Measurement of RF Interference from an ID 7356 Transceiver Logic Board Assembly Transceiver

For	The Chamberlain Group, Inc. 845 Larch Ave. Elmhurst, IL 60126
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Test Personnel	Mark E. Longinotti
Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Frequency Hopping Spread Spectrum Intentional Radiators Operating within the bands 902-928MHz FCC “Code of Federal Regulations” Title 47, Part15, Subpart 15B, Section 15.107 and 15.109 for Receivers Industry Canada RSS-210 Industry Canada RSS-GEN

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REVISION HISTORY

Revision	Date	Description
—	November 3, 2010	Initial release

Measurement of RF Emissions from an ID 7356 Transceiver Logic Board Assembly Transceiver

1 INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a The Chamberlain Group, Inc. ID 7356 Transceiver Logic Board Assembly, Serial No. None Assigned, transceiver (hereinafter referred to as the EUT). The EUT is a frequency hopping spread spectrum transceiver. The EUT was designed to transmit in the 902.25MHz to 926.75MHz band using an internal antenna. The receive portion of the EUT is a super-heterodyne type receiver designed to receive over the 310MHz to 926.75MHz band. The EUT contains a tuner which utilizes one local oscillator (LO) and an intermediate frequency (IF) at 937.5kHz below the tuned frequency. (For testing purposes only, an antenna port was placed on the transceiver board so that some tests could be performed using the antenna conducted method.) The EUT was manufactured and submitted for testing by The Chamberlain Group, Inc. located in Elmhurst, IL.

1.2 Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109, for receivers and Subpart C, Sections 15.207 and 15.249 for Intentional Radiators Operating within the 902-928 MHz band.

The test series was also performed to determine if the EUT meets the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.2 and Section 7.2.3 for receivers and the Industry Canada Radio Standards Specification RSS-Gen Section 7.2.2 and RSS-210 Annex 2, section A2.9 for Transmitters.

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 EMC Laboratory 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.

1.5 Laboratory Conditions

The temperature at the time of the test was 22C and the relative humidity was 35%.

2 APPLICABLE DOCUMENTS

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

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, , dated 1 October 2009
- 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"
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- Industry Canada RSS-210, Issue 7, June 2007, “Spectrum Management and Telecommunications Radio Standards Specification, Low-power License-exempt radio communication devices (All Frequency Bands): Category I Equipment”

- Industry Canada RSS-GEN, Issue 2, June 2007, "Spectrum Management and Telecommunications Radio Standards Specification, General Requirements and Information for the Certification of radio communication equipment"

3 EUT SET-UP AND OPERATION

3.1 General Description

The EUT is a transceiver, ID 7356 Transceiver Logic Board Assembly. A block diagram of the EUT setup is shown as Figure 1.

3.1.1 Power Input

The EUT obtained 115V 60Hz power via a 3 wire, 6 foot long, unshielded power cord. The high and low leads were connected through a line impedance stabilization network (LISN) which was located on the copper ground plane. The network complies with the requirements of Paragraph 4.1.2 of ANSI C63.4-2003.

3.1.2 Peripheral Equipment

No peripheral equipment was submitted with the EUT.

3.1.3 Interconnect Cables

No interconnect cables were submitted with the EUT.

3.1.4 Grounding

The EUT was grounded only through the third wire of its input power cord.

3.2 Operational Mode

For all tests, the EUT was placed on an 80cm high non-conductive stand. The EUT was energized. The EUT was programmed to operate in one of the following modes:

- Receive at 310MHz
- Receive at 434.54MHz
- Receive at 926.75MHz
- Scanning Receiver Mode
- Transmit at 902.25MHz
- Transmit at 914.75MHz
- Transmit at 926.75MHz
- Frequency Hopping Enabled

3.3 EUT Modifications

No modifications were required for compliance.

4 TEST FACILITY AND TEST INSTRUMENTATION

4.1 Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2003 for site attenuation.

4.2 Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

Conducted emission tests were performed with a spectrum analyzer in conjunction with a quasi-peak adapter. Radiated emissions were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths specified by the FCC and with the quasi-peak and average detector functions.

4.3 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).

4.4 Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

The measurement uncertainty for these tests is presented below:

Conducted Emission Measurements		
Combined Standard Uncertainty	1.07	-1.07
Expanded Uncertainty (95% confidence)	2.1	-2.1

Radiated Emission Measurements		
Combined Standard Uncertainty	2.26	-2.18
Expanded Uncertainty (95% confidence)	4.5	-4.4

5 TEST PROCEDURES

5.1 Receiver

5.1.1 Powerline Conducted Emissions

5.1.1.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, 15.107(a) and Industry Canada RSS-Gen section 7.2.2, all radio frequency voltages on the power lines of a receiver shall be below the values shown below when using a quasi-peak or average detector:

CONDUCTED LIMITS FOR A RECEIVER

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 EUT is considered to have met both requirements and measurements do not need to be performed using the Average detector.

5.1.1.2 Procedures

The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms.

a) The EUT was operated in the receive at 390MHz mode.

b) Measurements were first made on the 115V, 60Hz high line.

c) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands.

d) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector.

e) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.)

f) Steps (d) and (e) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits.

g) Steps (c) through (f) were repeated on the 115V, 60Hz return line.

5.1.1.3 Results

The plots of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT operated in the receive at 390MHz mode are shown on pages 23 and 25. The tabular quasi-peak and average results from each input power line with the EUT operated in the Mode 1 mode are shown on pages 22 and 24. All power line conducted emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 177kHz. The emissions level at this frequency was 2.9dB within the limit. Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 2.

5.1.2 Radiated Measurements

5.1.2.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.109(a) and Industry Canada RSS-Gen, Section 7.2.3, all radio frequency emissions from a receiver shall be below the limits shown on the following table:

RADIATION LIMITS FOR A RECEIVER

Frequency MHz	Distance between EUT And Antenna 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.

5.1.2.2 Procedures

Testing was performed separately on a low, middle, high channel, and with the EUT in the scanning receiver mode. The emissions in the frequency range of 30MHz to 2GHz were measured and plotted using a 'screen-dump' utility. (The emissions in the frequency range of 30MHz to 5GHz were measured and plotted for the EUT operating in the receive at the high channel mode and in the scanning receiver mode.) Testing was performed with the antenna of the EUT in place.

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 a quasi-peak detector and an average detector require long integration times, it is not practical to automatically sweep through the quasi-peak and average levels. Therefore, radiated emissions from the EUT 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 detector or average detector.

The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range above 1GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna polarization 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 from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.
2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:
    a) The EUT 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.
    d) For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.

5.1.2.3 Results

The preliminary plots are presented on pages 26 through 41. The plots are presented for a reference only, and are not used to determine compliance. The final radiated levels are presented on page 42 through 46. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closet to the limit (worst case) occurred at 4629.063MHz. The emissions level at this frequency was 5.6dB within the limit. Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown on Figure 3 and Figure 4.

5.2 Transmitter

5.2.1 Powerline Conducted Emissions

5.2.1.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Per 15.207(a) and Industry Canada RSS-Gen section 7.2.2, all radio frequency voltages on the power lines of a transmitter shall be below the values shown below when using a quasi-peak or average detector:

Frequency MHz	Conducted Limit (dBuV)	
	Quasi-peak	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 EUT is considered to have met both requirements and measurements do not need to be performed using the Average detector.

5.2.1.1 Procedures

The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms.

a) The EUT was operated in the transmit at 914.75MHz mode.

b) Measurements were first made on the 115V, 60Hz high line.

c) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands.

d) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector.

e) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.)

f) Steps (d) and (e) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits.

g) Steps (c) through (f) were repeated on the 115V, 60Hz return line.

5.2.1.1 Results

The plots of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT operated in the transmit at 914.75MHz mode are shown on pages 48 and 50. The tabular quasi-peak and average results from each input power line with the EUT operated in the transmit at 914.75MHz mode are shown on pages 47 and 49. All power line conducted emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 150kHz. The emissions level

at this frequency was 3.8dB within the limit. Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 2.

5.2.2 20dB Bandwidth

5.2.2.1 Requirements

Per 15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. If the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels. If the 20dB bandwidth of the hopping channel is 250kHz or greater (but not greater than 500kHz), the system shall use at least 25 hopping channels.

5.2.2.2 Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. With the hopping function disabled, the EUT 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 ≥ 1% of the 20 dB BW. The span was set to approximately 2 to 3 times the 20 dB bandwidth.

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.

5.2.2.3 Results

The plots on pages 51 through 53 show that the maximum 20 dB bandwidth was 243.5kHz. The 99% bandwidth was measured to be 204.4kHz. Therefore, since the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels.

5.2.3 Carrier Frequency Separation

5.2.3.1 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.

5.2.3.2 Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. With the hopping function enabled, the EUT 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.

5.2.3.3 Results

Page 54 shows the carrier frequency separation. As can be seen from this plot, the carrier frequency separation is 501kHz, which is greater than the 20dB bandwidth (243.5kHz).

5.2.4 Number of Hopping Frequencies

5.2.4.1 Requirements

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. If the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels. If the 20dB bandwidth of the hopping channel is 250kHz or greater (but not greater than 500kHz), the system shall use at least 25 hopping channels.

5.2.4.2 Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. With the hopping function enabled, the EUT 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 EUT'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.

5.2.4.3 Results

Page 55 shows the number of hopping frequencies. As can be seen from this plot, the number of hopping frequencies is 50 which is the minimum number of required hopping frequencies for systems with a 20dB bandwidth less than 250kHz.

5.2.5 Time of Occupancy

5.2.5.1 Requirements

Per section 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928MHz band, if the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

5.2.5.2 Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to 1 MHz. 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. The analyzer's display was plotted using a 'screen dump' utility. Then, the sweep time was expanded to 20seconds to capture the number of hops in the appropriate sweep time. A single sweep was made. The analyzer's display was plotted using a 'screen dump' utility. The dwell time in the specified time period was then calculated from dwell time per hop multiplied by the number of hops in the specified time period.

5.2.5.3 Results

Pages 56 and 57 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 (2.635msec/hop) multiplied by (64 hops in 20 seconds). This calculated value is equal to 0.1686 seconds which is less than the 0.4 seconds maximum allowed.

5.2.6 Peak Output Power

5.2.6.1 Requirements

Per section 15.247(b)(2), for frequency hopping systems operating in the 902-928MHz band and employing at least 50 hopping channels, the maximum peak output conducted power shall not be greater than 1W (30dBm). Per section 15.247(b)(4), this limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below 30dBm by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.6.2 Procedures

The EUT was placed on the non-conductive stand and set to transmit. A bilog antenna was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 20dB bandwidth. The span was set to approximately 5 times the 20 dB bandwidth. The EUT 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, a dipole antenna was then set in place of the EUT 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 and antenna gain, as required. The peak power output was calculated for low, middle, and high hopping frequencies.

5.2.6.3 Results

The results are presented on page 58. The maximum EIRP measured from the transmitter was 15.3dBm or 33.9mW which is below the 4 Watt limit.

5.2.7 Duty Cycle Factor Measurements

5.2.7.1 Procedures

The duty cycle factor is used to convert peak detected readings to average readings. This factor is computed from the time domain trace of the pulse modulation signal.

With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 7.6usec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of the “on-time”. The trace is recorded.

Next the spectrum analyzer center frequency is set to the transmitter frequency with a zero span width and 10msec/div. This shows if the word is longer than 100msec or shorter than 100msec. If the word period is less than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as the (On-time/ word period) where the word period = (On-time + Off-time).

5.2.7.2 Results

The plots of the duty cycle are shown on data pages 59 and 60. The maximum pulse density of the EUT is one 2.635msec pulse in a 100msec period. The duty cycle correction factor was calculated to be -31.58 (-31.58 = 20 x log (2.635msec/100msec)).

5.2.8 Radiated Spurious Emissions Measurements

5.2.8.1 Requirements

Per section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Paragraph 15.209(a) has the following radiated emission limits:

Frequency MHz	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.2.8.2 Procedures

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. 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.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 10.0GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 10.0GHz.

1) For all harmonics not in the restricted bands, the following procedure was used:
   a) The field strength of the fundamental was measured using a bilog antenna. The bilog was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
   d) All harmonics not in the restricted bands must be at least 20 dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.
2) For all emissions in the restricted bands, the following procedure was used:
   a) The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and

the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are remeasured using a quasi-peak detector.

e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

f) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken. If the dwell time per channel of the hopping signal is less than 100msec, then the reading obtained with the 10 Hz video bandwidth may be further adjusted by a “duty cycle correction factor”, derived from 20*log(dwell time/100msec). These readings must be no greater than the limits specified in 15.209(a).

5.2.8.3 Results

Preliminary radiated emissions plots with the EUT transmitting at 902.25MHz, 914.75MHz, and 926.75MHz are shown on pages 61 and 72. Final radiated emissions data are presented on data pages 73 through 78. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closet to the limit (worst case) occurred at 4573.75MHz. The emissions level at this frequency was 1.2dB within the limit. Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown on Figures 3 and Figure 4.

5.2.9 Band Edge Compliance

5.2.9.1 Requirements

Per section 15.247(d), the emissions at the band-edges must be at least 20dB below the highest level measured within the band but attenuation below the general limits listed in 15.209(a) is not required.

5.2.9.2 Procedures

5.2.9.2.1 Low Band Edge

1) The EUT was setup inside the test chamber on a non-conductive stand.
2) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
3) The EUT was set to transmit continuously at the channel closest to the low band-edge (hopping function disabled).
4) The EUT was maximized for worst case emissions at the measuring antenna. The maximum meter reading was recorded.
5) To determine the band edge compliance, the following spectrum analyzer settings were used:
    a. Center frequency = low band-edge frequency.
    b. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
    c. Resolution bandwidth (RBW) ≥ 1% of the span.
    d. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
    e. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)
    f. The analyzer's display was plotted using a 'screen dump' utility.

6) Step 5) was repeated with the frequency hopping function enabled.

5.2.9.2.2 High Band Edge

1) The EUT was setup inside the test chamber on a non-conductive stand.
2) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
3) The EUT was set to transmit continuously at the channel closest to the high band-edge (hopping function disabled).
4) The EUT was maximized for worst case emissions at the measuring antenna.
5) To determine the band edge compliance, the following spectrum analyzer settings were used:

    a. Center frequency = high band-edge frequency.
    b. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
    c. Resolution bandwidth (RBW) ≥ 1% of the span.
    d. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
    e. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the right of the center frequency (band-edge) must be below the display line.)
    f. The analyzer's display was plotted using a 'screen dump' utility.

6) Step 5) was repeated with the frequency hopping function enabled.

5.2.9.3 Results

Pages 79 through 82 show the radiated band-edge compliance results. As can be seen from these plots, the emissions at the low end band edge and the high end band edge are within the 20 dB down limits.

6 CONCLUSIONS

It was determined that The Chamberlain Group, Inc. ID 7356 Transceiver Logic Board Assembly frequency hopping spread spectrum transceiver, Serial No. None Assigned, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 902-928 MHz band, when tested per ANSI C63.4-2003.

It was also determined that The Chamberlain Group, Inc. ID 7356 Transceiver Logic Board Assembly frequency hopping spread spectrum transceiver, Serial No. None Assigned, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.2 and Section 7.2.3 for receivers and the Industry Canada Radio Standards Specification RSS-Gen Section 7.2.2 and RSS-210 Annex 2, section A2.9 for transmitters, when tested per ANSI C63.4-2003.

7 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 EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

8 ENDORSEMENT DISCLAIMER

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

9 EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW3	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-35-120-5R0-10-12	PL2924	1GHZ-20GHZ	8/27/2010	8/27/2011
CDX0	COMPUTER	ELITE	WORKSTATION	---	---	N/A	
GRE0	SIGNAL GENERATOR	AGILENT TECHNOLOGIES	E4438C	MY42083127	250KHZ-6GHZ	2/16/2010	2/16/2011
NDQ0	TUNED DIPOLE ANTENNA	EMCO	3121C-DB4	311	400-1000MHZ	3/26/2010	3/26/2011
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	6/7/2010	6/7/2011
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	8/31/2010	8/31/2011
PLL2	50UH LISN 462D	ELITE ELECTRONIC ENG	462D/70A	003	0.01-400MHZ	1/12/2010	1/12/2011
PLLI	50UH LISN 462D - FL	ELITE ELECTRONIC ENG	462D/70A	019	0.01-400MHZ	12/9/2009	12/9/2010
RBA0	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100145	20HZ-26.5GHZ	3/12/2010	3/12/2011
RBB0	EMI TEST RECEIVER 20HZ TO 40GHZ	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	3/16/2010	3/16/2011
SES1	24VDC POWER SUPPLY	P TRANS	FS-32024-1M	002	18-27VDC	NOTE 1	
T1N2	10DB 20W ATTENUATOR	NARDA	766-10	---	DC-4GHZ	8/9/2010	8/9/2011
T2DL	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BS0910	DC-18GHZ	8/9/2010	8/9/2011
T2S8	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	BV3541	DC-18GHZ	1/5/2010	1/5/2011
XPQ2	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T10000-0	3	1.8-10GHZ	10/28/2010	10/28/2011

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

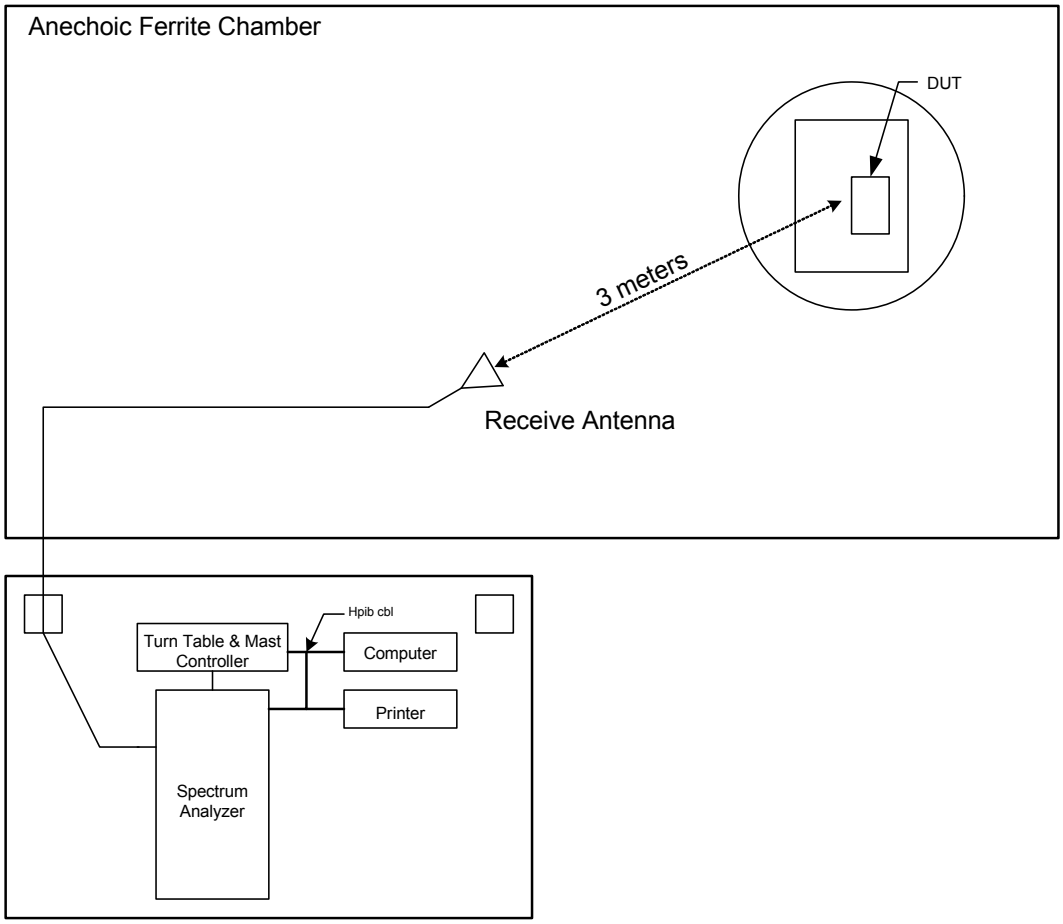
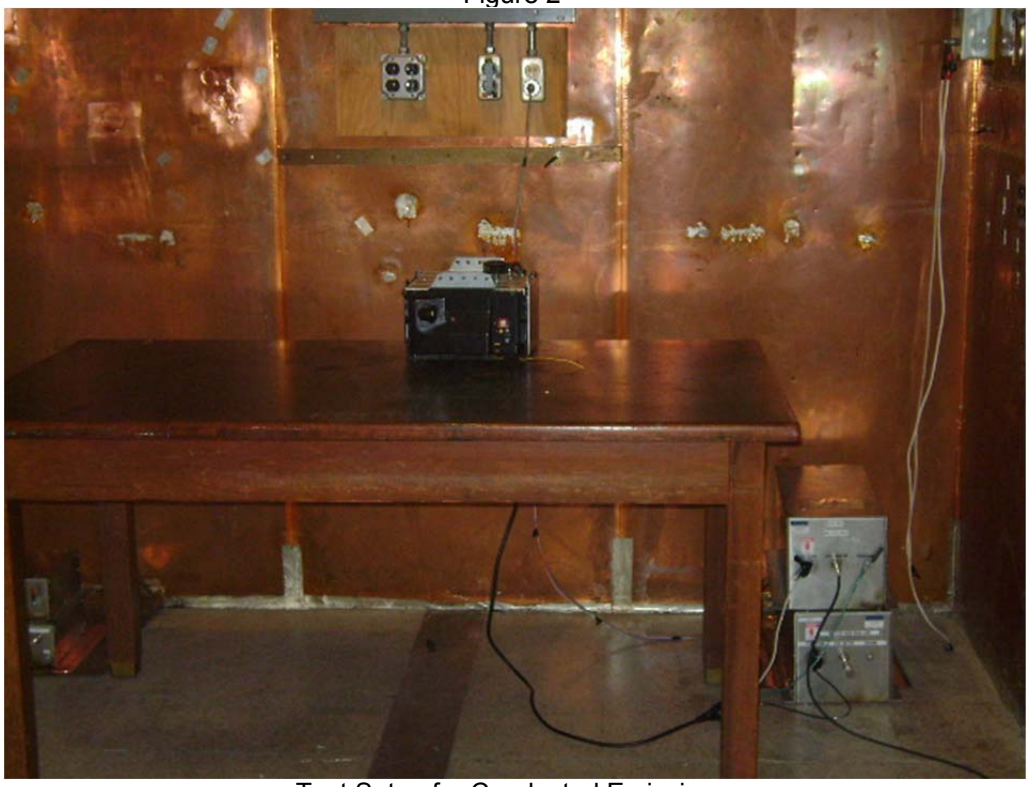


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

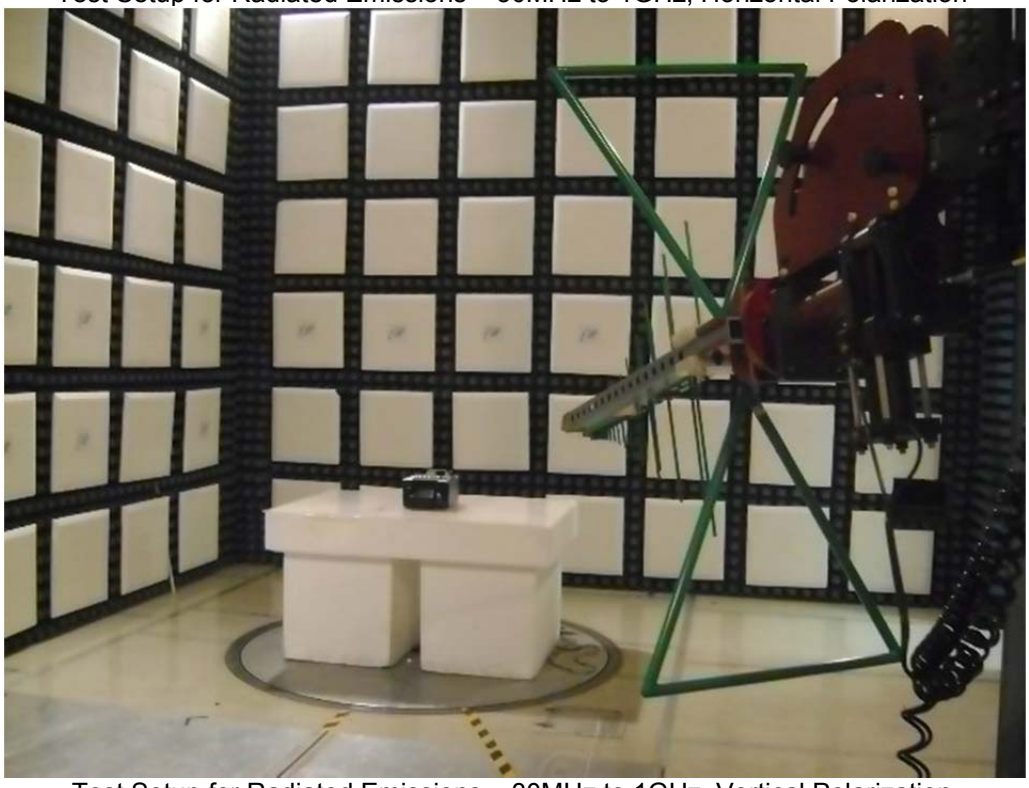
Figure 2



Test Setup for Conducted Emissions

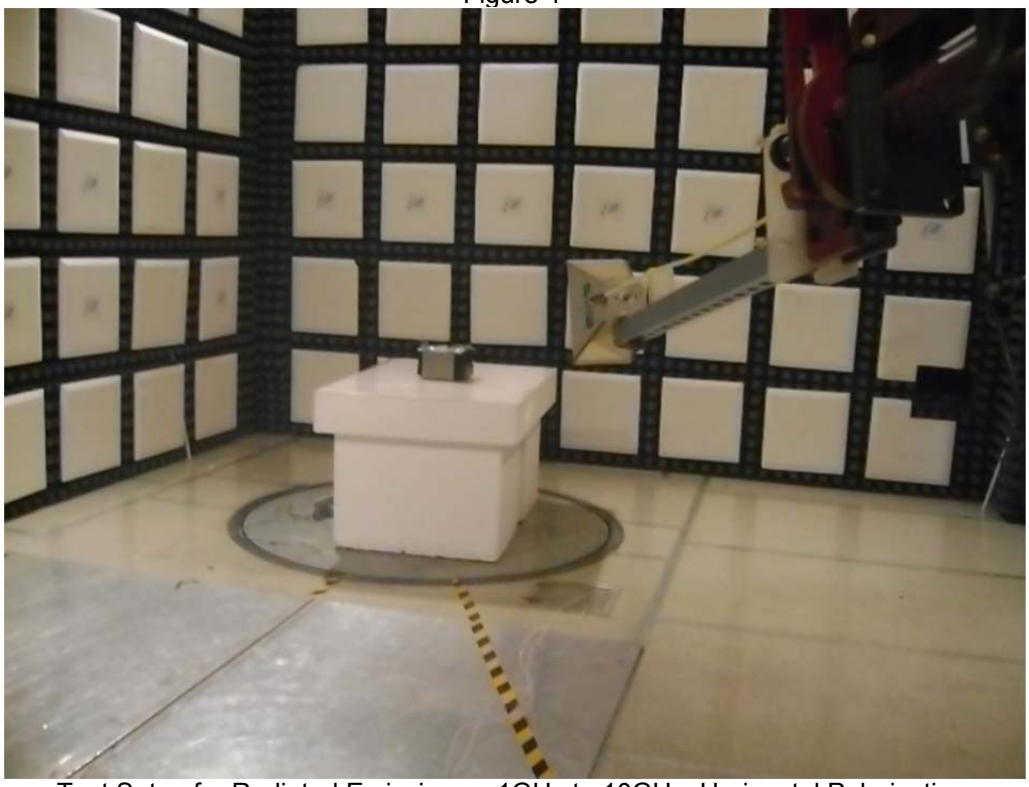
Figure 3

Test Setup for Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization



Test Setup for Radiated Emissions – 30MHz to 1GHz, Vertical Polarization

Figure 4



Test Setup for Radiated Emissions – 1GHz to 10GHz, Horizontal Polarization

Test Setup for Radiated Emissions – 1GHz to 10GHz, Vertical Polarization

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Rx @ 390MHz
Line Tested	:	HIGH
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 12:58:48 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 3 dB margin below limit

