

To: Joel T. Schneider@EMC@PSNBL
From: OET <oetech@fccsun07w.fcc.gov>
Cc:
Subject: ... no subject ...
Attachment:
Date: 3/30/00 16:08 PM

To: Joel Schneider, null
From: Joe Dichoso
jdichoso@fcc.gov
FCC Application Processing Branch

Re: FCC ID OV5-VCA10001
Applicant: John Deere Special Technologies
Correspondence Reference Number: 13156
731 Confirmation Number: EA96765
Date of Original E-Mail: 03/30/2000

The grant can only reflect the actual capability of the device. The voice specification will be deleted. The specification 40K0F1D must be justified or corrected.
40K0F1D represents a signal with a necessary bandwidth of 40 khz , FM modulation and data.
You need to supply the necessary bandwidth calculation (2M+2D) for the 1200 baud signal. Where M is the maximum modulation frequency and D is the maximum deviation. This should be consistent with the plot of the emission.
The emission designator must be corrected accordingly.

PLEASE ALSO ADDRESS THE FOLLOWING RF SAFETY QUESTIONS. PLACE THE REPLY IN THE RF EXPOSURE INFO FOLDER.

John Deere, EA 96765 -

1. The filing is requesting for 630 mW, assuming ERP. The measurement data indicates field strengths that relates to about 1.54 W EIRP (0.94 W ERP). The filing also indicates it is identical to a previously approved device, except for the antenna, which had 4.0 W maximum output. The output discrepancies need clarification in order to determine RF exposure compliance.
2. The antenna in the external photo exhibit is a rod but the installation manual describes a total different antenna. Please clarify and provide antenna gain information for determining RF exposure compliance.
3. The antenna installation instructions included an RF exposure warning label that requires users and nearby persons to maintain 50 cm separation from the antenna. The antenna should be installed properly to provide the needed separation distance, the burden should not be on the users or bystanders. Please provide supporting information on how the 50 cm was determined and its appropriateness for the intended installation configurations. Please revise manual information accordingly and upload the relevant pages.
4. Based on the output power level determined in item #1 above, please address RF exposure compliance issues - routine MPE evaluation or supporting info demonstrating device is categorically excluded from routine MPE evaluation.

Kwok Chan

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal pursuant to Section 2.917 (c) and forfeiture of the filing fee pursuant to section 1.1108.

DO NOT reply to this e-mail by using the Reply button. In order for your response to be processed expeditiously, you must upload your response via the Internet at www.fcc.gov, Electronic Filing, OET Equipment Authorization Electronic Filing. If the response is submitted through Add Attachments, in order to expedite processing, a message which informs the processing staff that a new exhibit has been submitted must also be submitted via Submit Correspondence. Also, please note that partial responses increase processing time and should not be

submitted.

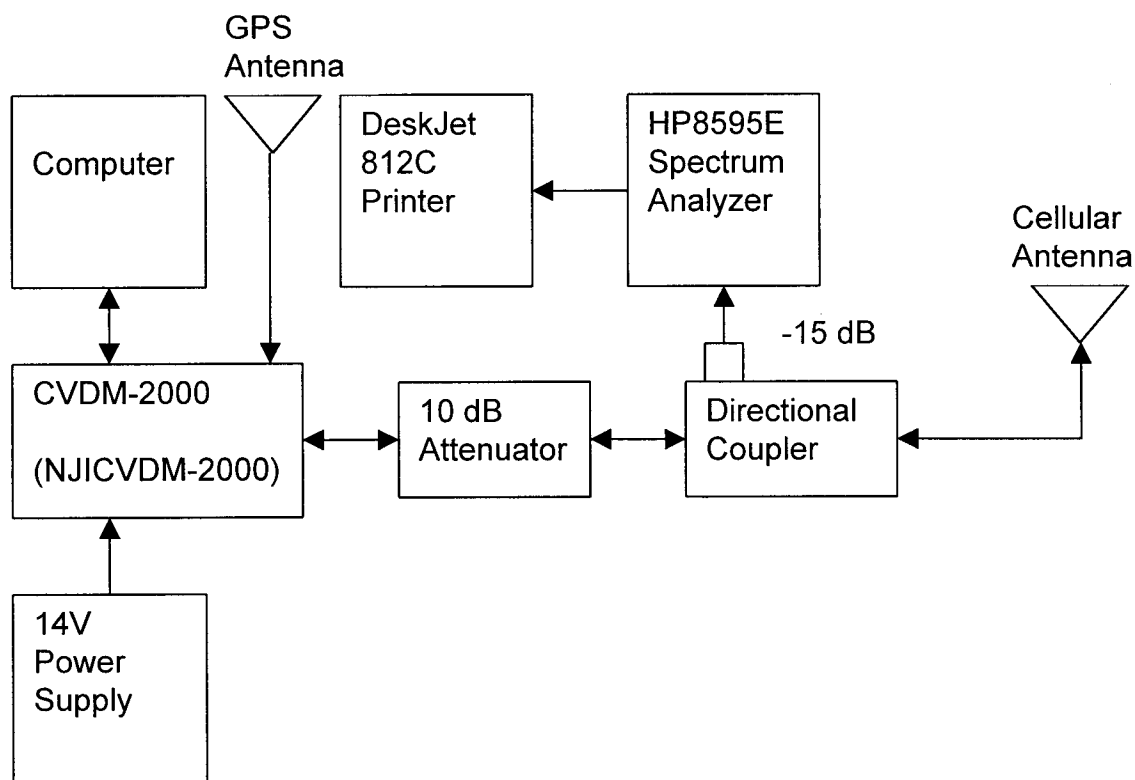
Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.

