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**Infinition** inc.

3630 Jean Talon, Trois-Rivières, Québec, Canada G8Y 2G7

tel: (819) 371-3386 · fax: (819) 371-0340



# BR-3501

## User Manual

## Warning



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  $5 \text{ mW/cm}^2$  (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.

## Specifications

<i>Operating Frequency</i>	<i>35 GHz</i>
<i>Transmitting Power</i>	<i>100 mW</i>
<i>Antenna Gain</i>	<i>30 dBi</i>
<i>Transmitter Stability</i>	<i><math>\pm 0.1\%</math></i>
<i>Beam Width</i>	<i><math>4^\circ \times 4^\circ</math></i>
<i>Side Lobes</i>	<i>-24 dB</i>
<i>Weight</i>	<i>12 Kg</i>

## Installation

The BR-3501 radar system includes the following three components:

- Radar antenna
- Tripod
- Tripod mounting adapter

Before attempting to install your radar, you should familiarize yourself with your new tripod and understand how the mounting adapter can be secured in place to hold the radar.

### *Installation Steps:*

- Adjust your tripod to a convenient height and orientation.
- Install the tripod mounting adapter under the base of the radar.
- Mount the radar on the tripod ensuring that the mounting adapter is properly locked in place.
- Adjust the radar height, tilt and inclination to your needs using the tripod controls.

## Operation

The BR-3501 rear panel contains only three components:

### *Power/Signal Connector*

The BR-3501 is interfaced to a processing unit using a single six-wire cable equipped with military connectors. This cable is used to provide power to the antenna, to carry the radar doppler signal to the processing unit and to carry the antenna transmission control. You should connect your radar cable from this connector to the appropriate radar input on your processing unit.

The connector type is ITT Cannon MS3124E16-8P. The following table describes the pinout of this connector:

Pin	Function
A	AC Neutral
B	110 Volts AC
C	Not Connected
D	Remote Make (+ 5 Vdc Output)
E	Make Ground
F	Doppler Signal + (5 Vpp max.)
G	Doppler Signal - (5 Vpp max.)
H	Ground

The remote activation of the transmitter can be achieved by short circuiting pins D and E of the connector.

### *Transmitter Switch*

The transmitter switch controls the state of the radar transmitter. When set to *On*, the radar will transmit the radar signal. When set to *Remote*, the radar will not actually transmit until the system is armed. The armed state is controlled by the processing unit via the *Power/Signal* cable.

### *Gain Adjustment Knob*

Depending on the type of projectile being tested, the amplitude of the return signal may vary greatly. Just think of the returned signal of a 155mm projectile versus the returned signal of a 2mm fragment. Typical Doppler processing units have a minimum dynamic range of 72 dB. The gain adjustment allows you to control the level of amplification applied to the returned signal before it is output to a processing unit. The gain adjustment knob provides nine (9) gain levels ranging from 10 dB up to 90 dB. Having control over the gain allows you to avoid very strong signals from being amplified outside the supported dynamic range which would lead to a loss of information when processing. Similarly, it allows you to maximize the gain applied to a very weak signal returned by a small projectile.