REPORT OF

TEST DATA FOR

PNI

Prepared by
Daniel C. Swann
February 13, 2004

RX7500 and RX7600 Radar Detectors

GEL File PNI 01-2004

GLEN ELLEN LABORATORIES
1876 London Ranch Road
Glen Ellen, CA 95442

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1. Test Methodology

The radiated tests were performed in accordance with the procedures specified by ANSI C63.4-2001. Compliance with applicable standards was determined by comparing the measured results with respect to the limits specified in rulemaking FCC 02-211. These measurements were made on February 12, 2004, by Dan Swann and Scott Campbell.

Measurements were made at 1 meter distance, as allowed by 47CFR Section 15.31(f)(1). The limit for the 1 meter measurement was calculated using an inverse linear distance extrapolation faction (20 dB/decade),

Limit 1 meter = Limit 3 meters + 20*LOG(3/1)

or

Limit 1 meter = Limit 3 meters + 9.5 dB

The test procedure used was the following:

1) Determine the frequency of the peak emission:

Start Frequency	11.7 GHz
Stop Frequency	12.2 GHz
RBW	Equal to or greater than 1 MHz
VBW	Equal to or greater than 1 MHz
Detector Function	Peak

Maximize the emissions with regards to device orientation, antenna polarization, and antenna height. Sweep the band using Max Hold for a minimum of 2 minutes. Record this frequency for measuring the peak emission. In addition record the frequency of other spurious emissions noted.

2) Determine the peak level of the emission:

Center Frequency	Set to the frequency determined in Step 1
RBW	Equal to or greater than 1 MHz
VBW	Equal to or greater than 1 MHz
Detector Function	Peak

1. Test Methodology (continued)

2) (continued)

Measure the value of the peak emission using Max Hold for a minimum of 2 minutes. This can be done at zero span or a frequency span where the analyzer does not show a "Measurement Uncalibrated" message. Record the peak value. If the peak measurement is compliant with the average limit an average measurement is not necessary. If the peak value exceeds the average limit by less than 20 dB proceed to Step 3.

3) Determine the average level of the emission:

Center Frequency	Set to the frequency determined in Step 1
Span	Zero
RBW	Equal to or greater than 1 MHz
VBW	Equal to or greater than 10 Hz
Detector Function	Peak

This measurement uses video averaging and must be done in Linear mode. The analyzer Reference Level will have to be adjusted so that a signal is clearly visible on the screen. Measure the value of the emission using Max Hold for a minimum of 2 minutes. Record this as the average value.

Step 2 and Step 3 was repeated for other spurious emissions within the band.

2. Description of Test Facility, including information on calibration as presented in Glen Ellen Laboratories FCC, CISPR and Bellcore test reports.

2.1 Site Description

The Glen Ellen Laboratories open field test site complies with the requirements specified by VDE 0876/9.78, VDE 0877 Part 1/11.81, VDE 0877 Part 2/2.85, CISPR 16, CISPR 22, and ANSI C63.4-1992. The test site closely follows the theoretical normalized site attenuation specifications for both horizontal and vertical polarizations. The site has been fully described in a report dated November 3, 2002, submitted to the FCC, and accepted in a letter dated November 8, 2002 (Registration Number 90613.)