DATE: 12-Apr-00
TO: Joel Schneider
CC: Ron Stahlhut, William Coopman
FROM: Bill Crook
SUBJECT: Bell 212A Modem Occupied Bandwidth Measurement

I completed the occupied bandwidth measurements that you requested today, but I need to clarify how the measurements were made.

I didn't have special firmware, which would allow me to just turn on the modem and measure the spectral output. Therefore, I made measurements of an actual over-the-air data transmission, which is a composite of both the modem and SAT modulation.

The CVDM-2000 was configured as shown below.



I used a host computer to place an actual call to the UUT (CVDM-2000), established a modem link and then configured the UUT to provide continuous GPS fix information to the host computer (over-the-air). The antenna transmitter output of the UUT was sampled during the data session and the occupied bandwidth plots were made. The plots were hard copies so, I scanned them into my computer and created a PDF file (OccBW.PDF), which I will provide to you as well. The file consists of two pages.

The first page contains spectral plots of the CVDM-2000 in CW mode (3 different spans), which is provided to you as a reference. During the data session, the cell site commanded the CVDM-2000 to channel 242 and PLC5 (+16 dBm) so, I manually commanded the unit to the same channel (ch 242) and power level (PLC5) for the CW

measurements. Please note that there is roughly 25 dB of loss between the CVDM-2000 antenna output and the spectrum analyzer input.

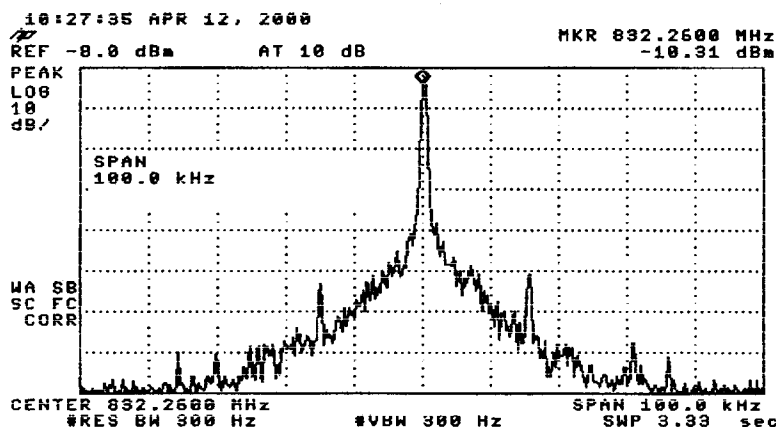
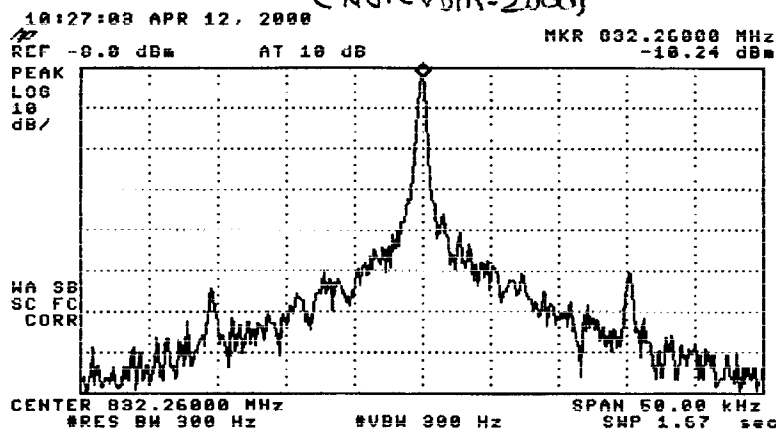
The second page contains spectral plots of the CVDM-2000 in data mode (3 different spans), during the actual over-the-air data session. Once again, these plots were taken with the CVDM-2000 commanded to channel 242 and PLC5 (cell site order).

