TELERADIO REMOTE CONTROL
FCC INFORMATION

RF Measurement Report

Prepared by:

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Ellicott City, Maryland 21043
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In Support of:

FCC DECLARATION OF CONFORMANCE

For:

TeleRadio Remote Control
1006 Corporate Lane Unit C
Murry Corporate Park
Export, Pennsylvania 15632

Model: 840/850 Remote Control Receiver

FCCID: ONF8516RX840

Demonstration of Compliance with FCC Rules Part 15.231

June 21, 2001

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NCL PROJ.# TeleRadio-589

1.0 General Information:

This report has been prepared on behalf of **TeleRadio Remote Control**, to support the Declaration of Conformance of a Part 15 Intentional Radiator. The Equipment Under Test (EUT) was the **Model: 840/850 Remote Control Receiver.** The EUT configuration consisted of one Transmitter and one Receiver unit. The test results reported in this document relate only to the item that was tested.

Radio-Noise Emissions tests were performed according to the ANSI C63.4- 1992, ***"Method 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

1.1 Summary:

The TeleRadio Remote Control. **Model 840/850 Remote Control Receiver,** complies with the Part 15 Radio Limits for Intentional Radiator..

1.2 Test Methodology;

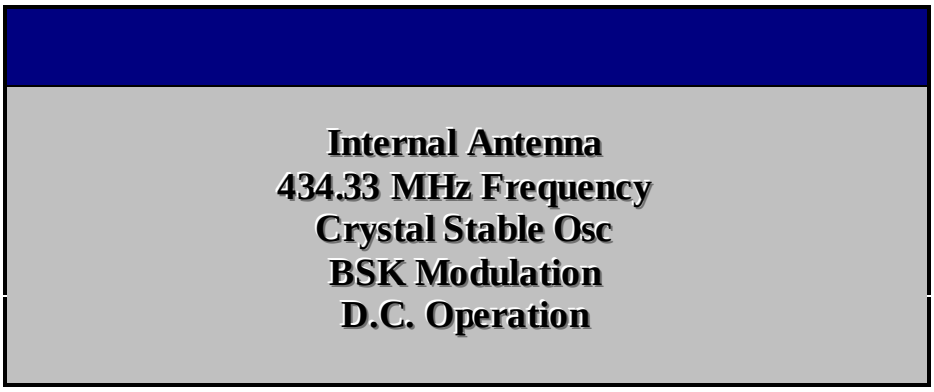
Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 1992. Radiated testing was performed at an antenna to EUT distance of three (3) meters.

1.3 Test Facility:

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of National Certification Laboratory 8370 Court Avenue, Suite B-1, Ellicott City, Maryland 21043. This site has been fully described in a report dated May 26, 1993, submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.0 Description of Equipment Under Test (EUT):

The EUT features:



2.1 EMI Countermeasure:

The following modifications were made to the EUT, by the project engineer to assure compliance to specifications:

None.

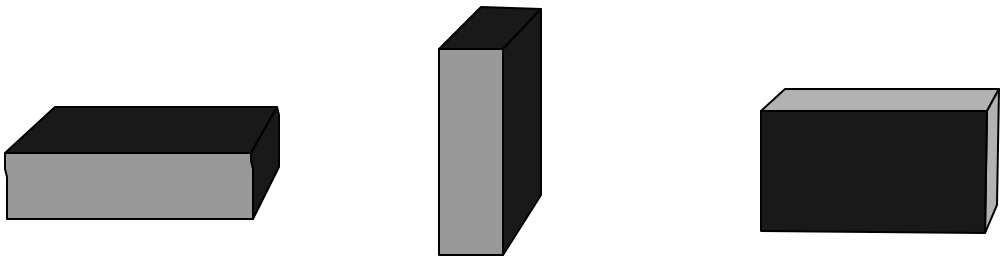
3.0 Test Program:

The EUT was tested in receive mode during testing which produced the highest EMI. Worst case emissions are recorded in the data tables.

