



INTRODUCTION

The radar (RAdio Detection And Ranging) system is an electronic device used to detect the presence, direction and speed of a target (aerial, terrestrial or maritime). The radar device is a main component in many systems of navigation, air traffic control, meteorological monitoring, military surveillance, astronomy, etc.

The radar sends a high frequency signal pulses and detects the reflected signal (echo) from a radar target in the detection zone.

The Radar Trainer “ERA” is a radar unit, designed by EDIBON, to study the basic principles about the radar technology.

The ERA trainer uses a compact radar which allows students to acquire solid formation about the operation, configuration and installation of a radar system without any previous knowledge. In addition to this, ERA trainer allows students to operate and manage a professional radar system.

Students will be able to know different radar concepts such as radar antenna, range and bearing measurement, rain suppressor, sensitivity control, guard zone, etc.

This trainer is fully provided with a set of practices, that has to be done at the outdoor, that allow students to understand how works the radar technology and allows the student to learn, in a simple and practical way, the terms and concepts used in radar system such as distance measurements of static and moving objects, operation modes, sensitivity control, suppressing clutters, communication with the a GPS module, etc.



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GENERAL DESCRIPTION

The ERA trainer consists of different elements: interface unit, radar antenna, GPS module, extendable tripod stand and mobile cart.

Interface unit:	It contains the display and the radar control system. The interface unit is the main element of the ERA trainer and controls and shows the information provided by the outdoor devices: the radar antenna and the GPS module. It contains the display unit that shows all the navigation data and the radar PPI (Plan Position Indicator). The display unit also includes the buttons to configure the many options of the radar system (setting alarms, sensitivity adjustment, suppressing the clutter, etc). The interface unit includes a battery with a battery charger to facilitate the outdoor operation of the trainer. The interface unit also includes two indicator leds to show the battery status and the connectors to the GPS module and the radar antenna in the front panel.
Radar Antenna:	It contains the directional antenna, the microwave generator and the microwave receiver. The directional antenna can rotate to scan the horizontal plane. It also includes a connection cable to the interface unit, with approximately 10 m. of long, which allows the users to place the radar antenna at safe distance from the interface unit. The radar antenna is mounted on an extendable tripod stand which hold the antenna at an appropriate height. The radar antenna has to be placed at outside of the laboratory in a large and open area.
GPS module:	It is a device that shows the current location, altitude, speed and UTC time information anywhere on the earth using the Global Positioning System (GPS). The GPS module includes a cable to connect to the interface unit, for power supply of the GPS module and communicating with the display unit.
Extendable tripod stand:	Extendable tripod stand to hold the radar antenna at appropriate height. The tripod stand contains a bull's eye level for the radar antenna leveling in uneven grounds.
Mobile cart:	It is a mobile structure to hold the elements of the ERA trainer. It allows user to operate with the ERA trainer at the outdoor. The mobile cart incorporates wheels (strong tires) to facilitate its mobility and the operation in uneven grounds.

SPECIFICATIONS

The Radar Trainer "ERA" consists of:

Interface unit:

It contains the display and the radar control system.

Display unit:

High definition 6" rectangular monochrome LCD display.

Display resolution: 240x320 pixels.

Markers: Heading Line, Bearing Scale, Range Rings, Variable Range Marker (VRM), Electronic Bearing Line (EBL), Tuning Bar, Cursor, Parallel Cursor, Alarm Zone, Waypoint Mark*, North Mark*.

Alphanumeric indications: Range, Range Ring Interval, Display Mode (HU), Interference Rejection (IR), Variable Range Marker (VRM), Electronic Bearing Line (EBL), Stand-By (ST-BY), Guard Alarm (G (IN), G (OUT), UP RANGE), Echo Stretch (ES), Range and Bearing to Cursor, Bearing or L/L Position, Echo Tailing (TRAIL), Trailing Time, Trailing Elapsed Time, Watchman (WATCHMAN), Zoomed Display (ZOOM), Navigation Data*, Heading* (HDC).

*:external data required.

Battery system:

Battery charger (included inside the interface unit).

Battery: nominal voltage: 12Vdc, capacity: 24AH.

Connector to the GPS module.

Connector to the Radar Antenna.

Radar Antenna:

Outdoor operation.

Directional antenna: Micro-strip patch array antenna.

Horizontal polarization.

Frequency 9.4 GHz (X-band).

Antenna rotation speed 24/31/41 rpm nominal (auto-select according to range).

Horizontal Beamwidth less than 6.2°. Vertical Beamwidth 25°.

Connection cable to the interface unit.

GPS module:

High contrast display with gray scale. Display resolution: 120x160 pixels.

GPS Accuracy: 15 m. DGPS (WAAS) Accuracy: 3 m.

Connection cable to the interface unit.

Extendable tripod stand:

Telescopic tripod stand, of anodized aluminum, to hold the radar antenna at the appropriate height. It includes a bull's eye level indicator. Operation range: 1.20 m – 3.05 m. Maximum supported weight: 7.5 kg.

Mobile cart:

Mobile cart to hold the elements of the ERA trainer. It incorporates wheels (strong tires) to facilitate its mobility and the operation in uneven grounds.

Cables and Accessories, for normal operation.

Manuals:

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Familiarization with the trainer.
- 2.- Establish communication with GPS module.
- 3.- Configuration of the radar range.
- 4.- Sensitivity adjustment.
- 5.- Range measurement.
- 6.- Bearing measurement.
- 7.- Setting of the suppressing interference function.
- 8.- Setting of the suppressing rain clutter function.
- 9.- Analysis of the guard alarm function and establish a guard zone.
- 10.- Analysis of the watchman function.

REQUIRED SERVICES

- Electrical supply: single-phase, 220V./50Hz or 110V./60Hz for the battery charger.

DIMENSIONS & WEIGHTS

- Dimensions: 600 x 900 x 1700 mm. approx.
(23.62 x 35.43 x 66.93 inches approx.).
- Weight: 50 Kg. approx.
(110 pounds approx.).

*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



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