You also requested a Carson's Rule estimation of the occupied bandwidth. The modulation frequency is 1.2 kHz and the peak deviation is about 2.5 kHz. Therefore, the estimated bandwidth is $2(1.2 + 2.5) = 7.4$ kHz.

I hope that I've been able to provide you with enough additional information to enable the FCC to move forward on the John Deere Special Technologies unit pending Equipment Authorization (FCC ID OV5-VCA10001). If not, please don't hesitate to contact me.

CVDM-2000 - CW MODE (NJICVDM-2000)

12 APR 00
LWC



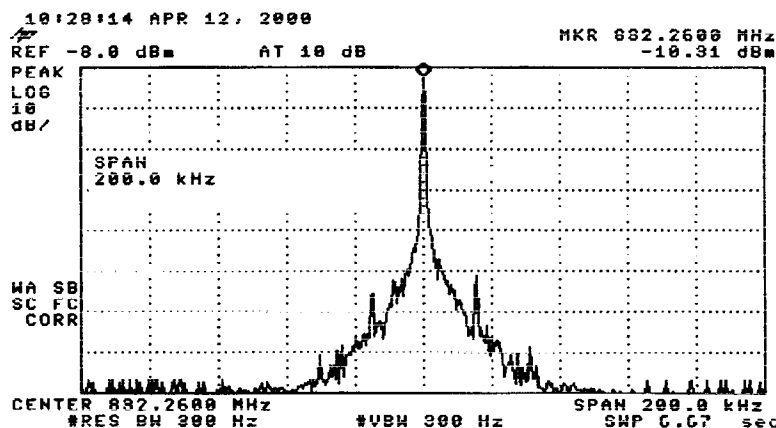
SPAN
ZOOM

FULL
SPAN

ZERO
SPAN

LAST
SPAN

PEAK
ZOOM



SPAN
ZOOM

FULL
SPAN

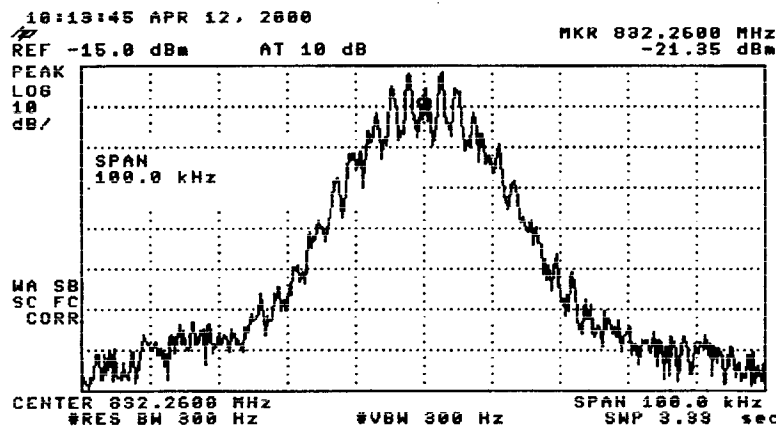
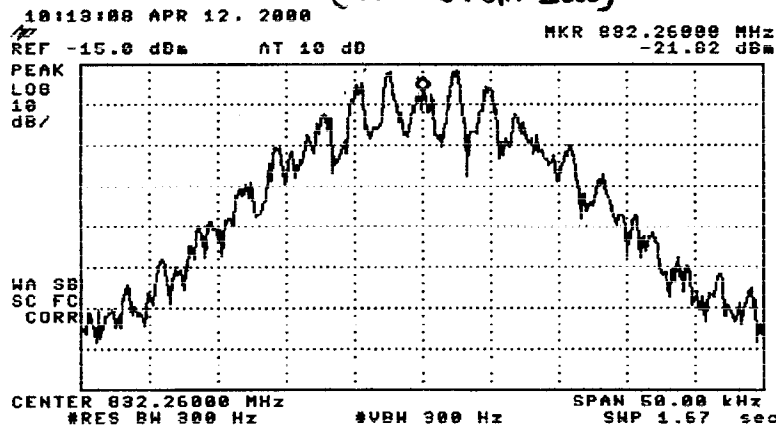
ZERO
SPAN

