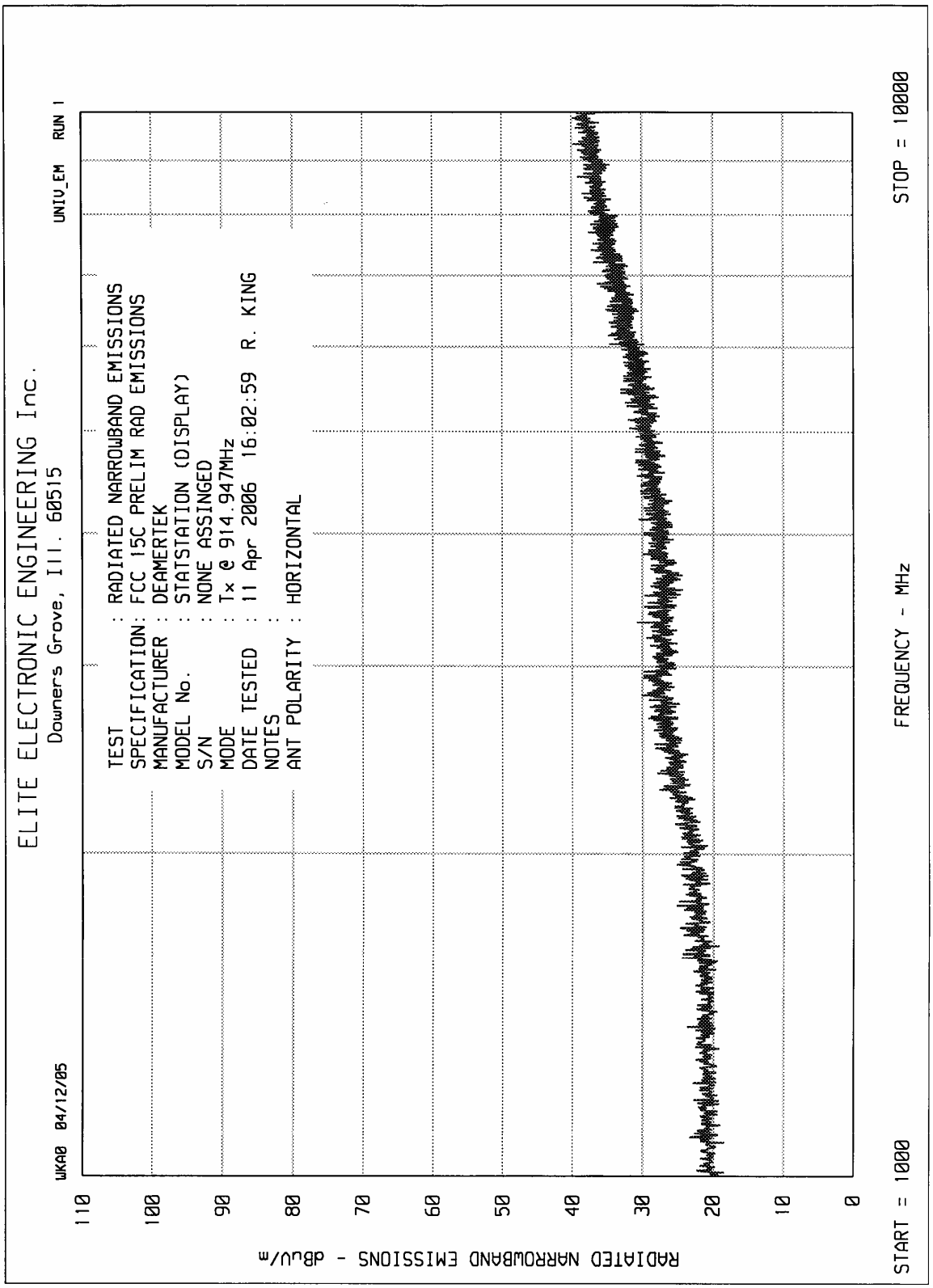

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATSTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 902.792MHz
DATE TESTED : 11 Apr 2006 15:55:52 R. KING
NOTES : :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000

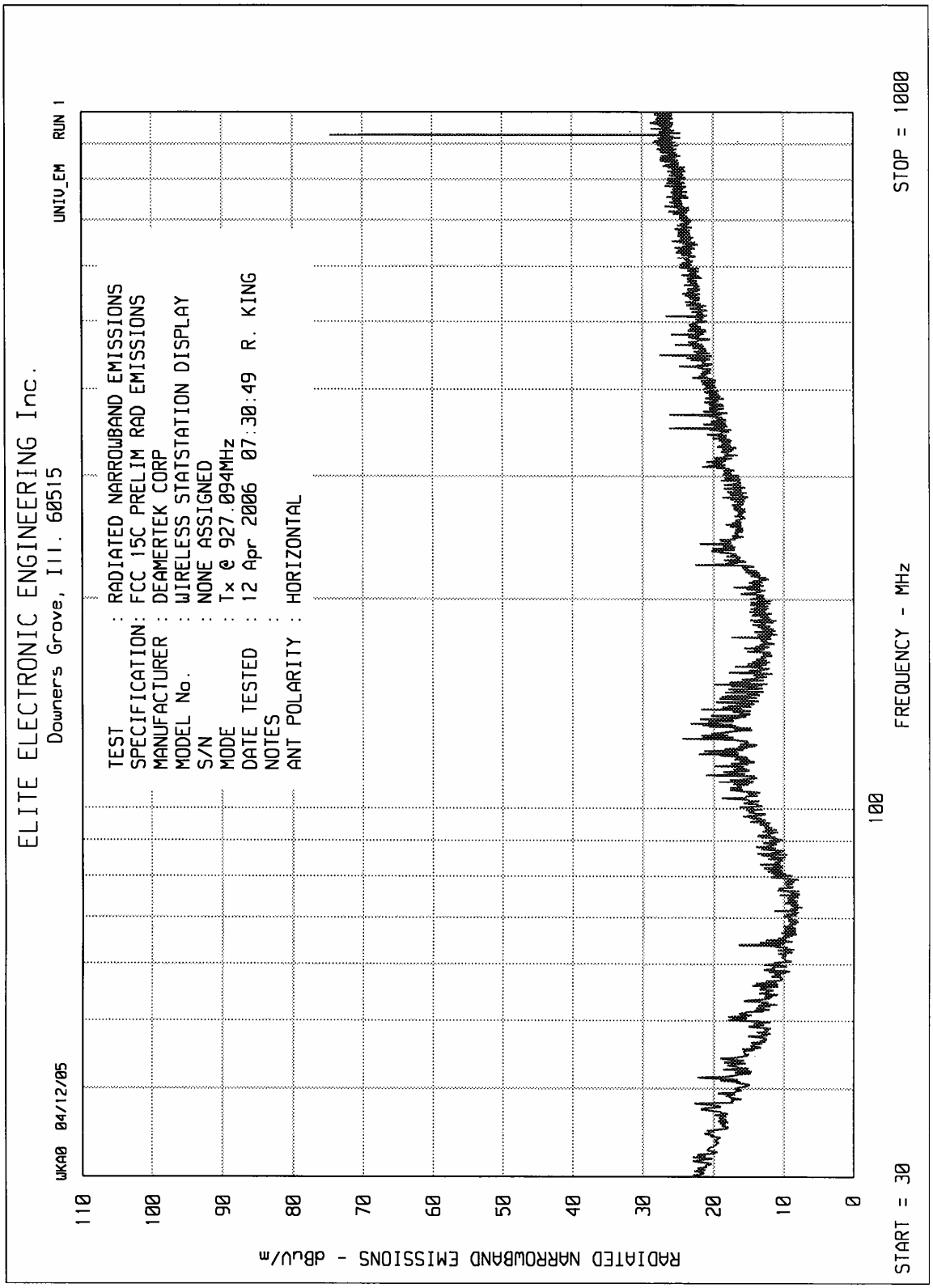

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATISTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 902.792MHz
DATE TESTED : 11 Apr 2006 15:58:25 R. KING
NOTES : :
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000

