



JOB# 3501AUT7

January 31, 2008

**FCC RF EXPOSURE EXHIBIT**

**PART 1.1310 ENVIRONMENTAL ASSESSMENT**

**FOR A UHF AMPLIFIER (90 S)**



**TABLE OF CONTENTS**

1. Test Report Information..... 1

2. Identification of the Equipment Under Test ..... 2

3. Standard test conditions ..... 1

4. Part 1.1310 Environmental Assessment ..... 1

5. Statement of compliance..... 1



## 1. TEST REPORT INFORMATION

- a) Laboratory:  
Timco Engineering, Inc  
849 N.W. State Road 45  
Newberry, Florida 32669
  
- b) FCC Correspondence Reference Number: 7355
  
- c) Client:  
Crescend Technologies, LLC  
920 East State Parkway  
Schaumburg, IL 60173
  
- d) Identification: FCC ID: CWWP310KL1CP9UP
- e) Description: VHF Amplifier
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: January 31, 2008
- h) EUT Received: November 2, 2007
- i) Sampling method: No sampling procedure used.
- j) Uncertainty: In accordance with Timco's internal quality manual.
- k) Test results: The results presented in this report relate only to the item tested.
- l) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.



## **2. IDENTIFICATION OF THE EQUIPMENT UNDER TEST**

NAME AND ADDRESS OF APPLICANT:

Crescend Technologies, LLC  
920 East State Parkway  
Schaumburg, IL 60173

MANUFACTURER: Applicant

FCC ID: CWWP310KL1C9UP

MODEL NO: P3-10KL1-C9-UP

DESCRIPTION: VHF Amplifier

TYPE OF EMISSION: Amplifier

FREQUENCY RANGE, MHz: 935.8875 – 936.9875 MHz, 896.8875-897.9875 MHz

POWER RATING, Watts: 35 Watts

Switchable or Variable N/A

MODULATION: Amplifier

ANTENNA: 4 dBi omni directional vertical (typical antenna for this radio)  
With 15 feet of RG 8U. Attenuation at 900 MHz:  
Nominal Value: 1. dB/15 feet. typical installation

NOTE: RF Power set to highest output across all probe readings/heights.



### **3. STANDARD TEST CONDITIONS**

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10 to 40 degrees C (50 to 104 degrees F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

Temperature: 89.5°F

Humidity: 51%

### **4. PART 1.1310 ENVIRONMENTAL ASSESSMENT**

Specification: FCC: 47 CFR 1.1310

Measurement Guide: ANSI/IEEE C95.1 1992

Test Equipment: Maximum Permissible Exposure (MPE) measurement system, consisting of:

Amplifier Research Model FM-5004

Amplifier Research, Isotropic Field Probe Model FP-5000  
10 kHz – 1000 MHz

Bird Wattmeter Model 43 with 850-960 MHz, 100 Watt slug



### Measurement Procedure:

1. The following measurements were performed with an Amplifier Research Field Probe using ANSI/IEEE C95.1 as a guide.
2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures.
3. The EUT's radiating element (antenna) was placed on a wooden table 80 cm high. The vertical whip antenna was mounted in a typical operational manner.
4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements.
5. The minimum safe distance was calculated from the formula  $\text{Power Density} = \text{EIRP} / 4\pi R^2$  (Peak Watts/m<sup>2</sup>). The calculation is shown with the measurement data.
6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range 0 to 140 cm height range. plane of 0 to 360 degrees. Worst case emissions were found to be at point perpendicular from the antenna base and were the same at different axes.
7. Bird Wattmeter/Antenna measurements: 35 Watts conducted into a 50 Ohm

Results follow:

FCC Rules: 1.1307, 1.1310, 2.1091  
Description, EUT: UHF Amplifier (90 S)  
Test Frequency, MHz = 930  
Antenna Gain = 4 dBi  
Coax loss 1 dB  
Rated Probe: Amplifier Research FM-5004 Probe



LIMITS: Uncontrolled Exposure 47 CFR 1.1310

- 0.3-1.234 MHz: Limit [mW/cm<sup>2</sup>] = 100
- 1.34-30 MHz: Limit [mW/cm<sup>2</sup>] = (180/f<sup>2</sup>)
- 30-300 MHz: Limit [mW/cm<sup>2</sup>] = 0.2
- 300-1500 MHz Limit [mW/cm<sup>2</sup>] = f/1500
- 1500-100,000 MHz: Limit [mW/cm<sup>2</sup>] = 1.0

Power, measured @ 50% Duty Cycle = 15 Watts in 50 Ohm

Limit: Uncontrolled Exposure = 0.62 mW/cm<sup>2</sup>

Tested Distance: 67 cm from antenna base

Probe Height: 80 cm.

Results: at tested distance of 67 cm and 35 Watts conducted output power

Probe Height(cm)	Evolts	E <sup>2</sup> Volts	E <sup>2</sup> / 2.4π	Pd mW/cm <sup>2</sup>	Pd/2* mW/cm <sup>2</sup> (50% DCCF)
80	46	2116	280.6	0.28	0.14
100	36.5	1332.25	176.7	0.17	0.09
120	37.5	1406.25	186.5	0.18	0.09
140	34	1176.49	156	0.15	0.08
60	36	1296	171.8	0.17	0.086
	Distance 67 cm.	Maximum Pd		0.28	

\* 50% Operational Duty Cycle Correction Factor

Conclusion: The installation of a 4 dBi vertically mounted antenna at a separation distance of 67cm meets the maximum permissible exposure limits as set forth in IEEE C95.1 and FCC OET Bulletin 65.

TEST ENGINEER: Nam Nguyen

SUPERVISED BY: Mario de Aranzeta



## **5. STATEMENT OF COMPLIANCE**

This is to declare:

1. THAT the report was prepared either by, and/or under the direct supervision of, the undersigned staff.
2. THAT the data was obtained on representative unit, randomly selected.
4. THAT, to the best of our knowledge and belief, the facts set forth in this report and accompanying technical data are true and correct.

TEST ENGINEER: Nam Nguyen

SUPERVISING ENGINEER: Mario de Aranzeta