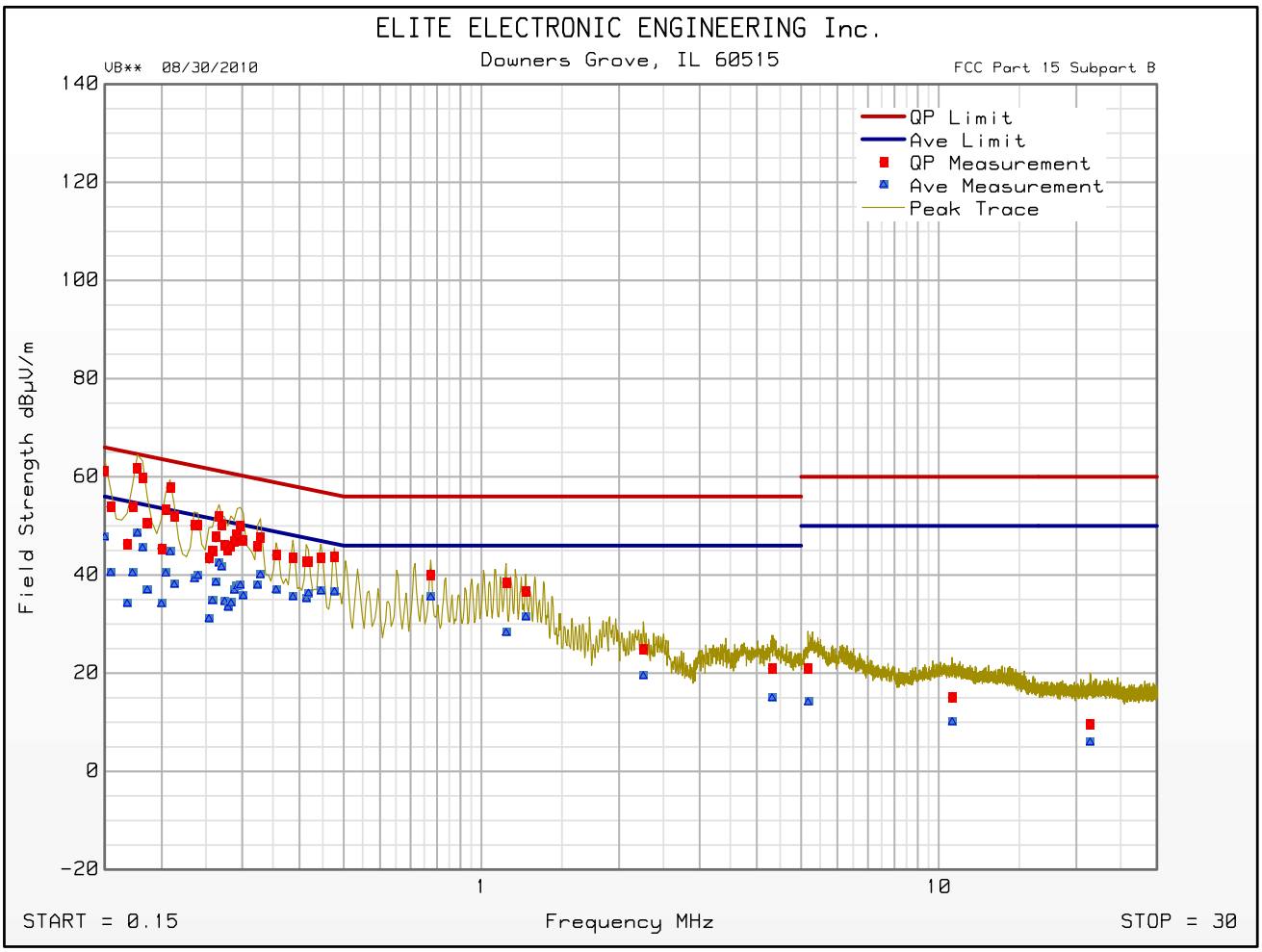
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.177	61.7	64.6		48.5	54.6	
0.297	49.9	60.3		37.9	50.3	
0.775	40.2	56.0		35.5	46.0	
1.132	38.5	56.0		28.2	46.0	
1.250	36.7	56.0		31.4	46.0	
2.259	24.9	56.0		19.4	46.0	
4.319	21.0	56.0		14.9	46.0	
5.176	21.0	60.0		14.0	50.0	
10.692	15.1	60.0		10.1	50.0	
21.421	9.6	60.0		5.9	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Rx @ 390MHz
Line Tested	:	HIGH
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 12:58:48 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Rx @ 390MHz
Line Tested	:	RETURN
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 01:08:42 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 3 dB margin below limit

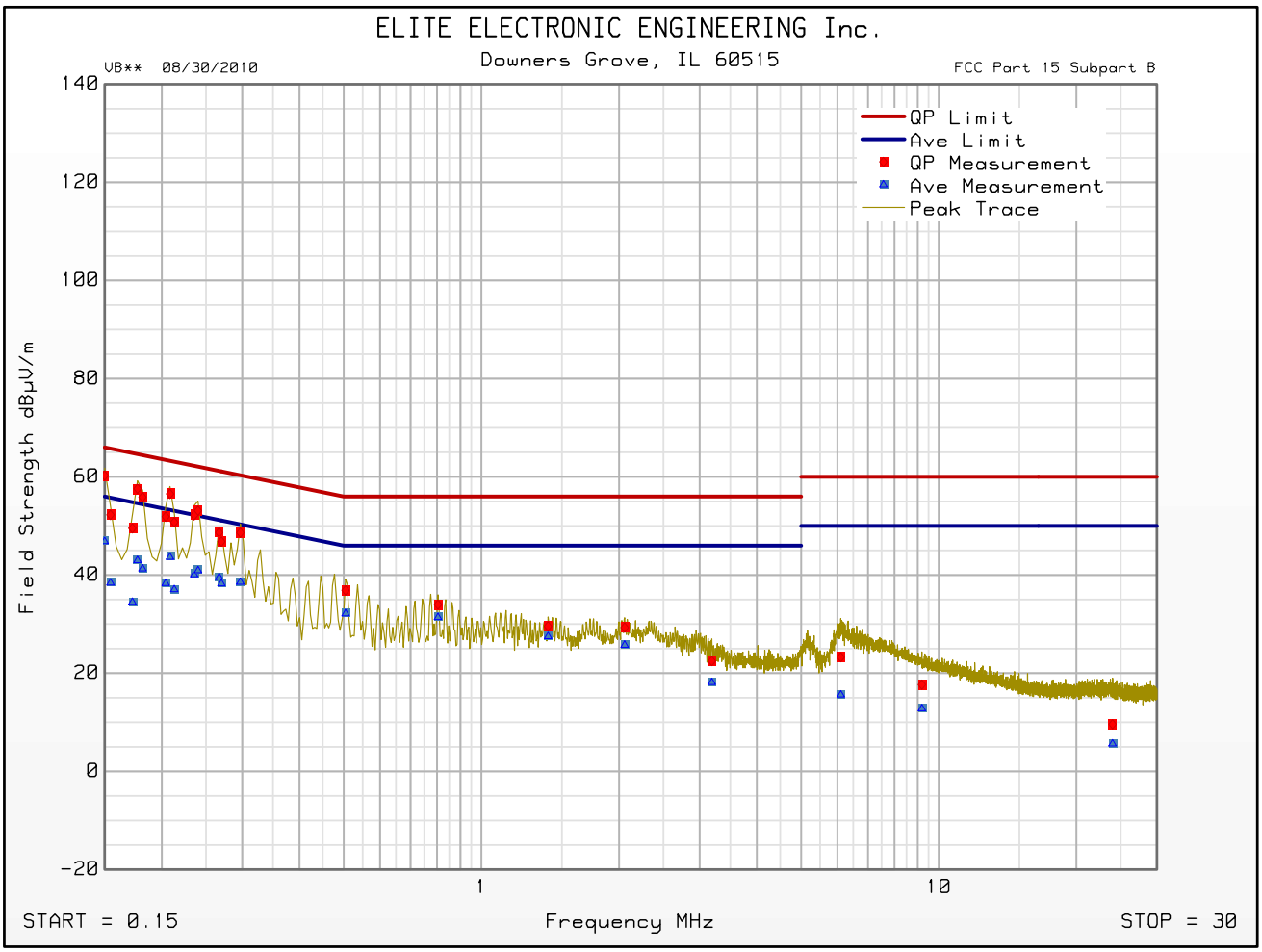
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.150	60.3	66.0		46.8	56.0	
0.297	48.6	60.3		38.6	50.3	
0.505	36.9	56.0		32.1	46.0	
0.804	34.0	56.0		31.4	46.0	
1.399	29.5	56.0		27.5	46.0	
2.057	29.3	56.0		25.7	46.0	
3.190	22.5	56.0		18.1	46.0	
6.107	23.3	60.0		15.6	50.0	
9.185	17.7	60.0		12.8	50.0	
23.986	9.6	60.0		5.6	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

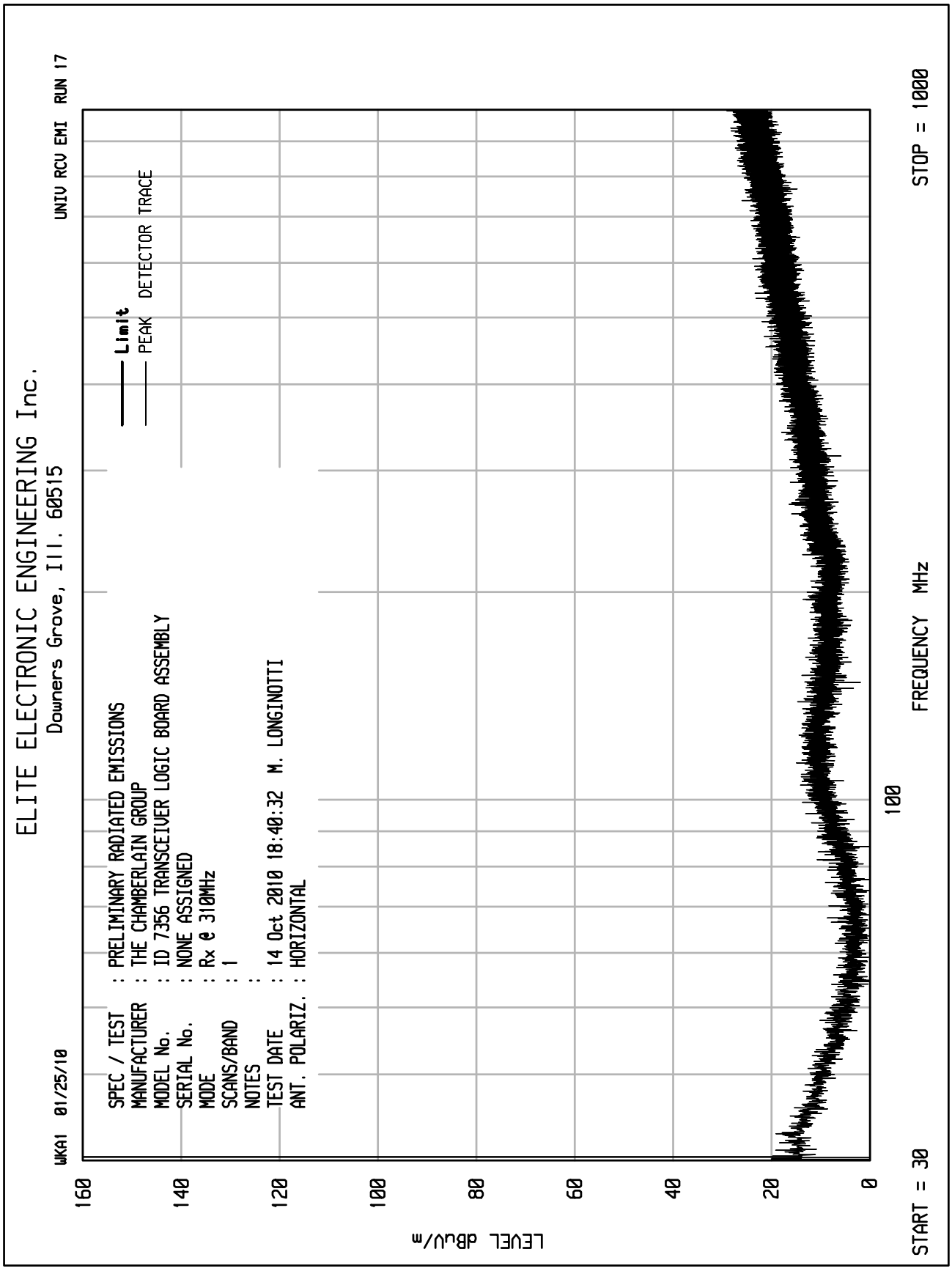
Cumulative Data

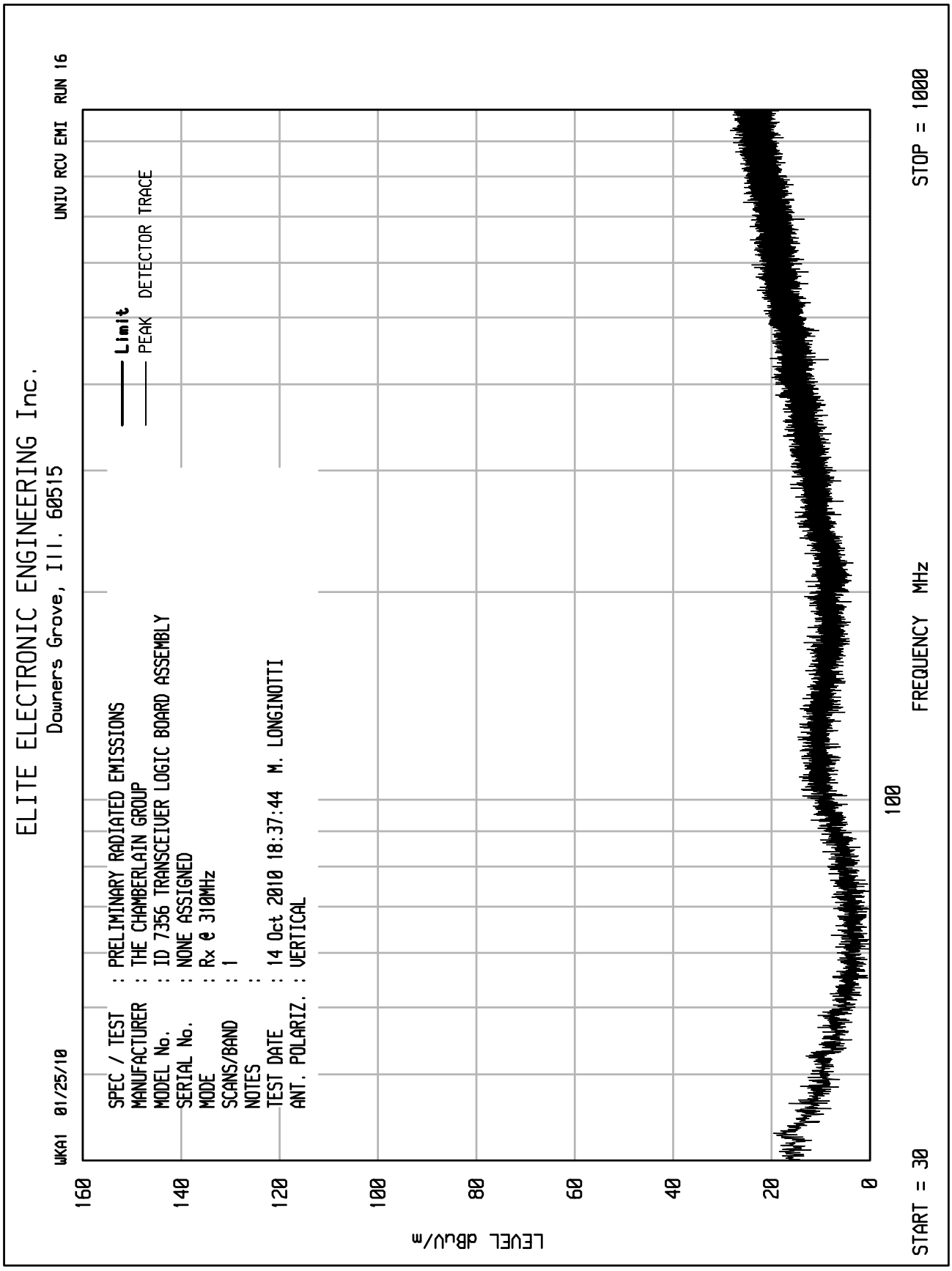
VB** 08/30/2010

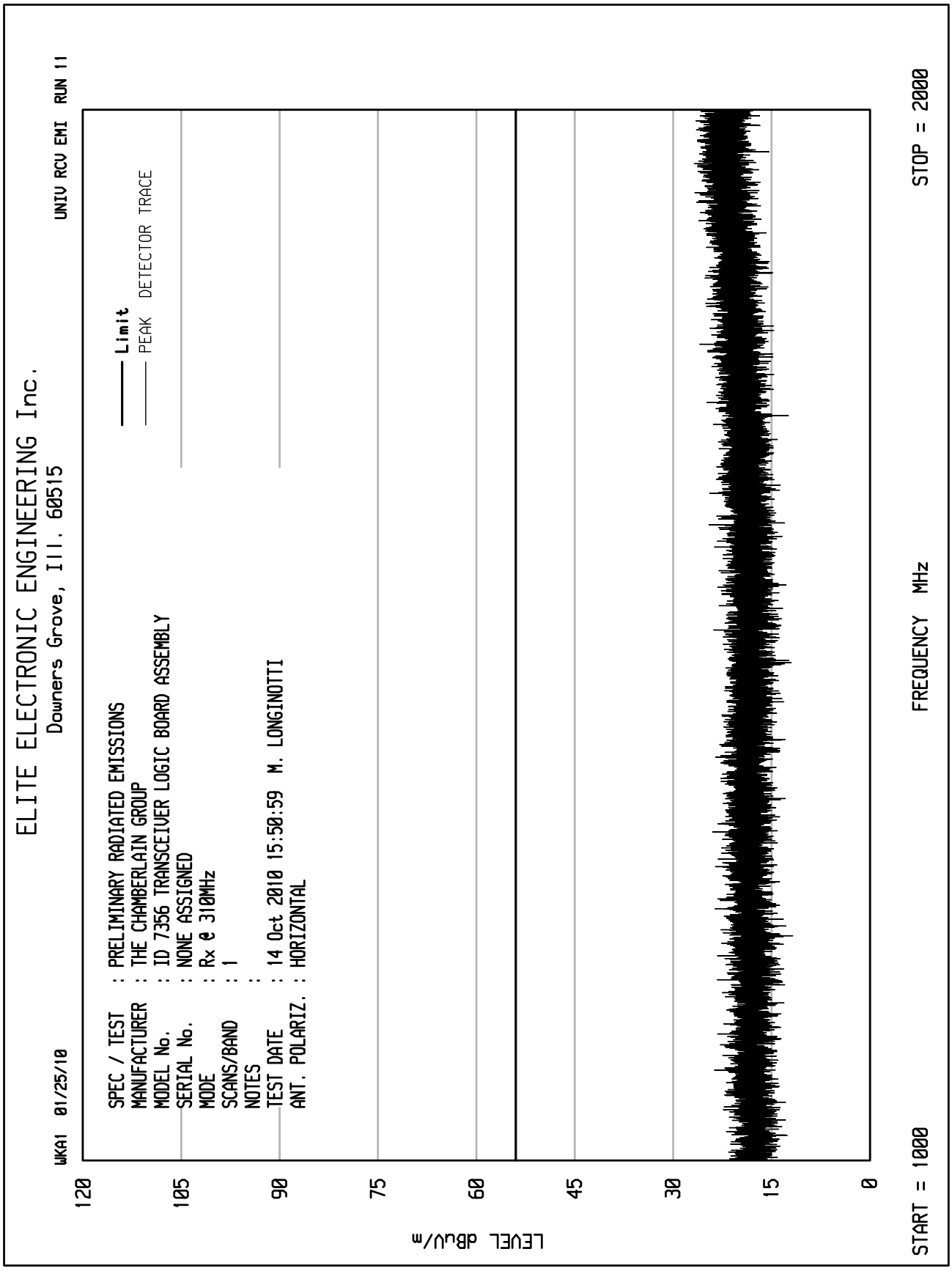
Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Rx @ 390MHz
Line Tested	:	RETURN
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 01:08:42 PM

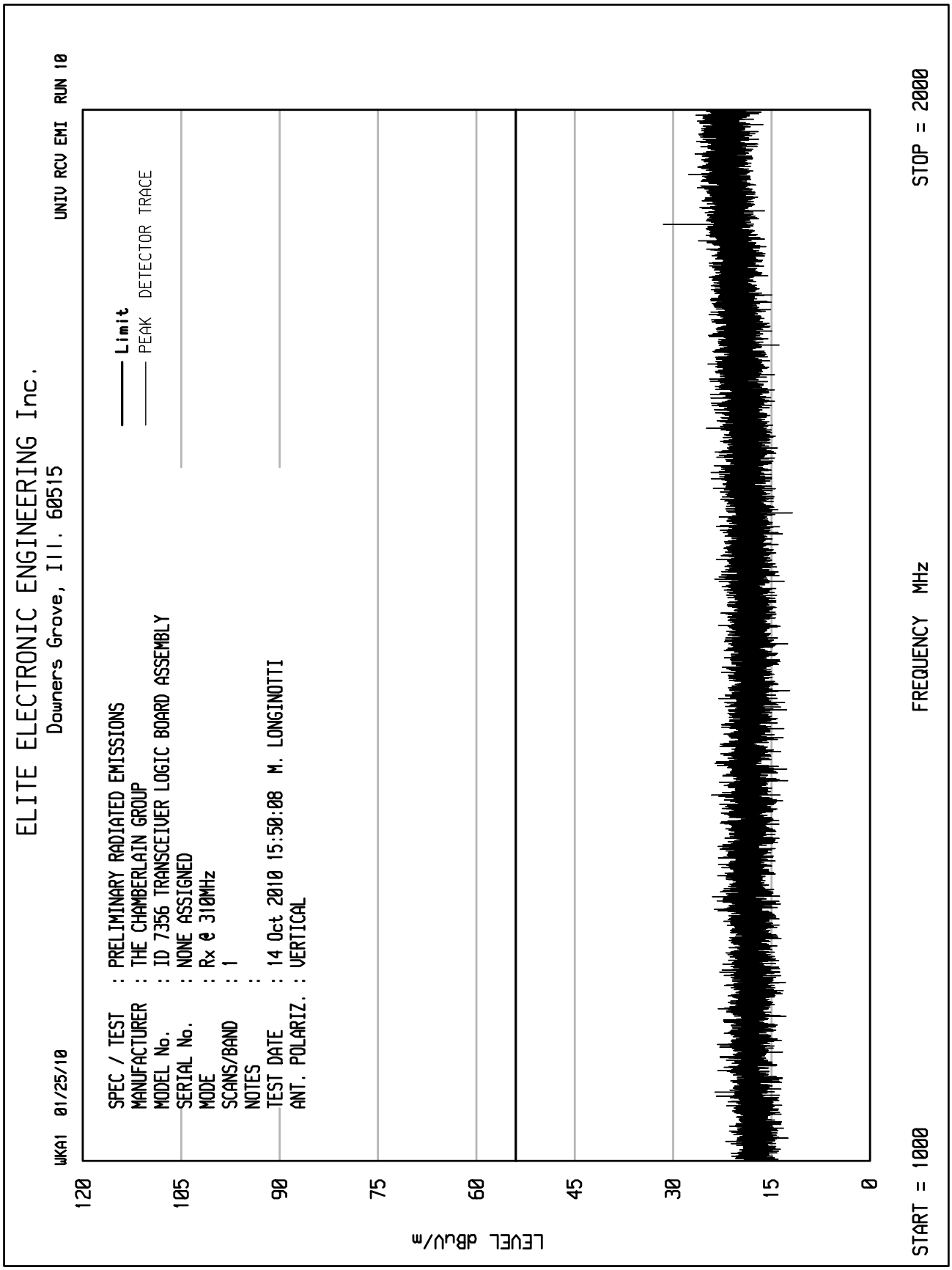


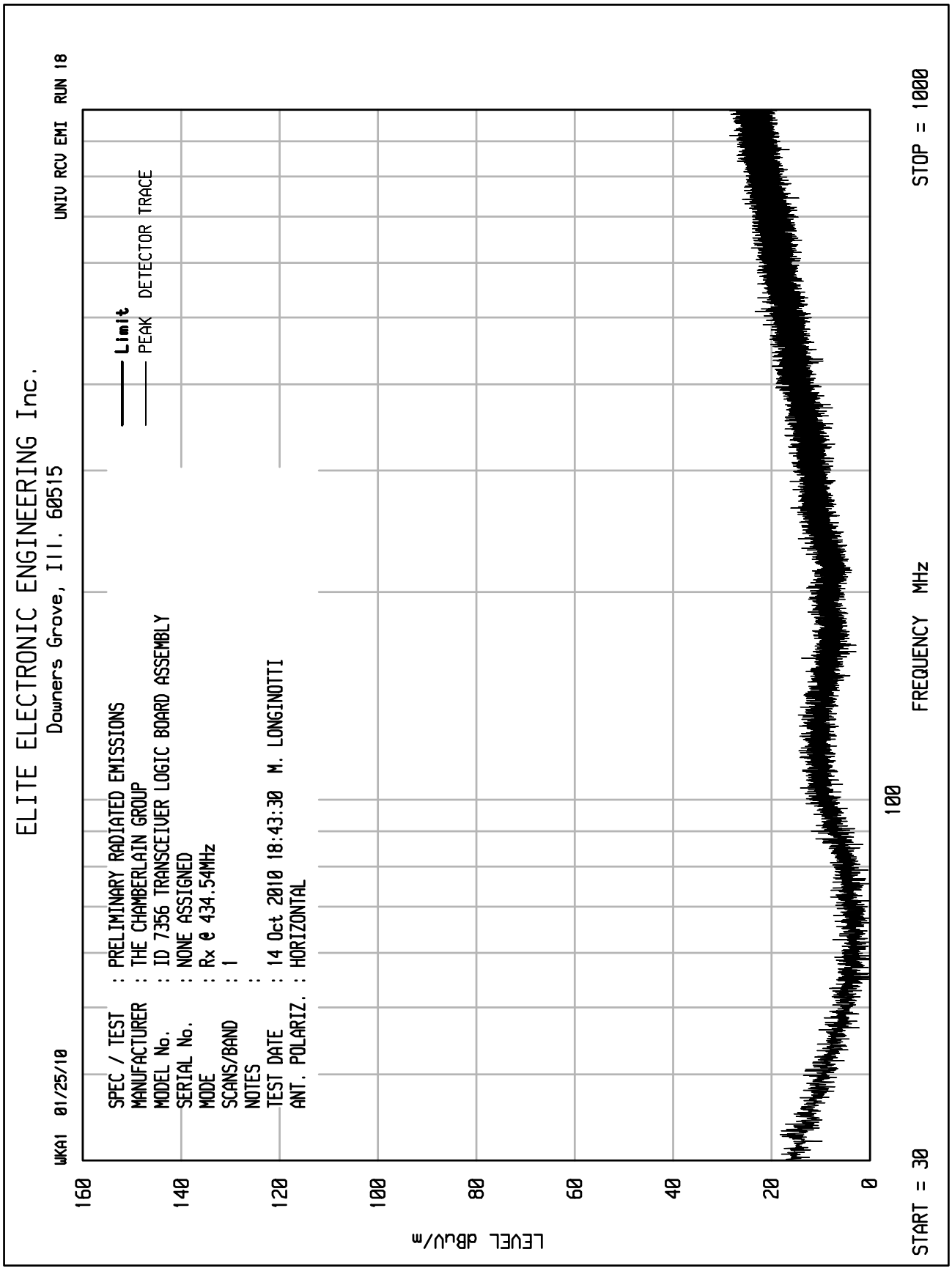
Emissions Meet QP Limit
Emissions Meet Ave Limit

