

Features:

- * Antenna Training System with over 25 Antennas
- * PLL transmitter and receiver 86-860 MHz.
- * 50 KHz step size with measurement in 0.1 dB resolution
- * 110 dB dynamic range.
- * Directional Coupler for VSWR/ Return Loss.
- * Stepper motor antenna rotator.
- * 1 degree resolution stepper motor
- * USB interface with polar/cartesian plotting software
- * All SMA connectors, Teflon Cables.
- * All antenna gain, return loss and pattern plot provided
- * 1000 location Frequency and level storage in receiver

1. PLL Synthesized Digital RF Transmitter/Receiver



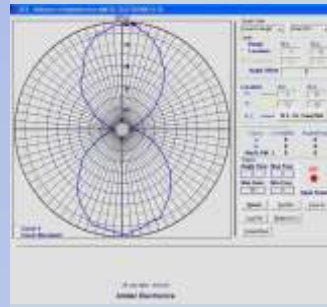
Frequency range: 86 - 860 MHz PLL for Tx and Rx
 Step size: 0.05, 0.1, 0.25, 0.5, 1, 10, 100 MHz
 Accuracy: 0.01%
 Display: 16X2 Backlit LCD
 Controls: Menu, Enter, Escape, Up & Down
 Memory: 1000 frequency store/recall
 Modulation FM: Internal 1KHz/ External Microphone
 RF Level : 0 dBm (FCC complied)
 Attenuator: 35dB internal switchable
 Impedance: 50 ohms SMA
 Measurements: RF level in pW, dBm, dBuV, dBr
 Resolution: 0.1dB
 Dynamic range: 110 dB (75dB log +35dB attenuator)
 Speaker: Inbuilt for Audio output
 USB interface: USB connectivity to PC for antenna plotting using supplied software
 Auto mode: For antenna gain & SWR bandwidth with transmitter & polar/ cartesian plots with Stepper.
 Demodulation: FM Demodulation out
 Rotation: 0-359 degrees with 1 deg resolution
 Angular steps: 1, 5, 10, 45 degrees
 Auto mode: 1. Automatic rotation with receiver
 : 2. Tracking operation with Tx
 Mode: CW/CCW rotation, Fast Slow speed modes
 Down converter: 39MHz out for spectrum analyser
 RSSI: Received Signal strength Indication for Fading analysis
 Power Supply : 100-240V AC, 50-60 Hz

2. Stepper Motor Controller Unit



Display: 16X2 backlit LCD
 Rotation: 0-359 degrees
 Resolution: 1 degree.
 Angular steps: 1, 5, 10, 45°
 Memory: 1000 angular position store/recall
 Auto mode: Automatic rotation with receiver
 Mode: CW/CCW rotation, Fast Slow speed modes
 Power Supply: 100-240V AC, 50-60 Hz

3. Software



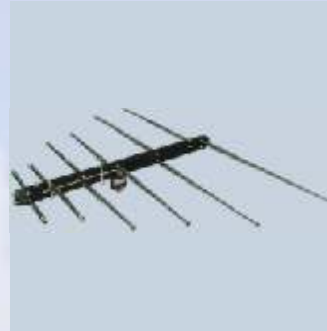
USB interface with polar plotting with log, linear cartesian and polar plots, V_i , V_r & Return loss plots, Multiple pattern overlay, Double cursor, Zoom, Colour editing, 1000 location editor, Absolute/Relative, 3dB/10dB beam-width, Gain, Front to back, Side lobe level and position, Plot rotate, File-edit, save, get.

4. Directional Coupler



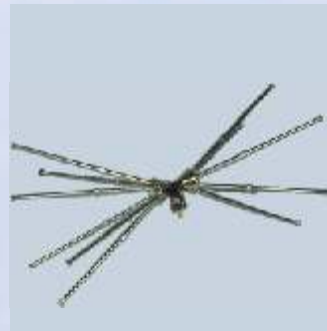
Coupling: 17dB
 Directivity: 20dB
 Insertion Loss: <1.5dB
 Bandwidth: 0.05 -1 GHz
 Usage: Antenna forward & reverse power & VSWR measurements.
 Connector : SMA

5. Log Periodic Dipole Array



S11: >10dB
 Bandwidth: 600 ± 300 MHz
 Gain: 4dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 80°
 Polarisation : Linear
 Front to Back Ratio: >6dB
 Connector : SMA

6. Biconical



S11: >10dB
 Bandwidth: 600 ± 300 MHz
 Gain: 2dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

7. Microstrip Slot



S11: >10dB
 Bandwidth: 850 ± 20 MHz
 Gain: 2dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

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8. Microstrip Annular Ring Patch



$F_c: 0.85 \pm 0.05$ GHz
 $S_{11}: 10 \pm 2$ dB
 Polarisation : Linear
 Gain : 5dBi
 Impedance : 50 Ohms
 Connector : SMA

13. Discone



$S_{11}: >10$ dB
 Bandwidth: 600 ± 300 MHz
 Gain: 0dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

9. Microstrip Circular Patch



$F_c: 0.85 \pm 0.05$ GHz
 $S_{11}: 10 \pm 2$ dB
 Polarisation : Linear
 Gain : 5dBi
 Impedance : 50 Ohms
 Connector : SMA

