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FCC REPORT OF RADIO INTERFERENCE

for

Tractel, Inc.
110 Shawmut Rd.
Canton, MA 02021

FCC ID: OVL-DYNAFORLLXTX

January 13, 2000

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EXHIBITS

1.0 Introduction

This report has been prepared on behalf of Tractel, Inc. to support the attached Application for Certification of a Part 15 Intentional Radiator. The Equipment Under Test was the ***DYNAFOR Radio Transmitter***.

Radio-Noise Emissions tests were performed according to **ANSI C63.4-1992** ***"Methods of Measurement of RFI from Low-Voltage Electronic Equipment in the Range of 9 KHz - 40 GHz"***. The measuring equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

Testing was performed at National Certification Laboratory in Ellicott City, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch. FCC acceptance was granted on May 26, 1993.

1.1 Summary

The ***Tractel, Inc. DYNAFOR Radio Transmitter*** complies with the Part 15.249 Radio Limits for operation within the band 902-928 MHz of an Intentional Radiator.

2.0 Description of Equipment Under Test (EUT)

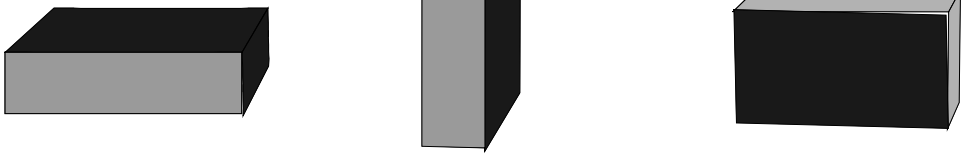
The EUT Features:

FEATURES	**FREQUENCY**
LCD Readout	921.65 MHz
RF Module Design	
PCM Encoding	
Battery Powered Only	
Load Weight Measure Function	
External Whip Antenna	

3.0 Test Configuration

The EUT was setup on the test table in a manner which follows the general guidelines of ANSI C63.4, Section 6 "**General Operating Conditions and Configurations**".

The EUT was configured in 3 orthogonal positions to determine the maximum RF level at each emission frequency. The data tables give the EUT postion designation that produces worst-case field strength, in an X, Y, Z system. This is described below:



X **Y** **Z**

4.0 Conducted Emissions Scheme

The EUT is powered by battery only.

5.0 Radiated Emissions Scheme

The EUT was initially scanned in the frequency range 30 to 9216 MHz indoors, at a distance of 1 meter to determine its emissions profile. The EUT was then placed on an 80 cm high 1 X 1.5 meter non-conductive motorized turntable for radiated testing on the 3-meter open area test site. The emissions from the EUT are measured continuously at every azimuth by rotating the turntable. Waveguide horn and log periodic broadband antennas are mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna is varied between 1 and 4 meters. Cables are varied in position to produce maximum emissions. Both the horizontal and vertical field components are measured.

The output from the antenna is connected to the input of the spectrum analyzer. The detector function is set to **PEAK** as required. The resolution bandwidth of the spectrum analyzer system is set at 120 kHz, for measurements in the range 30 MHz – 960 MHz, and 1 MHz for measurements in the range of 960 MHz – 9 GHz, with all post-detector filtering no less than 10 times the resolution bandwidth. All emissions within 20 dB of the limit are recorded in the data tables.

To convert the spectrum analyzer reading into a quantified E-field level to allow comparison with the FCC limits, it is necessary to account for various calibration factors. These factors include cable loss (CL) and antenna factors (AF). The AF/CL in dB/m is algebraically added to the Spectrum Analyzer Voltage in $db_{\mu}V$ to obtain the Radiated Electric Field in $dB_{\mu}V/m$. This level is then compared with the FCC limit.

