EDUCATIONAL ANTENNA TRAINING SYSTEM

Product Overview

The Educational Antenna Training System is a comprehensive RF and microwave laboratory platform designed for practical study of antenna theory, radiation characteristics, polarization, beam patterns, gain measurement, array formation, propagation, and Radar Cross Section (RCS) experiments. The system supports both UHF/L-band and X-band antenna investigations with computer-controlled measurement capability.

System Configuration

A. Antenna Set 1 (0.5 GHz – 1.5 GHz)

Operating Frequency Range

- 0.5 GHz to 1.5 GHz

Included Antennas

Sr. No.	Antenna Type
A.1	Half-Wavelength Dipole
A.2	Extended Dipole (Length > λ/2)
A.3	Folded Dipole with Balun
A.4	Monopole over Ground Plane
A.5	Circular Loop Antenna
A.6	Square Loop Antenna

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

Sr. No.	Antenna Type
A.7	Fixed Yagi Antenna (>3 Elements)
A.8	Adjustable Yagi Antenna
A.9	Log-Periodic Antennas (2 Nos.)
A.10	Drooping Monopole Antennas (2 Nos.)

Experiments

- Radiation pattern measurement
- Polarization studies
- Gain comparison
- Directivity analysis
- Impedance matching
- Antenna array investigations

B. Antenna Set 2 (8 GHz – 12 GHz)

Operating Frequency Range

- 8 GHz to 12 GHz (X-Band)

Included Antennas

Sr. No.	Antenna Type
B.1	Open-Ended Waveguide
B.2	Slotted Waveguide
B.3	Small Aperture Horn Antenna
B.4	Large Aperture Horn Antennas (2 Nos.)
B.5	Helical Antenna (Left-Hand Circular Polarization)
B.6	Helical Antennas (Right-Hand Circular Polarization) – 2 Nos.
B.7	Single Rectangular Patch Antenna
B.8	Parallel-Fed Patch Array
B.9	Series-Fed Patch Array

Applications

- Microwave antenna characterization
- Circular polarization studies
- Array antenna measurements

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- Aperture antenna analysis
- Microwave propagation experiments

C. RF Signal Generators

RF Generator 1

Parameter	Specification
Frequency Range	0.5 GHz to 1.5 GHz
Frequency Tuning	Minimum 200 MHz Tuning Range
Compatibility	Supports all Antennas in Set 1
RF Output	Laboratory Grade RF Signal Source
Connector Interface	RF Compatible Connectors

RF Generator 2

Parameter	Specification
Frequency Range	8 GHz to 12 GHz
Compatibility	Supports all Antennas in Set 2
Output Stability	Suitable for Antenna Measurements
RF Output	Microwave Signal Source

D. Antenna Support System

Features

- Fixed transmitting antenna mount
- Adjustable positioning mechanism
- Multiple antenna adapters
- Supports all supplied antenna types
- Stable laboratory construction
- Precision alignment capability

E. Computer Controlled Receiving System

Mechanical Assembly

- Receiving antenna mast
- Motorized rotation system

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- Integrated shaft encoder
- Precision angular positioning

RF Interface

- SMA antenna connector at mast base
- Compatible with supplied antennas
- Low-loss RF interconnections

Signal Processing

- RF signal detector
- Variable attenuator
- Measurement conditioning circuitry

Data Acquisition

- USB computer interface
- Real-time measurement acquisition
- Computer-controlled antenna scanning
- Radiation pattern recording capability

RCS Measurement Capability

- Complete accessories for Radar Cross Section measurements
- Experimental setup support
- Measurement fixtures and accessories included

Power Requirements

Parameter	Specification
Input Supply	220–240 V AC
Frequency	50 Hz
Phase	Single Phase

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F. Accessories

Included Accessories

Item	Description
F.1	Waveguide to SMA Adaptors for B.1, B.2, B.3 & B.4
F.2	Dedicated Storage Cabinet for Antennas
F.3	RF Cables Compatible with All Antennas
F.4	Interconnection Cables for Data Acquisition System