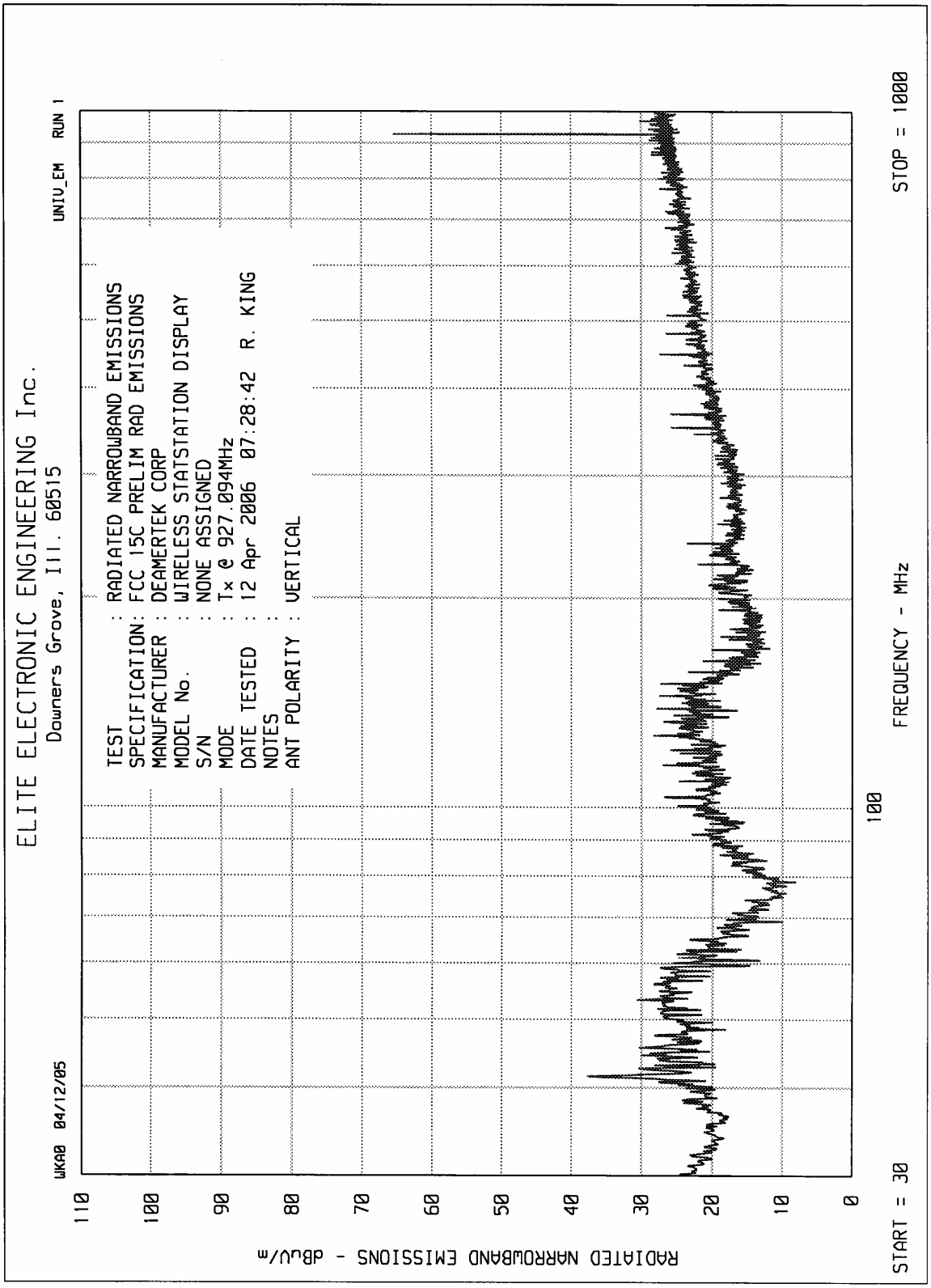

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 914.947MHz
DATE TESTED : 12 Apr 2006 07:33:52 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000

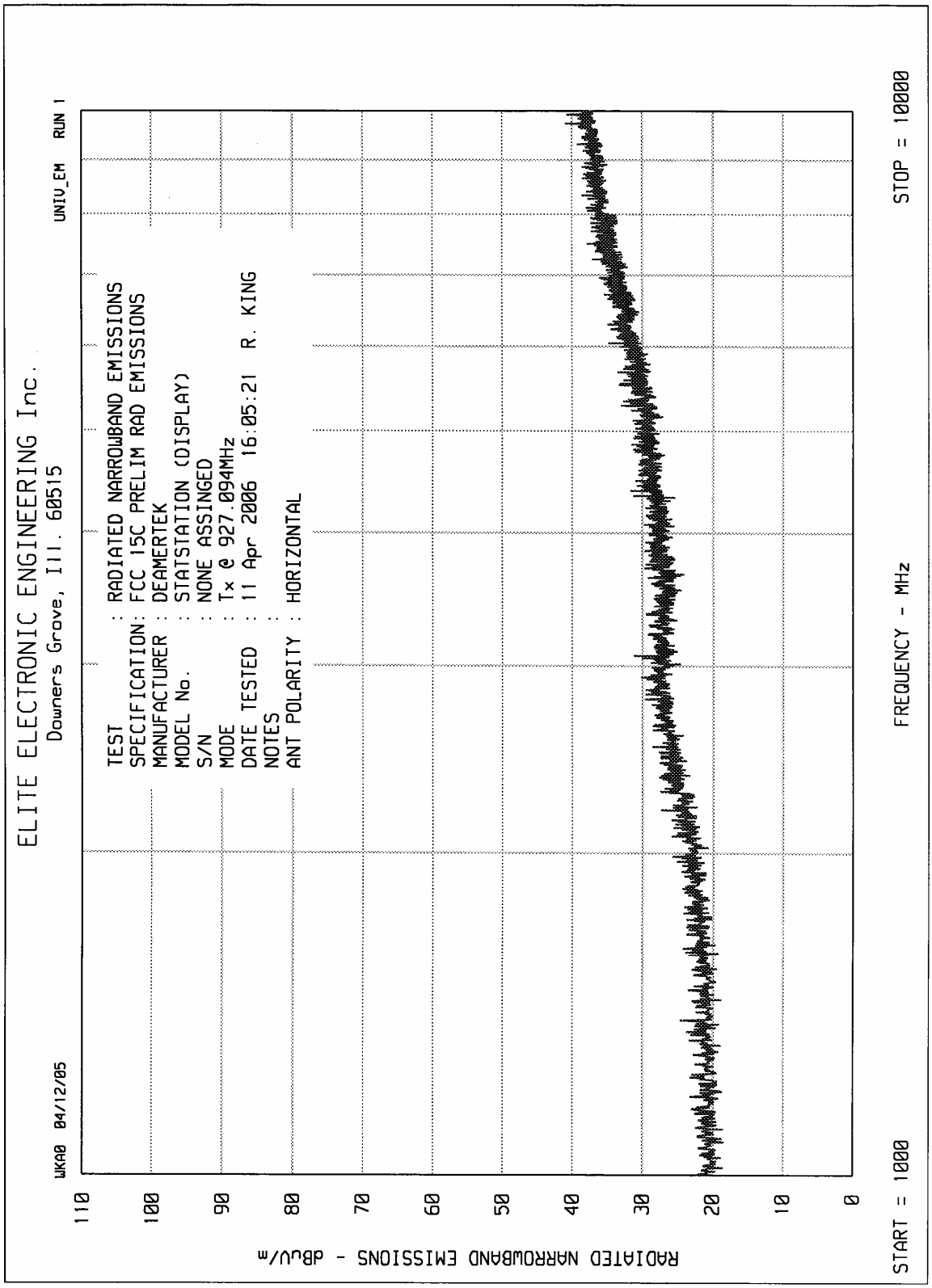

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 914.947MHz
DATE TESTED : 12 Apr 2006 07:38:12 R. KING
NOTES :
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
STOP = 1000
FREQUENCY - MHz