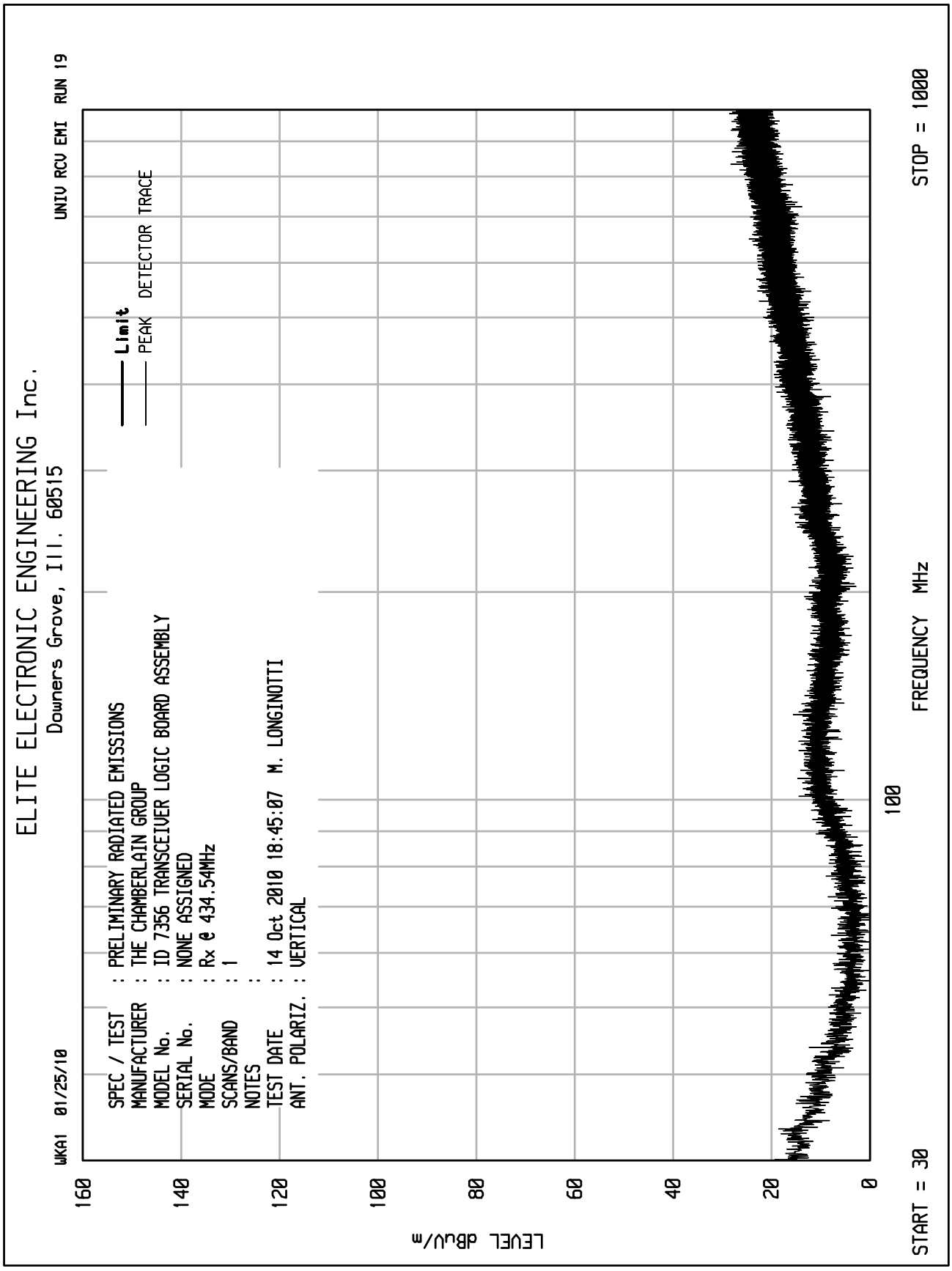

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 17
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 18:40:32 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

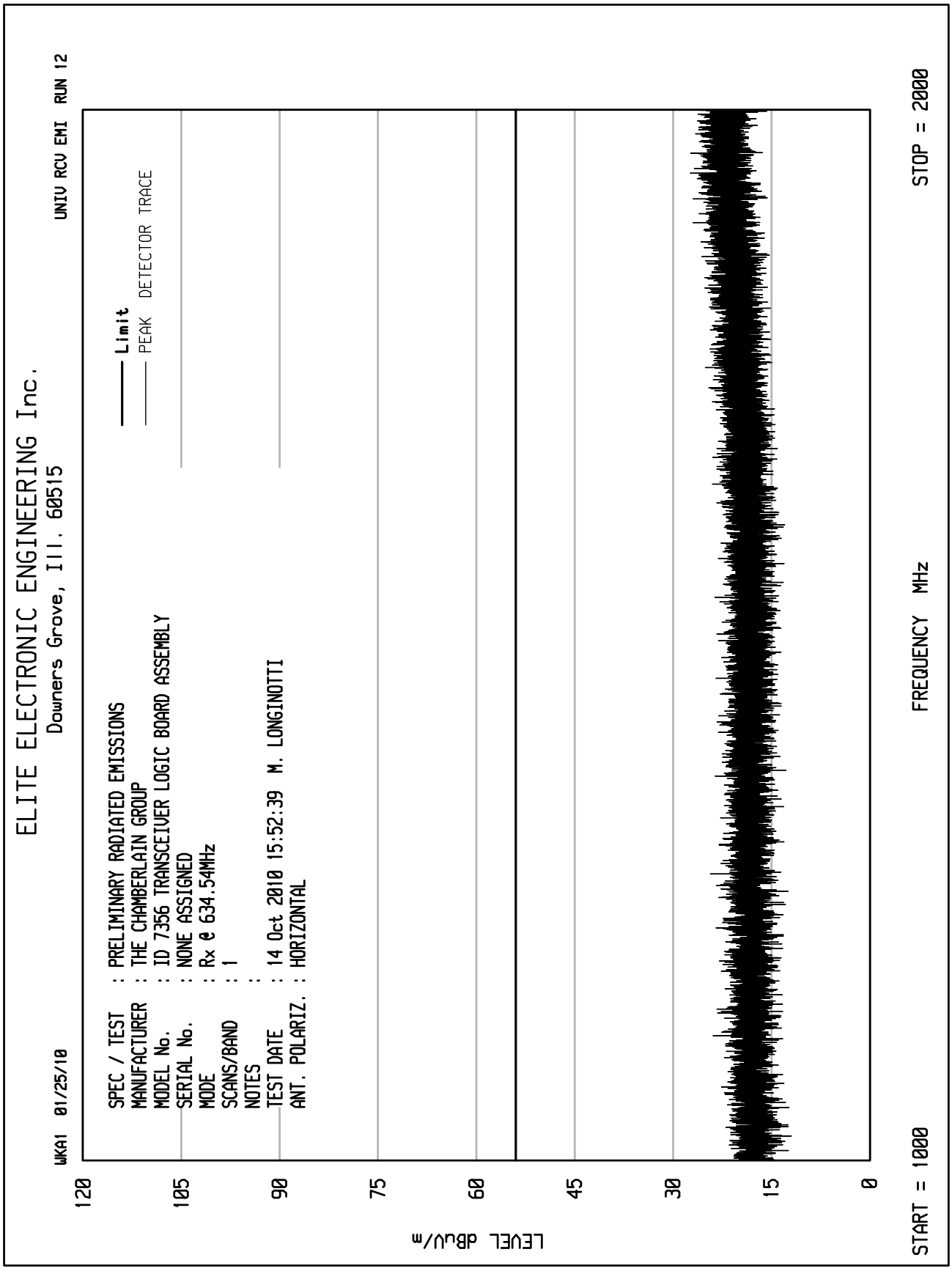

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 16
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 18:37:44 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

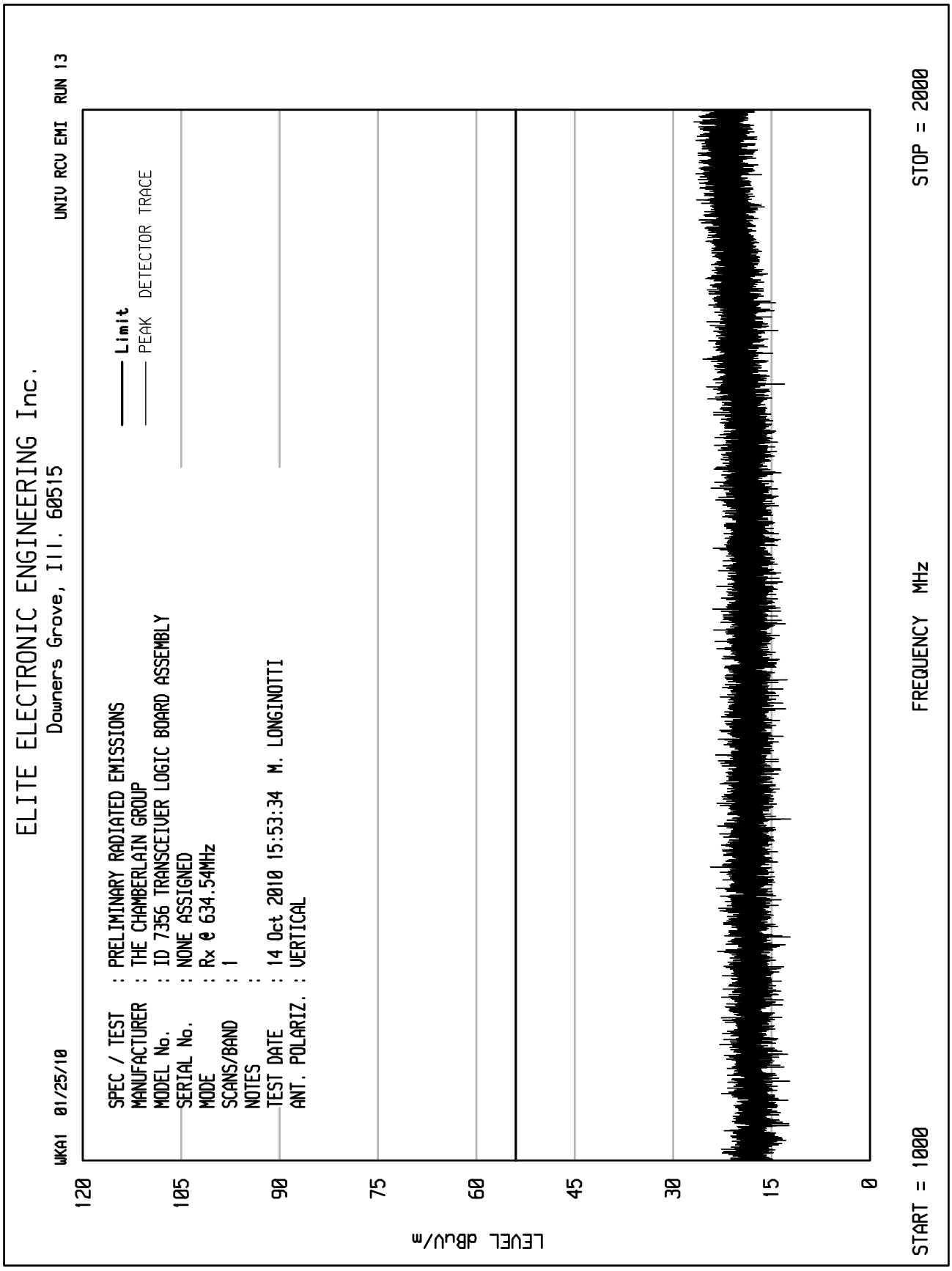

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 11
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 15:50:59 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 2000

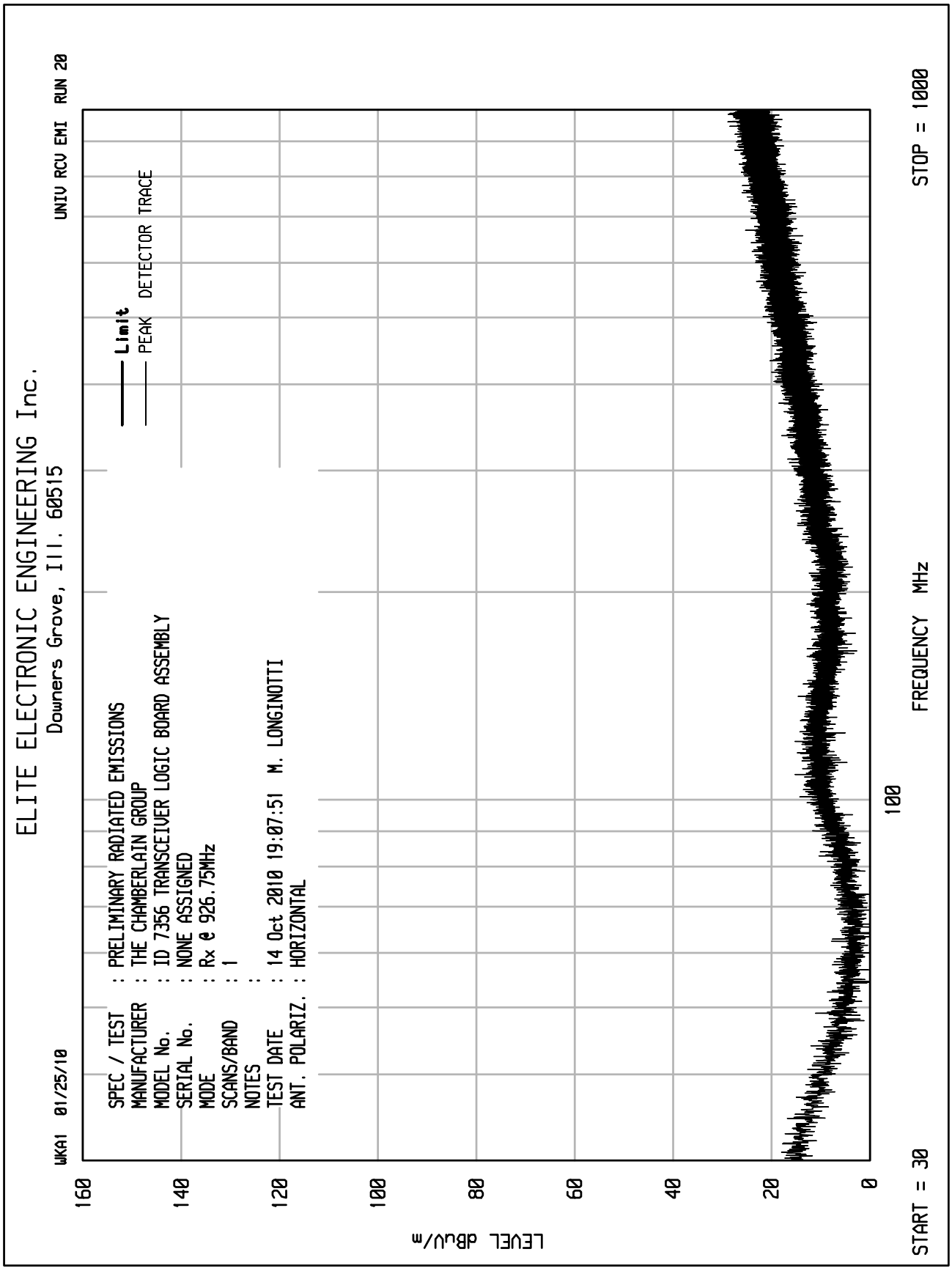

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 10
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 15:50:08 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 2000

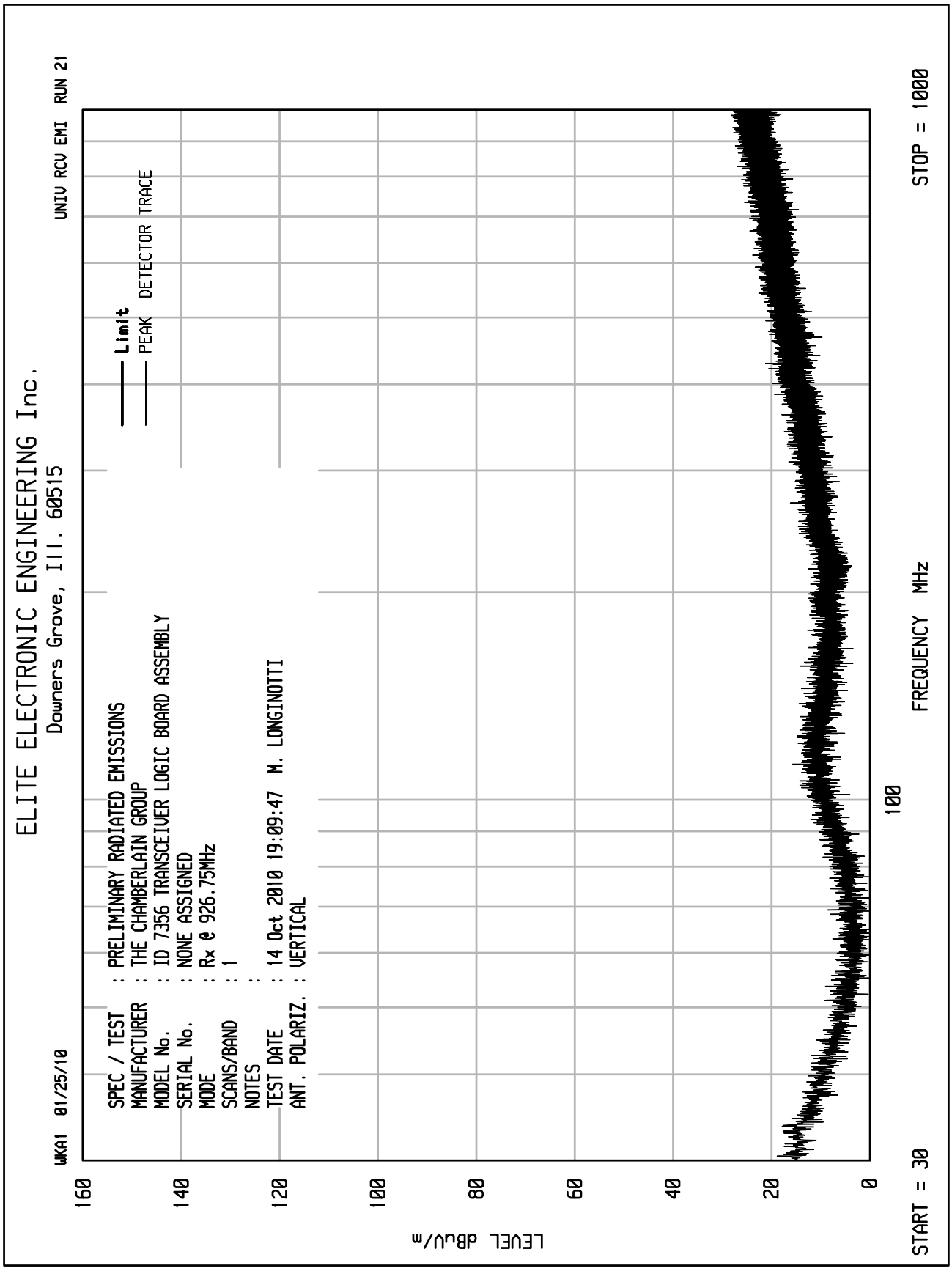

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 18
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 434.54MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 18:43:30 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

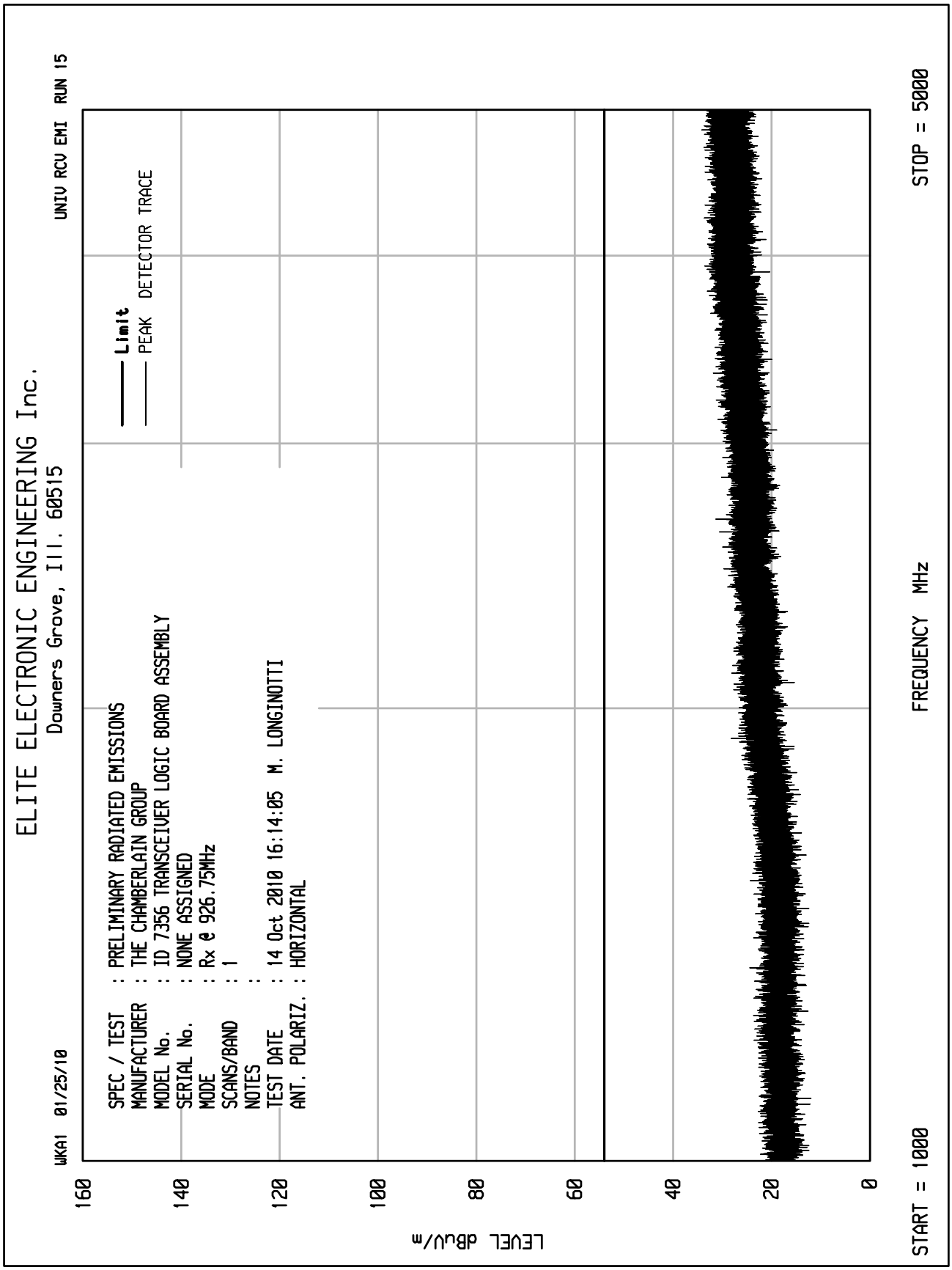

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 19
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 434.54MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 18:45:07 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

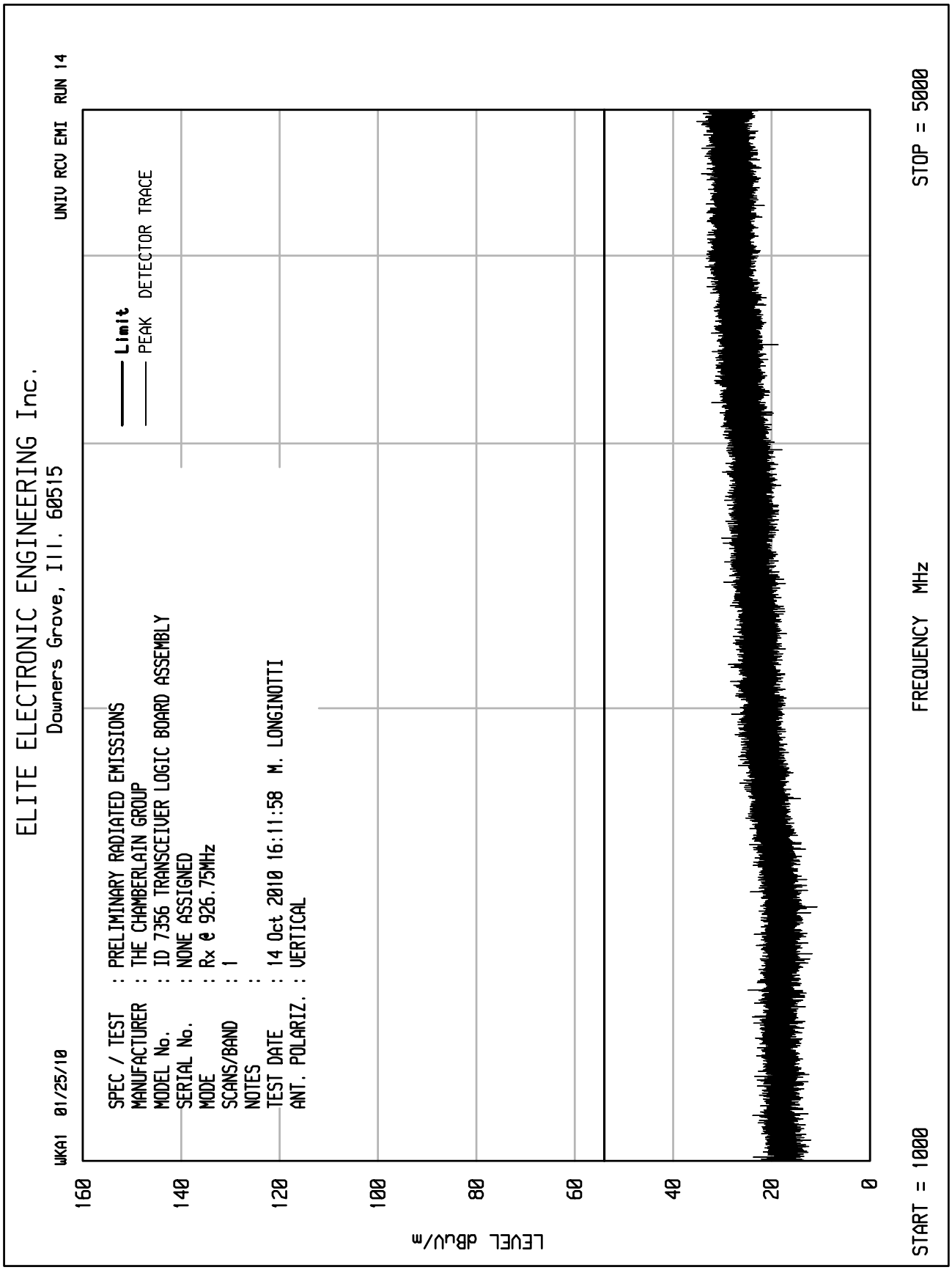

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 12
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 634.54MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 15:52:39 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 2000

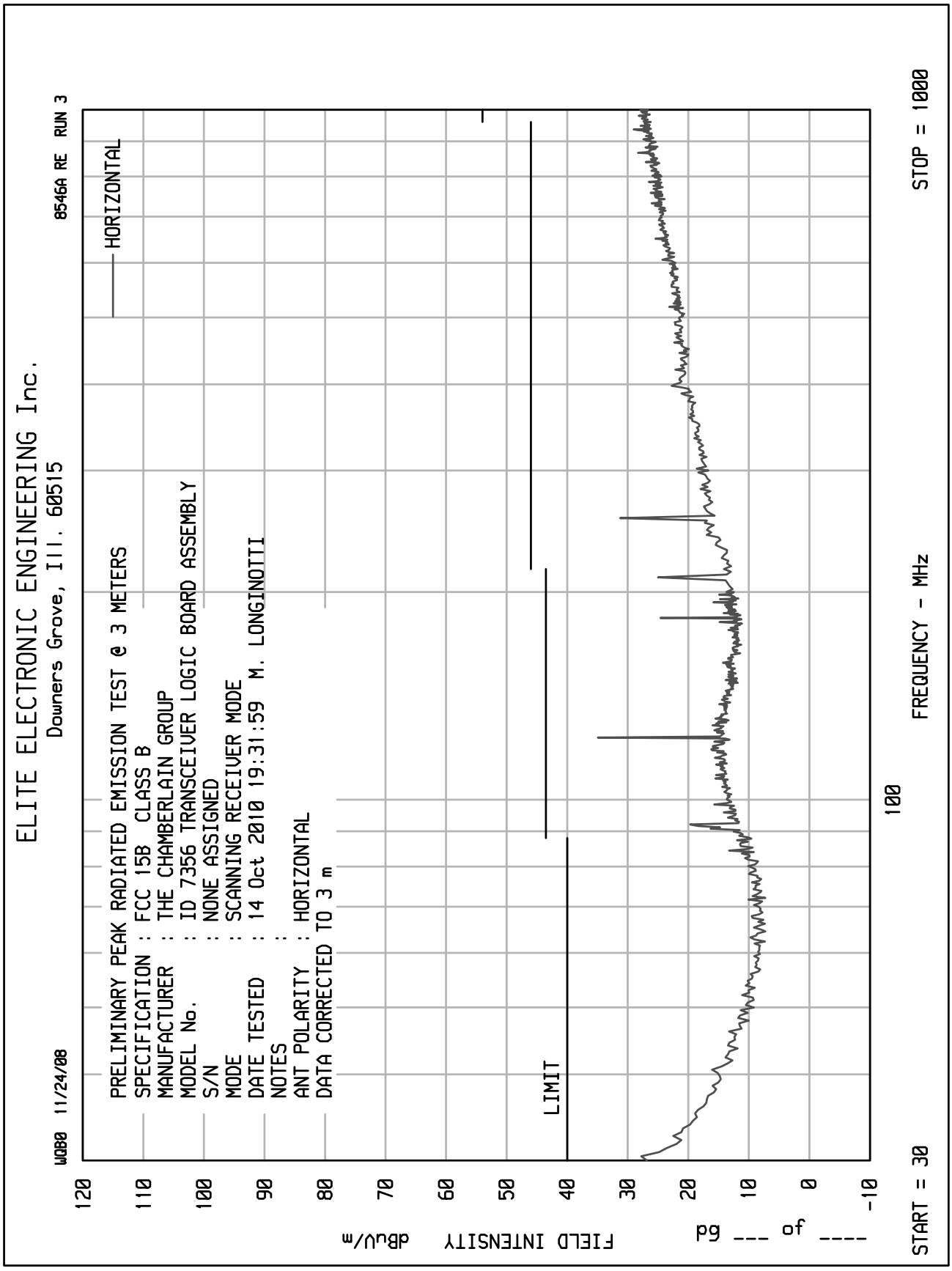

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 13
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 634.54MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 15:53:34 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 2000