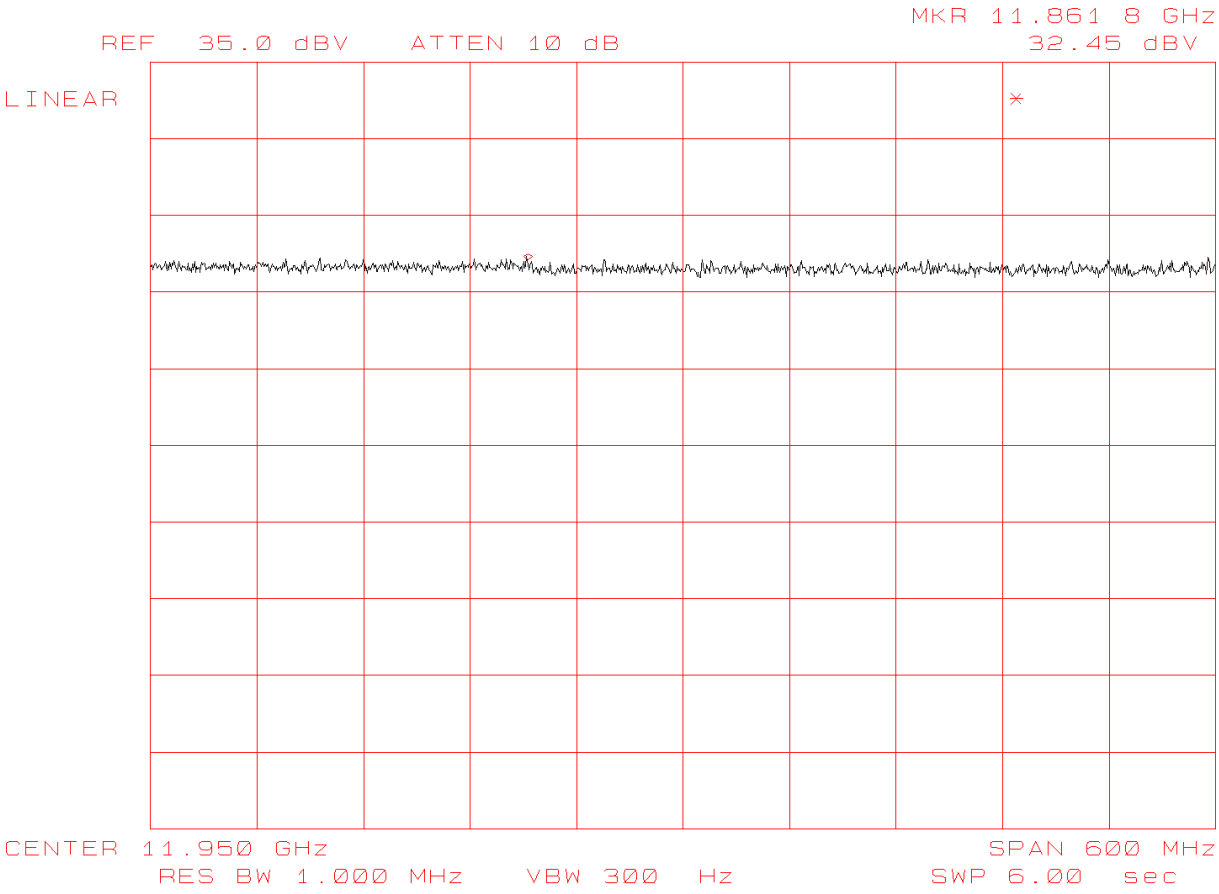
The facility is located near the town of Glen Ellen, California, at the street address of 1876 London Ranch Road. The site is at approximately 175 meters altitude on the East side of Sonoma Mountain, at the coordinates of 38 degrees 22 minutes North Latitude and 122 degrees 32 minutes West Longitude. The site sits north of a ridge approximately 100 meters higher in elevation and 1000 meters to the South, which attenuates VHF and above frequencies from the San Francisco Bay area 60 kilometers to the South. The open field test site consists of a 10 by 20 meter area of galvanized hardware cloth placed on top of a flat asphalt surface located in an open meadow. All seams of adjacent widths of hardware cloth are soldered together. The metal turntable top surface is flush with the ground plane. All metal objects other than the groundscreen/flush turntable are located a considerable distance further than the standard 10-meter CISPR measurement ellipse.

2.2 Test Equipment List

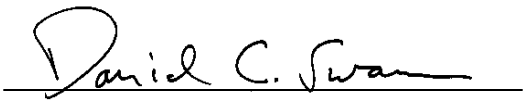
Test equipment used included:

1. Hewlett Packard 8566B opt L24 spectrum analyzer, cal due 06-05-04.
2. GEL AP2-10 preamplifier, 2 GHz to 18 GHz, cal due 4-23-04.
3. ETS Horn Antenna, 1 GHz to 18 GHz, cal due 8-18-04.