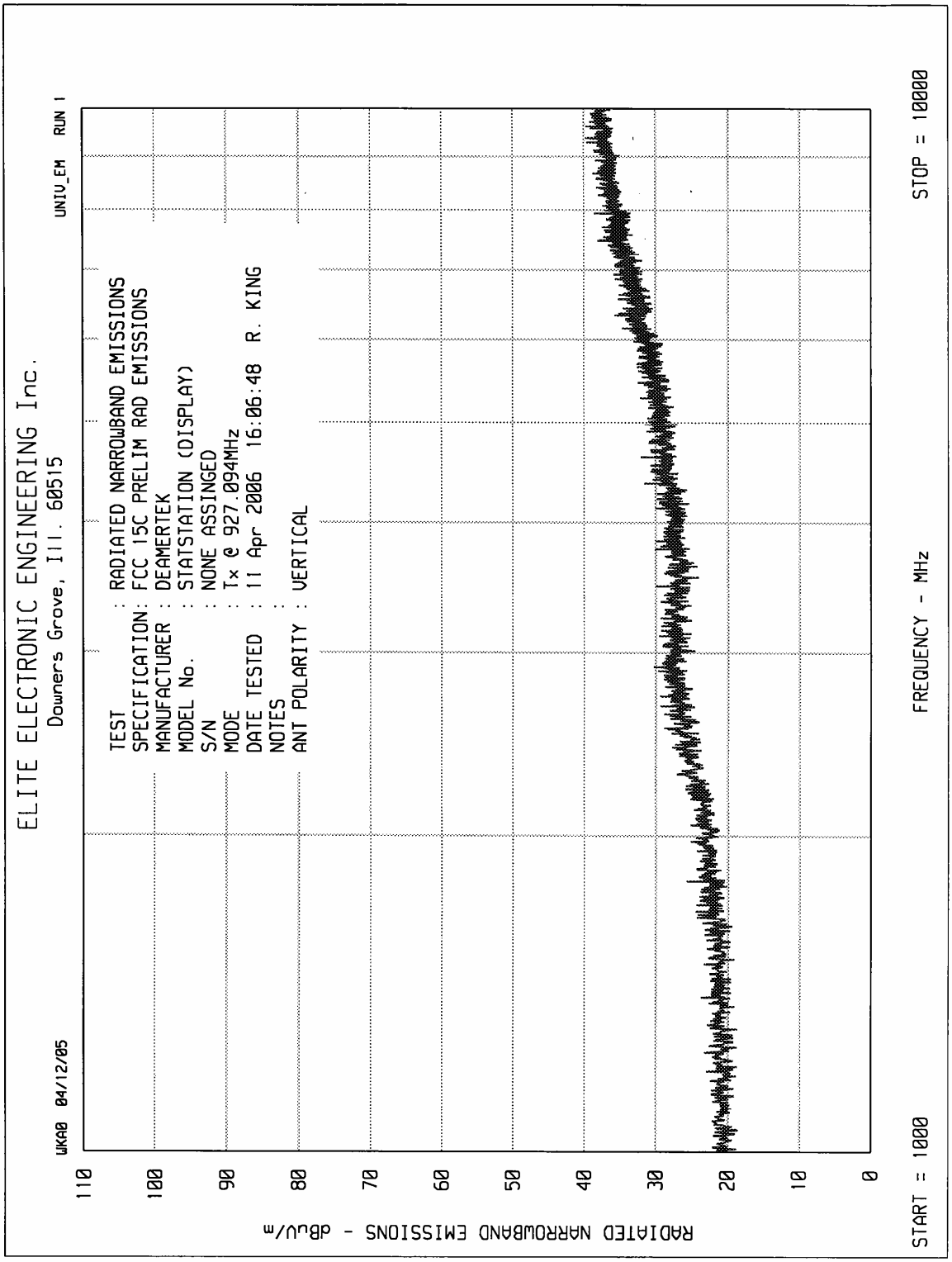

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATSTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 914.947MHz
DATE TESTED : 11 Apr 2006 16:01:33 R. KING
NOTES : .
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATSTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 914.947MHz
DATE TESTED : 11 Apr 2006 16:02:59 R. KING
NOTES : :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 927.094MHz
DATE TESTED : 12 Apr 2006 07:30:49 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK CORP
MODEL No. : WIRELESS STATSTATION DISPLAY
S/N : NONE ASSIGNED
MODE : Tx @ 927.094MHz
DATE TESTED : 12 Apr 2006 07:28:42 R. KING
NOTES : :
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 30
100
FREQUENCY - MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATSTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 927.094MHz
DATE TESTED : 11 Apr 2006 16:05:21 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV_EM RUN 1
WKA0 04/12/05
TEST : RADIATED NARROWBAND EMISSIONS
SPECIFICATION: FCC 15C PRELIM RAD EMISSIONS
MANUFACTURER : DEAMERTEK
MODEL No. : STATSTATION (DISPLAY)
S/N : NONE ASSINGED
MODE : Tx @ 927.094MHz
DATE TESTED : 11 Apr 2006 16:06:48 R. KING
NOTES :
ANT POLARITY : VERTICAL
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 10000

Data Sheet

MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart C, Section 15.247
Radiated Spurious Emissions Measurement
DATE : April 13, 2006
NOTES : Transmitting at 902.792MHz
: TEST DISTANCE IS 3 METERS
: Grey rows indicate restricted bands which must meet the general limits.

FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	Limit uV/m
902.8	H	67.8		1.9	22.3	0.0	92.0	39812.0	
902.8	V	63.0		1.9	22.9	0.0	87.8	24547.9	
1805.6	H	57.8		2.9	28.0	-34.5	54.2	511.1	3981.0
1805.6	V	55.4		2.9	28.0	-34.5	51.8	387.7	3981.0
2708.4	H	43.1		3.7	31.4	-34.5	43.7	153.4	500.0
2708.4	V	42.8		3.7	31.4	-34.5	43.4	148.2	500.0
3611.2	H	38.7		4.4	32.5	-34.6	41.0	111.6	500.0
3611.2	V	39.1	*	4.4	32.5	-34.6	41.4	116.8	500.0
4514.0	H	39.5	*	4.8	32.8	-34.7	42.5	132.7	500.0
4514.0	V	39.4	*	4.8	32.8	-34.7	42.4	131.2	500.0
5416.8	H	37.7	*	5.2	35.2	-34.2	43.9	157.3	3981.0
5416.8	V	37.7	*	5.2	35.2	-34.2	43.9	157.3	3981.0
6319.6	H	41.9	*	5.8	36.1	-34.5	49.3	293.3	3981.0
6319.6	V	42.1	*	5.8	36.1	-34.5	49.5	300.1	3981.0
7222.4	H	41.3	*	6.6	37.6	-34.5	50.9	351.9	500.0
7222.4	V	41.4	*	6.6	37.6	-34.5	51.0	355.9	500.0
8125.2	H	41.8	*	7.1	37.6	-34.7	51.7	386.3	500.0
8125.2	V	41.1	*	7.1	37.6	-34.7	51.0	356.4	500.0
9028.0	H	41.1	*	7.5	37.9	-34.6	51.9	394.3	500.0
9028.0	V	41.2	*	7.5	37.9	-34.6	52.0	398.8	500.0

Checked BY : Richard E. King

Richard E. King

Data Sheet

MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart C, Section 15.247
Radiated Spurious Emissions Measurement
DATE : April 13, 2006
NOTES : Transmitting at 914.947MHz
: TEST DISTANCE IS 3 METERS
: Grey rows indicate restricted bands which must meet the general limits.

FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	Limit uV/m
914.9	H	66.6		2.0	22.3	0.0	90.9	34879.7	
914.9	V	62.6		2.0	23.1	0.0	87.6	24125.3	
1829.8	H	58.7		2.9	28.1	-34.5	55.2	575.3	3507.0
1829.8	V	59.2		2.9	28.1	-34.5	55.7	609.4	3507.0
2744.7	H	43.3		3.8	31.5	-34.5	44.1	159.5	500.0
2744.7	V	42.9		3.8	31.5	-34.5	43.7	152.3	500.0
3659.6	H	40.8		4.4	32.6	-34.6	43.2	144.3	500.0
3659.6	V	38.9		4.4	32.6	-34.6	41.3	115.9	500.0
4574.5	H	40.0	*	4.8	33.0	-34.7	43.2	144.4	500.0
4574.5	V	39.7	*	4.8	33.0	-34.7	42.9	139.5	500.0
5489.4	H	38.3	*	5.3	35.4	-34.2	44.8	173.4	3507.0
5489.4	V	38.1	*	5.3	35.4	-34.2	44.6	169.4	3507.0
6404.3	H	41.0	*	5.9	36.1	-34.5	48.6	268.3	3507.0
6404.3	V	41.4	*	5.9	36.1	-34.5	49.0	280.9	3507.0
7319.2	H	40.6	*	6.7	37.8	-34.6	50.5	333.9	500.0
7319.2	V	41.0	*	6.7	37.8	-34.6	50.9	349.7	500.0
8234.1	H	42.0	*	7.1	37.7	-34.7	52.1	403.5	500.0
8234.1	V	42.7	*	7.1	37.7	-34.7	52.8	437.3	500.0
9149.0	H	41.3	*	7.5	38.0	-34.7	52.2	405.4	500.0
9149.0	V	40.7	*	7.5	38.0	-34.7	51.6	378.4	500.0