4.0 Test Configuration for Radiated and Conducted Emissions:

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."** Once the Start or Stop buttons are pressed, the transmission is on for a 1 second period before automatically timed off. Tests were performed by repeated depressing of the buttons.

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



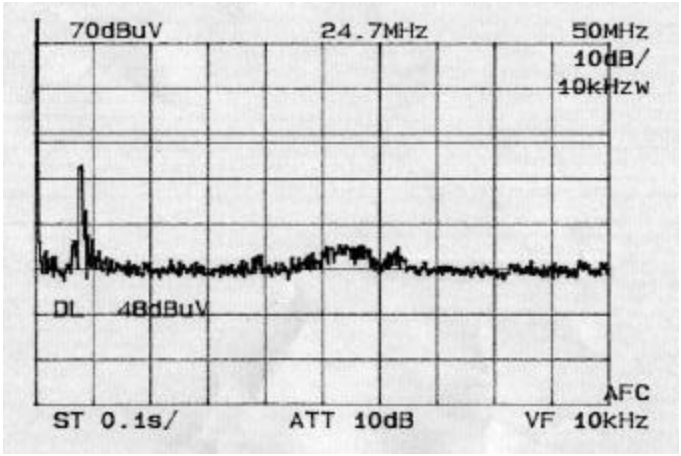
X Y Z

5.0 Conducted Emissions Scheme:

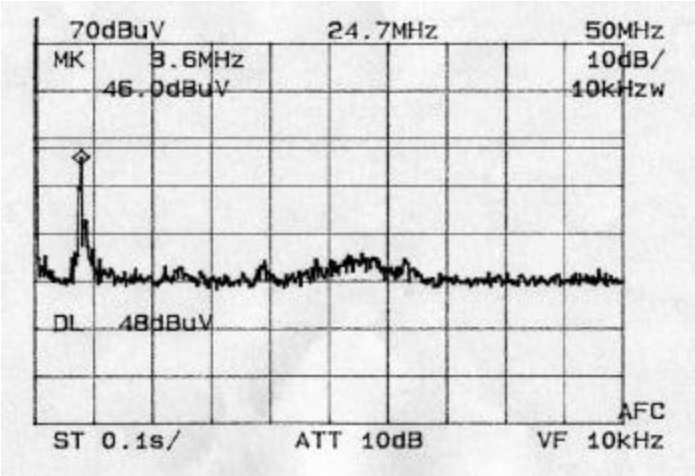
The EUT is placed on an 80 cm high 1 X 1.5 meter non-conductive table. Power to the CPU is provided through a Solar Corporation 50 Ω/50 µH line Impedance Stabilization Network bonded to a 2.2 X 2 meter horizontal ground plane, and a 2.2 X 2 meter vertical ground plane. The LISN has its AC input supplied from filtered AC power source. A separate LISN provides AC power to the peripheral equipment. I/O cables are moved about to obtain maximum emissions.

The 50Ω output of the LISN is connected to the input of the spectrum analyzer and emissions in the frequency range of 450 kHz to 30 MHz are searched. The detector function is set to quasi-peak and the resolution bandwidth is set at 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth for final measurements. All emissions within 20 dB of the limit are recorded in the data tables.

5.1 AC Conducted Emissions Line 1 Plot:



5.2 AC Conducted Emissions Line 2 Plot:



FCC CLASS "B" CONDUCTED EMISSIONS DATA

CLIENT: TeleRadio
EUT: Receiver
CPU:
CLOCK
MODE: Receive

LINE 1-Neutral: Quasi-Peak Level Date: 07/20/2001

FREQUENCY MHz	SPEC. Ana. dBuV	Calc. Volt. uV	FCC LIMIT uV	MARGIN dB	CONDITION
3.600	42.40	131.83	250.00	5.56	PASS
4.100	32.80	43.65	250.00	15.16	PASS
26.200	25.20	18.20	250.00	22.76	PASS

LINE 2-Phase: Quasi-Peak Level

FREQUENCY MHz	SPEC. Ana. dBuV	Calc. Volt. uV	FCC LIMIT uV	MARGIN dB	CONDITION
3.600	46.00	199.53	250.00	1.96	PASS
4.100	32.60	42.66	250.00	15.36	PASS
27.600	25.80	19.50	250.00	22.16	PASS

TEST ENGINEER:

Brian Haghtalab

6.0 Radiated Emissions Scheme:

The EUT was initially scanned in the frequency range 30 to 4340 MHz indoors, at a distance of one (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 one (1) and four (4) meters. 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. All emissions within 20 dB of the limit are recorded in the data table.

