

26 March, 2001

Federal Communications Commission
7435 Oakland Mills Road
Columbia, MD 21046

Attention: Frank Coperich
fcoperic@fcc.gov
FCC Application Processing Branch

Re: FCC ID PDGBR-3501
Applicant: Infinition inc
Correspondence Reference Number: 18565
731 Confirmation Number: EA99716

Subject: Safety Warning Justification for BR-3501 Doppler Radar

Mr. Coperich,

This letter is in response to your e-mail dated 23 March, 2001 requesting a justification of the conditions contained in the Warning statement for RF exposure (limits).

The following Warning Statement:

"Based on the recommendations of the National Council on Radiation Protection and Measurements (NCRP) in occupational/controlled situations, continued exposure to radiation should be avoided within 1 meter in front of the radar. Radiation levels outside this region fall within regulations of 5 mW/cm² (for periods less than 6 minutes) and are not considered safety hazards. Direct visual contact with the radar when transmitting should be avoided at all times."

contained in the BR-3501 User Manual is justified below.

The maximum permissible exposure for occupational/controlled situations is obtained as follow:

Radar Specifications

Transmitter Frequency: 35 GHz

Transmitter Power: 100 mW or 0.1 W
Antenna Gain: 30 dBi

Limits for Occupational/Controlled Exposure

Frequency Range: 1500 – 100000 MHz
Power Density: 5 mW/cm² or 50 W/m²
Averaging Time: 6 minutes

Based on the radar equation, the power density at a given distance can be calculated as follow:

$$\frac{10^{G/10} * P}{4 * \pi * R^2} = PD$$

where
G is the antenna gain [dBi]
P Transmitter Power [W]
R Range [m]
PD Power Density [W/m²]

The minimum range for a safe exposure based on the radar specifications and the limits for occupational/controlled situations is given by:

$$R \geq \sqrt{\frac{10^{G/10} * P}{PD * 4 * \pi}} = \sqrt{\frac{10^{30/10} * 0.1}{50 * 4 * \pi}} = 0.40m$$

where
G = 30 dBi
P = 0.1 W
PD = 50 W/m²

Exposure to radiation should be avoided within 0.4 meter in front of the radar. For additional safety, the minimum range specified in the safety warning has been increased to 1 meter.

Sincerely,



Jean-Luc Gagnon
President
Infinition Inc. <http://www.infinition.com>