Checked BY : Richard E. King

Richard E. King

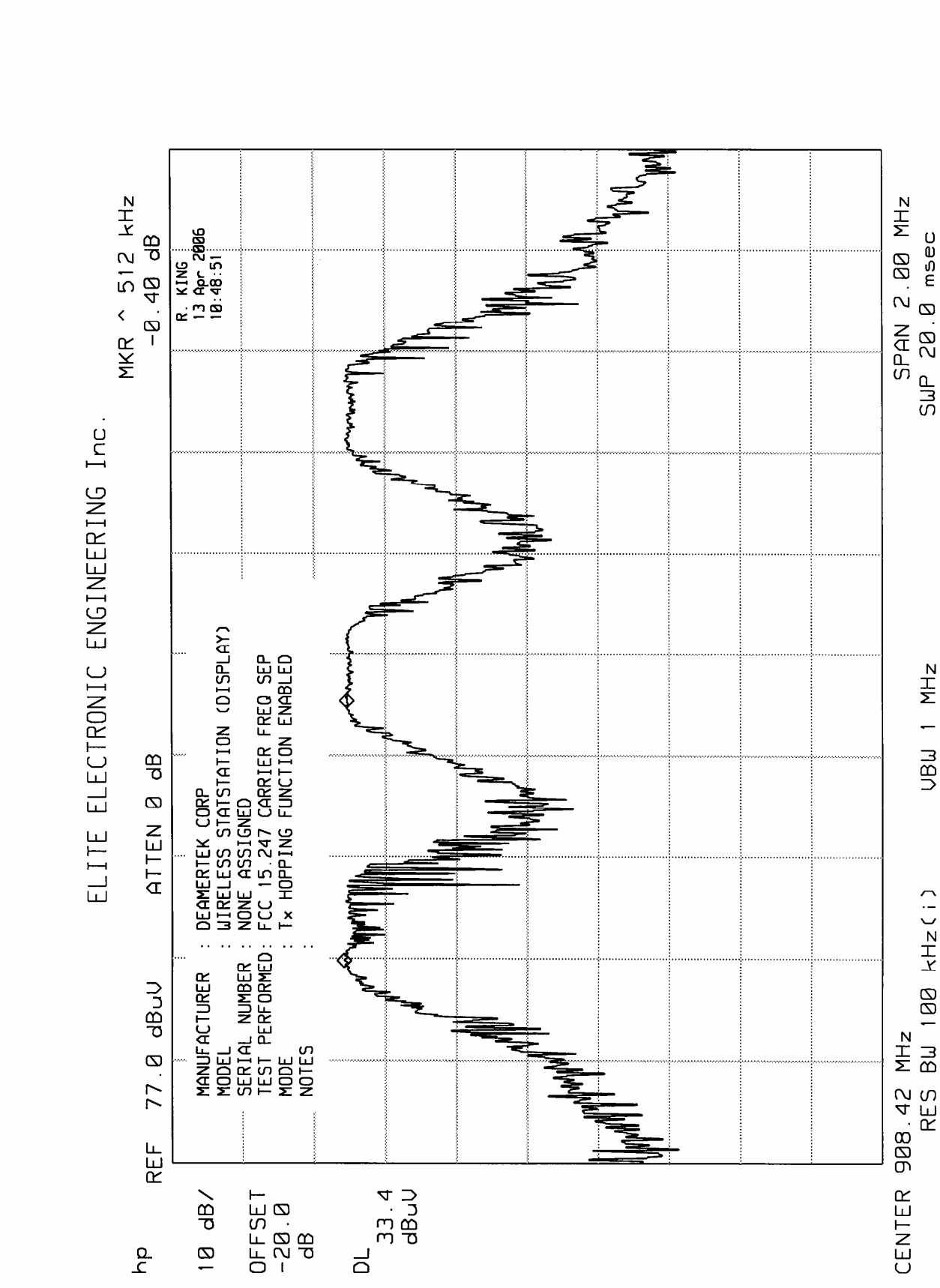
Data Sheet

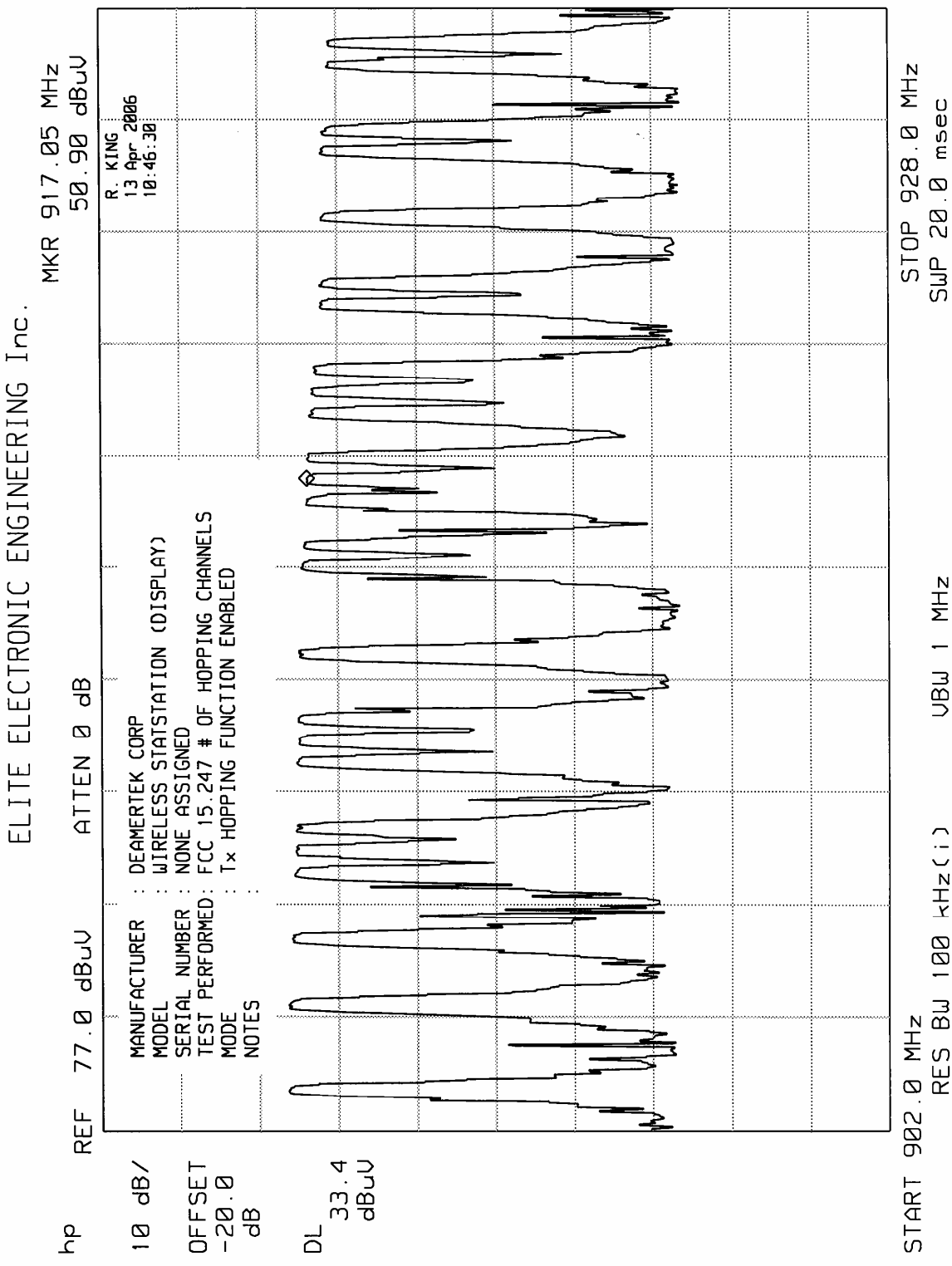
MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart C, Section 15.247
Radiated Spurious Emissions Measurement
DATE : April 13, 2006
NOTES : Transmitting at 927.094MHz
: TEST DISTANCE IS 3 METERS
: Grey rows indicate restricted bands which must meet the general limits.

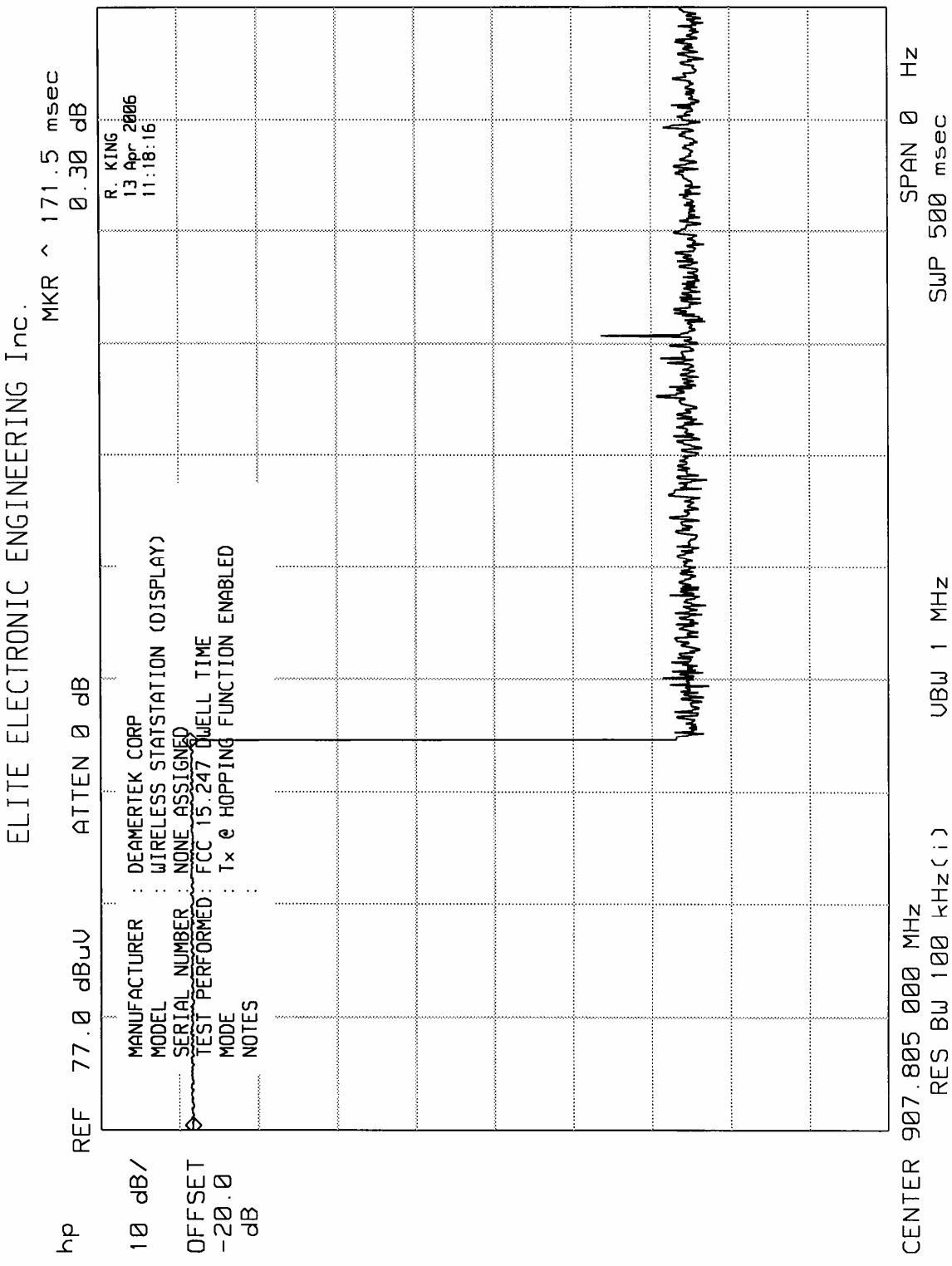
FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	AMBIENT	CABLE LOSS dB	ANT. FACT. dB	PRE. AMP. dB	TOTAL dBuV/m	TOTAL uV/m	Limit uV/m
927.1	H	65.3		2.0	22.4	0.0	89.7	30551.9	
927.1	V	63.8		2.0	23.5	0.0	89.2	28982.9	
1854.2	H	59.0		2.9	28.2	-34.5	55.6	604.4	3055.0
1854.2	V	60.3		2.9	28.2	-34.5	56.9	702.0	3055.0
2781.3	H	47.3		3.8	31.6	-34.5	48.2	256.9	500.0
2781.3	V	42.4		3.8	31.6	-34.5	43.3	146.1	500.0
3708.4	H	42.0		4.4	32.6	-34.5	44.5	168.1	500.0
3708.4	V	40.8		4.4	32.6	-34.5	43.3	146.4	500.0
4635.5	H	39.3	*	4.9	33.2	-34.6	42.7	136.8	500.0
4635.5	V	39.3	*	4.9	33.2	-34.6	42.7	136.8	500.0
5562.6	H	38.2	*	5.3	35.5	-34.2	44.8	173.2	3055.0
5562.6	V	38.1	*	5.3	35.5	-34.2	44.7	171.3	3055.0
6489.7	H	39.8	*	6.0	36.2	-34.5	47.5	237.0	3055.0
6489.7	V	40.2	*	6.0	36.2	-34.5	47.9	248.2	3055.0
7416.8	H	41.8	*	6.7	38.0	-34.6	51.9	394.3	3055.0
7416.8	V	41.0	*	6.7	38.0	-34.6	51.1	359.6	3055.0
8343.9	H	41.0	*	7.2	37.8	-34.7	51.3	367.0	500.0
8343.9	V	40.9	*	7.2	37.8	-34.7	51.2	362.8	500.0
9271.0	H	40.9	*	7.5	38.2	-34.8	51.8	389.1	3055.0
9271.0	V	41.0	*	7.5	38.2	-34.8	51.9	393.6	3055.0