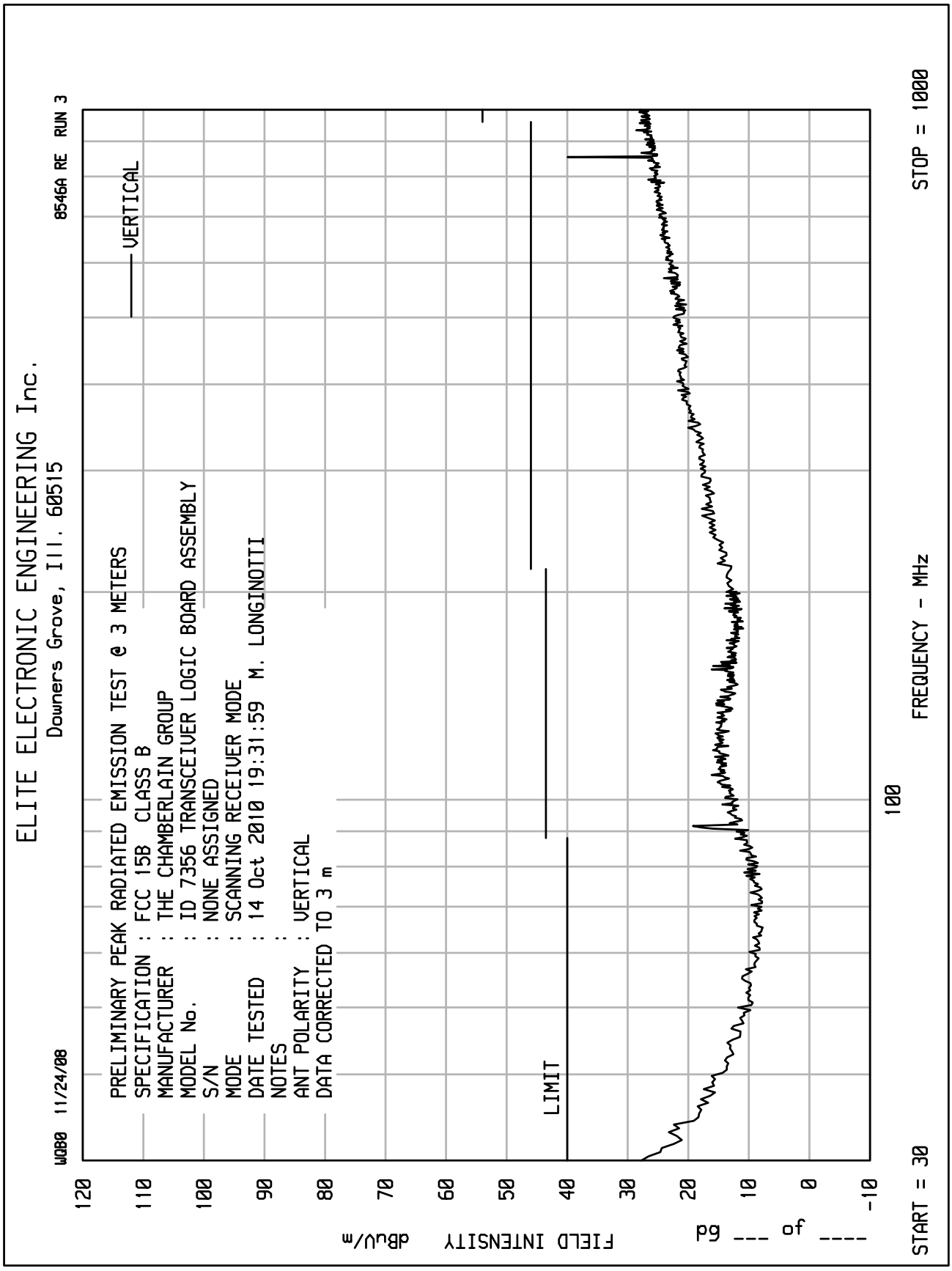

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 20
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 19:07:51 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

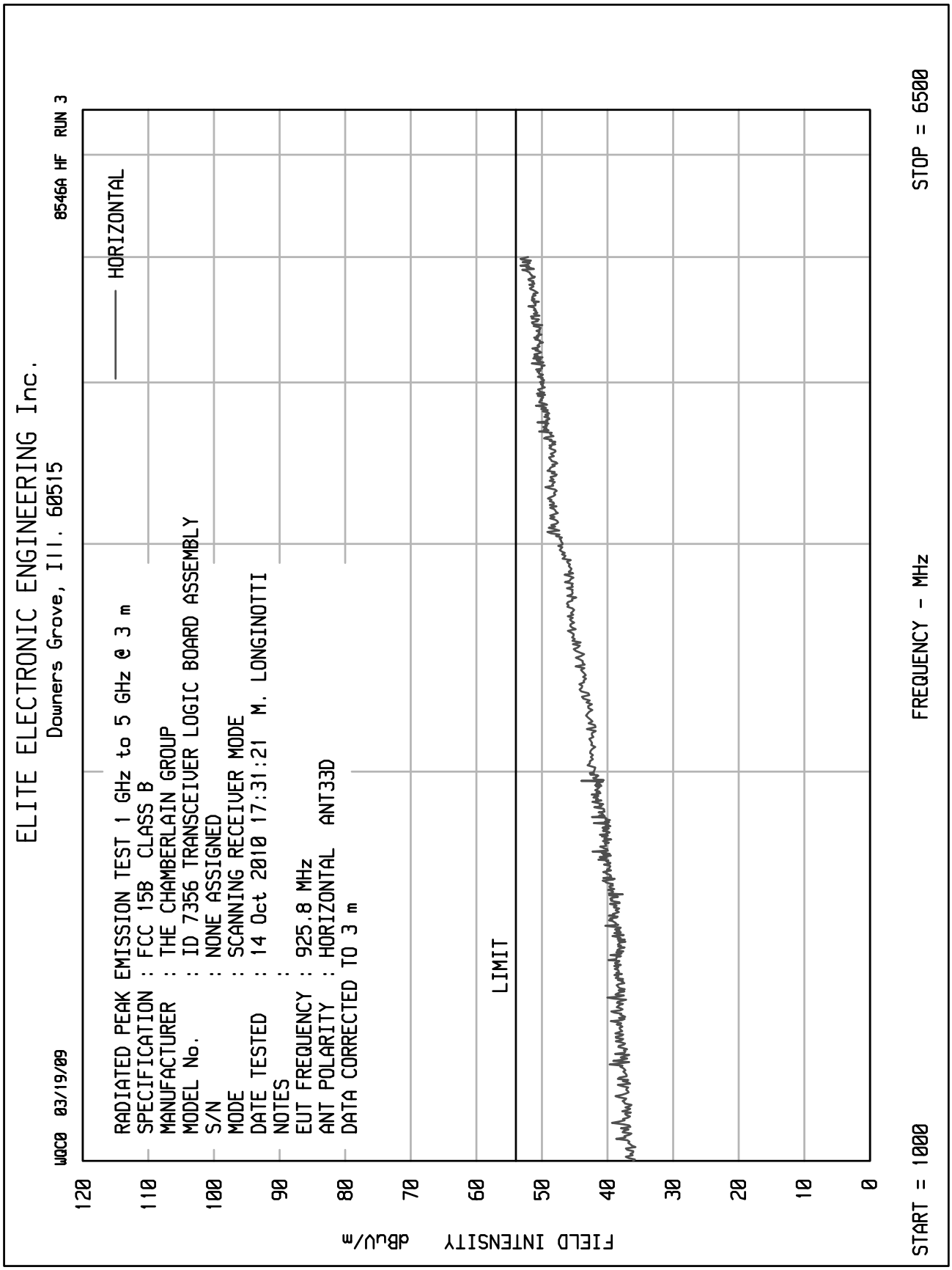

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 21
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 19:09:47 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

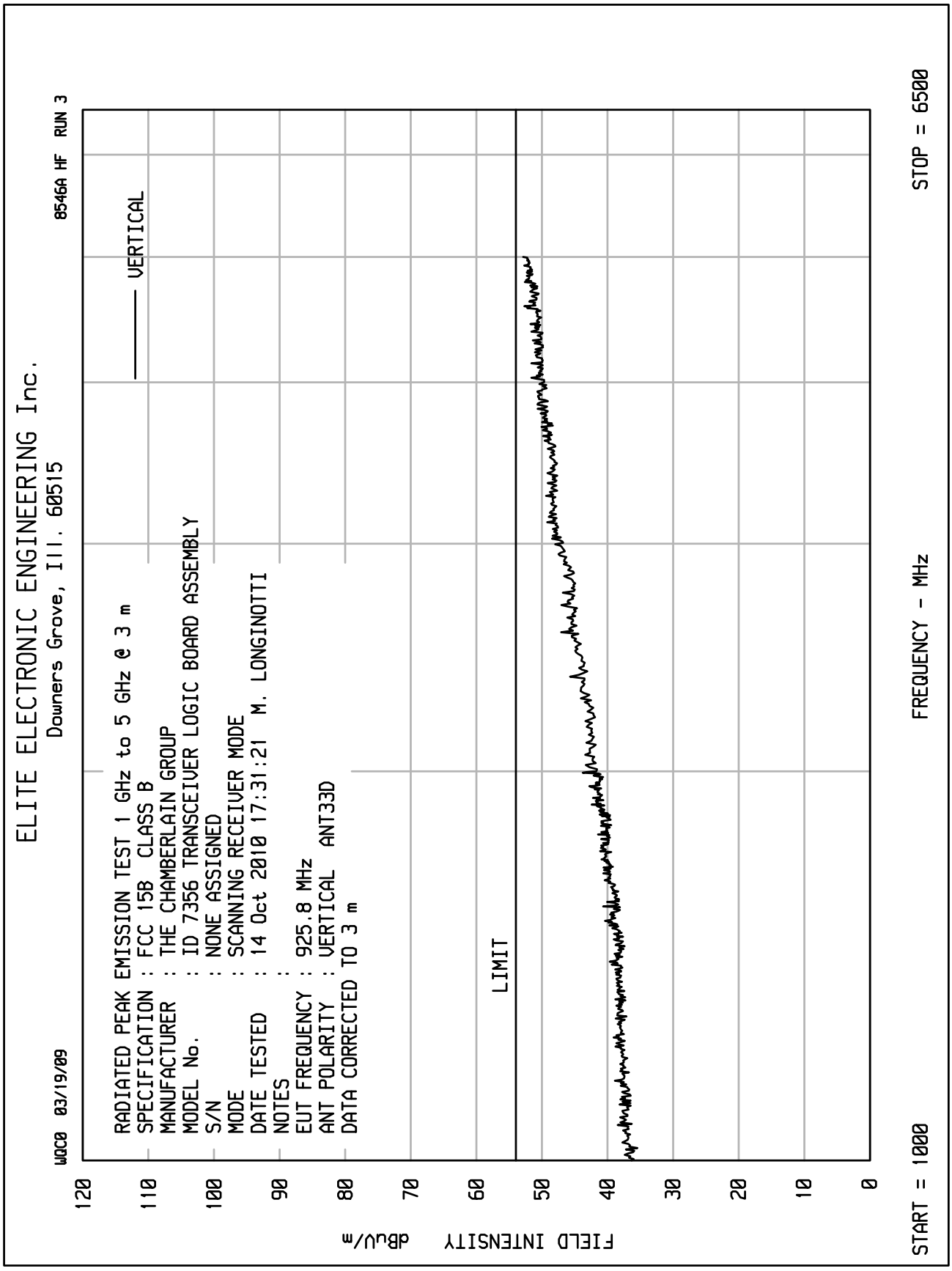

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 15
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 16:14:05 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 14
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Rx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Oct 2010 16:11:58 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
8546A RE RUN 3
WQ80 11/24/08
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
S/N : NONE ASSIGNED
MODE : SCANNING RECEIVER MODE
DATE TESTED : 14 Oct 2010 19:31:59 M. LONGINOTTI
NOTES : :
ANT POLARITY : HORIZONTAL
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
START = 30
100
FREQUENCY - MHz
STOP = 1000
pg --- of ----


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
8546A RE RUN 3
WQ80 11/24/08
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
S/N : NONE ASSIGNED
MODE : SCANNING RECEIVER MODE
DATE TESTED : 14 Oct 2010 19:31:59 M. LONGINOTTI
NOTES : :
ANT POLARITY : VERTICAL
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
START = 30
100
FREQUENCY - MHz
STOP = 1000
pg --- of ----


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQCD 03/19/09
8546A HF RUN 3
RADIATED PEAK EMISSION TEST 1 GHz to 5 GHz @ 3 m
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
S/N : NONE ASSIGNED
MODE : SCANNING RECEIVER MODE
DATE TESTED : 14 Oct 2010 17:31:21 M. LONGINOTTI
NOTES :
EUT FREQUENCY : 925.8 MHz
ANT POLARITY : HORIZONTAL ANT33D
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC0 03/19/09
8546A HF RUN 3
RADIATED PEAK EMISSION TEST 1 GHz to 5 GHz @ 3 m
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
S/N : NONE ASSIGNED
MODE : SCANNING RECEIVER MODE
DATE TESTED : 14 Oct 2010 17:31:21 M. LONGINOTTI
NOTES :
EUT FREQUENCY : 925.8 MHz
ANT POLARITY : VERTICAL ANT33D
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500

Manufacturer : The Chamberlain Group, Inc.
Model No. : Assembly ID 7356
Serial No. : None Assigned
Specification : FCC-15.109 Spurious Radiated Emissions
Date : October 14, 2010
Mode : Rx @ 310MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, SES1
Notes : Test Distance is 3 meters
Notes :

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
309.063	H	3.8	Ambient	1.4	14.3	0.0	19.4	9.4	200.0	-26.6
309.063	V	3.7	Ambient	1.4	14.3	0.0	19.3	9.3	200.0	-26.7
618.125	H	4.4	Ambient	2.0	19.5	0.0	25.9	19.7	200.0	-20.1
618.125	V	4.3	Ambient	2.0	19.5	0.0	25.8	19.5	200.0	-20.2
927.188	H	5.6	Ambient	2.4	21.9	0.0	29.9	31.2	200.0	-16.2
927.188	V	5.6	Ambient	2.4	21.9	0.0	29.9	31.2	200.0	-16.2
1236.250	H	50.2	Ambient	2.8	25.5	-40.2	38.3	82.2	500.0	-15.7
1236.250	V	49.3	Ambient	2.8	25.5	-40.2	37.4	74.1	500.0	-16.6
1545.313	H	49.2	Ambient	3.2	26.2	-40.0	38.6	85.4	500.0	-15.4
1545.313	V	49.4	Ambient	3.2	26.2	-40.0	38.8	87.4	500.0	-15.2
1854.375	H	48.8	Ambient	3.5	27.6	-40.0	39.9	98.8	500.0	-14.1
1854.375	V	49.7	Ambient	3.5	27.6	-40.0	40.8	109.6	500.0	-13.2

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : The Chamberlain Group, Inc.
Model No. : Assembly ID 7356
Serial No. : None Assigned
Specification : FCC-15.109 Spurious Radiated Emissions
Date : October 14, 2010
Mode : Rx @ 434.54MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, SES1
Notes : Test Distance is 3 meters
Notes :

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
433.603	H	3.7	Ambient	1.7	17.0	0.0	22.4	13.2	200.0	-23.6
433.603	V	3.7	Ambient	1.7	17.0	0.0	22.4	13.2	200.0	-23.6
867.205	H	5.0	Ambient	2.3	21.4	0.0	28.8	27.4	200.0	-17.3
867.205	V	5.0	Ambient	2.3	21.4	0.0	28.8	27.4	200.0	-17.3
1300.808	H	50.7	Ambient	2.9	25.7	-40.2	39.1	89.9	500.0	-14.9
1300.808	V	50.8	Ambient	2.9	25.7	-40.2	39.2	91.0	500.0	-14.8
1734.410	H	49.1	Ambient	3.4	27.1	-40.0	39.6	95.3	500.0	-14.4
1734.410	V	49.2	Ambient	3.4	27.1	-40.0	39.7	96.4	500.0	-14.3

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : The Chamberlain Group, Inc.
Model No. : Assembly ID 7356
Serial No. : None Assigned
Specification : FCC-15.109 Spurious Radiated Emissions
Date : October 14, 2010
Mode : Rx @ 926.75MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, SES1
Notes : Test Distance is 3 meters
Notes :

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
925.813	H	5.6	Ambient	2.4	21.9	0.0	29.9	31.1	200.0	-16.2
925.813	V	5.8	Ambient	2.4	21.9	0.0	30.1	31.8	200.0	-16.0
1851.625	H	50.2	Ambient	3.5	27.6	-40.0	41.3	115.9	500.0	-12.7
1851.625	V	50.2	Ambient	3.5	27.6	-40.0	41.3	115.9	500.0	-12.7
2777.438	H	49.1	Ambient	4.0	30.4	-39.2	44.2	162.7	500.0	-9.8
2777.438	V	49.7	Ambient	4.0	30.4	-39.2	44.8	174.3	500.0	-9.2
3703.250	H	47.7	Ambient	4.8	33.3	-38.5	47.3	230.5	500.0	-6.7
3703.250	V	47.4	Ambient	4.8	33.3	-38.5	47.0	222.6	500.0	-7.0
4629.063	H	47.2	Ambient	5.6	33.8	-38.2	48.4	262.2	500.0	-5.6
4629.063	V	47.0	Ambient	5.6	33.8	-38.2	48.2	256.3	500.0	-5.8

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

ETR No. 8546A
DATA SHEET TEST NO. 3

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL NO. : NONE ASSIGNED
TEST MODE : SCANNING RECEIVER MODE
NOTES :
TEST DATE : 14 Oct 2010 19:31:59
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY MHz	QP READING dBuV	ANT FAC dB	CBL FAC dB	EXT ATTN dB	DIST FAC dB	TOTAL dBuV/m	QP LIMIT dBuV/m	AZ deg	ANT HT cm	POLAR
30.25	4.0	19.3	.5	0.0	0.0	23.9	40.0	60	340	H
56.01	-.9	7.2	.7	0.0	0.0	6.9	40.0	-0	200	V
90.86	7.1	9.6	.9	0.0	0.0	17.7	43.5	-0	120	H
119.81	-1.1	13.0	1.0	0.0	0.0	12.9	43.5	120	340	H
122.38	-1.3	12.9	1.0	0.0	0.0	12.7	43.5	60	200	H
154.82	-.7	10.9	1.0	0.0	0.0	11.2	43.5	300	120	V
183.13	-.7	10.2	1.0	0.0	0.0	10.4	43.5	240	200	H
253.83	-.3	13.1	1.3	0.0	0.0	14.1	46.0	60	200	H
348.31	-.4	15.3	1.5	0.0	0.0	16.4	46.0	60	200	V
394.33	0.0	16.8	1.5	0.0	0.0	18.3	46.0	180	340	H
562.30	-.5	19.0	1.9	0.0	0.0	20.4	46.0	300	340	V
653.53	-.3	19.8	2.1	0.0	0.0	21.7	46.0	-0	340	H
786.19	.1	20.6	2.5	0.0	0.0	23.1	46.0	240	200	V
858.52	0.0	21.4	2.5	0.0	0.0	23.9	46.0	60	200	V
932.91	.2	21.9	2.5	0.0	0.0	24.6	46.0	120	200	H

ETR No.
DATA SHEET HF TEST NO. 3

RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL NO. : NONE ASSIGNED
TEST MODE : SCANNING RECEIVER MODE
NOTES :
TEST DATE : 14 Oct 2010 17:31:21
EUT FREQUENCY : 925.8 MHz
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m
ANTENNA : ANT33D

FREQUENCY MHz	AVG READING dBuV	ANT FAC dB	CBL FAC dB	DIST FAC dB	TOTAL dBuV/m	AVG LIMIT dBuV/m	PASS/ FAIL	AZ deg	ANT HT cm	POLAR
1036.66	-2.5	23.8	2.6	0.0	23.9	54.0		120	120	H
1220.31	7.9	24.7	2.8	0.0	35.5	54.0		120	200	H
1354.26	-2.6	25.0	2.9	0.0	25.3	54.0		60	120	H
1544.64	-2.3	25.2	3.1	0.0	26.0	54.0		60	120	V
1634.88	-3.1	25.8	3.2	0.0	25.9	54.0		300	120	H
1761.24	8.2	26.4	3.3	0.0	37.9	54.0		240	200	H
1904.90	-2.6	27.5	3.4	0.0	28.4	54.0		240	120	V
1997.05	-2.8	27.6	3.5	0.0	28.3	54.0		120	340	H
2571.86	-2.0	29.6	4.2	0.0	31.7	54.0		60	340	V
3042.81	-1.8	30.9	4.7	0.0	33.7	54.0		0	120	V
3311.89	-2.3	31.9	4.9	0.0	34.5	54.0		120	340	H
3846.34	-2.0	32.9	5.3	0.0	36.2	54.0		300	200	H
4117.37	-2.1	33.0	5.5	0.0	36.4	54.0		180	120	V
4574.03	-1.4	33.1	5.8	0.0	37.5	54.0		0	340	V
4942.03	-1.6	34.2	6.0	0.0	38.6	54.0		120	340	H

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 914.75MHz
Line Tested	:	HIGH
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 09:16:49 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 3 dB margin below limit

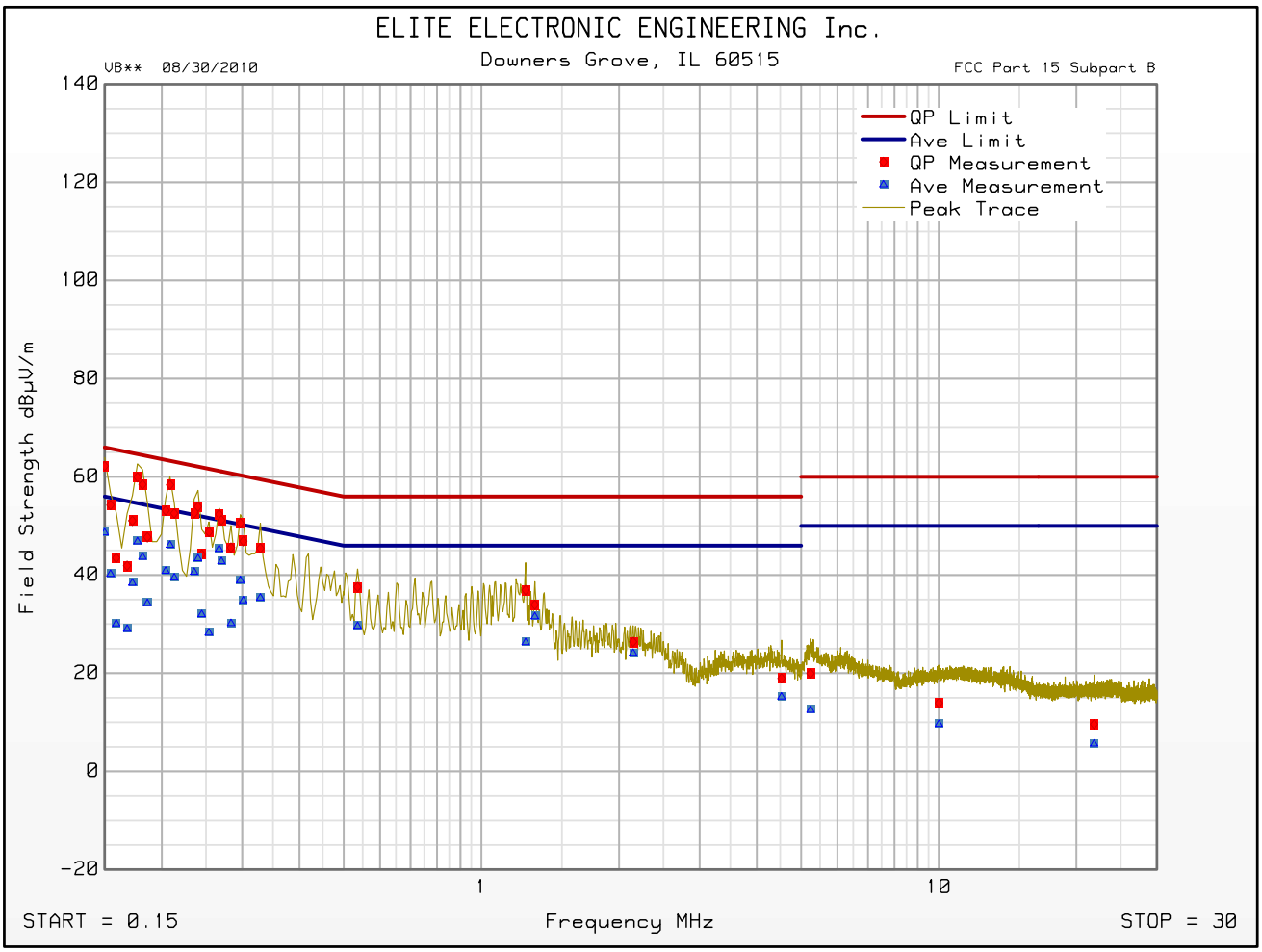
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.150	62.2	66.0		48.6	56.0	
0.297	50.6	60.3		38.9	50.3	
0.536	37.6	56.0		29.6	46.0	
1.249	37.0	56.0		26.2	46.0	
1.309	33.9	56.0		31.5	46.0	
2.147	26.4	56.0		24.1	46.0	
4.531	19.0	56.0		15.2	46.0	
5.243	19.9	60.0		12.5	50.0	
10.008	13.9	60.0		9.6	50.0	
21.857	9.6	60.0		5.6	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 914.75MHz
Line Tested	:	HIGH
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 09:16:49 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 914.75MHz
Line Tested	:	RETURN
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 09:10:23 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 3 dB margin below limit