LAST
SPAN

PEAK
ZOOM

CVDM-2000 - Bell 212A, 1200 Baud, DPSK MODEM (NJICVDM-2000)

12 APR 00
WXC



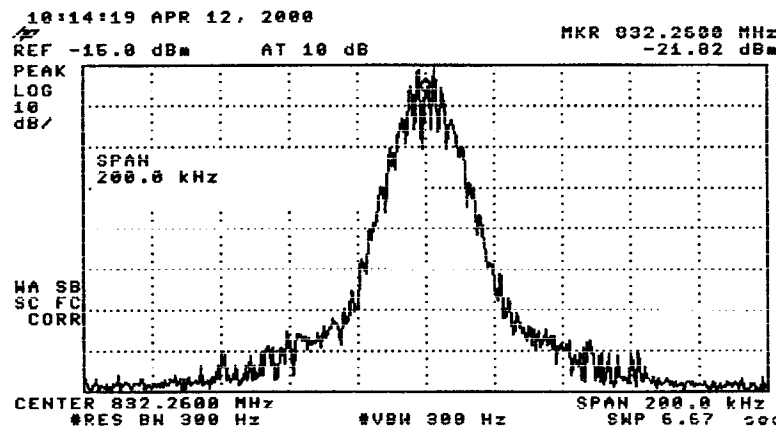
SPAN
ZOOM

FULL
SPAN

ZERO
SPAN

LAST
SPAN

PEAK
ZOOM



SPAN
ZOOM

FULL
SPAN

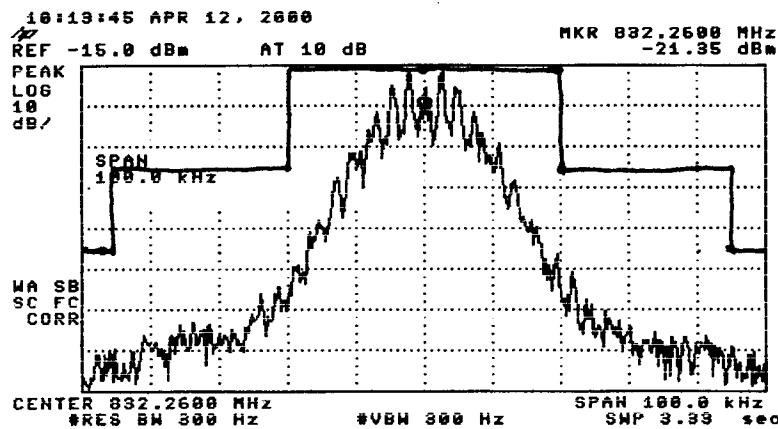
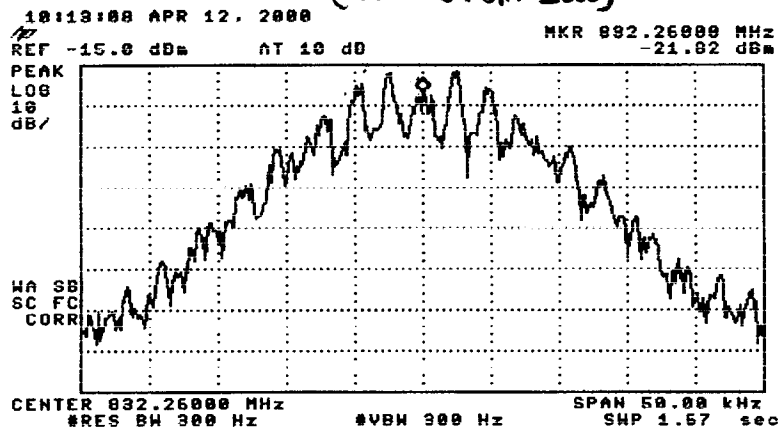
ZERO
SPAN

LAST
SPAN

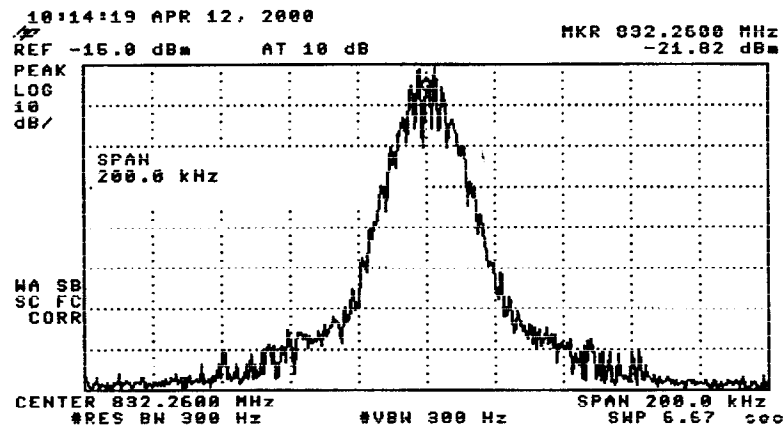
PEAK
ZOOM

CVDM-2000 - Bell 212A, 1200 Baud, DPSK MODEM (NT1CVDM-2000)