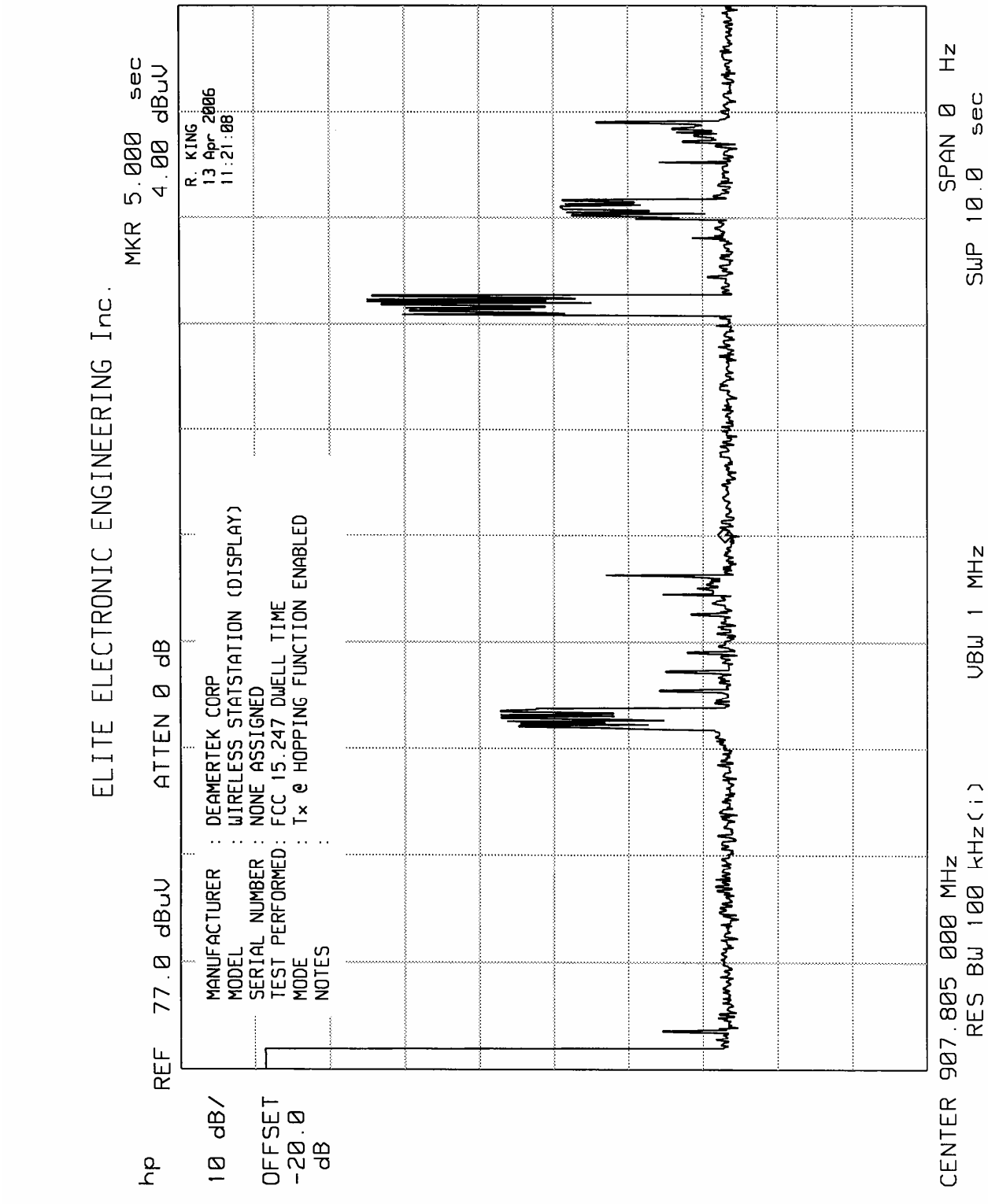
Checked BY : Richard E. King

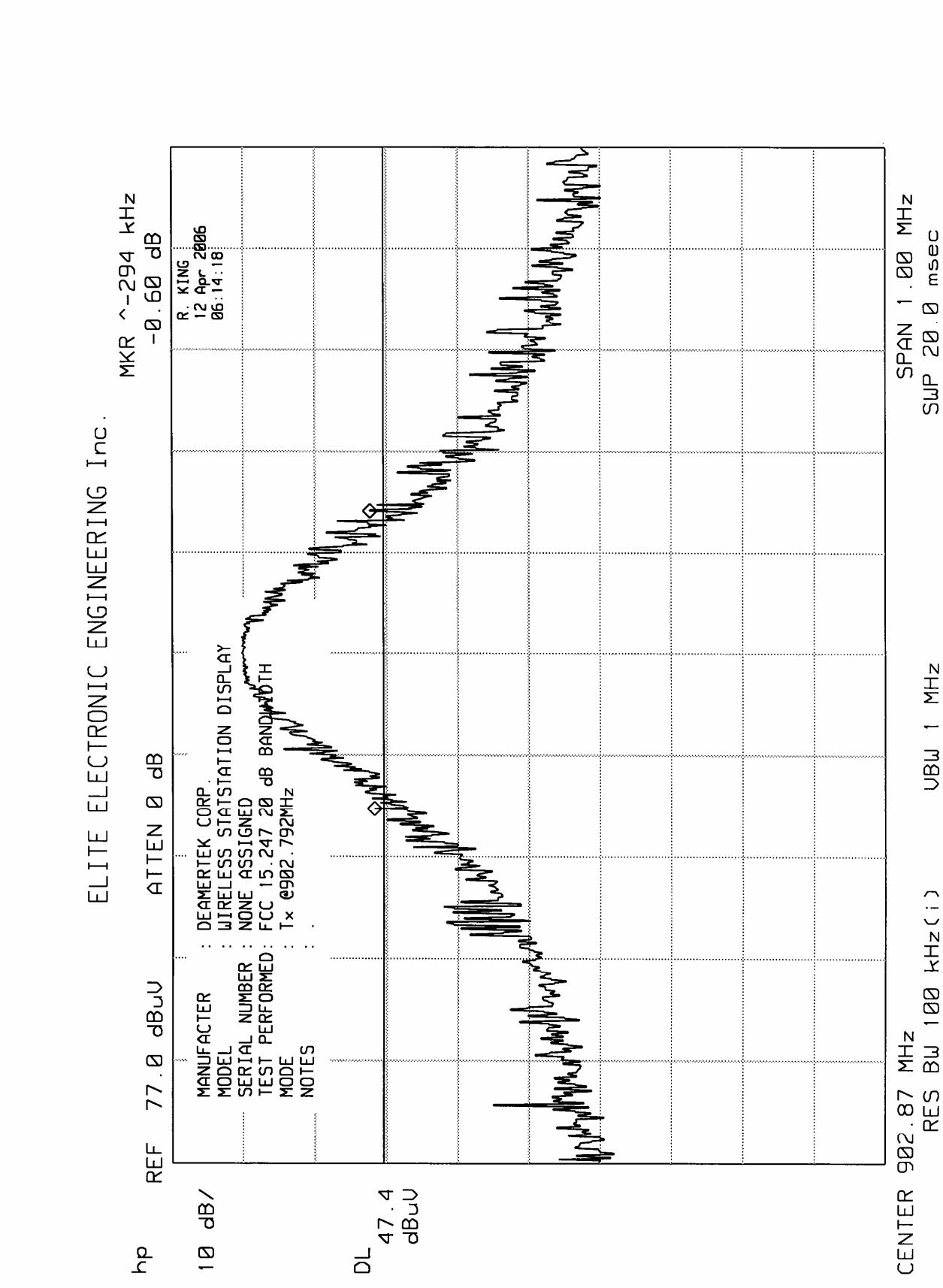
Richard E. King

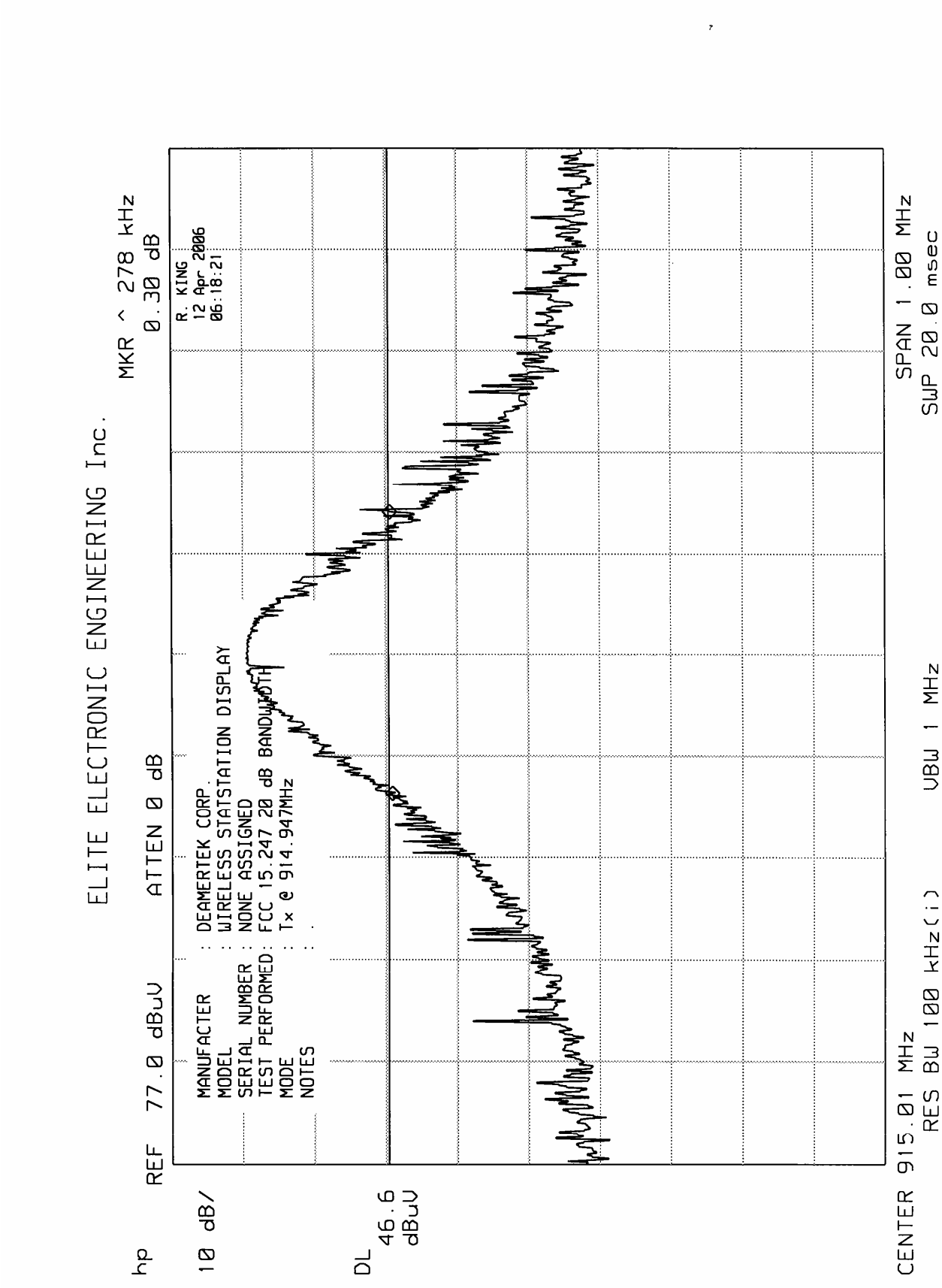

ELITE ELECTRONIC ENGINEERING Inc.
MKR ^ 512 kHz
-0.40 dB
R. KING
13 Apr 2006
10:48:51
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
DL
33.4
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 CARRIER FREQ SEP
MODE : Tx HOPPING FUNCTION ENABLED
NOTES :
CENTER 908.42 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 2.00 MHz
SWP 20.0 msec

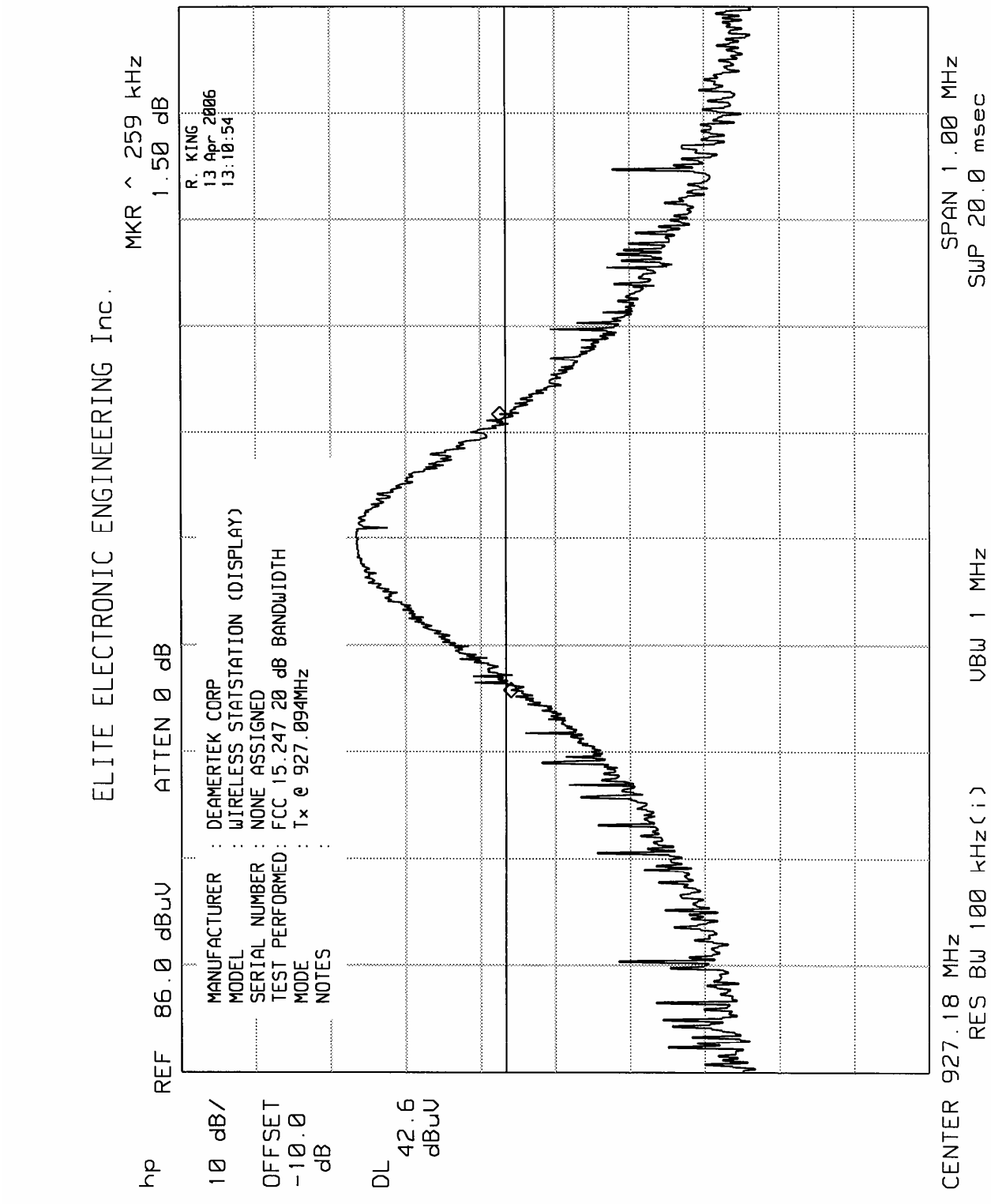

ELITE ELECTRONIC ENGINEERING Inc.
MKR 917.05 MHz
50.90 dBuV
R. KING
13 Apr 2006
10:46:30
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
DL
33.4
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 # OF HOPPING CHANNELS
MODE : Tx HOPPING FUNCTION ENABLED
NOTES : :
START 902.0 MHz
RES BW 100 kHz(i)
VBW 1 MHz
STOP 928.0 MHz
SWP 20.0 msec


ELITE ELECTRONIC ENGINEERING Inc.
MKR ^ 171.5 msec
0.30 dB
R. KING
13 Apr 2006
11:18:16
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 DWELL TIME
MODE : Tx @ HOPPING FUNCTION ENABLED
NOTES :
CENTER 907.805 000 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 0 Hz