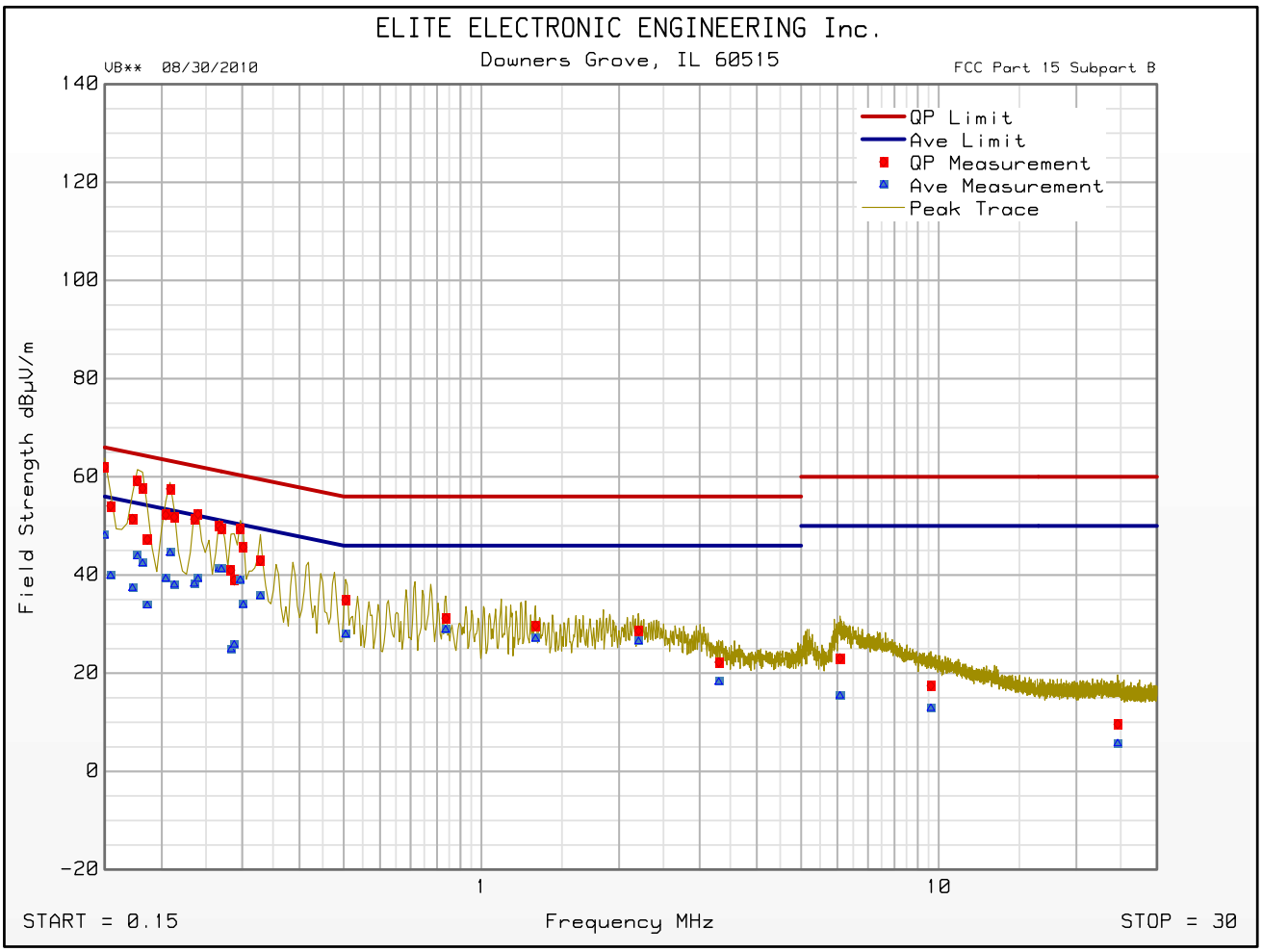
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.150	62.1	66.0		48.0	56.0	
0.297	49.4	60.3		38.9	50.3	
0.505	34.9	56.0		27.9	46.0	
0.835	31.2	56.0		28.8	46.0	
1.313	29.7	56.0		27.0	46.0	
2.205	28.6	56.0		26.5	46.0	
3.302	22.2	56.0		18.2	46.0	
6.080	23.0	60.0		15.4	50.0	
9.608	17.5	60.0		12.9	50.0	
24.607	9.6	60.0		5.7	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

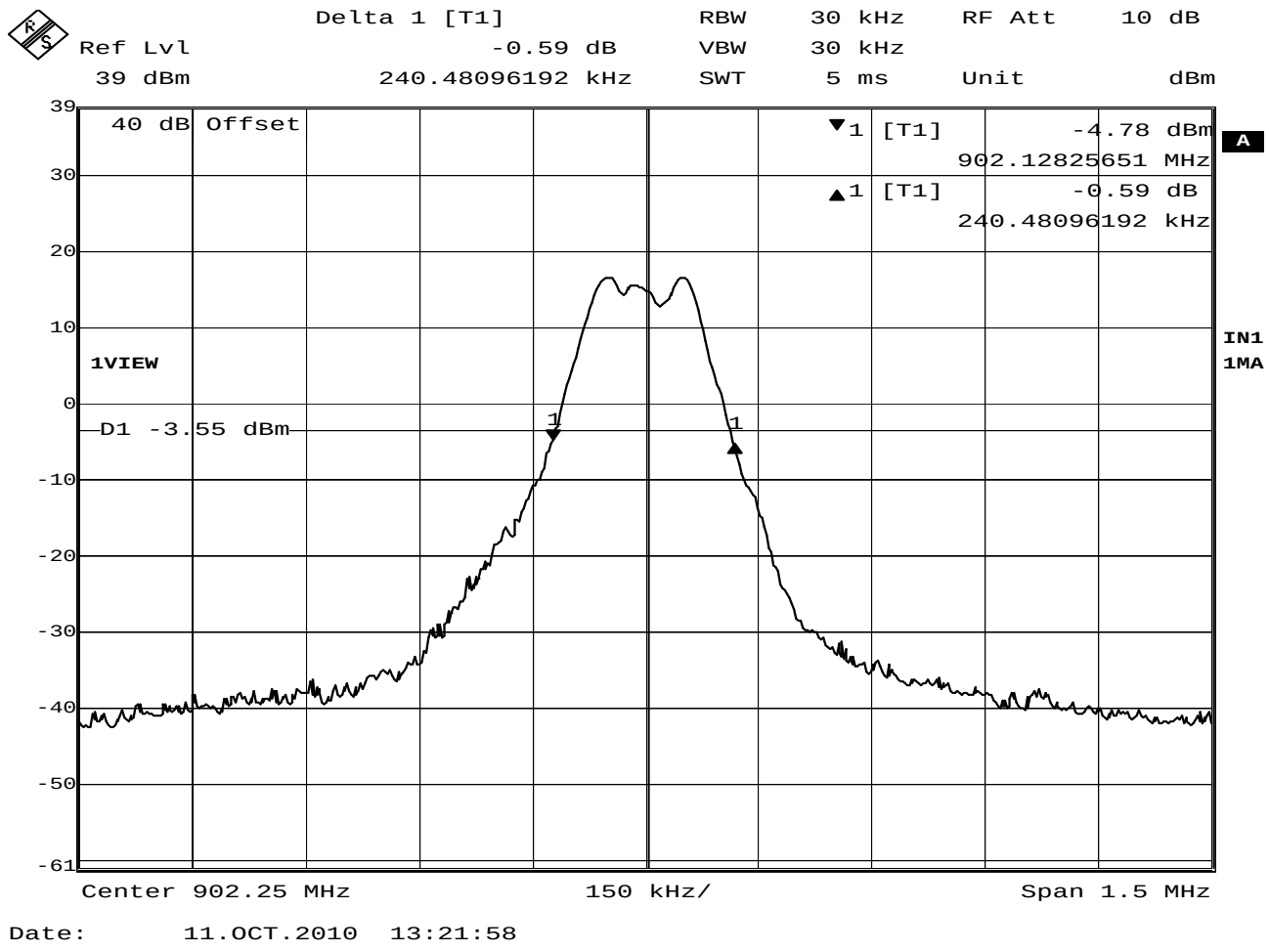
Cumulative Data

VB** 08/30/2010

Manufacturer	:	THE CHAMBERLAIN GROUP
Model	:	ID 7356 LOGIC BOARD ASSEMBLY TRANSCEIVER
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 914.75MHz
Line Tested	:	RETURN
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-3
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	Class B
Test Date	:	Oct 13, 2010 09:10:23 AM

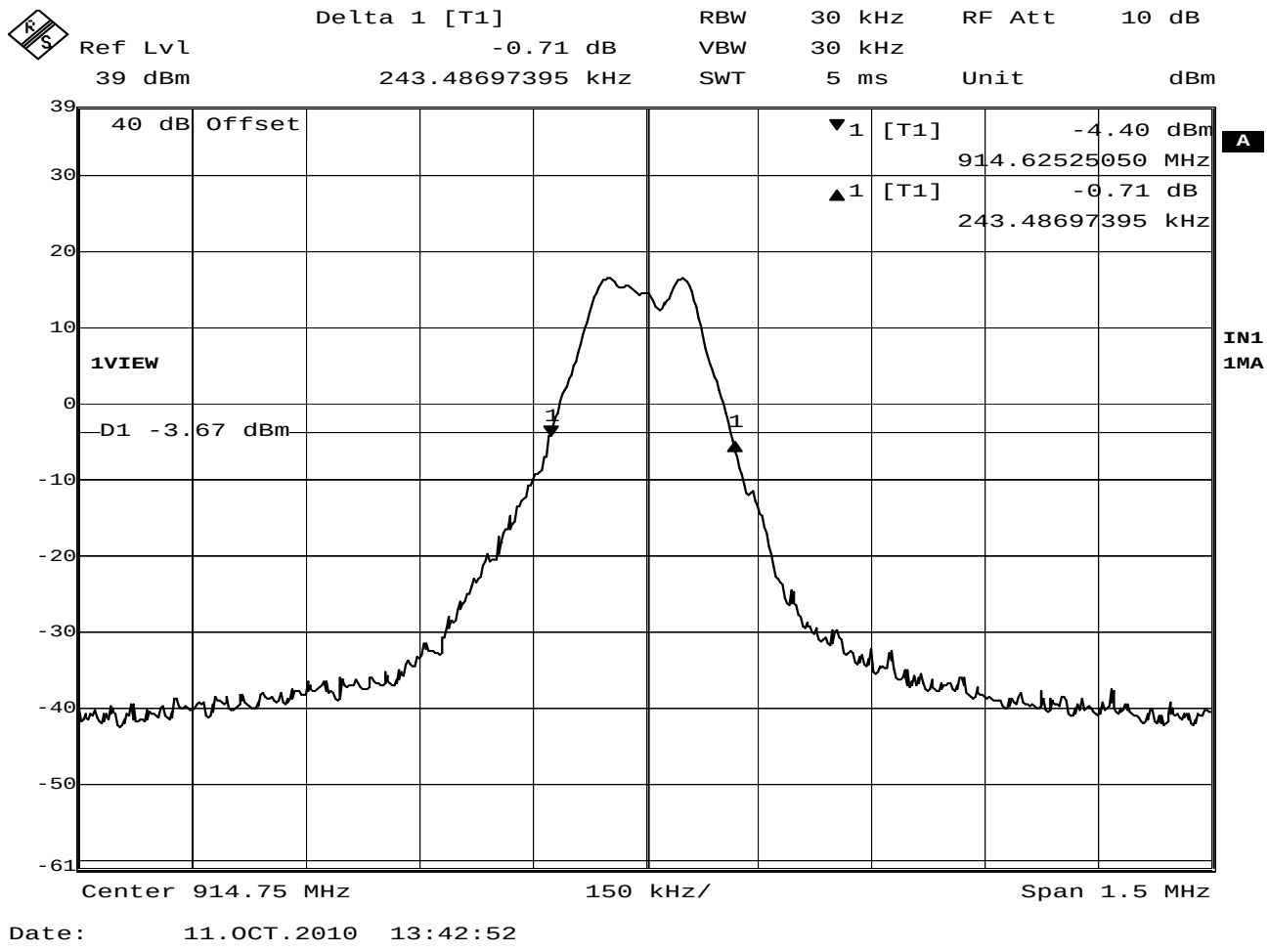


Emissions Meet QP Limit
Emissions Meet Ave Limit



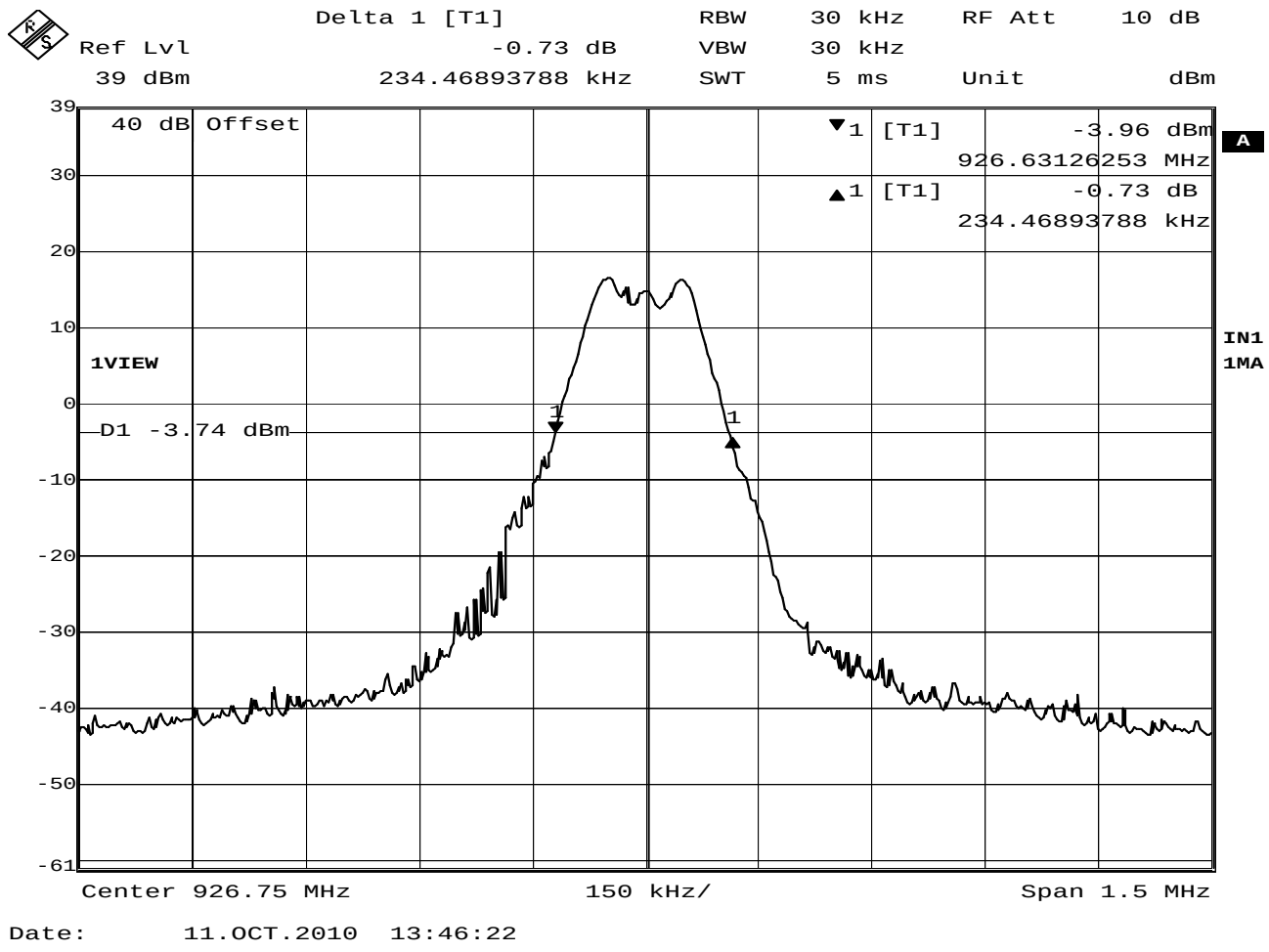
15.247(a) 20dB Band Width (antenna conducted)

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Tx @ 902.25MHz
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	20dB band width is 240.48kHz
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



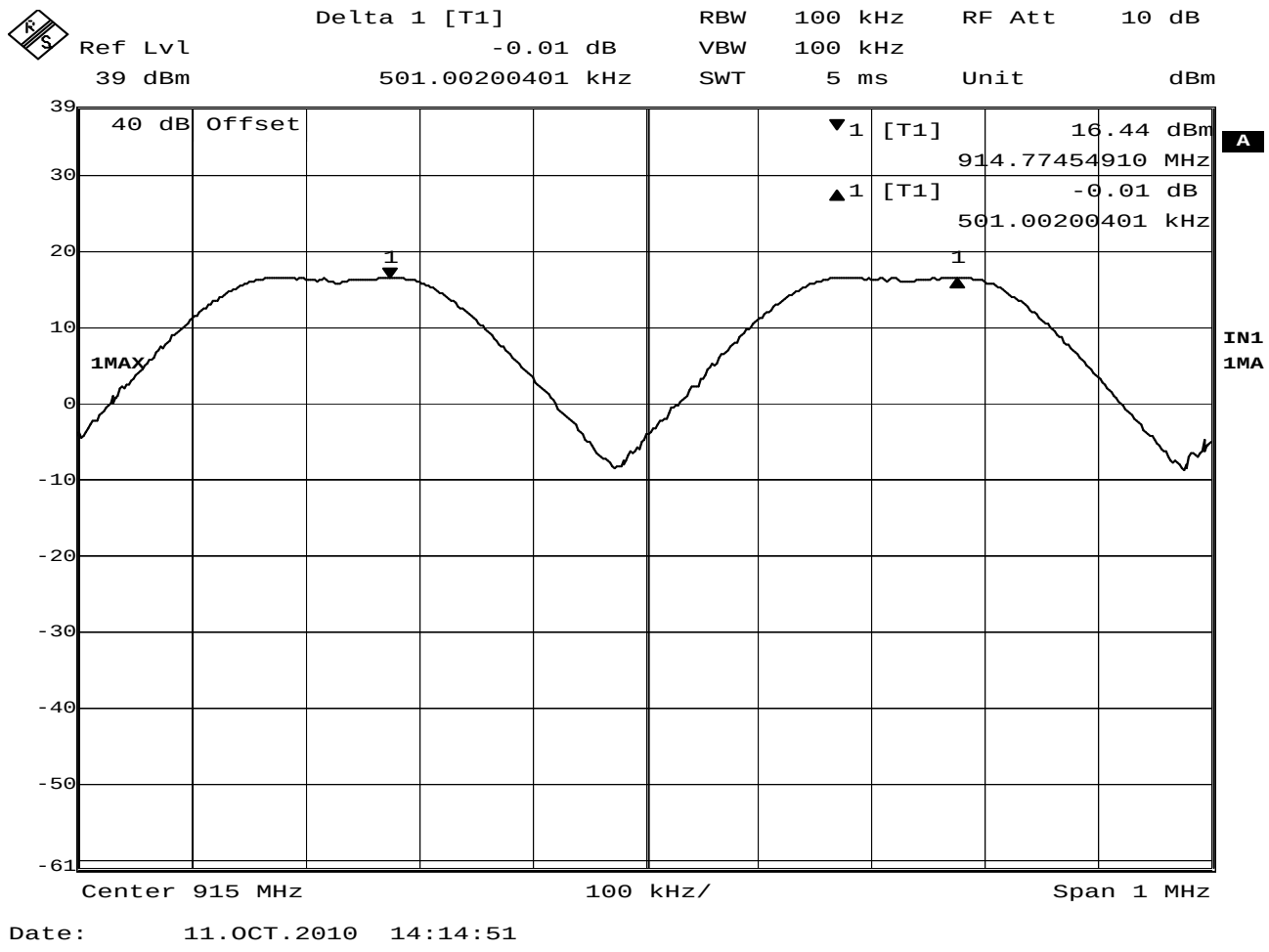
15.247(a) 20dB Band Width (antenna conducted)

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Tx @ 914.75MHz
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	20dB band width is 243.49kHz
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



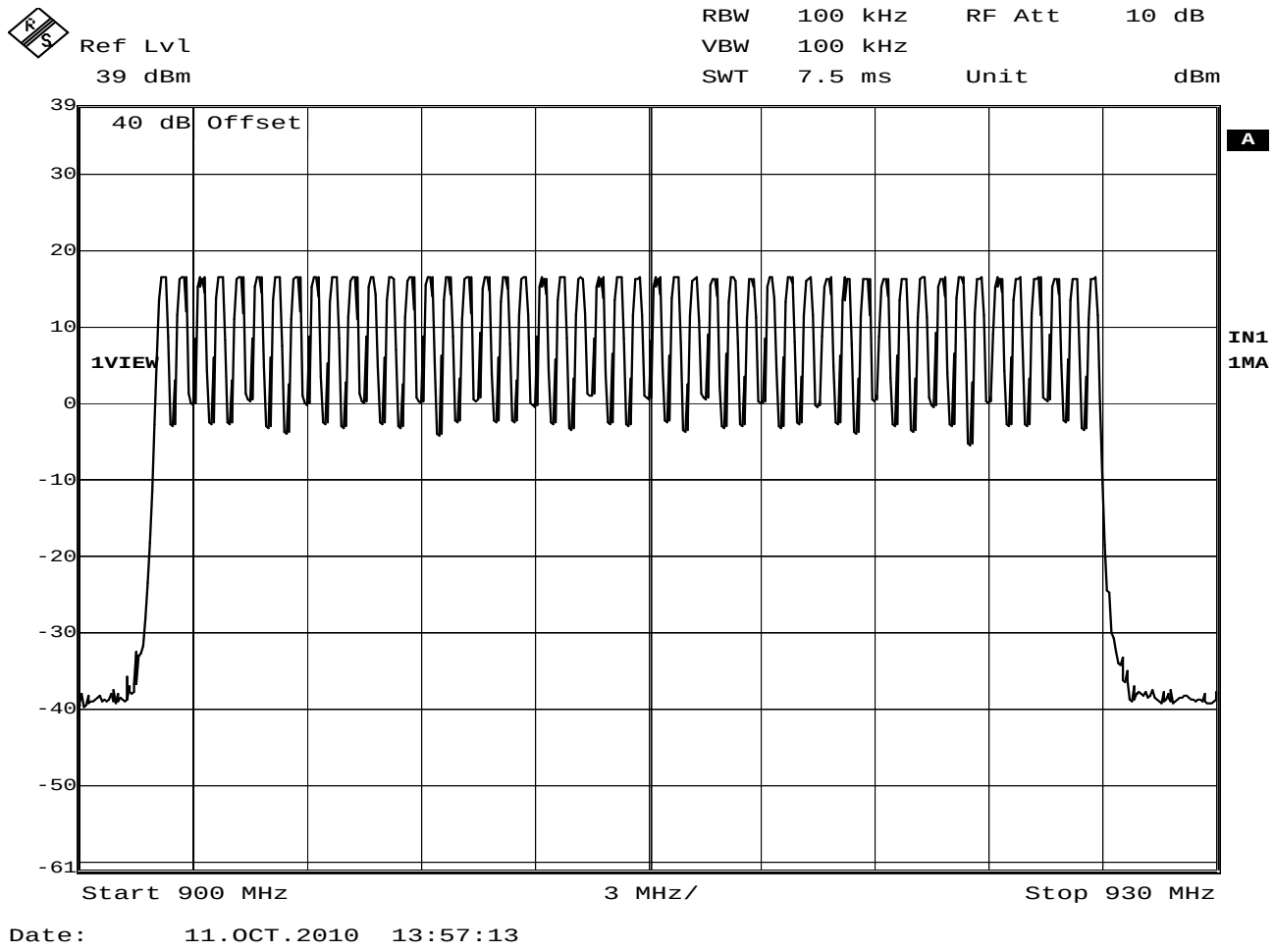
15.247(a) 20dB Band Width (antenna conducted)

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Tx @ 926.75MHz
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	20dB band width is 234.47kHz
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



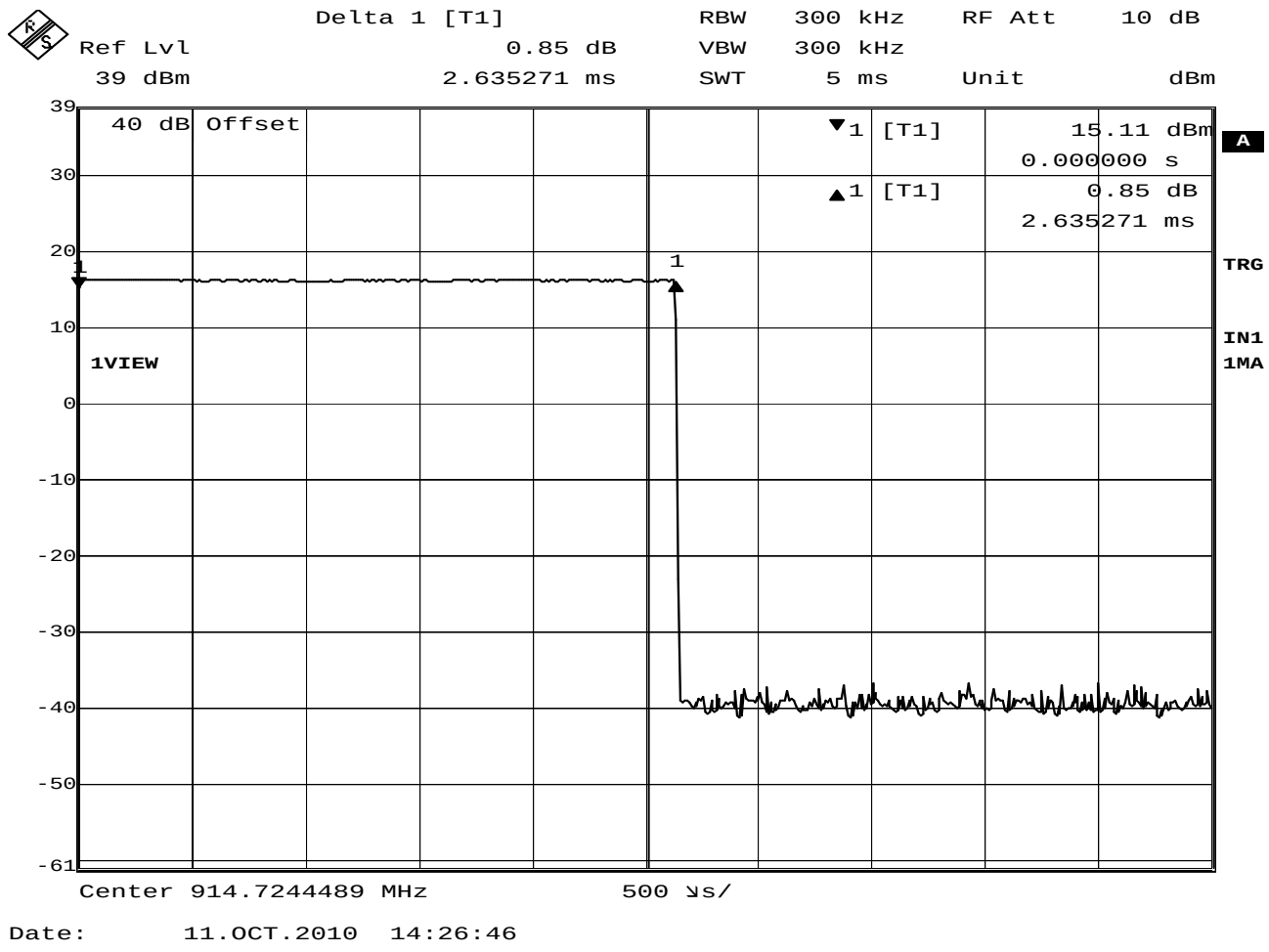
15.247(a) Carrier Frequency Separation

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping Enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Carrier Frequency Separation = 501kHz
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