Measurements from 30-1000 MHz: The output from the antenna is connected to the input of the spectrum analyzer. The detector function is set to **Quasi-Peak**. The resolution bandwidth of the spectrum analyzer system is set at 120 kHz for the range 30-1000 MHz with all post-detector filtering no less than 10 times the resolution bandwidth.

Measurements from 1-4 GHz: The output from the horn antenna is connected to the input of a 30 dB pre-Amp, which is in turn attached to the spectrum analyzer. The detector function is set to **Peak**. The resolution bandwidth of the spectrum analyzer system is set at 1 MHz for the range 1-4 GHz.

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 dBµV/m. This level is then compared to the FCC limit.

EXAMPLE

Spectrum Analyzer Voltage:	**VdBmV**
Composite Factor:	**AF/CL dB/m**
Electric Field:	**E dBmV/m = V dBmV + AF/CL dB/m**
Linear Conversion:	**E mV/m = Antilog (E dBmV/m /20)**

6.1 Radiated Emissions Data Table:

FCC RADIATED EMISSIONS DATA

CLIENT: **TeleRadio Co.**
EUT: **840/850 RC RX**
CPU:
CLOCK **434.33 MHz**
MODE: **Receiver**

3 METER TEST **Ouasi-Peak Level** **DATE: 06/21/2001**

FREQUENCY MHz	POLARITY Ant.	POLARITY EUT	SPEC A dBuV	AF/C dB/m	AMP Gain dB	Average Factor dB	QP E-Field dbuV/m	QP Limit dBuV/m	MARGIN dB	CONDITION
54.23	V	Y	19.00	15.00	0.00	0.00	34.00	40.00	6.00	PASS
65.48	V	Y	15.00	16.00	0.00	0.00	31.00	40.00	9.00	PASS
78.91	V	Y	16.00	12.00	0.00	0.00	28.00	40.00	12.00	PASS
112.36	V	Y	19.00	15.00	0.00	0.00	34.00	43.50	9.50	PASS
234.56	H	Z	15.00	21.00	0.00	0.00	36.00	46.00	10.00	PASS
312.45	H	Z	14.00	14.00	0.00	0.00	28.00	46.00	18.00	PASS