SWP 500 msec


ELITE ELECTRONIC ENGINEERING Inc.
hp
REF 77.0 dBuV
ATTEN 0 dB
MKR 5.000 sec
4.00 dBuV
10 dB/
OFFSET
-20.0
dB
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 DWELL TIME
MODE : Tx @ HOPPING FUNCTION ENABLED
NOTES :
R. KING
13 Apr 2006
11:21:08
CENTER 907.805 000 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SWP 10.0 sec
SPAN 0 Hz


ELITE ELECTRONIC ENGINEERING Inc.
MKR ^-294 kHz
-0.60 dB
R. KING
12 Apr 2006
06:14:18
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
MANUFACTER : DEAMERTEK CORP.
MODEL : WIRELESS STATSTATION DISPLAY
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 20 dB BANDWIDTH
MODE : Tx @902.792MHz
NOTES : .
DL
47.4
dBuV
SPAN 1.00 MHz
SWP 20.0 msec
CENTER 902.87 MHz
RES BW 100 kHz(i)
VBW 1 MHz


ELITE ELECTRONIC ENGINEERING Inc.
MKR ^ 278 kHz
0.30 dB
R. KING
12 Apr 2006
06:18:21
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
MANUFACTER : DEAMERTEK CORP.
MODEL : WIRELESS STATSTATION DISPLAY
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 20 dB BANDWIDTH
MODE : Tx @ 914.947MHz
NOTES : .
DL
46.6
dBuV
SPAN 1.00 MHz
SWP 20.0 msec
CENTER 915.01 MHz
RES BW 100 kHz(i)
VBW 1 MHz