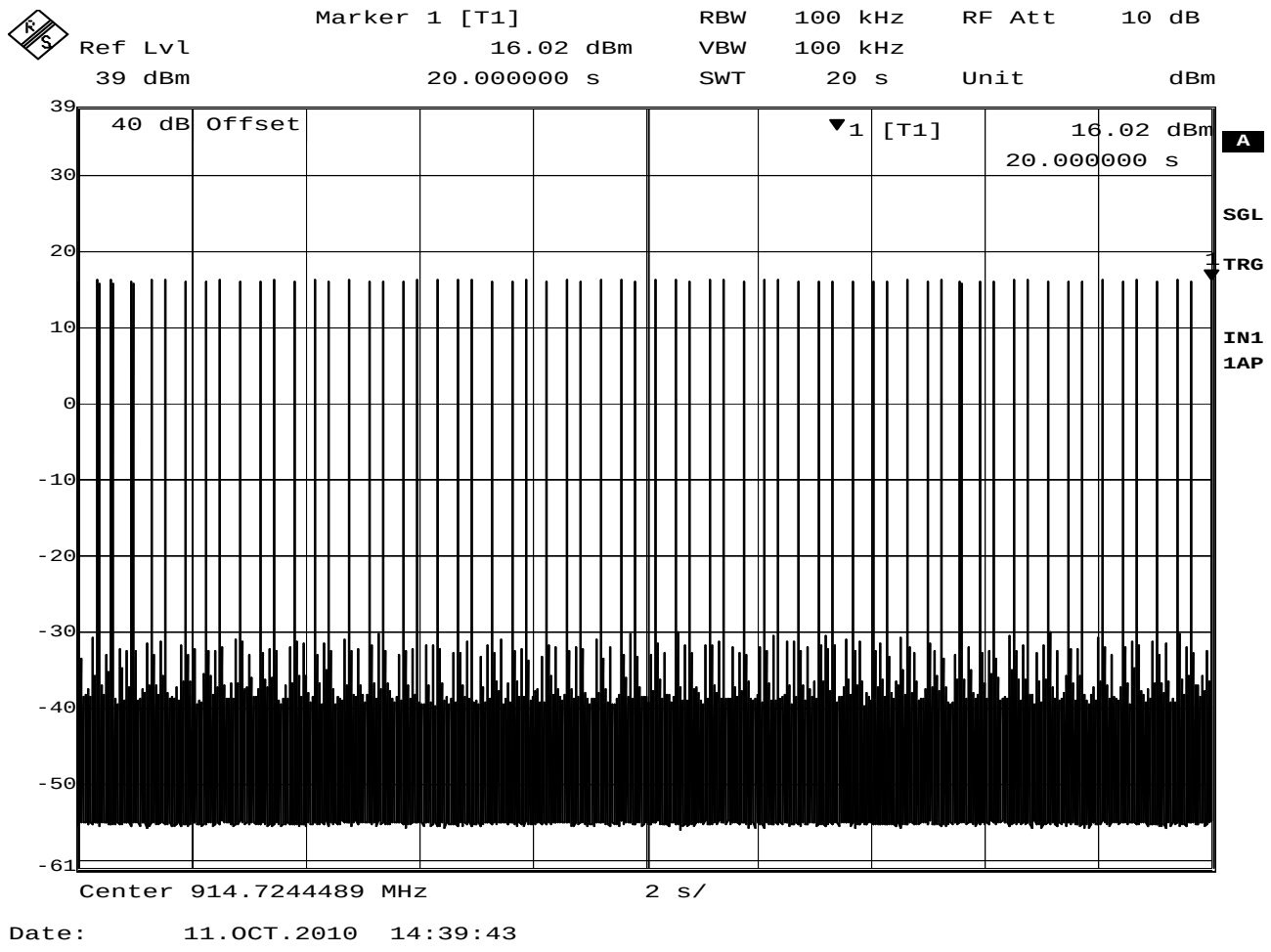
15.247(a) Number of Hopping Channels (antenna conducted)

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping Enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Number of Hopping Channels = 50
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



15.247(a) Time of Occupancy

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping Enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	On time per hop is 2.635msec
NOTES	:	
EQUIPMENT USED	:	RBA0, T2DL, T2S8



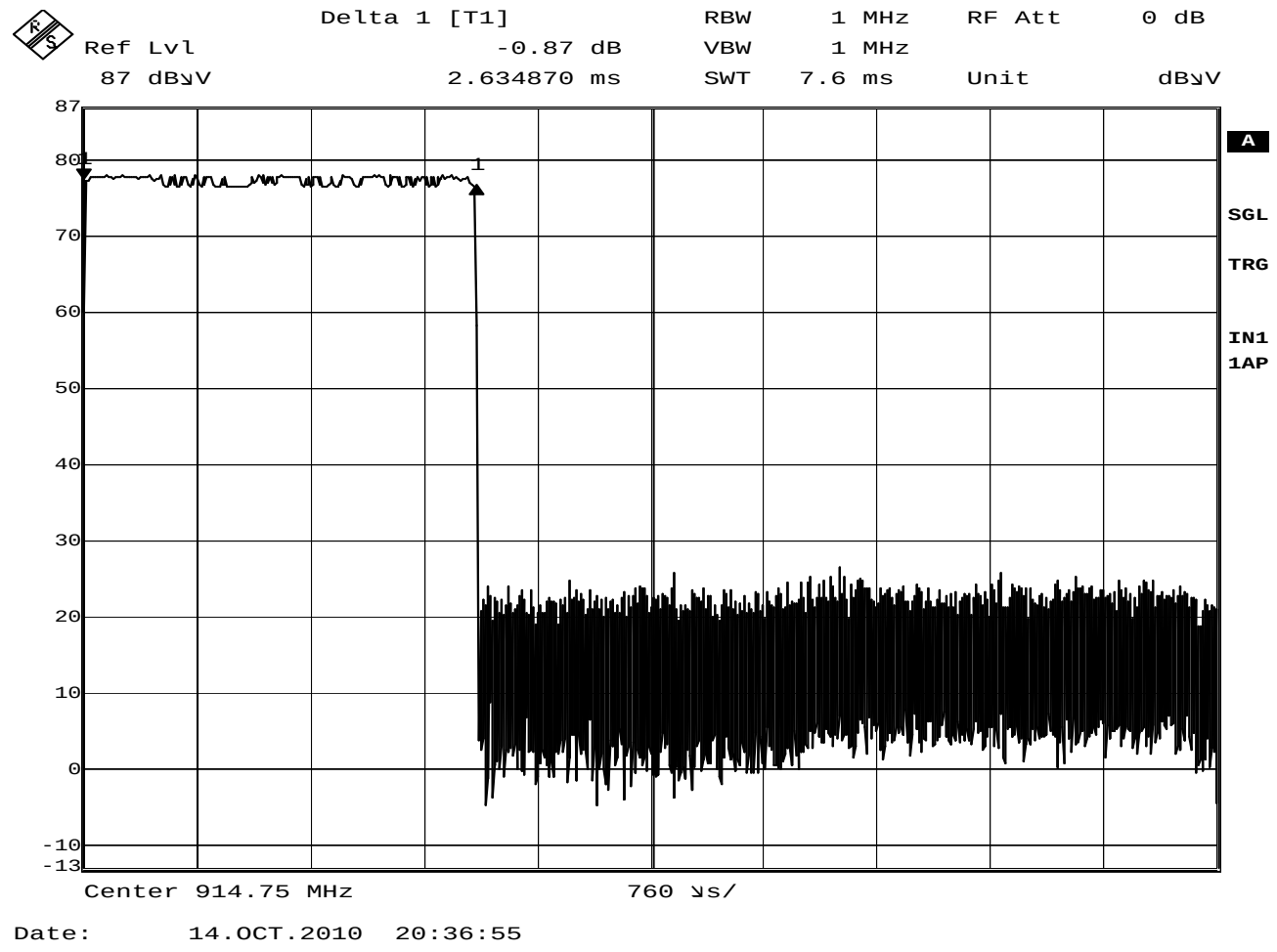
15.247(a) Time of Occupancy

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping Enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Number of hops in a 20 second period is 64. On time per hop is 2.635msec. Therefore the total time of occupancy is (on time per hop) x (number of hops in a 20 second period)
NOTES	:	Time of occupancy = (2.635msec/hop) x (64hops) = 168.64msec
EQUIPMENT USED	:	RBA0, T2DL, T2S8

Manufacturer : The Chamberlain Group, Inc.
Model No. : ID 7356 transceiver logic board assembly
Serial No. : None Assigned
Specification : FCC-15.247 Effective Isotropic Radiated Power (EIRP)
Date : October 11, 2010
Mode : See Below
Equipment Used : RBB0, NTA2, NDQ0, GRE0
Notes : Test Distance is 3 meters

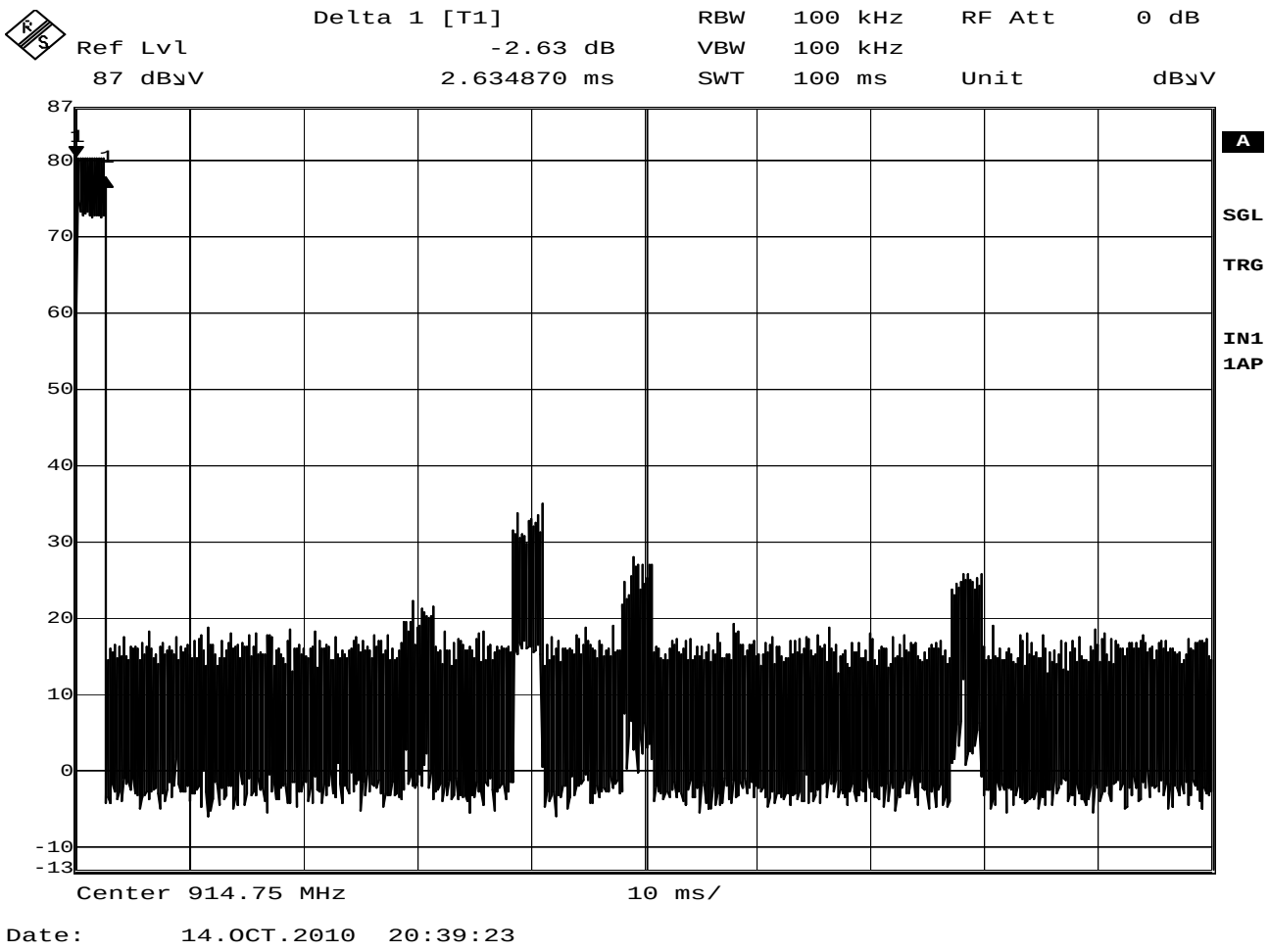
Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	Matched SIG. GEN. (dBm)	Ant Gain (dB)	CBL (dB)	EIRP Total (dBm)	Limit dBm
Transmit at 902.25MHz								
902.3	H	87.8		11.5	2.2	1.9	11.8	36.0
902.3	V	89.8		15.0	2.2	1.9	15.3	36.0
Transmit at 914.75MHz								
914.8	H	87.8		11.6	2.2	1.9	11.8	36.0
914.8	V	88.4		13.9	2.2	1.9	14.1	36.0
Transmit at 926.75MHz								
926.8	H	86.1		9.7	2.2	1.9	9.9	36.0
926.8	V	87.2		12.7	2.2	1.9	12.9	36.0

EIRP (dBm) = Matched Signal Generator (dBm) + Antenna Gain (dB) – Antenna Gain (dB)



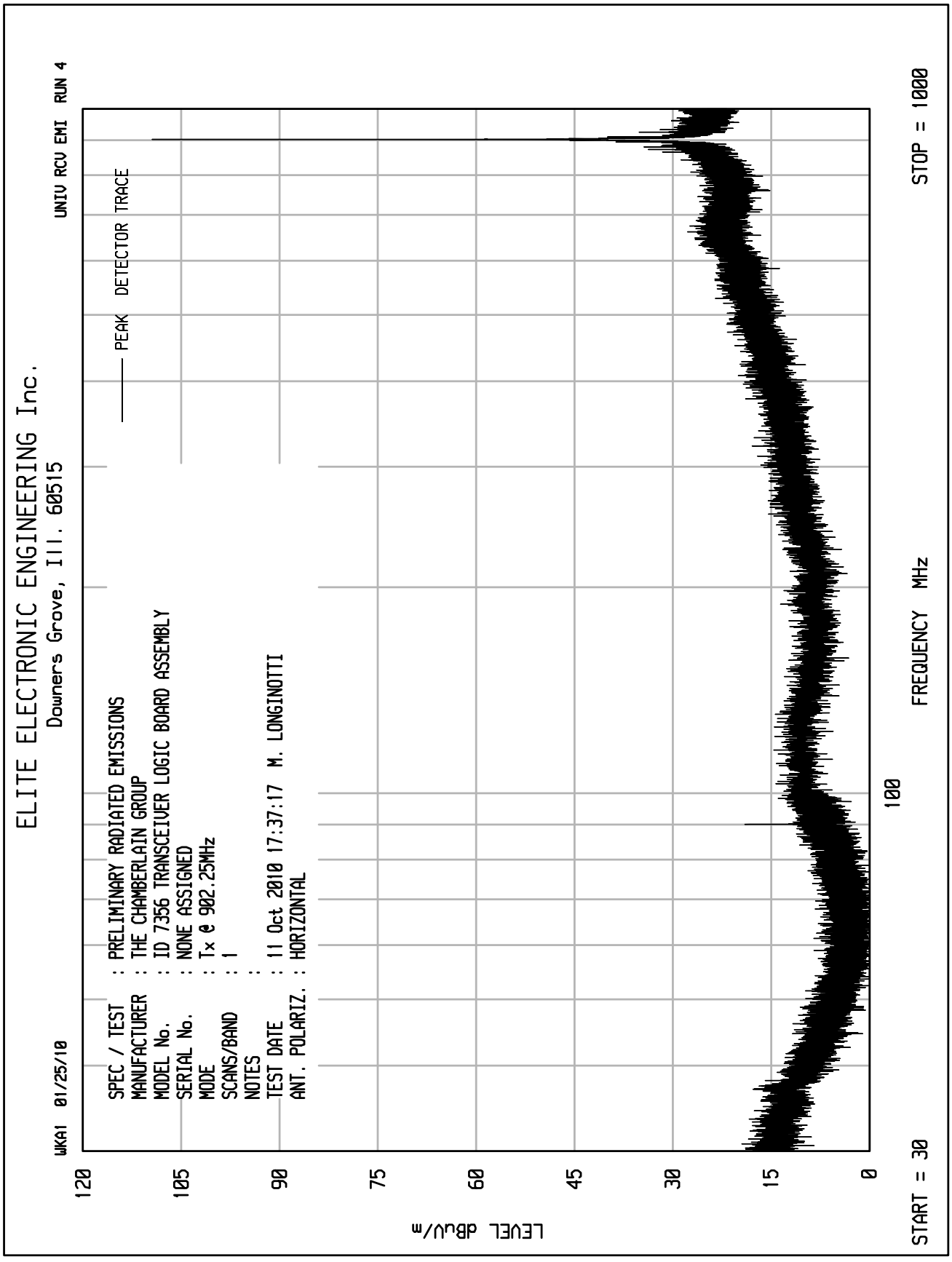
15.247 Duty Cycle Correction Factor

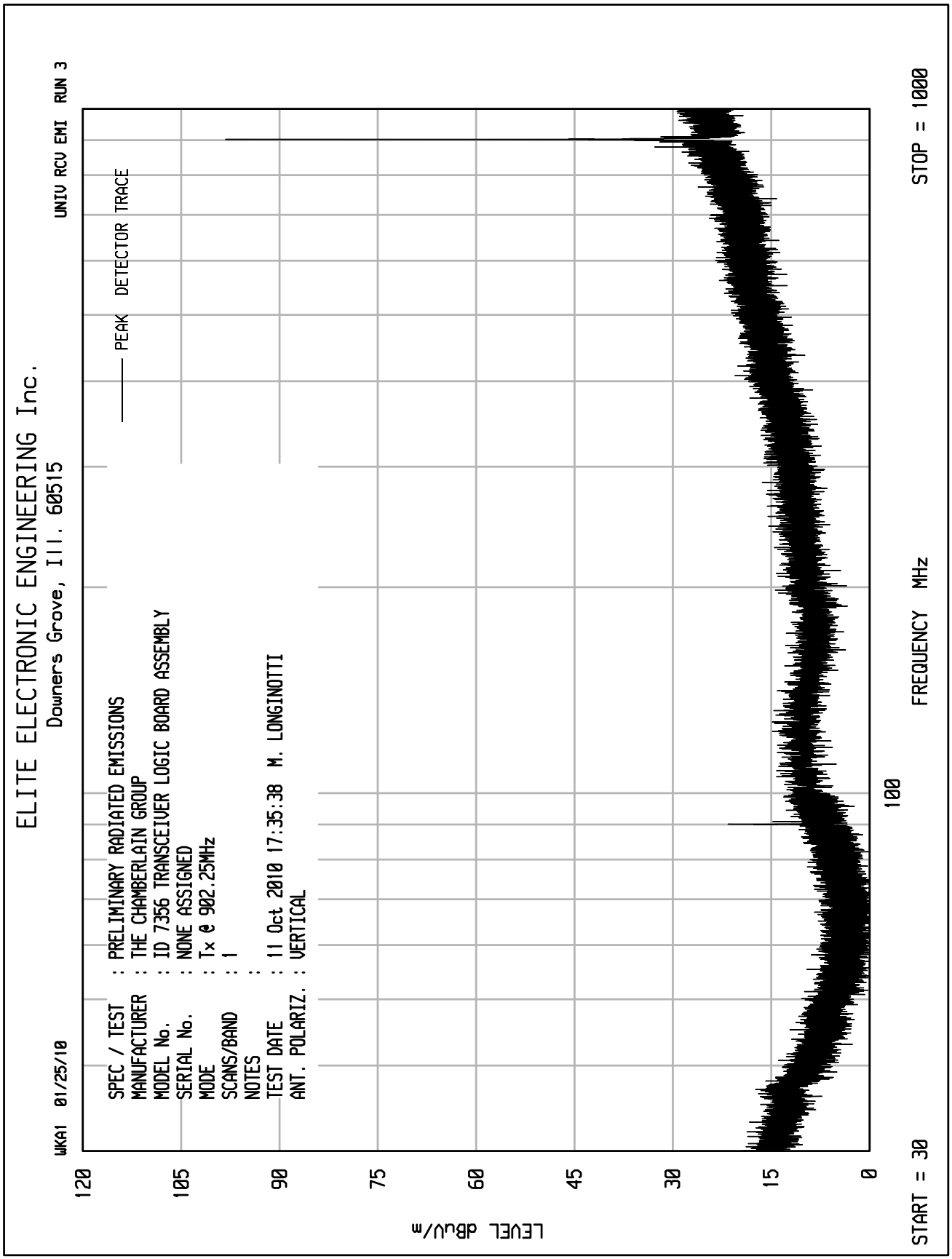
MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Duty Cycle Correction Factor
NOTES	:	Pulse Width = 2.635msec
EQUIPMENT USED	:	RBB0, NTA2

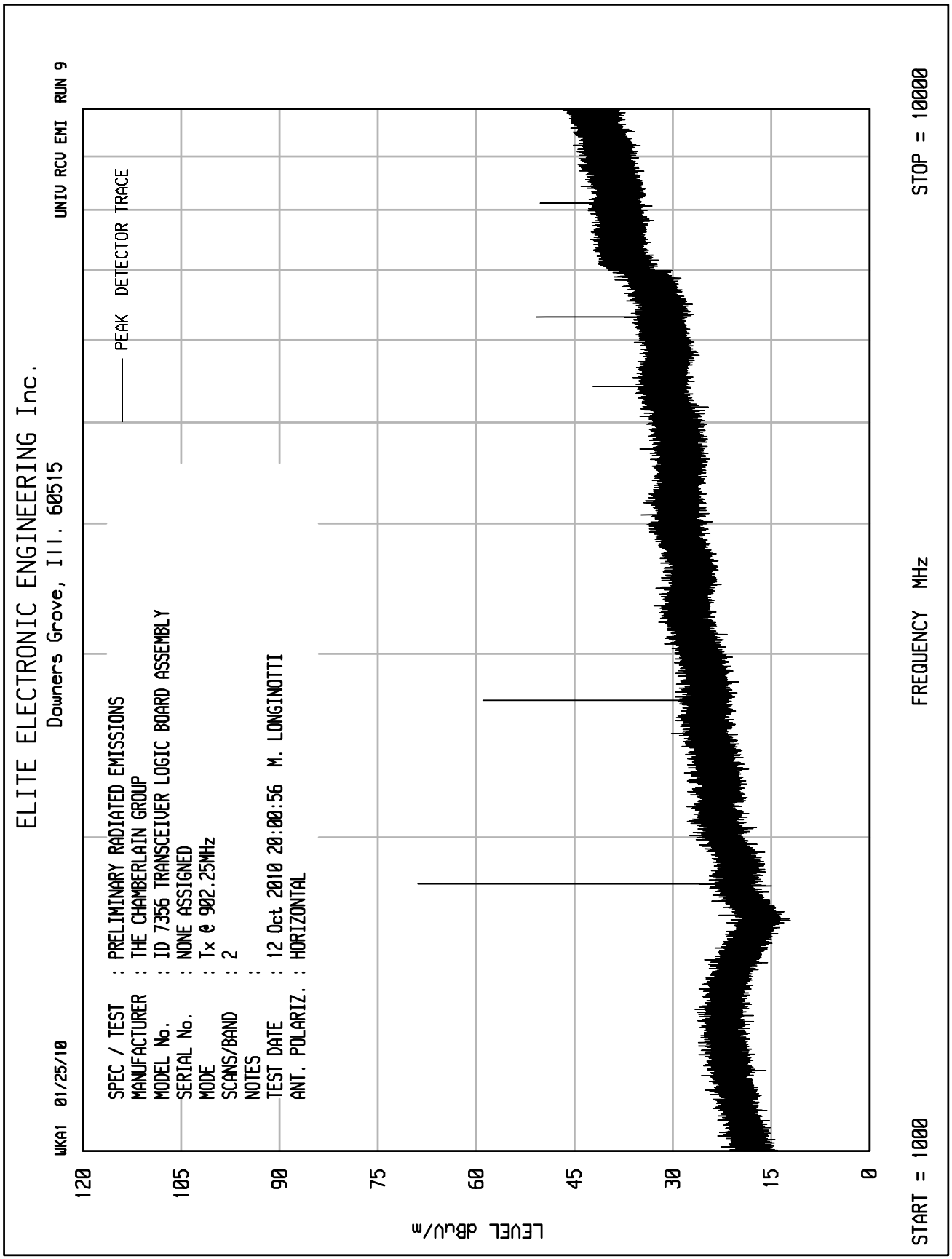


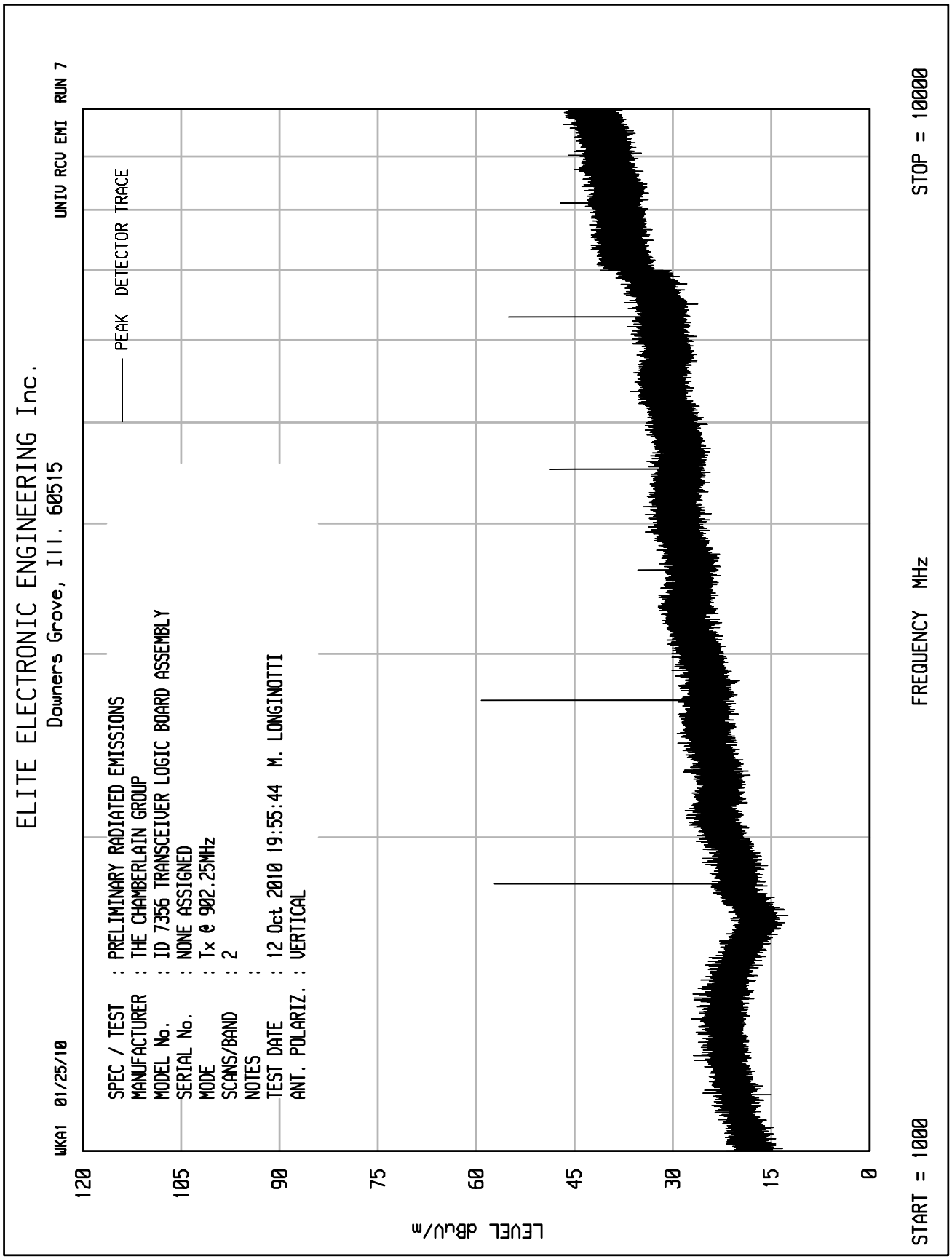
15.247 Duty Cycle Correction Factor

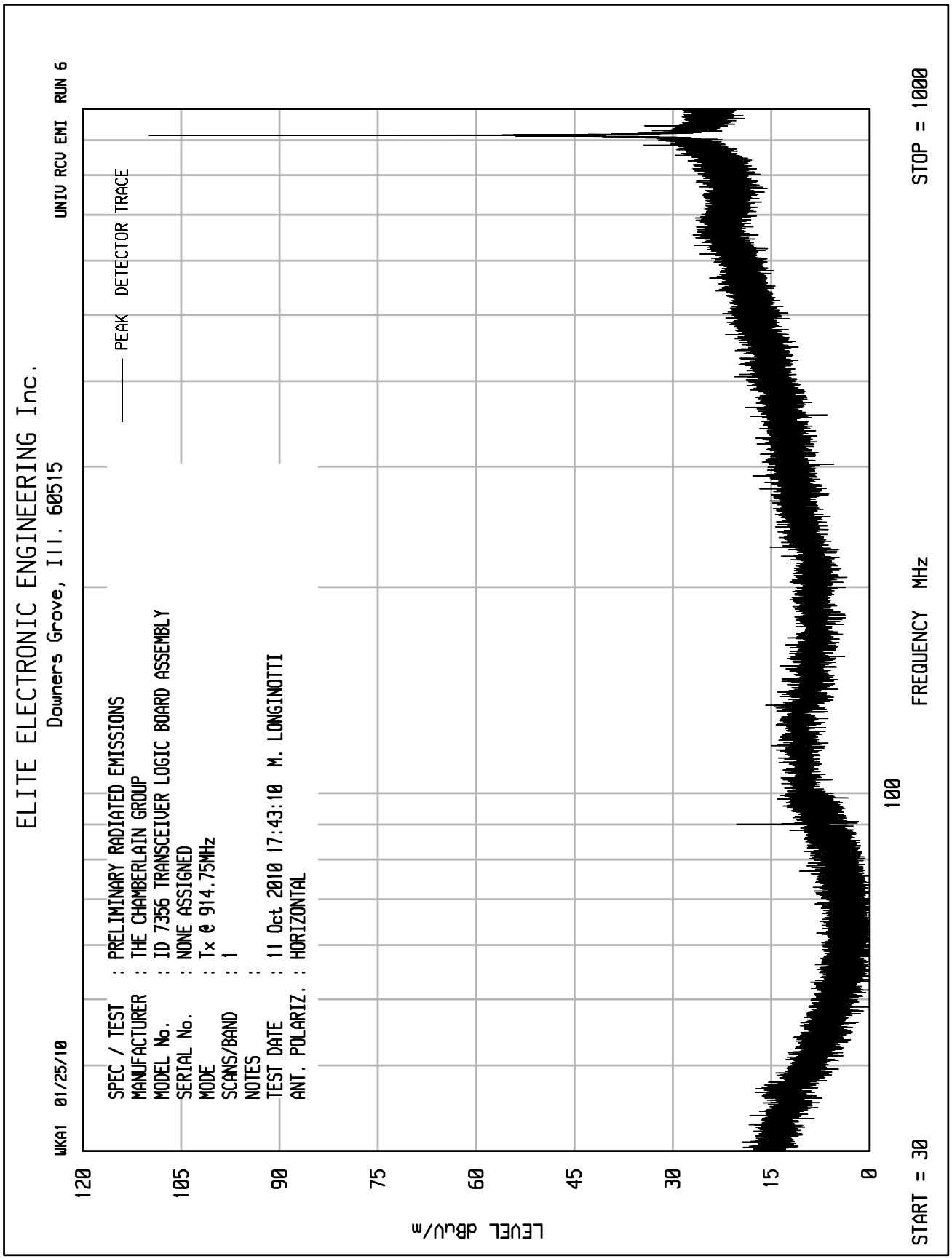
MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Duty Cycle Correction Factor
NOTES	:	Pulse Width = 2.635msec, 1 pulse in 100msec period
	:	Duty Cycle Correction Factor = 20*log(2.635msec/100msec) = -31.58dB
EQUIPMENT USED	:	RBB0, NTA2

