

**Test Report  
For  
Datamatic Ltd.  
Firefly Transceiver FCC ID: ODYD2200**

**DUT:** Wireless transceiver model D2200

**Test Date:** 21-August-2003

**Manufacturer:** Datamatic, Ltd.  
3600 K Avenue  
Plano, Texas  
(972) 234-5000

**Conducted by:** Control Design & Testing, Inc.  
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(540) 582-2826

CD&amp;T

FCC ID: ODYD2200

#### A. DEVICE UNDER TEST

The product is transceiver used for the wireless transmission of public utility gas meter data. This device works in conjunction with a receiver (ODYD237) that has been previously certified. This product is designed to operate under the provisions of Part 15.249 of the FCC rules.

The transmit frequency is 916.500 MHz., nominal. The modulation mode is on/off keying using a proprietary pulse position scheme. This device is programmed to transmit single data packets at intervals of 1 to 18 seconds and to communicate continuously in half duplex mode when interrogated by the host transceiver. Power for the device is provided by an internal "D" size 3.6 volt lithium battery.

The rf section consists of an RF Monolithics TR1000L transmitter module, a two element antenna matching network and helical wire antenna. The antenna is custom manufactured for the applicant and is soldered to the printed circuit board. There is no provision to connect an external antenna.

This device will be sold in three different plastic enclosures each bearing the FCC ID on the outside. These enclosures are shown in the external photographs. The battery, circuit, layout and board form factor will be the same in each case. The entire assembly will be weather sealed.

#### B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Testing of this device was conducted at the Carl T. Jones test facility located in Springfield, Virginia. Site #90490

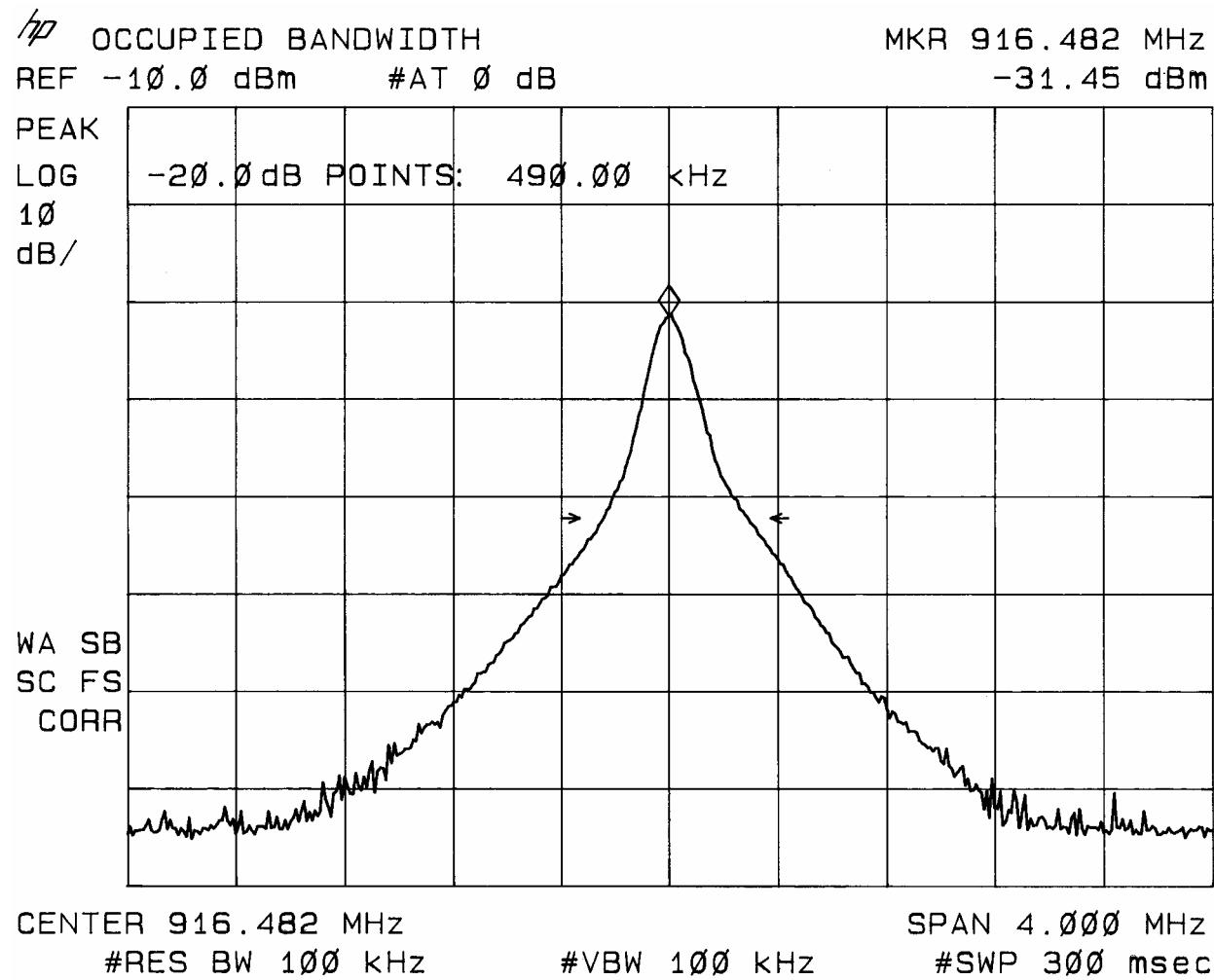
The receiver section of this device is a sequenced TRF, clocked at approximately 745 kHz. and does not use a local oscillator. The device was locked in the receive mode and scanned from 30 MHz. to 1 GHz. No emissions were detected.