ELITE ELECTRONIC ENGINEERING Inc.
hp
REF 86.0 dBuV
ATTEN 0 dB
MKR ^ 259 kHz
1.50 dB
10 dB/
OFFSET
-10.0
dB
DL
42.6
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 20 dB BANDWIDTH
MODE : Tx @ 927.094MHz
NOTES :
R. KING
13 Apr 2006
13:10:54
CENTER 927.18 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 1.00 MHz
SWP 20.0 msec

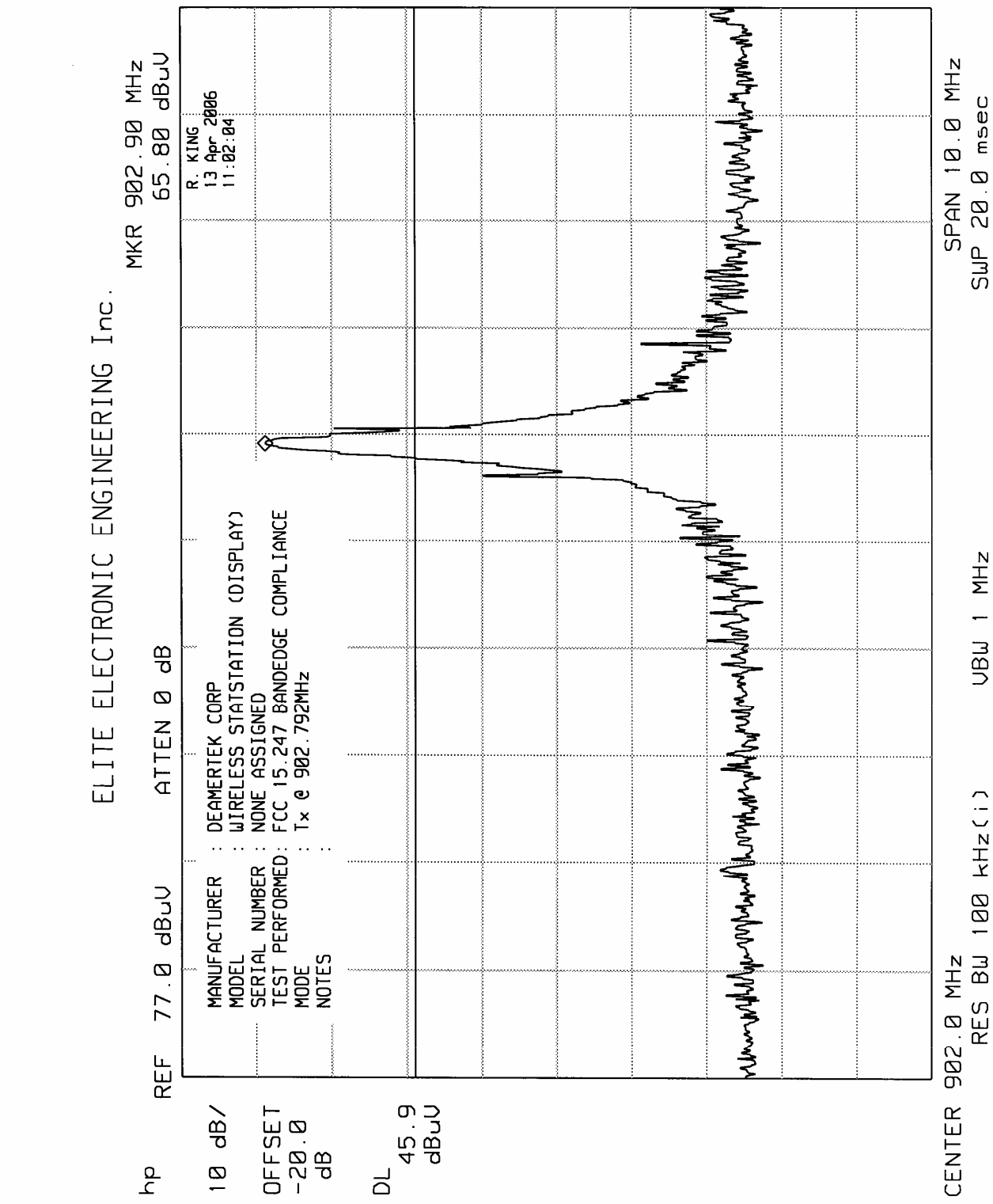
Data Sheet

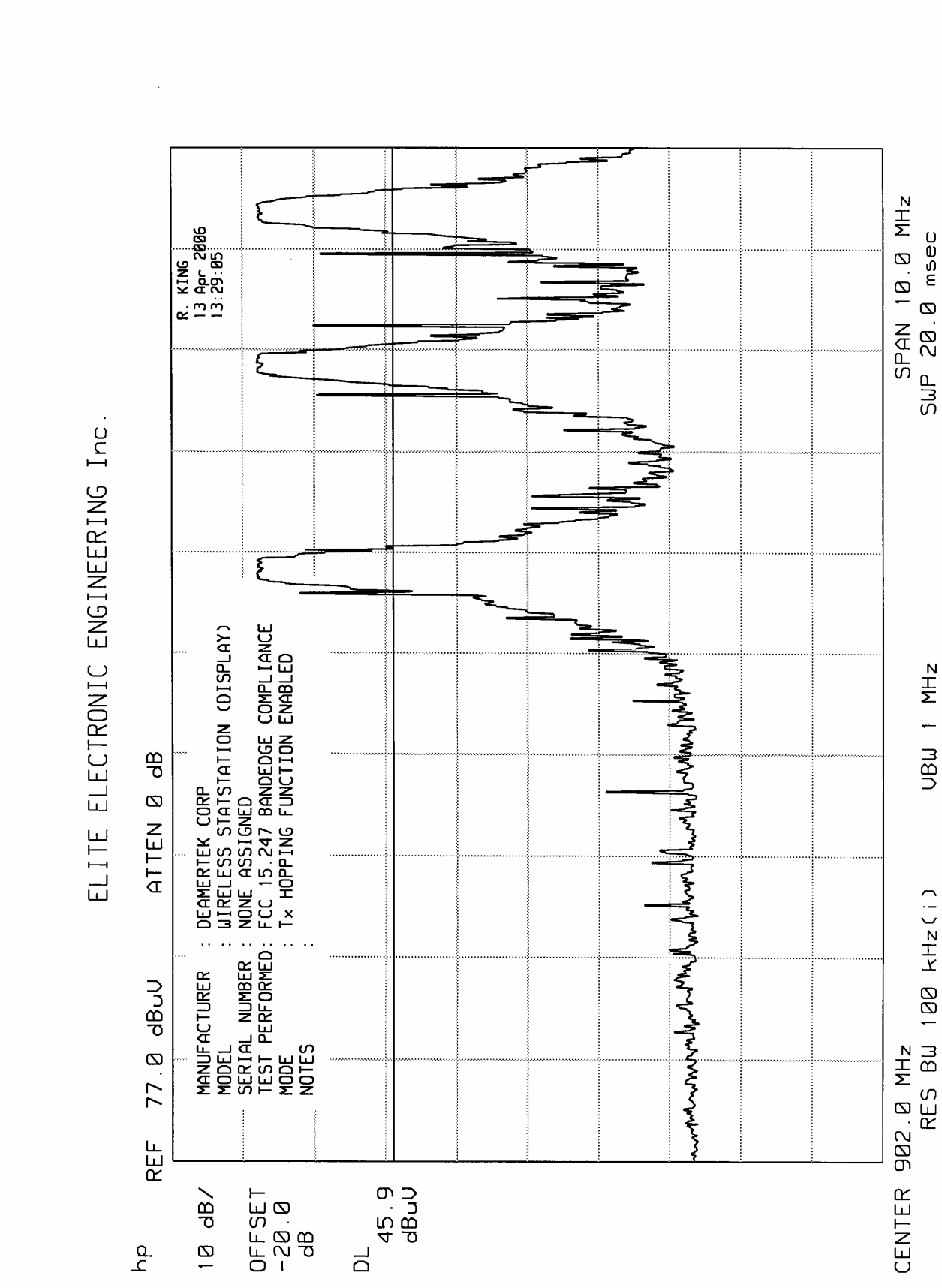
MANUFACTURER : De Amertek Corporation
MODEL : Wireless Statstation Display
S/N : None assigned
SPECIFICATION : FCC Part 15, Subpart C, Section 15.247
Peak Output Power – Radiated Measurement
DATE : April 13, 2006
NOTES : Transmitting at 902.792MHz
: TEST DISTANCE IS 3 METERS
: EIRP = S.G. RDG - Cable Loss + Antenna Gain.