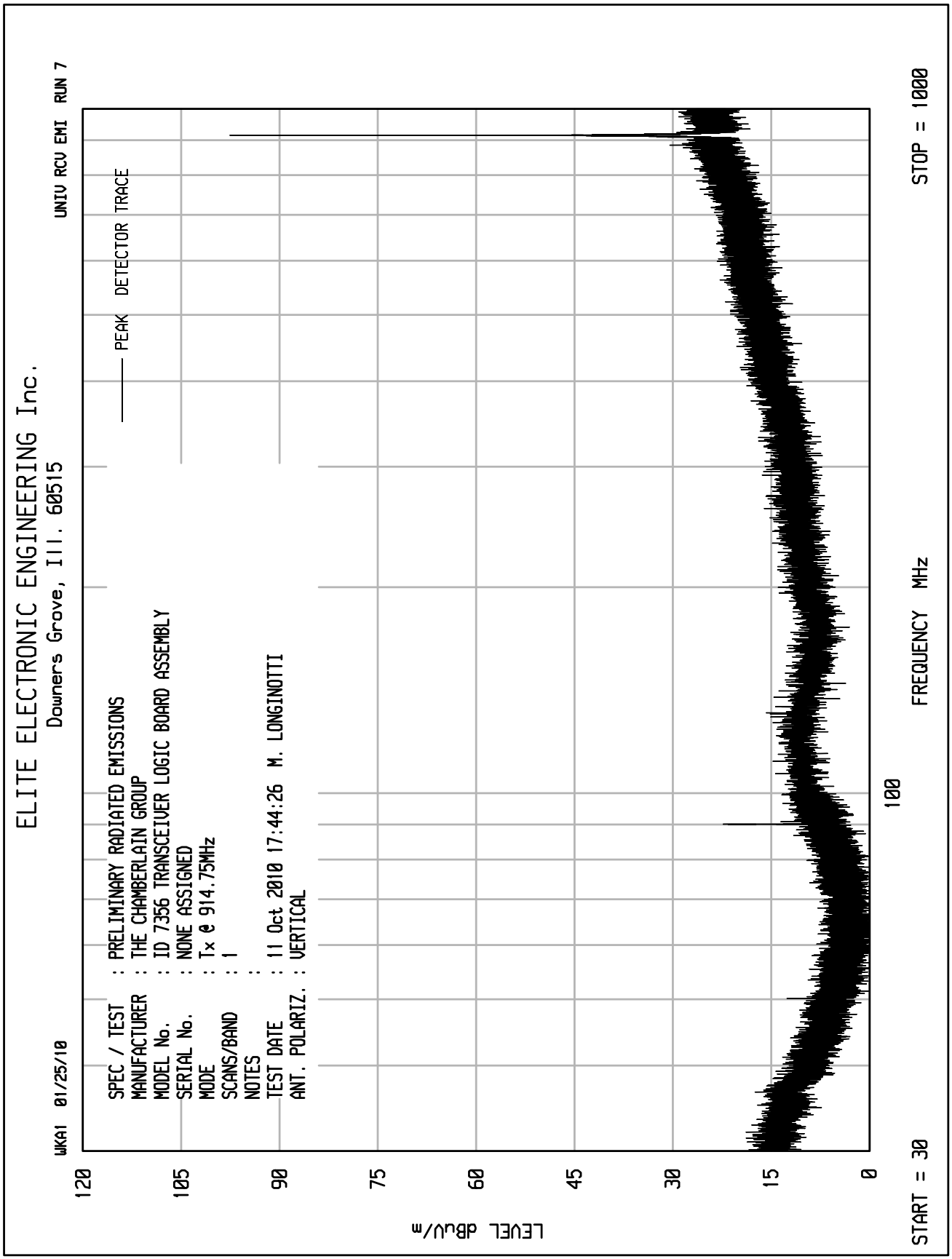

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:37:17 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

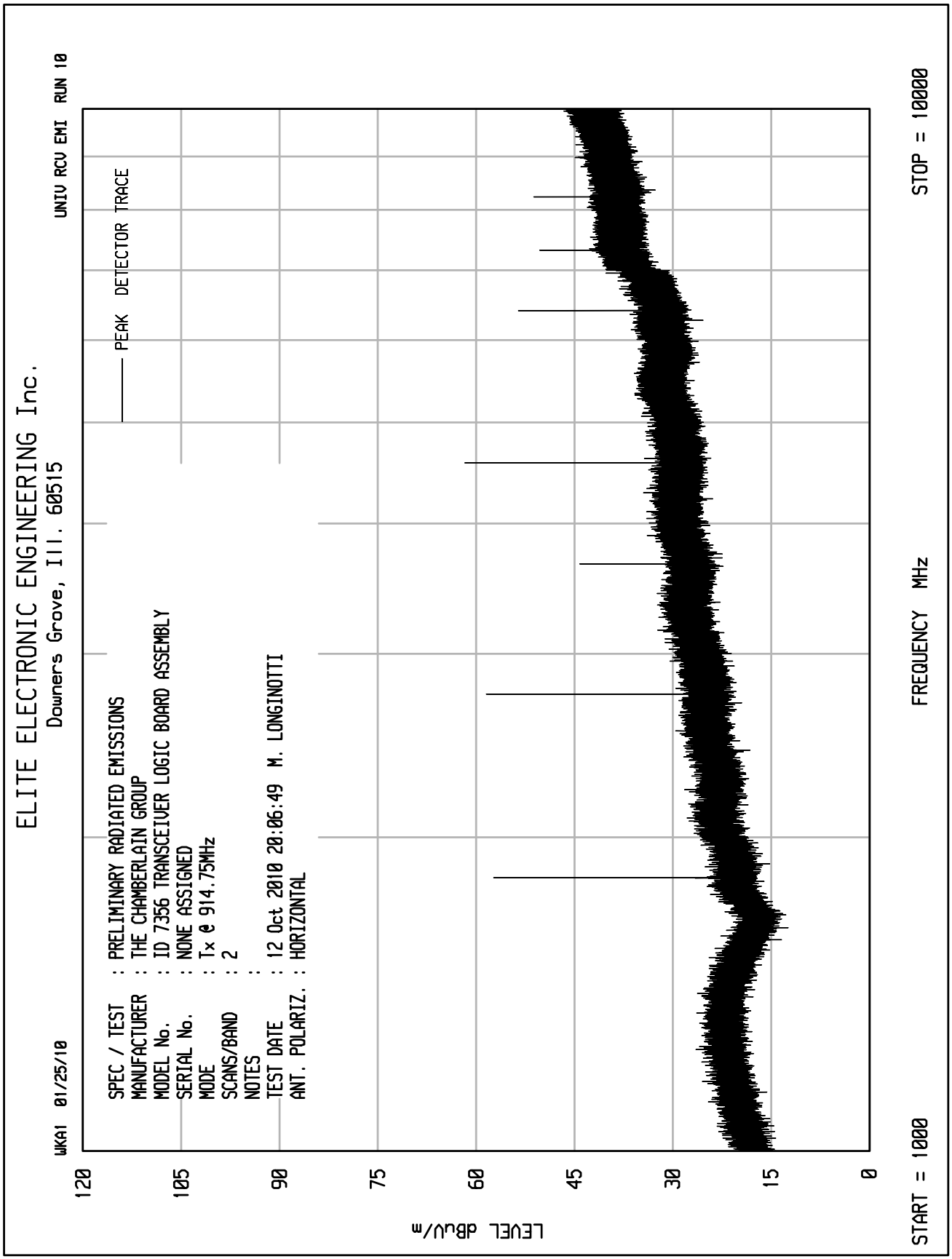

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:35:38 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

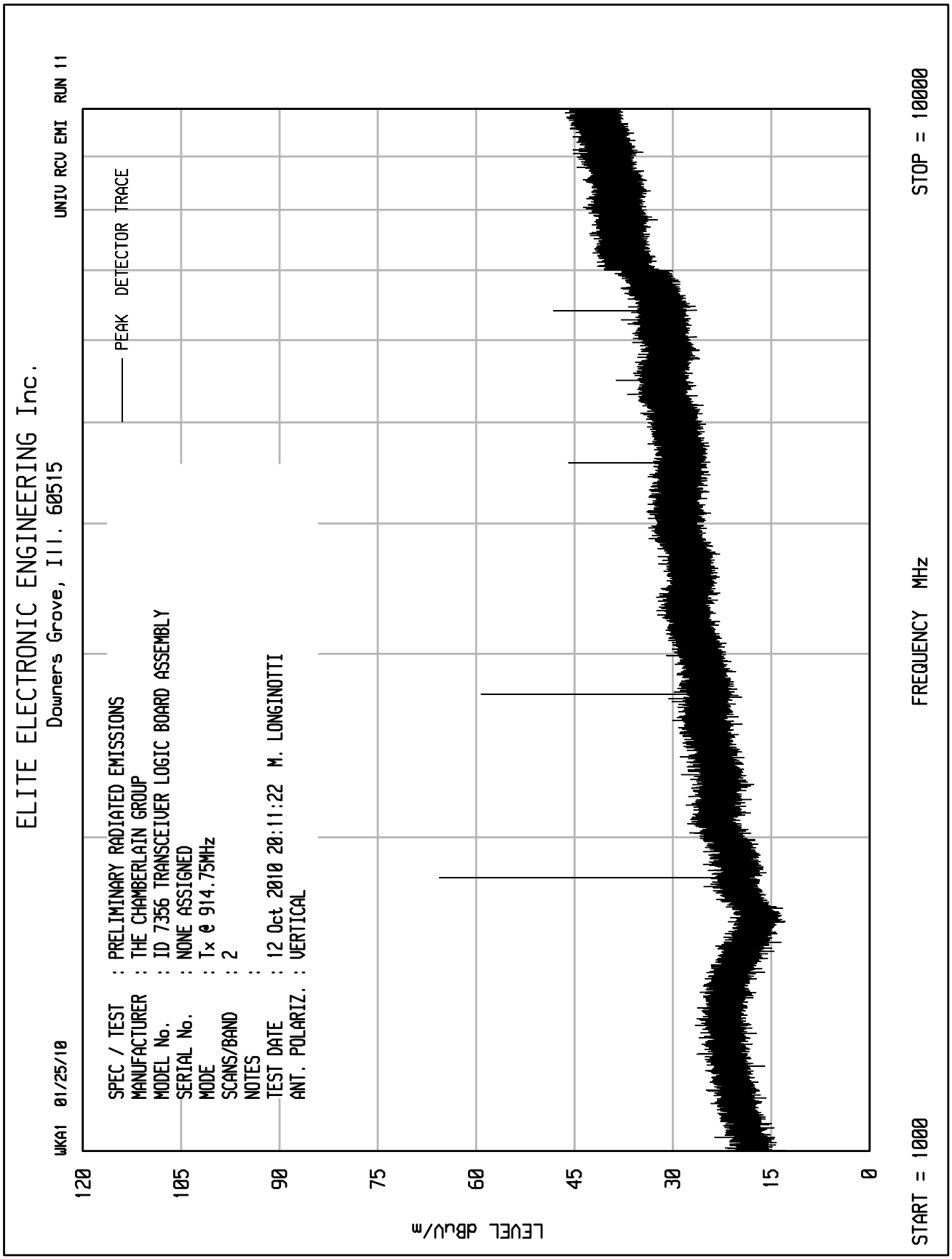

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 9
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 902.25MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 20:00:56 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

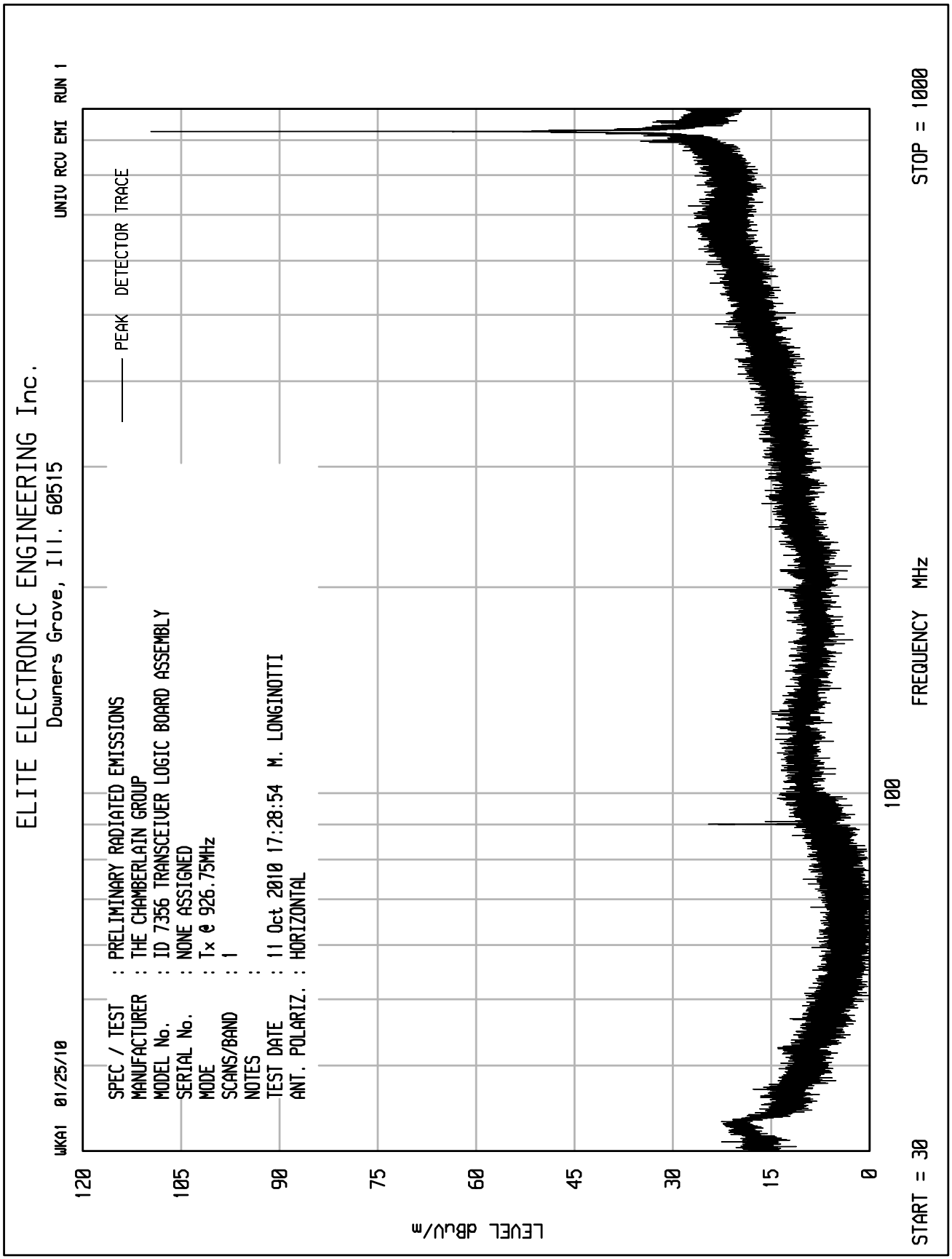

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 7
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 902.25MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 19:55:44 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

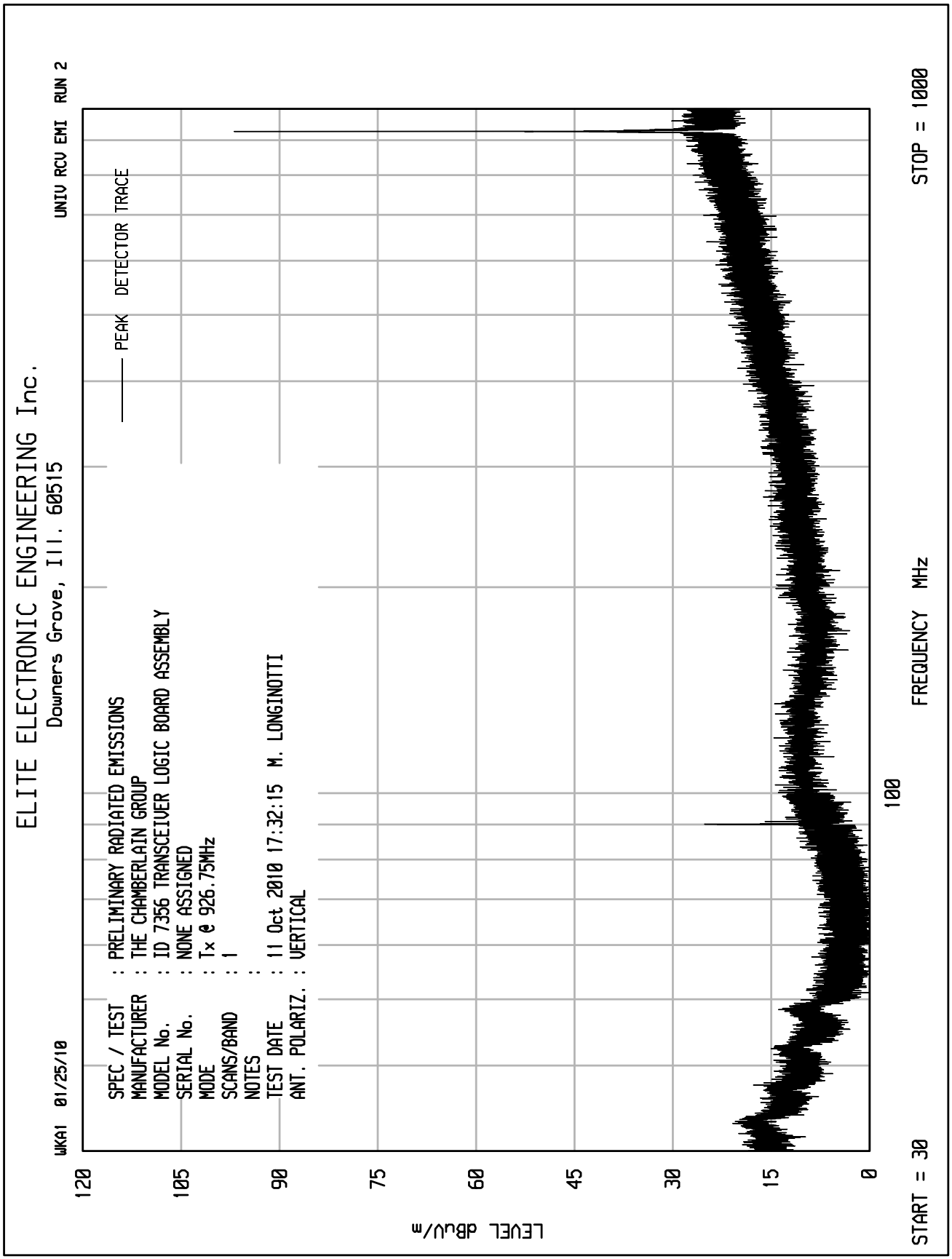

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 6
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:43:10 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

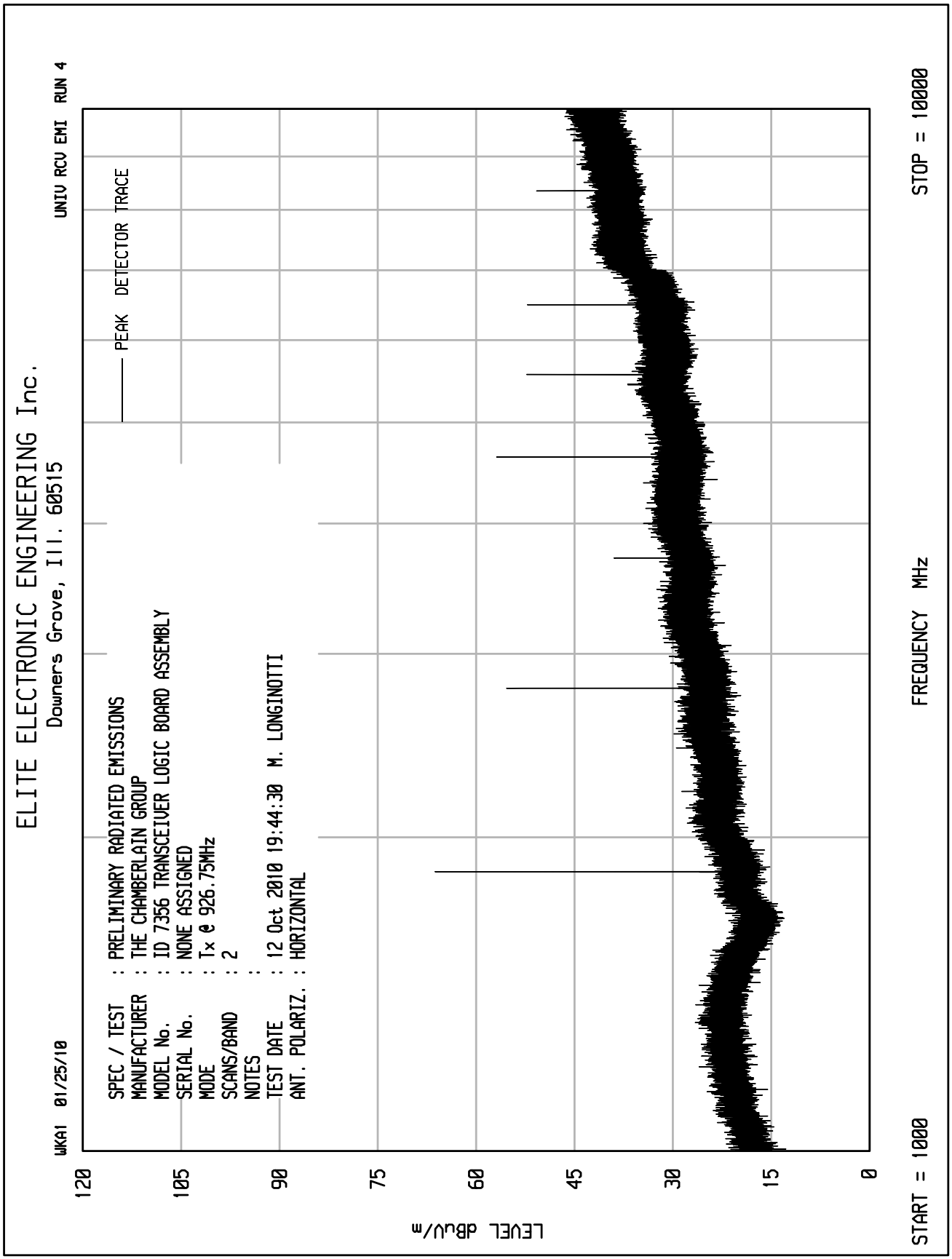

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 7
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:44:26 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

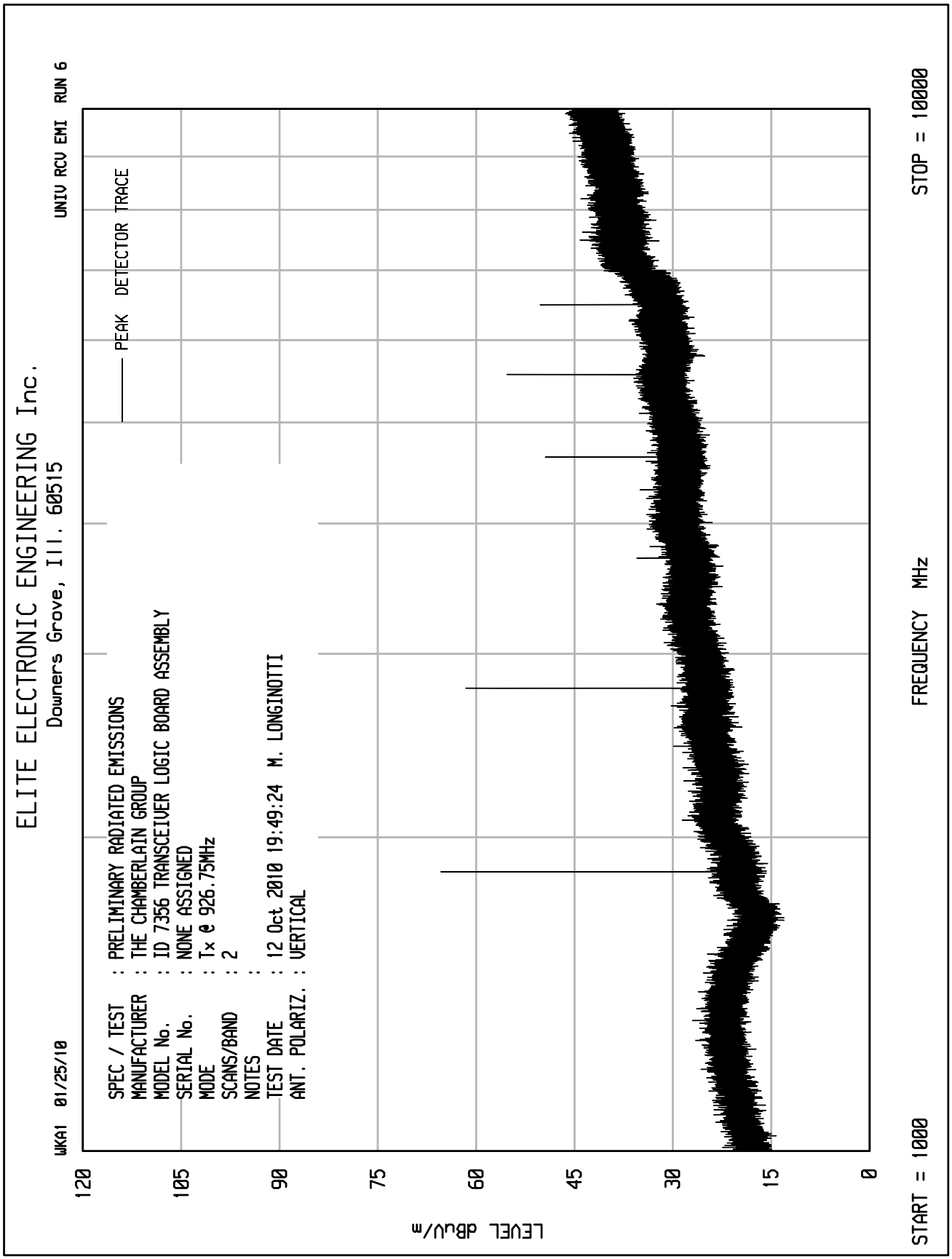

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 10
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 914.75MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 20:06:49 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 11
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 914.75MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 20:11:22 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:28:54 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 11 Oct 2010 17:32:15 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 926.75MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 19:44:30 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 6
WKA1 01/25/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : ID 7356 TRANSCEIVER LOGIC BOARD ASSEMBLY
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 926.75MHz
SCANS/BAND : 2
NOTES :
TEST DATE : 12 Oct 2010 19:49:24 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions
Date : October 12, 2010
Mode : Tx @ 902.25MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Peak Readings