3.1 Unintentional Radiated Emissions, RX7500, in band 11.7 to 12.2 GHz



Test Personnel:

Tester Signature  Date February 13, 2004

Tester Name Daniel C. Swann

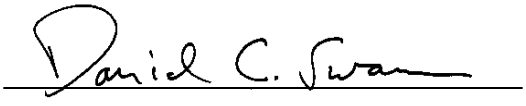
3.1 Unintentional Radiated Emissions, RX7500, in band 11.7 to 12.2 GHz (continued)

RX7500

Frequency MHz	1 meter Corrected Measured Amplitude dBuV	Horn Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	1 meter FCC Limit dBuV/m plus 20 dB	FCC Margin dB	3 meter Field Strength uV/m
Vertical Polarization (Polarization for maximum signal level, Horizontal Polarization was lower)								
peak hold, over frequency span 11.650 to 12.250 GHz, highest amplitude at:								
11861.800	40.5	39.7	1.4	17.0	64.5	83.5	-19.0	533
zero span, peak hold								
11861.800	39.6	39.7	1.4	17.0	63.7	83.5	-19.8	483

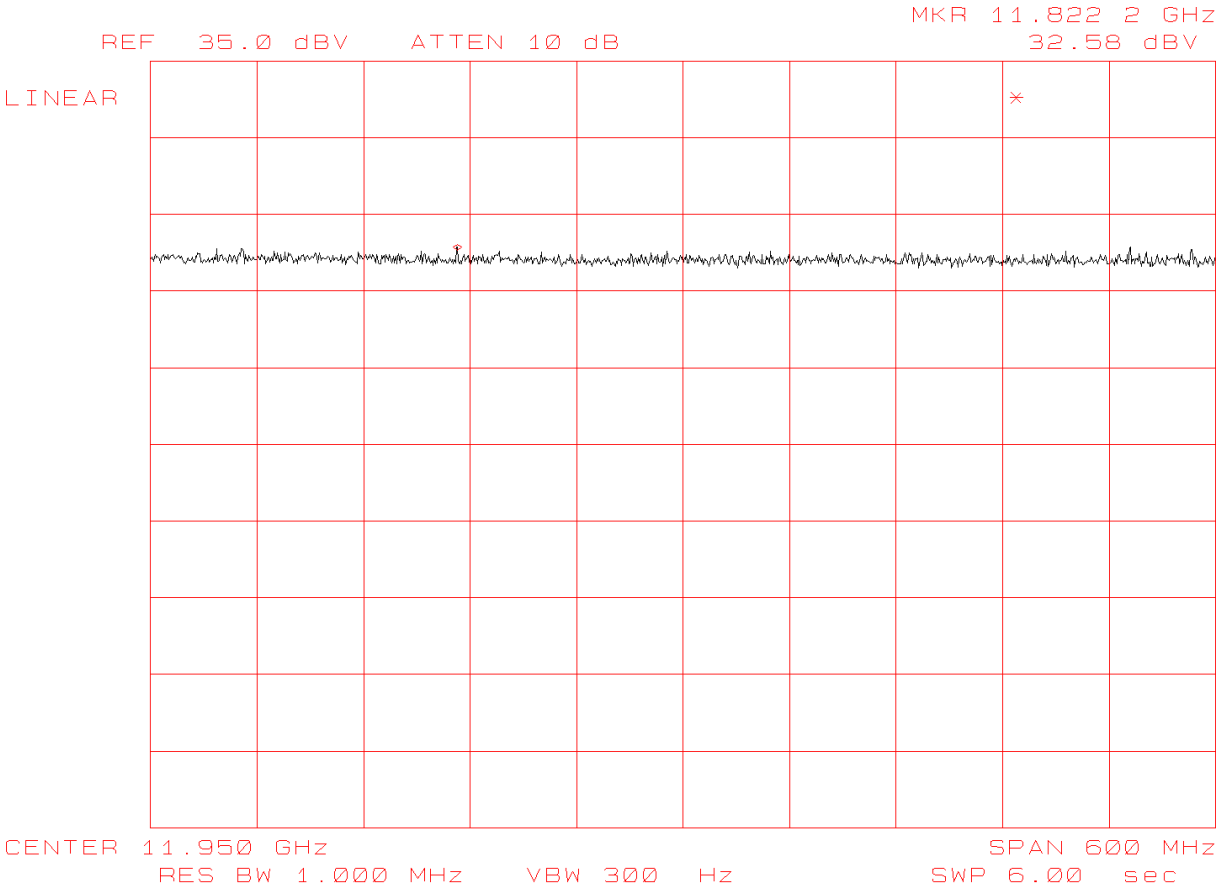
Frequency MHz	Corrected Measured Amplitude dBuV	Horn Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	1 meter FCC Limit dBuV/m	FCC Margin dB	3 meter Field Strength uV/m
Vertical Polarization								
zero span, average measurement								
11861.800	33.6	39.7	1.4	17.0	57.7	63.5	-5.8	242