Transmitter field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). Testing was conducted with a fresh battery and monitored periodically to insure that the battery voltage (under load) was maintained at 95% of nominal or greater.

The device under test was placed on a rotating turntable 0.8 meters high, centered at 3 meters distant from the measurement antenna. The device was placed in the center of the turntable and tested in the two positions shown in the test setup photographs.

For the purpose of radiated emissions testing, the sample was locked in CW mode. For the occupied bandwidth (Plot 1) the sample was set to transmit typical data packets

Plot 1



The field strength measurements were taken using an HP8596E spectrum analyzer, an EMCO 3121C dipole set, an EMCO 3115 double ridge guide horn and an Avantek UJ210 preamp. The device was scanned from 30 MHz. to 10 GHz. and all emissions were noted. In this case, the only emissions detected were those harmonically related to the fundamental transmit frequency.

At each detected emission frequency, the device was measured by rotating the turntable and adjusting the antenna height over a range of 1 to 4 meters to obtain the maximum output level. This procedure was performed with both horizontal and vertical antenna polarizations for both of the setup positions shown in the test setup photos. The peak reading for each frequency was recorded in the fourth column in Table 1 below.

Measurements taken for weak emissions were performed by reducing the distance from the measurement antenna to 1 meter and factoring -9.54dB into the calculation. This method was used for the 6<sup>th</sup> and 7<sup>th</sup> harmonics.

As provided in Part 15.35, the pulse format used by this device would result in a duty cycle correction of approximately -5.4 dB. However, since the peak readings for all harmonic and spurious emissions were 6dB or more under the limits, this correction was not applied to the calculations.

**Table 1**

RADIATED EMISSIONS DATA							
CLIENT: DATAMATIC		FCC ID: ODYD2200					
ANTENNA: DIPOLES/DRG HORN		EUT: DATA TRANSCEIVER					
PART 15.249, 15.109		TEST DATE: 21-August-03					
Frequency In MHz.	Ant. Polar. H/V	Ant. Factor dB	Peak reading dBm	Duty Cycle -dB	Peak Power uV/m@3m	Corrected Power uV/m@3m	FCC Limit uV/m@3m
916.483	V	30.8	-44.33		47152		50000
1832.966	V	30.2	-90.77		210		500
2749.449	V	33.4	-96.09		164		500
3665.932	H	35.7	-101.04		121		500
4582.415	V	36.6	-99.71		156		500
5498.898	V	38.6	-105.26		104		500
6415.381	H	39.1	-108.68		74		500