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
902.250	H	87.8		2.4	21.8	0.0	112.0	396789.8		
902.250	V	89.8		2.4	21.8	0.0	114.0	499528.8		
1804.500	H	84.7		3.4	27.4	-40.0	75.5	5988.2	49952.9	-18.4
1804.500	V	81.0		3.4	27.4	-40.0	71.8	3911.1	49952.9	-22.1
2706.750	H	69.5		3.9	30.2	-39.4	64.2	1628.3	5000.0	-9.7
2706.750	V	67.8		3.9	30.2	-39.4	62.5	1338.9	5000.0	-11.4
3609.000	H	60.0		4.7	33.0	-38.5	59.2	914.8	5000.0	-14.8
3609.000	V	56.5		4.7	33.0	-38.5	55.7	611.4	5000.0	-18.3
4511.250	H	67.6		5.5	33.5	-38.2	68.4	2623.8	5000.0	-5.6
4511.250	V	62.9		5.5	33.5	-38.2	63.7	1527.3	5000.0	-10.3
5413.500	H	59.8		6.2	35.5	-38.2	63.3	1453.9	5000.0	-10.7
5413.500	V	55.3		6.2	35.5	-38.2	58.8	866.1	5000.0	-15.2
6315.750	H	66.7		7.0	35.3	-38.4	70.5	3355.9	49952.9	-23.5
6315.750	V	60.1		7.0	35.3	-38.4	63.9	1569.7	49952.9	-30.1
7218.000	H	44.3		7.6	37.6	-38.4	51.1	359.9	49952.9	-42.8
7218.000	V	42.9		7.6	37.6	-38.4	49.7	306.3	49952.9	-44.2
8120.250	H	55.2		8.0	37.9	-38.7	62.3	1304.2	5000.0	-11.7
8120.250	V	53.4		8.0	37.9	-38.7	60.5	1060.1	5000.0	-13.5
9022.500	H	47.5	Ambient	8.8	38.3	-38.8	55.8	617.0	5000.0	-18.2
9022.500	V	46.5	Ambient	8.8	38.3	-38.8	54.8	549.9	5000.0	-19.2

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Gray rows indicate emissions in restricted bands

Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions in Restricted Bands
Date : October 12, 2010
Mode : Tx @ 902.25MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Average Readings in Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
2706.8	H	64.3		3.9	30.2	-39.4	-31.6	27.5	23.6	500.0	-26.5
2706.8	V	62.5		3.9	30.2	-39.4	-31.6	25.7	19.2	500.0	-28.3
3609.0	H	53.9		4.7	33.0	-38.5	-31.6	21.5	11.9	500.0	-32.4
3609.0	V	50.0		4.7	33.0	-38.5	-31.6	17.6	7.6	500.0	-36.3
4511.3	H	62.1		5.5	33.5	-38.2	-31.6	31.3	36.7	500.0	-22.7
4511.3	V	57.1		5.5	33.5	-38.2	-31.6	26.3	20.7	500.0	-27.7
5413.5	H	53.2		6.2	35.5	-38.2	-31.6	25.1	17.9	500.0	-28.9
5413.5	V	47.6		6.2	35.5	-38.2	-31.6	19.5	9.4	500.0	-34.5
8120.3	H	46.7		8.0	37.9	-38.7	-31.6	22.2	12.9	500.0	-31.8
8120.3	V	44.6		8.0	37.9	-38.7	-31.6	20.1	10.1	500.0	-33.9
9022.5	H	36.0	Ambient	8.8	38.3	-38.8	-31.6	12.7	4.3	500.0	-41.3
9022.5	V	34.7	Ambient	8.8	38.3	-38.8	-31.6	11.4	3.7	500.0	-42.6

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB) + Duty Cycle (dB)

Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions
Date : October 12, 2010
Mode : Tx @ 914.75MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Peak Readings

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
914.750	H	87.8		2.4	21.8	0.0	112.0	397393.9		
914.750	V	88.4		2.4	21.8	0.0	112.6	425815.3		
1829.500	H	82.3		3.5	27.5	-40.0	73.3	4608.9	42581.5	-19.3
1829.500	V	83.0		3.5	27.5	-40.0	74.0	4995.7	42581.5	-18.6
2744.250	H	71.2		3.9	30.3	-39.3	66.1	2028.7	5000.0	-7.8
2744.250	V	67.5		3.9	30.3	-39.3	62.4	1325.0	5000.0	-11.5
3659.000	H	60.9		4.7	33.2	-38.5	60.3	1035.2	5000.0	-13.7
3659.000	V	53.9		4.7	33.2	-38.5	53.3	462.4	5000.0	-20.7
4573.750	H	71.8		5.5	33.7	-38.2	72.8	4360.0	5000.0	-1.2
4573.750	V	66.5		5.5	33.7	-38.2	67.5	2368.5	5000.0	-6.5
5488.500	H	51.0		6.2	35.6	-38.2	54.6	539.5	42581.5	-37.9
5488.500	V	48.1		6.2	35.6	-38.2	51.7	386.4	42581.5	-40.8
6403.250	H	64.5		7.0	35.2	-38.5	68.3	2594.7	42581.5	-24.3
6403.250	V	56.6		7.0	35.2	-38.5	60.4	1044.9	42581.5	-32.2
7318.000	H	50.5		7.7	37.8	-38.4	57.5	752.1	5000.0	-16.5
7318.000	V	52.4		7.7	37.8	-38.4	59.4	936.0	5000.0	-14.6
8232.750	H	54.7		8.1	37.9	-38.7	61.9	1244.5	5000.0	-12.1
8232.750	V	53.3		8.1	37.9	-38.7	60.5	1059.3	5000.0	-13.5
9147.500	H	46.6	Ambient	8.7	38.4	-38.7	55.0	562.4	5000.0	-19.0
9147.500	V	46.6	Ambient	8.7	38.4	-38.7	55.0	562.4	5000.0	-19.0

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Gray rows indicate emissions in restricted bands

Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions in Restricted Bands
Date : October 12, 2010
Mode : Tx @ 914.75MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Average Readings in Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
2744.3	H	65.6		3.9	30.3	-39.3	-31.6	29.0	28.1	500.0	-25.0
2744.3	V	61.7		3.9	30.3	-39.3	-31.6	25.1	17.9	500.0	-28.9
3659.0	H	54.4		4.7	33.2	-38.5	-31.6	22.2	12.9	500.0	-31.8
3659.0	V	46.0		4.7	33.2	-38.5	-31.6	13.8	4.9	500.0	-40.2
4573.8	H	65.6		5.5	33.7	-38.2	-31.6	35.0	56.3	500.0	-19.0
4573.8	V	59.2		5.5	33.7	-38.2	-31.6	28.6	26.9	500.0	-25.4
7318.0	H	40.1		7.7	37.8	-38.4	-31.6	15.5	6.0	500.0	-38.4
7318.0	V	43.8		7.7	37.8	-38.4	-31.6	19.2	9.2	500.0	-34.7
8232.8	H	45.1		8.1	37.9	-38.7	-31.6	20.7	10.9	500.0	-33.3
8232.8	V	43.1		8.1	37.9	-38.7	-31.6	18.7	8.6	500.0	-35.3
9147.5	H	33.3	Ambient	8.7	38.4	-38.7	-31.6	10.1	3.2	500.0	-43.9
9147.5	V	32.9	Ambient	8.7	38.4	-38.7	-31.6	9.7	3.1	500.0	-44.3

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB) + Duty Cycle (dB)

Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions
Date : October 12, 2010
Mode : Tx @ 926.75MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Peak Readings

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
926.750	H	86.1		2.4	21.9	0.0	110.4	329796.6	200.0	64.3
926.750	V	87.2		2.4	21.9	0.0	111.5	374322.7	200.0	65.4
1853.500	H	79.7		3.5	27.6	-40.0	70.8	3463.9	37432.3	-20.7
1853.500	V	80.7		3.5	27.6	-40.0	71.8	3886.5	37432.3	-19.7
2780.250	H	68.8		4.0	30.4	-39.2	63.9	1574.4	5000.0	-10.0
2780.250	V	70.1		4.0	30.4	-39.2	65.2	1828.6	5000.0	-8.7
3707.000	H	58.8		4.8	33.3	-38.5	58.4	828.4	5000.0	-15.6
3707.000	V	53.1		4.8	33.3	-38.5	52.7	429.8	5000.0	-21.3
4633.750	H	65.2		5.6	33.8	-38.2	66.4	2086.8	5000.0	-7.6
4633.750	V	64.4		5.6	33.8	-38.2	65.6	1903.1	5000.0	-8.4
5560.500	H	60.2		6.3	35.6	-38.2	63.9	1567.5	37432.3	-27.6
5560.500	V	60.8		6.3	35.6	-38.2	64.5	1679.6	37432.3	-27.0
6487.250	H	64.9		7.1	35.1	-38.5	68.6	2706.8	37432.3	-22.8
6487.250	V	57.0		7.1	35.1	-38.5	60.7	1090.1	37432.3	-30.7
7414.000	H	49.0		7.7	38.0	-38.5	56.2	647.0	5000.0	-17.8
7414.000	V	50.0		7.7	38.0	-38.5	57.2	725.9	5000.0	-16.8
8340.750	H	50.6		8.2	37.9	-38.8	57.9	784.2	5000.0	-16.1
8340.750	V	51.1		8.2	37.9	-38.8	58.4	830.6	5000.0	-15.6
9267.500	H	38.6		8.7	38.4	-38.6	47.1	226.3	37432.3	-44.4
9267.500	V	37.1		8.7	38.4	-38.6	45.6	190.4	37432.3	-45.9

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Gray rows indicate emissions in restricted bands

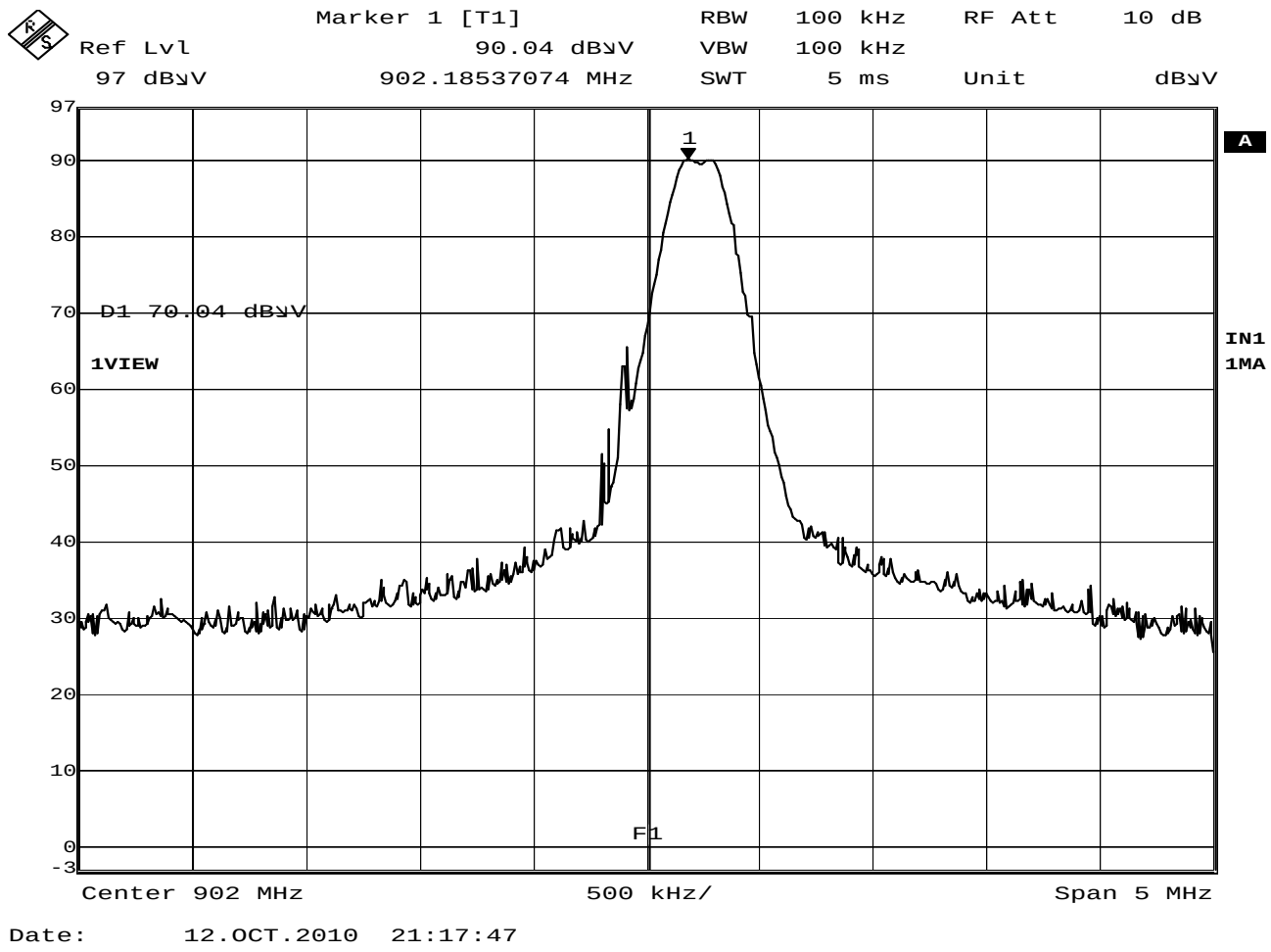
Manufacturer : The Chamberlain Group
Model No. : ID 7356 Transceiver Logic Board Assembly
Serial No. : None Assigned
Specification : FCC-15.247 Spurious Radiated Emissions in Restricted Bands
Date : October 12, 2010
Mode : Tx @ 926.75MHz
Equipment Used : RBB0, NTA2, NWH0, APW3, XPQ2, SES1
Notes : Test Distance is 3 meters
Notes : Average Readings in Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
2780.3	H	62.8		4.0	30.4	-39.2	-31.6	26.4	20.8	500.0	-27.6
2780.3	V	64.6		4.0	30.4	-39.2	-31.6	28.2	25.6	500.0	-25.8
3707.0	H	46.4		4.8	33.3	-38.5	-31.6	14.4	5.2	500.0	-39.6
3707.0	V	42.9		4.8	33.3	-38.5	-31.6	10.9	3.5	500.0	-43.1
4633.8	H	58.9		5.6	33.8	-38.2	-31.6	28.5	26.6	500.0	-25.5
4633.8	V	58.2		5.6	33.8	-38.2	-31.6	27.8	24.6	500.0	-26.2
7414.0	H	38.1		7.7	38.0	-38.5	-31.6	13.7	4.9	500.0	-40.2
7414.0	V	39.7		7.7	38.0	-38.5	-31.6	15.3	5.8	500.0	-38.6
8340.8	H	38.7		8.2	37.9	-38.8	-31.6	14.4	5.3	500.0	-39.6
8340.8	V	39.0		8.2	37.9	-38.8	-31.6	14.7	5.4	500.0	-39.3

H – Horizontal V – Vertical

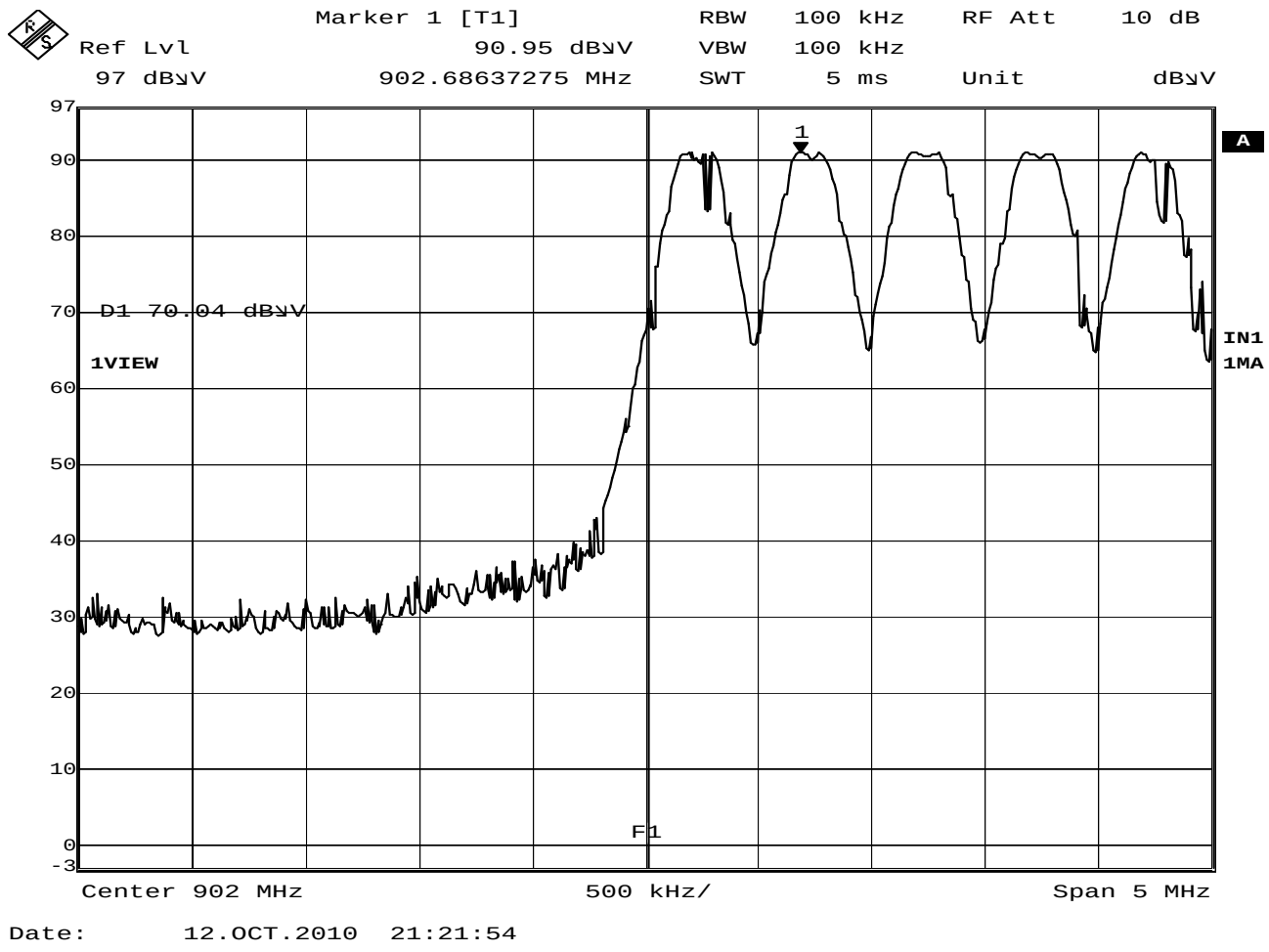
* - Ambient

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB) + Duty Cycle (dB)



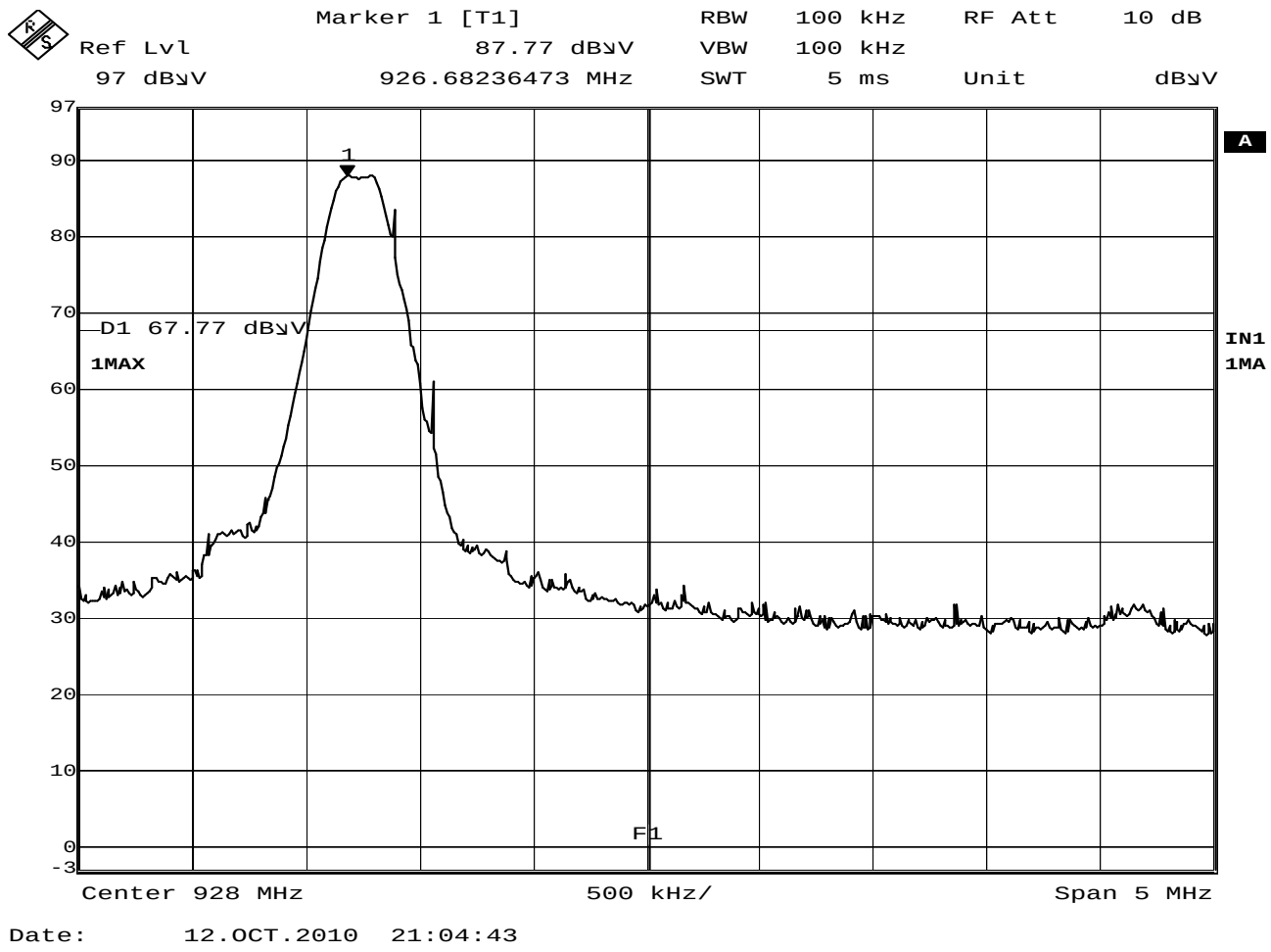
15.247(d) Band Edge Compliance

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Tx @ 902.25MHz
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Band Edge Compliance
NOTES	:	Display line D1 represents the 20dB down point from the in band emissions in a 100kHz bandwidth. Display line F1 represents the band edge (902MHz)
EQUIPMENT USED	:	RBB0, NTA2



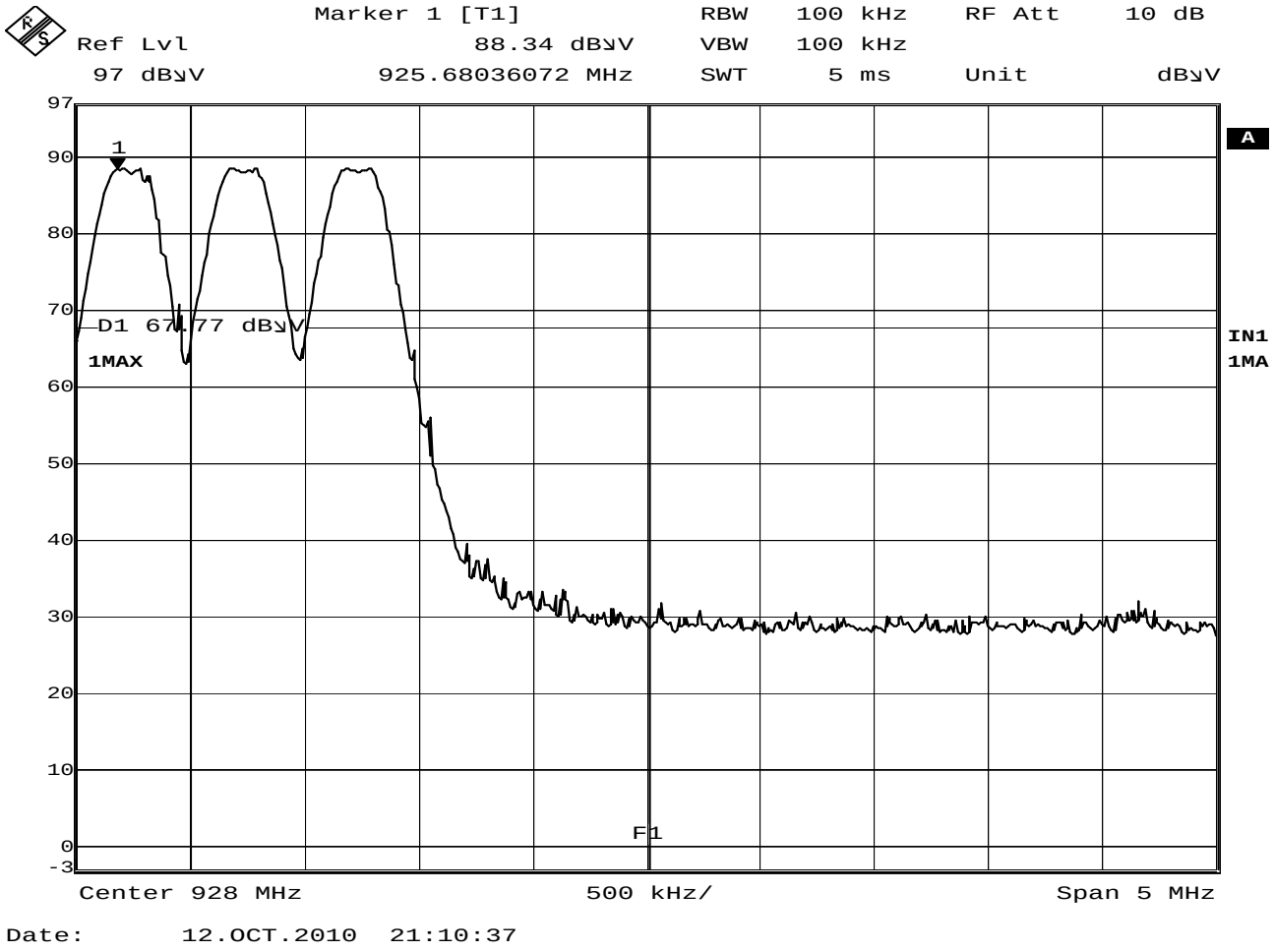
15.247(d) Band Edge Compliance

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Band Edge Compliance
NOTES	:	Display line D1 represents the 20dB down point from the in band emissions in a 100kHz bandwidth. Display line F1 represents the band edge (902MHz)
EQUIPMENT USED	:	RBB0, NTA2



15.247(d) Band Edge Compliance

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Tx @ 926.75MHz
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Band Edge Compliance
NOTES	:	Display line D1 represents the 20dB down point from the in band emissions in a 100kHz bandwidth. Display line F1 represents the band edge (928MHz)
EQUIPMENT USED	:	RBB0, NTA2



15.247(d) Band Edge Compliance

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	ID 7356 transceiver logic board assembly
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Hopping Enabled
NOTES	:	
TEST DATE	:	October 11, 2010
TEST PARAMETERS	:	Band Edge Compliance
NOTES	:	Display line D1 represents the 20dB down point from the in band emissions in a 100kHz bandwidth. Display line F1 represents the band edge (928MHz)
EQUIPMENT USED	:	RBB0, NTA2