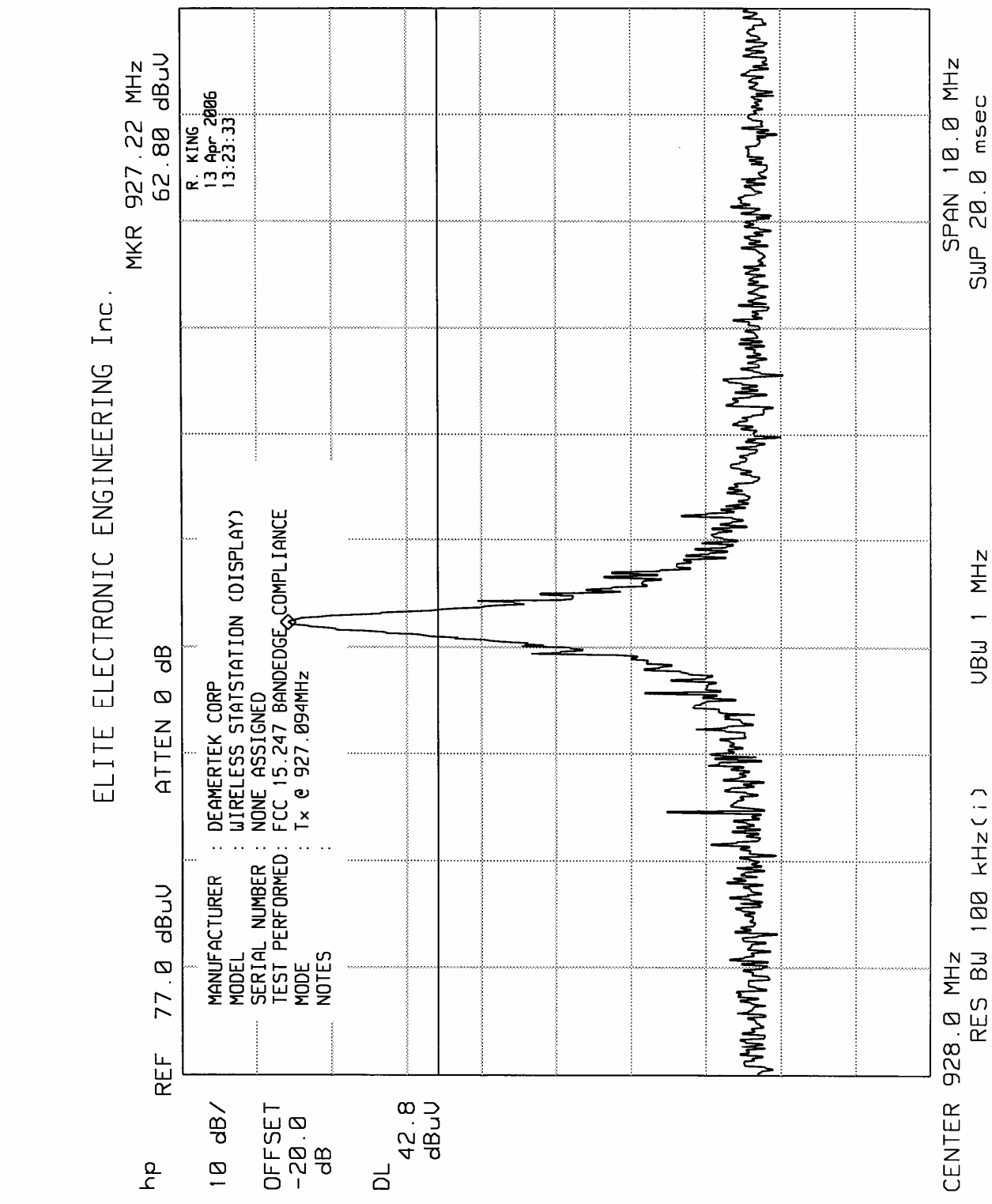
FREQ. MHz	ANT. POL.	MTR. RDG. dBuV	MATCHED SIGNAL GENERATOR READING dBm	CABLE LOSS dB	ANT. GAIN dB	EIRP TOTAL dBM
902.8	H	67.8	-5.5	1.9	2.5	-6.1
902.8	V	63.0	-9.7	1.9	2.5	-10.3
914.9	H	66.6	-6.6	1.7	2.5	-7.4
914.9	V	62.6	-9.8	1.7	2.5	-10.6
927.1	H	65.3	-7.8	1.5	2.5	-8.8
927.1	V	63.8	-8.3	1.5	2.5	-9.3

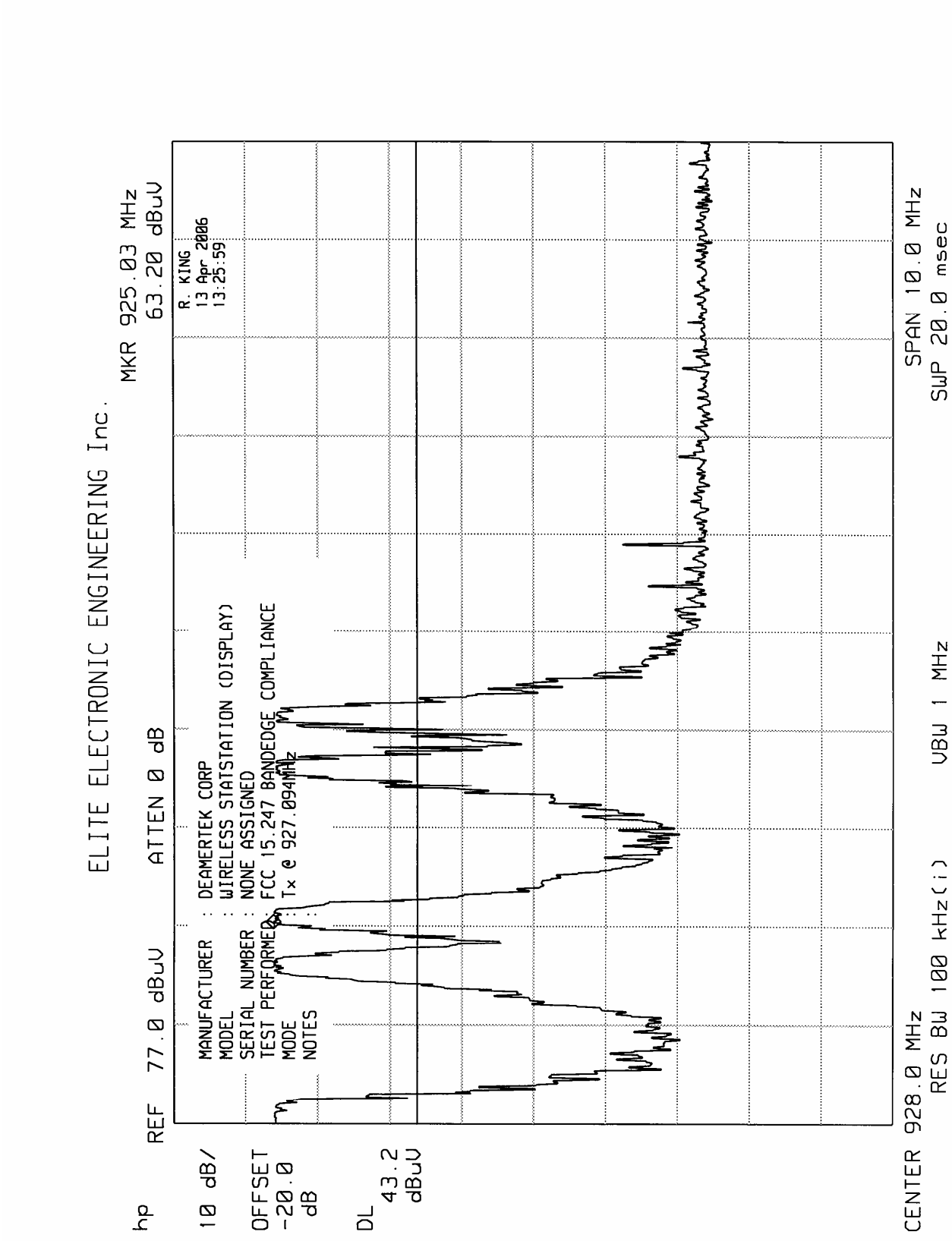
Checked BY : Richard E. King

Richard E. King


ELITE ELECTRONIC ENGINEERING Inc.
MKR 902.90 MHz
65.80 dBuV
R. KING
13 Apr 2006
11:02:04
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
DL
45.9
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 BANDEDGE COMPLIANCE
MODE : Tx @ 902.792MHz
NOTES : :
CENTER 902.0 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 10.0 MHz
SWP 20.0 msec


ELITE ELECTRONIC ENGINEERING Inc.
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
DL
45.9
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 BANDEDGE COMPLIANCE
MODE : Tx HOPPING FUNCTION ENABLED
NOTES :
R. KING
13 Apr 2006
13:29:05
CENTER 902.0 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 10.0 MHz
SWP 20.0 msec


ELITE ELECTRONIC ENGINEERING Inc.
MKR 927.22 MHz
62.80 dBuV
R. KING
13 Apr 2006
13:23:33
hp
REF 77.0 dBuV
ATTEN 0 dB
10 dB/
OFFSET
-20.0
dB
DL
42.8
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED: FCC 15.247 BANDEDGE COMPLIANCE
MODE : Tx @ 927.094MHz
NOTES : :
CENTER 928.0 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 10.0 MHz
SWP 20.0 msec


ELITE ELECTRONIC ENGINEERING Inc.
hp
REF 77.0 dBuV
ATTEN 0 dB
MKR 925.03 MHz
63.20 dBuV
10 dB/
OFFSET
-20.0
dB
DL
43.2
dBuV
MANUFACTURER : DEAMERTEK CORP
MODEL : WIRELESS STATSTATION (DISPLAY)
SERIAL NUMBER : NONE ASSIGNED
TEST PERFORMED : FCC 15.247 BANDEDGE COMPLIANCE
MODE : Tx @ 927.094MHz
NOTES :
R. KING
13 Apr 2006
13:25:59
CENTER 928.0 MHz
RES BW 100 kHz(i)
VBW 1 MHz
SPAN 10.0 MHz
SWP 20.0 msec