Example:

Spectrum Analyzer Volt: VdBuV

Composite Factor: AF/CLdB/m

Electric Field: $EdB_{\mu}V/m = VdB_{\mu}V + AF/CLdB/m$

Linear Conversion: $EuV/m = Antilog\ (EdB_{\mu}V/m/20)$

		FCC RADIATED EMISSIONS DATA						
CLIENT:		TRACTEL						
EUT:		DYNAFOR						
TUNING FREQ:		921.65 MHZ						
3-METER TEST		PEAK					AVG	
FREQ	POL	SPEC A	AF/CL	AMP	E-FIELD	E-FIELD	LIMIT	MRGN
MHz		dBuV	dB/m	GAIN	dBuV/m	uV/m	uV/m	dB
921.65	V	62.0	24.0	0	86.0	19952.6	50000.0	-8.0
1843.30	V	50.0	27.0	-30	47.0	223.9	500.0	-7.0
2764.95	V	42.0	31.0	-30	43.0	141.3	500.0	-11.0
3686.60	V	41.0	33.0	-30	44.0	158.5	500.0	-10.0
4608.25	H	41.0	34.0	-30	45.0	177.8	500.0	-9.0
5529.90	H	40.0	35.0	-30	45.0	177.8	500.0	-9.0
6451.55	V	36.0	36.0	-30	42.0	125.9	500.0	-12.0
7373.20	H	33.0	37.0	-30	40.0	100.0	500.0	-14.0
8294.85	V	32.0	37.0	-30	39.0	89.1	500.0	-15.0
9216.50	H	33.0	38.0	-30	41.0	112.2	500.0	-13.0
TEST ENGINEER								
_____DATE_____								
STEVE DAYHOFF								

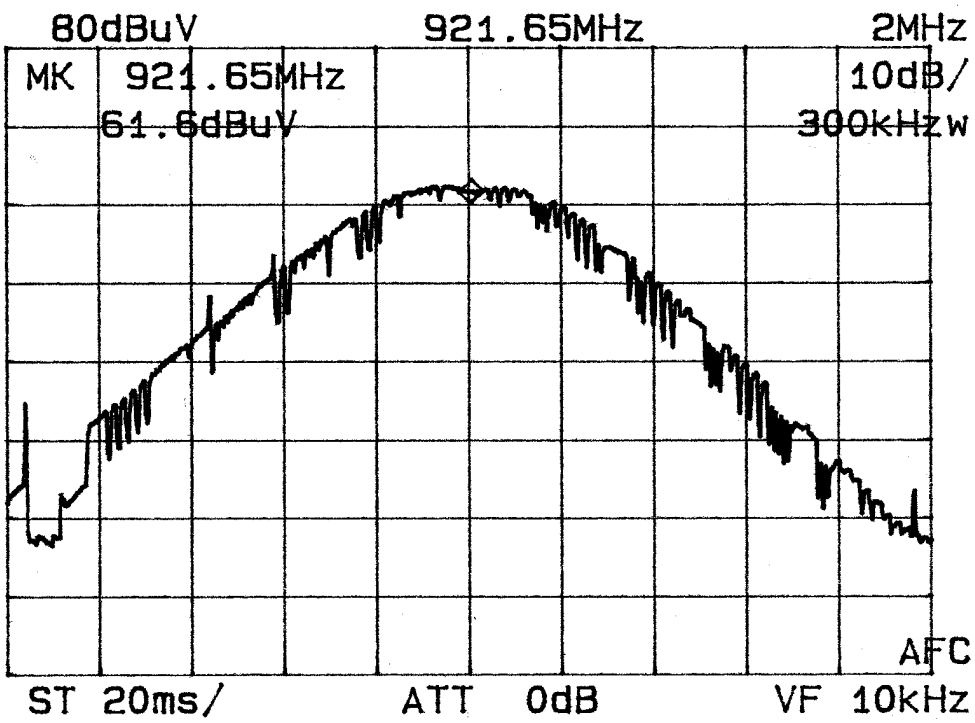

80dBuV
921.65MHz
2MHz
MK 921.65MHz
61.6dBuV
10dB/
300kHzw
AFC
ST 20ms/
ATT 0dB
VF 10kHz

Table 1

Support Equipment

MANUFACTURER	FCC ID #	SERIAL #
N/A	N/A	None

Table 2

Measurement Equipment Used

The following equipment is used to perform measurements:

EQUIPMENT	SERIAL NUMBER
Wavetek 2410A 1100 MHz Signal Generator	1362016
HP Model 8449B Preamplifier	12A533-A
EMCO Model 3146 Log Periodic Antenna	1222
Solar 8012-50-R-24-BNC LISN	924867
Advantest Model R4131D Spectrum Analyzer	54378A
EMCO Model 3115 Ridge Horn Antenna	1238
4 Meter Antenna Mast	None
Motorized Turntable	None
RG-233U 50 ohm coax Cable	None