TABLE 1 – EUT ACCESSORIES

Type	Make	Model
None		

TABLE 2
SUPPORT EQUIPMENT

MANUFACTURER	FCC ID #	SERIAL #
12 Volt AC Adapter - Linear	N/A	None

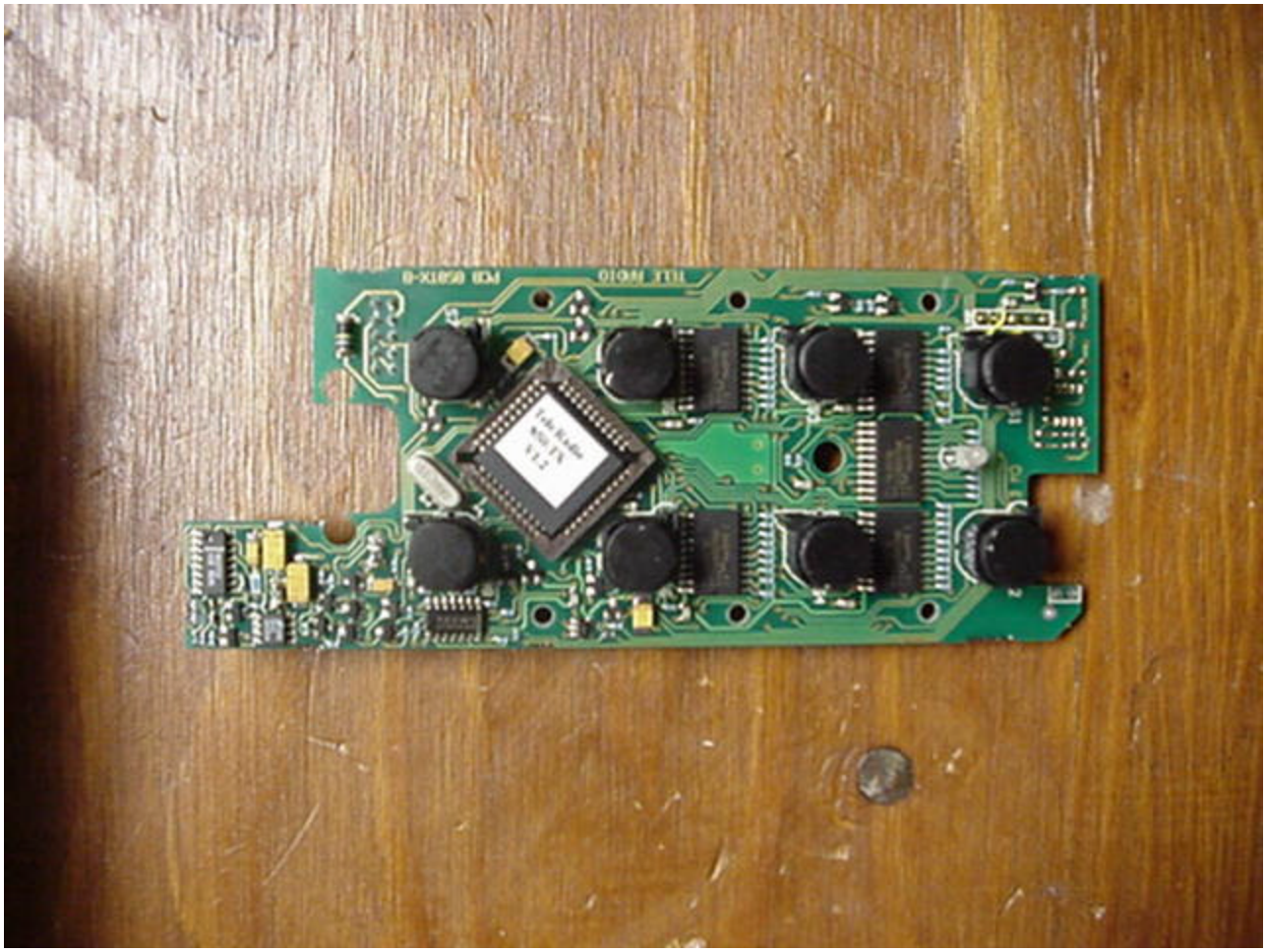
TABLE 3
MEASUREMENT EQUIPMENT USED

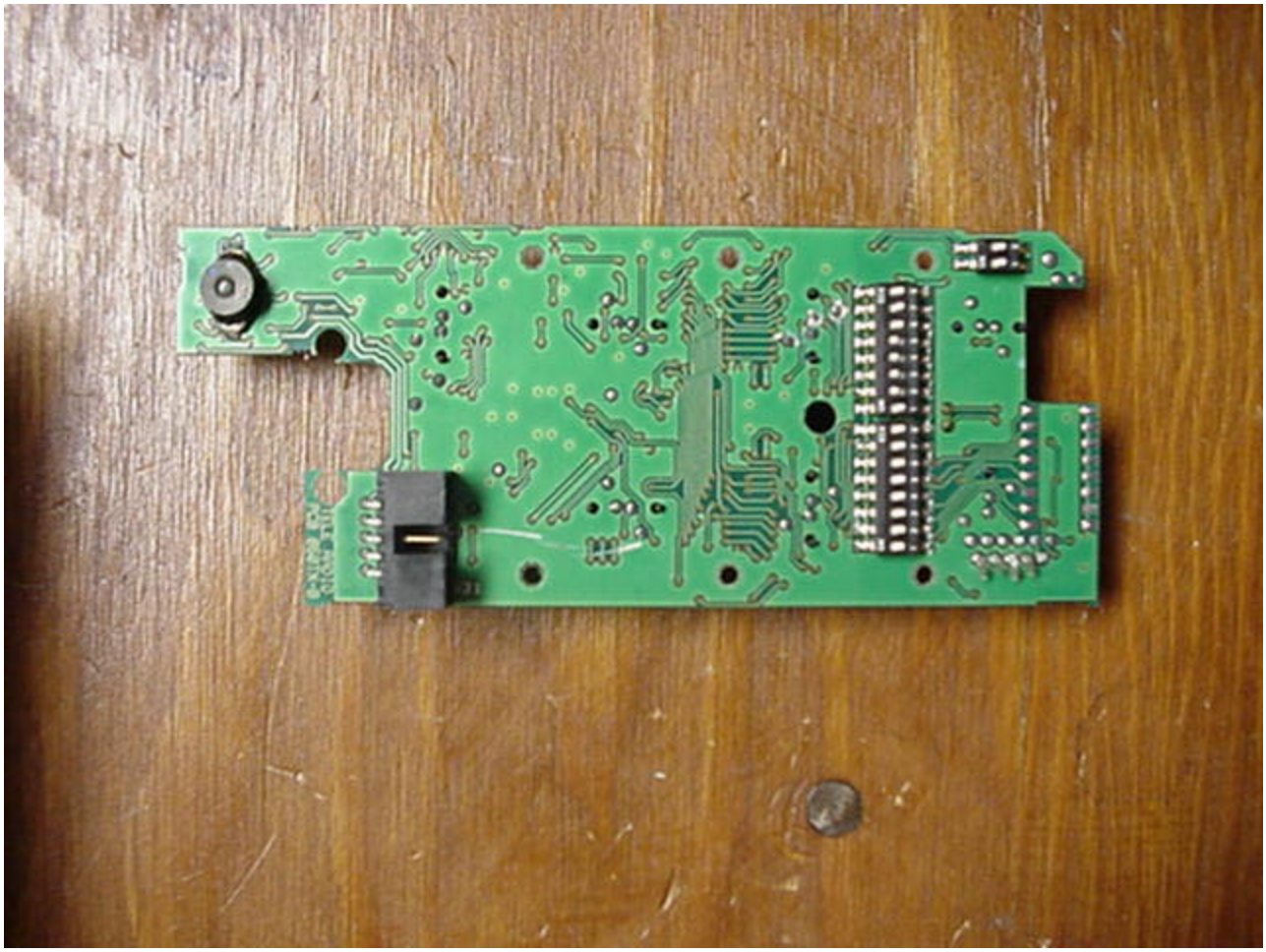
The following equipment is used to perform measurements:

EQUIPMENT	SERIAL #
Wavetek 2410A 1100 MHz Signal Generator	1362016
EMCO Model 3110 Biconical Antenna	1619
Antenna Research LPD-3500 Log Antenna	1005
EMCO Model 3146 Log Periodic Antenna	3007
HP 8348A Pre-Amplifier	197-2564A
Solar 8012-50-R-24-BNC LISN	924867
Bird 8306-300-N-30dB Attenuator	29198391515
Advantest Model R4131D Spectrum Analyzer	54378A
4 Meter Antenna Mast	
Motorized Turntable	
RG-233U 50 ohm coax Cable	
4 Meter Antenna Mast	

