

**OPERATOR'S MANUAL
FOR THE**
Phantom
RADAR

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PHANTOM RADAR

Technical Specifications

Type: Handheld Stationary Doppler K-Band.

Operating Frequency: 24.150 GHZ +/- 0.1GHZ.

Power Requirements: +10.5 to +16.5 VDC, 13.5 VDC Nominal, 1.5 Amp Max.

Reverse Polarity Protection: Inline Diode Protection.

Electronic Components: 100% solid state, integrated circuits and transistors and associated components.

Environmental: -20 to +60 degrees C; 90% relative humidity at +37 degrees C (non-condensing).

Accuracy (Internal): +/- 0.1 MPH.

Accuracy (External): + 0.1/-1 MPH.

Accuracy Verification (External): Tuning Fork (K-Band).

Internal Test: 60 MPH simulated Doppler signal checks internal circuits and display LEDs.

Display: 3 Full digits, LED, Indicators for: Power on: RF interference: and Low Voltage.

Lock Time: Instantaneous; No error introduced.

Microwave Data

Antenna Type: Conical.

Lens Type: Precision Ground "Rexalita".

Polarization: Right hand circular.

Beam Width: 12 Degrees nominal at 3dB.

Receiver Type: Low-nose schottky barrier mixer diode.

Microwave Source: Gunn-effect diode.

Power Output: 10-20 MW.

Frequency Output: 24.150 +/- 0.1 GHz (K-Band).

Physical Data

Construction: Lightweight aluminum chassis. PVC cover. 6 foot coiled power cord with fused lighter plug.

Weight 1 lb. 12 oz.

Height: 6.5 inches including handle.

Length: 7.5 inches.

Width: 3.375 inches.

The Phantom radar is a handheld stationary Doppler radar unit. It is designed to operate from a 12 Volt source, such as the cigarette lighter socket of a motor vehicle, or an approved optional battery pack. It is designed to monitor speeds of motor vehicles moving toward or away from the stationary operator.

OPERATING INSTRUCTIONS

Instructions for operating the Phantom radar.

- 1) Plug the power cord lighter plug into the vehicles 12 Volt lighter plug receptacle, or approved optional battery pack.
- 2) Turn the ON/OFF switch (located on the VOLUME control) to the ON position. Check to see if the red POWER INDICATOR lamp is on.
- 3) Perform the internal circuit test by pressing the TEST switch located on the face of the unit at the top. This will produce a reading 60 MPH on the display. Immediately after releasing the

TEST switch the Phantom will show "888" on the display and all indicators will light for about 1.5 seconds. This proves that all digit readouts and indicators are working properly.

- 4) Perform the external system check by striking a tuning fork against a non metallic object. While it is still vibrating, hold it parallel to the unit approximately 2" in front of the antenna. When the units' trigger switch is pulled, the unit should display the speed stamped on the tuning fork.
 - a) The speed LOCK circuit can be tested by releasing the trigger switch while the speed reading is displayed. This will cause the speed reading to flash on and off. This indicates a "locked" in speed. This can be cleared by depressing and then releasing the trigger switch.
- 5) Adjust the VOLUME control to achieve the desired level of audio output.
 - a) The SQUELCH switch can be set for either a continuous audio output in the UNSQUELCHED position, or, when in the SQUELCHED position, an audio output only when a speed is being displayed.
- 6) Adjust the RANGE control to the desired setting to suit traffic density and other road conditions.
- 7) To read a target, point the unit and depress the trigger switch.
- 8) To lock in a target reading, release the trigger switch while the speed is being displayed.
- 9) To release a locked in reading, press and release the trigger switch rapidly.
- 10) The unit should be turned off if it is not going to be used for an extended period of time.

In addition to the POWER ON indicating lamp, the unit also contains two other indicator lamps:

- 1) LOW VOLTAGE Lamp – This lamp will illuminate should the supply voltage (12 Volts) drop below the required voltage to operate the unit.
- 2) RADIO FREQUENCY INTERFERENCE (RFI) Lamp – This lamp will illuminate if strong RF interference is present.

When either of these conditions are experienced, and the lamp comes on, the display circuitry is inactivated and no readings will be displayed. This prevents erroneous readings caused by these conditions.

The unit is protected by a 5 AMP fuse located in the end of the lighter plug. The unit is also protected internally from reversed polarity being applied to the unit. Should this occur, the unit simply will not work, and no damage should occur to the unit.

OPERATING CONDITIONS / ANGLE ERROR

There are several conditions which will affect the operation of this type of radar unit:

Cosine angle – This is the angle created by a target , which is not moving directly toward or away from the operator (unit).

The formula is $\text{Cosine of angle} \times \text{actual speed} = \text{radar reading}$.

At small angles the error is very small.

If angle is 5 degrees, then radar will read 99.6% of actual speed / Example actual target speed 50 MPH, gun reading 49.8 MPH

If angle is 10 degrees, then radar will read 98.5% of actual speed / Example actual target speed 50 MPH, gun reading 49.2 MPH

If angle is 15 degrees, then radar will read 96.6% of actual speed / Example actual target speed 50 MPH, gun reading 48.3 MPH

- 1) AC Heater / Defroster Fan – This interference can take the form of a display number which correlates with the fan speed. This number will be dropped whenever a target reading is obtained. It CANNOT be added to the target speed reading. This form of interference can be eliminated by turning the fan off. It can be greatly reduced by operating the fan in the “low” setting. Also, better range will be obtained if the unit is pointed away from the operating fan.
- 2) Outside Interference – On occasion, an operator may select a location which produces random reading, or reduced range, for no apparent reason. This may be caused by outside interference, moving objects, or so on. If this occurs, the best cure is to move to another location.
- 3) Ghost Readings – Due to the advanced technology employed in this unit, it is one of the most sensitive units on the market today. It is not uncommon for this unit to pick up targets up to 2 miles away. Therefore, at maximum range (or sensitivity) the operator may experience undesired or “ghost” readings. These problems do not indicate a problem with the unit, but rather illustrate the units ability to pick up distant targets, sometimes, well beyond what the operator expects to be reading. This is especially true in congested areas, and can be easily remedied by reducing the RANGE setting.

This device complies with Part 15 of the FCC Rules which covers low power non licensed devices. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

WARRANTY

The PHANTOM radar is fully warranted against defects in materials and/or workmanship for a period of ONE FULL YEAR from the date of original delivery, to original owner.

Normal wear and tear, and user abuse is not covered under this warranty. Also, this warranty does not include damage to the unit resulting from accident, misuse, improper installation or operation, or unauthorized repair or alteration.

All service work is to be preformed by factory authorized technicians. To obtain warranty service work, unit must be shipped (at owners expense) to:

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NOTES:

The tuning fork is to check the calibration of the Radar. Strike the tuning fork on a hard surface and hold the fork still in front of the Radar and pull the trigger. The Radar should read the speed stamped on the fork. If it does not, the unit needs to be sent in for repair, or the tuning fork has been damaged.