14, 15. Crossed Dipole



$S_{11}: >10$ dB
 Bandwidth: 700 ± 50 MHz
 Gain: 2dBi
 Beamwidth : E plane 90°
 Beamwidth : H Plane 180°
 Polarisation : Circular LH& Circular RH
 Front to Back Ratio: 0dB
 Connector : SMA

10. Microstrip Triangular Patch



$F_c: 0.85 \pm 0.05$ GHz
 $S_{11}: 10 \pm 2$ dB
 Polarisation : Linear
 Gain : 5dBi
 Impedance : 50 Ohms
 Connector : SMA

16. Yagi 3el



$S_{11}: >10$ dB
 Bandwidth: 700 ± 100 MHz
 Gain: 4dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 80°
 Polarisation : Linear
 Front to Back Ratio: >6 dB
 Connector : SMA

11. Microstrip Semicircular Patch



$F_c: 0.85 \pm 0.05$ GHz
 $S_{11}: 10 \pm 2$ dB
 Polarisation : Linear
 Gain : 5dBi
 Impedance : 50 Ohms
 Connector : SMA

17. Yagi 4el



$S_{11}: >10$ dB
 Bandwidth: 700 ± 50 MHz
 Gain: 5dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 80°
 Polarisation : Linear
 Front to Back Ratio: >6 dB
 Connector : SMA

12. Microstrip Rectangular Patch



$F_c: 0.85 \pm 0.05$ GHz
 $S_{11}: 10 \pm 2$ dB
 Polarisation : Linear
 Gain : 5dBi
 Impedance : 50 Ohms
 Connector : SMA

18. Sleeve



$S_{11}: >10$ dB
 Bandwidth: 750 ± 20 MHz
 Gain: 2dBi
 Beamwidth : E plane 70°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

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ISO 9001:2000
 Quality Management System
 Cert. No. 2919

19. Monopole



S11: >10dB
 Bandwidth: 600 ± 300 MHz
 Gain: 1dBi
 Beamwidth : E plane 70°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

20,21. Dipole L/2 & L/4



S11: >10dB
 Bandwidth: 600 ± 300 MHz
 Gain: 2dBi
 Beamwidth : E plane 70°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

22. Folded Dipole



S11: >10dB
 Bandwidth: 600 ± 200 MHz
 Gain: 2dBi
 Beamwidth : E plane 70°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

23. L/4 Phase Array



S11: >10dB
 Bandwidth: 800 ± 200 MHz
 Gain: 3dBi
 Beamwidth : E plane 70°
 Beamwidth : H Plane 180°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

24. Quad



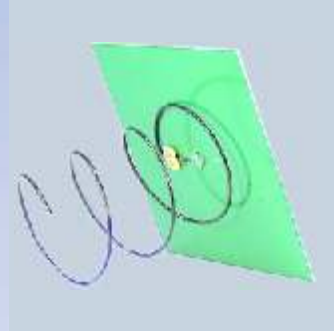
S11: >10dB
 Bandwidth: 600 ± 50 MHz
 Gain: 4dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 80°
 Polarisation : Linear
 Front to Back Ratio: 6dB
 Connector : SMA

25,269. Endfire & Broadside phased array



S11: >10dB
 Bandwidth: 800 ± 50 MHz
 Gain: 3dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 120°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

27,28. Helix LHCP & RHCP



S11: >10dB
 Bandwidth: 750 ± 100 MHz
 Gain: 4dBi
 Beamwidth : E plane 60°
 Beamwidth : H Plane 120°
 Polarisation : Circular RH
 Front to Back Ratio: 6dB
 Connector : SMA

29. Square Loop



S11: >10dB
 Bandwidth: 600 ± 50 MHz
 Gain: 2dBi
 Beamwidth : E plane 80°
 Beamwidth : H Plane 120°
 Polarisation : Linear
 Front to Back Ratio: 0dB
 Connector : SMA

30. Antenna azimuth positioner



Rotation: 0-359 degree
 Azimuth
 Resolution: 1 degree
 Mount: 1/2" BSW Cube
 Offset: Adjustable for phase center
 RCS: Low Non magnetic, non conductive, low dielectric
 Motor: Stepper Motor with heavy duty reduction gearbox

31. Accessories

- 1) Transmitter antenna mounting stand.
- 3) All necessary connectors & Teflon RF cables.
- 4) Students activity & Teachers reference Manual
- 5) Software CD
- 6) Antenna Kit
- 7) Voltage Probe
- 8) Measuring Tape
- 9) RS232 Lead
- 10) SMA-SMA lead 1.5m

E-Manual: Installation Video for ease of Learning

**Dimension : 75 X 55 x 45 cms. Weight : 30 Kg
 Warranty: 3 yrs.**

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Areas of Experimentation and scope of study

- * Inverse square law of propagation.
- * Radiation pattern of an Omni and directional antenna.
- * Vertical, Horizontal and Circularly polarized antennas.
- * Polarization discrimination linear & circular antennas
- * Resonant and non-resonant antenna.
- * Reciprocity of antenna.
- * Current distribution of an antenna.
- * Antenna parameters:
- * Radiation pattern E & H Plane - Polar & Cartesian Plots
- * Directive gain, beam width (Half Power/10dB), front to back ratio, plane of polarization, side lobe level & angle.
- * Antenna resonance, VSWR and bandwidth using directional coupler and adjust the antenna.
- * Comparative study of antennas.
- * Significance of parasitic element dimensions.
- * Construct antenna using antenna kit
- * Voice communication link using antennas. Plus lot more.

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