G. Two-Element Phasing System

Included Items

Item	Description
G.1	Additional Antenna Mast with Vertical Mounting Clip
G.2	RF Power Combiner/Splitter
G.3	30 cm RF Cable
G.4	35.4 cm RF Cable
G.5	40.8 cm RF Cable

Educational Applications

- Antenna array formation
- Phase shift analysis
- Beam steering concepts
- Array factor measurements
- Directional pattern synthesis

Key Learning Outcomes

- Antenna fundamentals
- Radiation pattern measurements
- Gain and directivity analysis
- Polarization studies
- Microwave antenna characterization
- Array antenna techniques
- RF propagation analysis

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- Radar Cross Section (RCS) measurements
- Computer-controlled antenna testing
- RF and microwave laboratory experimentation

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RF NEAR-FIELD H-FIELD PROBE

Product Overview

Precision magnetic field near-field probe designed for RF, EMC, EMI, PCB diagnostics, microwave measurements, and electromagnetic field characterization.

Technical Specifications

Parameter	Specification
Measurement Type	Magnetic Field (H-Field)
Frequency Range	10 MHz to 6 GHz (minimum)
Maximum Supported Frequency	Up to 10 GHz
Measurement Axis	Single Axis
Spatial Resolution	0.5 mm to 1 mm
Probe Head Radius	1 mm to 3 mm
Calibration Data	Included
Output Conversion	H-Field Values (A/m or Tesla)
Connector Type	SMA Female Preferred
Instrument Compatibility	Network Analyzers, Spectrum Analyzers, EMC Systems

Features

- High spatial resolution
- Directional magnetic field sensing
- Near-field mapping capability
- Calibrated measurement data
- Compact probe geometry
- Low disturbance measurement

RF NEAR-FIELD E-FIELD PROBE

Product Overview

High-resolution electric field probe for RF field characterization, EMC investigations, PCB emissions analysis, and microwave diagnostics.

Technical Specifications

Parameter	Specification
Measurement Type	Electric Field (E-Field)

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Parameter	Specification
Frequency Range	10 MHz to 3 GHz (minimum)
Maximum Supported Frequency	Up to 6 GHz
Measurement Axis	Single Axis
Spatial Resolution	1 mm to 5 mm
Probe Head Radius	1 mm to 3 mm
Calibration Data	Included
Output Conversion	Electric Field Values (V/m)
Connector Type	SMA Female Preferred
Instrument Compatibility	Network Analyzers, Spectrum Analyzers, EMC Systems

Features

- Accurate electric field measurements
- High-resolution field mapping
- Directional sensing capability
- Calibrated operation
- Easy integration with RF measurement systems
- Compact and lightweight construction

RF PRE-AMPLIFIER

Product Overview

Broadband low-noise RF pre-amplifier designed for use with near-field E-field and H-field probes to improve measurement sensitivity and dynamic range.

Technical Specifications

Parameter	Specification
Compatible Devices	RF Near-Field E-Field & H-Field Probes
Frequency Range	10 MHz to 8 GHz (minimum)
Maximum Supported Frequency	Up to 10 GHz
Gain	25 dB to 40 dB
Connector Type	SMA Female Preferred
Application	RF Signal Amplification
Operating Mode	Broadband

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Features

- Wide frequency coverage
- Low-noise operation
- Improved measurement sensitivity
- Enhanced dynamic range
- SMA connectivity
- Laboratory-grade construction
- Suitable for EMC and RF testing

Typical Applications

- Antenna Measurement Laboratories
- RF & Microwave Engineering Education
- EMC/EMI Investigations
- Wireless Communication Training
- Radar and Microwave Experiments
- Near-Field Scanning Systems
- Antenna Pattern Measurement
- Research & Development Laboratories
- Academic and Industrial RF Testing

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