

Phase Array Antenna Training System PAT20 Features:

- * PLL transmitter and receiver 0.005-2 Ghz.
- * 50 KHz step size
- * RF Power 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
- * RS232 interface with polar/cartesian plotting software
- * Microstrip Phase array antenna, Log Periodic antenna
- * All antenna gain, return loss and pattern plot
- * 1000 Frequency and level storage in receiver
- * ± 35 degree beam steering
- * 4X4 array of patch antennas with individual phase addressing
- * Microwave Absorber panels provided

Description:

Phased array antenna training system has been designed to unravel the mysterious subject of antenna beam steering in lab environment. Beam steering has been an abstract concept with theoretical formulation and computer simulation until now. Such antennas are extensively used in high power radars, which could not be presented as a model in lab for student experiments. The high power of these devices would not be safe for indoor use and exorbitant price would exclude any live practical. We offer a comprehensive system with PLL signal generator for energising the antenna and PLL receiver for testing the beam patterns. Phased array antenna is mounted on Stepper motor controlled rotator for polar plot measurement. Antenna phase controller is provided to steer the beam with any user algorithm.

Amitec PAT20 Technical Specifications: PLL Synthesized Digital RF Transmitter

Frequency range	: 5-2000 MHz PLL in 3 ranges
Step size	: 0.05, 0.1, 0.25, 0.5, 1, 10, 100 MHz
Accuracy	: 0.01%
Display	: 16X2 Backlit LCD
Memory	: 1000 frequency store/recall
Modulation FM	: Internal 1KHz/ External Microphone
RF Level	: 110 dBuV typical
Attenuator	: 40dB (external)
Output Z	: 50 ohms
Auto mode	: Tracking operation with receiver
Power Supply	: 100-240V AC, 50-60 Hz

PLL Synthesized Digital RF Receiver

Frequency range	: 5-2000 MHz PLL in 3 ranges
Step size	: 0.05, 0.1, 0.25, 0.5, 1, 10, 100 MHz
Accuracy	: 0.01%
Display	: 16X2 Backlit LCD
Memory store	: 1000 frequency & level recall
Measurements	: RF power level in dBuV
Resolution	: 0.1dB
Dynamic range	: 110 dB (70dB log +40dB attenuator)
Input Z	: 50 ohm
Speaker interface	: Inbuilt for Audio output PC RS 232 connectivity to PC for antenna Plotting using supplied software
Auto mode	: Data logging for antenna gain & SWR bandwidth with transmitter & polar/cartesian plots with Stepper.
Demodulation	: FM Demodulation out
Down converter	: 39MHz output for monitoring on spectrum analyser
RSSI	: Received Signal strength Indication for Fading analysis

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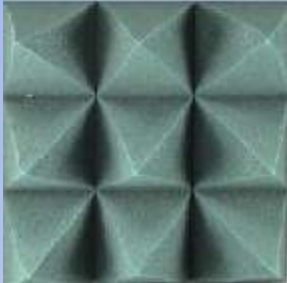
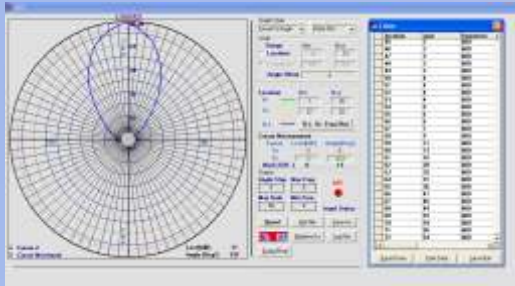
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Stepper Motor Controller Unit

Display	: 16X2 backlit LCD for angle
Rotation	: 0-359 degrees
Resolution	: 1 degree.
Controls	: Menu, Enter, Escape, Up & Down
Angular steps	: 1, 5, 10, 45 degrees
Memory store/	: 1000 angular position recall
Auto mode	: Automatic rotation with receiver
Mode	: Clockwise/Counterclockwise rotation, Fast Slow speed modes
Power Supply	: 100-240V AC, 50-60 Hz

Phase array Antenna

Gain	: 12 dBi
Frequency	: 1850MHz
Beamwidth	: Horizontal 20 degree typical
Input Impedance	: 50 Ohms
Connector	: SMA
Array Element	: Rectangular Patch Antenna, Log-periodic dipole, Tapered slot antenna
Polarization	: Linear X or Y rotatable
Array	: 4X4 (X and Y)
Element Spacing	: Fixed Lambda/2
Amplitude Taper	: Uniform amplitude X & Y
Phase Taper	: Adjustable Broadside
Phase Resolution	: <5degree
Phase shift total	: >360 degree
Beam Scan	: >±35 degrees (X and Y)

Phase Array Antenna Controller

Display	: 16X2 LCD
Display Mode	: Beam Number, Position, Speed
Control	: Digital push switches
Menu	: Reset to broadside, Specify Beam Scan, Incremental shift
Scan Mode	: Manual, continuous, triggered
Beam Sequence	: Incremental, PRBS, Even
Scan Speed	: Selectable
Resolution	: 10bit

Antennas : typical gain & VSWR<1.5

- 1) MIC LPDA 4dBi 0.9-3GHz
- 2) MIC LPDA 4dBi 0.9-3GHz

Software: RS 232 interface with polar plotting with log, linear cartesian and polar plots, Vi, Vr & 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.

Directional Coupler: Directional Coupler is provided with 2 GHz frequency response and 20 dB directivity for antenna forward & reverse power & VSWR measurements.

Accessories

- 1) Transmitter antenna mounting stand.
- 2) Stepper motor controlled mounting stand for rotation of receiving antenna.
- 3) All necessary connectors & Teflon cables.
- 4) Experimental Manual
- 5) Software CD
- 6) Polarization ConnectorX2
- 7) RS232 Lead
- 8) Microwave Absorber Panels

E-Manual: Installation Video for ease of Learning

Areas of experimentation and scope of study

- * Vertical, Horizontal polarized antennas.
- * Resonant and non-resonant antenna, VSWR
- * 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
- * Plus lot more.

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