TYPE OF EXHIBIT: TRANSMITTER EFFECTIVE RADIATED POWER

FCC PART: 95.135

MANUFACTURER: RITRON, INC.
505 West Carmel Drive
Carmel, IN 46032

MODEL: RLR-460

TYPE OF UNIT: UHF FM Repeater

FCC ID: AIERIT15-460

DATE: June 11, 2003

PROCEDURE:

1. The measurement for effective radiated power was taken at the RITRON, Inc. 3 meter test site, details of which are on file with the FCC.

2. The RLR-460 was aligned for transmitter operation on 457.1125 MHz at the 5.0 watt maximum output power rating for the unit per the tune-up procedure outlined in the Maintenance Manual. The unit was then terminated at the antenna port with the two antennas available from RITRON for use with this product, the AFB-1545 articulated whip and the RAM-1545 magnetic mount antenna. (The user may connect other antennas, however.)

3. All field strength measurements were made with the Hewlett-Packard Model 8560E Spectrum Analyzer and an Electro-Metrics EM-6924 adjustable dipole antenna.

4. With the AFB-1545 whip antenna, the RLR-460 was mounted in the three orientations possible, horizontal, vertical with long dimension horizontal, and vertical with long dimension vertical. The height of the field strength measurement antenna and the azimuth orientation of the RLR-460 were varied to provide maximum field strength. The AFB-1545 antenna was replaced with the RAM-1545 antenna connected via its cable and tested above a 0.5m x 0.5 m ground plane. The height of the field strength measurement antenna and the azimuth orientation of the antenna were varied to provide maximum field strength. The maximum levels were noted.

5. A substitution antenna, an Electro-Metrics EM-6924 adjustable dipole, was substituted for the RLR-460 at the RLR-460's location and at the location of the RAM-1545 antenna when it was used. An RF signal generator was set for the frequency of the RLR-460 with the level at the substitution antenna noted.

6. The height of the receiving antenna was adjusted for maximum signal strength. The level at the field strength antenna was noted.

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EQUATIONS:

The substitution antenna is specified from the manufacturer in terms of antenna factor rather than antenna gain. The conversion is:

Ga(dbd) = 20 log f (MHz) – AF(dB) – 31.9

The effective radiated power (ERP) is then:

ERP(dBm) = Pr(dBm) + Pgen(dBm) – Ps(dBm) – Ga(dBd)

Where:

Pr is the power level of the radio's emission at the receiving antenna output.

Pgen is the RF signal generator level at the substitution antenna input.

Ps is the power level of the substitution antenna emission at the receiving antenna output.

Ga is the gain of the substitution antenna.

The ERP is converted to watts from dBm by:

ERP(watts) = $\text{antilog}_{10}((\text{ERP(dBm)} - 30)/10)$

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RESULTS:

Antenna	Pr (dBm)	Pgen (dBm)	Ps (dBm)	Ga (dBd)	ERP (dBm)	ERP (watts)
AFB-1545	+8.5	0.0	-28.4	0.3	+36.6	4.57
RAM-1545	+2.8	0.0	-28.4	0.3	+30.9	1.23