12 APR 00
WXC



SPAN
ZOOM
FULL
SPAN
ZERO
SPAN
LAST
SPAN
PEAK
ZOOM



SPAN
ZOOM
FULL
SPAN
ZERO
SPAN
LAST
SPAN
PEAK
ZOOM

Radiated Electromagnetic Emissions



Test Report #: **W0208 Run 03** Test Area: **STS 3m**
 Test Method: **N/A** Test Date: **14-Apr-2000**
 EUT Model #: **VCA10001** EUT Power: _____
 EUT Serial #: _____
 Manufacturer: **Phoenix International**
 EUT Description: _____
 Notes: **12 VDC / 24 VDC**

Temperature: **15** °C
 Relative Humidity: **45** %
 Air Pressure: **98.8** kPa
 Page: **1** of 2

SALT SHAKER ANTENNA TYPE

NORMAL CONTINUOUS TRANSMIT MODE

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 N/A	DELTA2 N/A
836 MHZ MAXED:						
RES BW AND VIDEO BW = 100 kHz:						
836.00	88.4 Pk	6.6 / 21.4 / 0.0	116.4	H / 2.6 / 281.0	N/A	N/A
836.00	95.7 Pk	6.6 / 21.4 / 0.0	123.8	V / 1.1 / 77.0	N/A	N/A
848.97	95.6 Pk	6.7 / 21.5 / 0.0	123.8	V / 1.1 / 193.0	N/A	N/A
848.97	83.4 Pk	6.7 / 21.5 / 0.0	111.6	V / 2.1 / 188.0	N/A	N/A
NOTE! THE SECOND MEASUREMENT AT 848 MHZ IS WITH A HORIZONTAL ANTENNA POLARIZATION - MAXIMIZED.						
824.03	91.4 Pk	6.6 / 21.4 / 0.0	119.4	H / 1.3 / 101.0	N/A	N/A
824.03	96.9 Pk	6.6 / 21.4 / 0.0	124.9	V / 1.2 / 187.0	N/A	N/A
MAXIMIZED 1648 MHZ:						
1648.14	34.4 Pk	10.5 / 25.5 / 0.0	70.4	V / 1.2 / 187.0	N/A	N/A
1648.14	28.2 Pk	10.5 / 25.5 / 0.0	64.3	H / 1.2 / 187.0	N/A	N/A

Tested by: **J. C. Sausen**
 Printed

Signature

Reviewed by: _____
 Printed

Signature

Susan, please change the emission designator to 7k4f1d. Attach occupied bw measurements from Bill Crook, along with graphs, and paper graph with emission mask drawn on it. Include new pictures of test setups from W0208. Include data sheets for W0208 Run 3.

This explanation needs to go in the Radiation Exposure folder.

1. 630 mW is the erp measured by using the substitution method. Initially we maximized the field strength from the transmitter to be 127.1 dBuV/m with the test antenna (biconicalog) 3 meters away. We removed the transmitter, and replaced it with a half-wave dipole antenna tuned to 836 MHz. The output of the signal generator into the dipole necessary to match the 127.1 dBuV/m level is what produced the 630 mW level. This would be below the 1.5 W requirement for device operating below 1.5 GHz. This corresponded to the manufacturer's designed for level. Using $TP=(FS \times D)^2/30G$, it does produce answer of 940 mW, assuming antenna gain of 1.64. The substitution value would indicate the antenna gain to be 2.44. In either case the ERP is less than 1.5 W, which would categorically exclude device from routine MPE evaluation, and for a grant level I feel more confident in the substitution measured value than the calculated using assumed antenna gain.
2. We retested with the EUT configured with the stub antenna, and by the substitution method measured an ERP of 160 mW. The calculated value using $TP=(FS \times D)^2/30G$, assuming antenna gain of 1.64, would be 440 mW. In any case, the 1.5 W limit is not exceeded. The worst case scenario would be 630 mW (measured maximum rf output) x 2 (3 dB antenna gain), or 1.26 W, which is also below the 1.5 W level.
3. The revised manual indicates installation that provides for 20 cm separation from operator and indicates use of any other antenna than one provided may cause non-compliance to FCC requirements.