Test Personnel:

Tester Signature  Date February 13, 2004

Tester Name Daniel C. Swann

3.2 Unintentional Radiated Emissions, RX7600, in band 11.7 to 12.2 GHz



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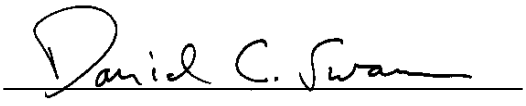
Tester Signature  Date February 13, 2004

Tester Name Daniel C. Swann

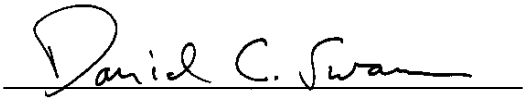
3.1 Unintentional Radiated Emissions, RX7500, in band 11.7 to 12.2 GHz (continued)

RX7600

Frequency MHz	1 meter Corrected Measured Amplitude dBuV	Horn Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	1 meter FCC Limit dBuV/m plus 20 dB	FCC Margin dB	3 meter Field Strength uV/m
Vertical Polarization (Polarization for maximum signal level, Horizontal Polarization was lower)								
peak hold, over frequency span 11.650 to 12.250 GHz, highest amplitude at:								
11822.200	44.9	39.7	1.4	17.0	68.9	83.5	-14.6	884
zero span, peak hold								
11822.200	43.5	39.7	1.4	17.0	67.5	83.5	-16.0	753

Frequency MHz	Corrected Measured Amplitude dBuV	Horn Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	1 meter FCC Limit dBuV/m	FCC Margin dB	3 meter Field Strength uV/m
Vertical Polarization								
zero span, average measurement								
11822.200	32.3	39.7	1.4	17.0	56.4	63.5	-7.1	209

Test Personnel:

Tester Signature  Date February 13, 2004

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3.6 Field Strength Calculation for Radiated Emissions

The field strength was calculated from the following formula:

FS = MEASURED SIGNAL + AF + CF - GAIN

Where FS = field strength, in dBuV/m

MEASURED SIGNAL = Spectrum Analyzer signal amplitude

AF = antenna factor

CF = cable attenuation factor

GAIN = pre-amplifier gain

FS (uV/m) = antilog[10] FS (dBuV/m)

For example, for the RX7500, at 111861.8 MHz, in vertical polarization, an average reading of 33.6 dBuV was measured. The antenna factor is 39.7 dB, the cable loss is 1.4 dB, and the pre-amplifier gain is 17.0 dB.

FS (dBuV/m) = 33.6 + 39.7 + 1.4 - 17.0

FS (dBuV/m) = 57.7 dBuV/m

1 meter FCC limit = 63.5 dBuV/m

1 meter FCC margin = - 5.8 dB