EXHIBIT 1.1
EXTERNAL PHOTOGRAPHS

EXHIBIT 1.2
INTERNAL PHOTOGRAPHS





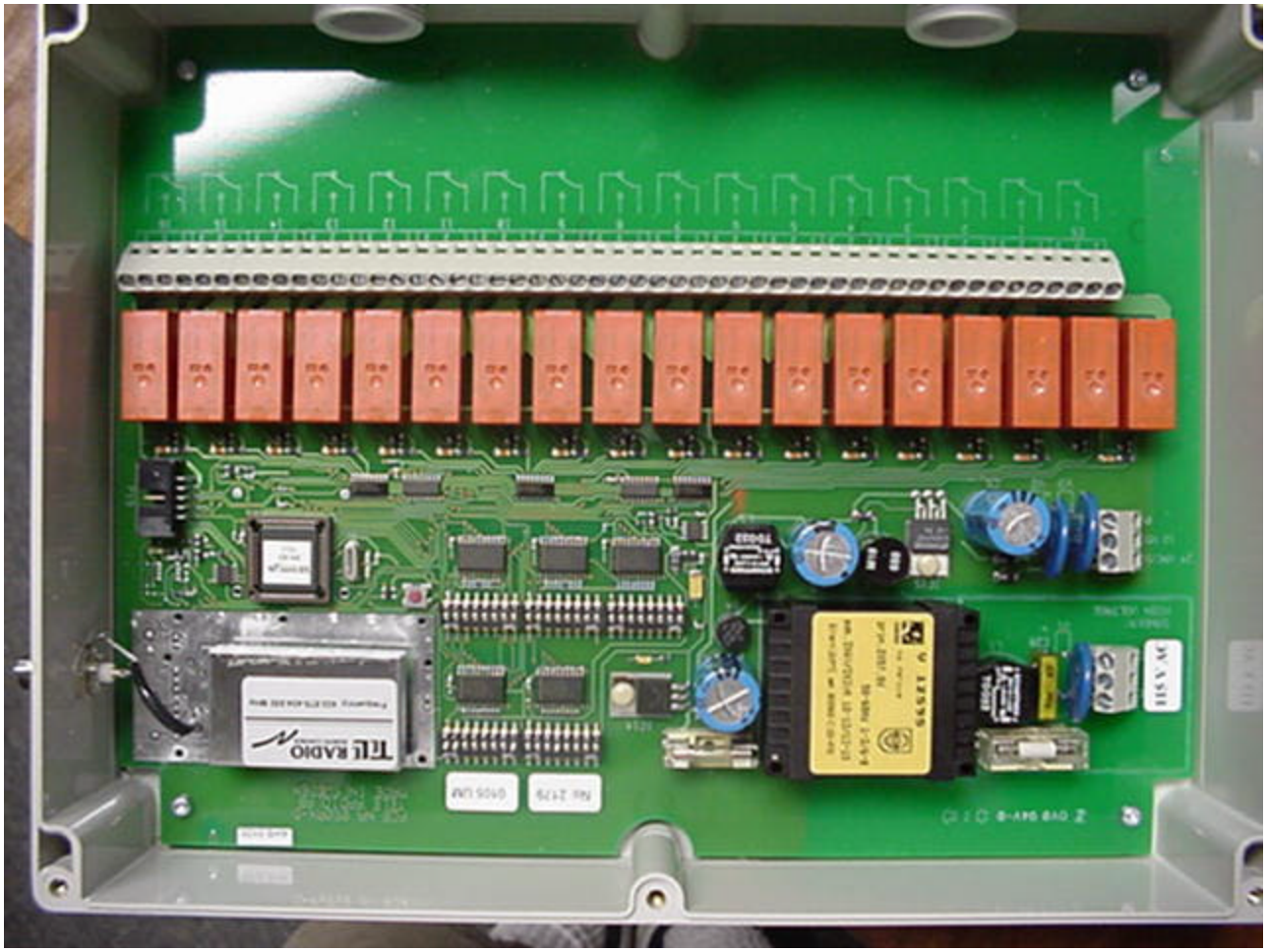

TLL RADIO

EXHIBIT 2
Class "B" Labeling Format

FCC ID: ONF8516RX840

This device complies with Part 15 of FCC Rules:
Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

MODEL No.

Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

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