AntennaLab 57-300

Description

AntennaLab 57-300 is an integrated package of antenna modelling hardware a pc based measurement system for teaching and demonstrating common antenna configurations at all levels of study. It can also be used as a design tool by those engaged in research and development of antenna systems.

AntennaLab is operated in conjunction with a PC and the whole system can easily be accommodated on a standard laboratory bench. The equipment comprises two towers, approximately 1 metre high, one of which contains a low-power generator controlled by a frequency synthesiser, and a motor/shaft encoder assembly to rotate the antenna under test. The antenna being investigated is mounted on a small platform on top of this tower.

The receiver tower contains a receiver controlled by a frequency synthesiser and produces a dc output representing the received signal intensity. A log periodic antenna is mounted on this tower and is not changed in normal use. The receiver and generator synthesisers are synchronised, the two tower assemblies being linked by a five-metre multi-way cable carrying both power and data. The 'generator' tower is linked to the pc.

A selection of components is supplied with the system to enable many of the common antenna types to be constructed.

The measurements are controlled and the results plotted by the pc. The unique and powerful software provides the test interface and provides high quality graphical displays. There are no user adjustments required on the equipment itself, although it is necessary to connect up the required RF configuration for specific measurements. The results are quantitative and, within the limits of environmental factors, are consistent with antenna theory. The assignments in the accompanying Espial software use the combination of hardware modelling and pc instrumentation to provide a powerful aid to understanding this important subject.

Features

- Feedback Espial teaching software
- Integration of hardware and software
- Models and tests real antennas
- Hardware modelling between 650MHz and 4400MHz
- PC based measurement and results
- Rapid, graphic display of antenna characteristics
- Bench-top operation
- Low, safe power output
- Automatic selection of reverse and forward coupler signals
- Automatic self-calibration
- USB interface

AntennaLab 57-300 is a unique package of hardware modelling and software based measurement system that is suitable for teaching the principles of antenna operation, through to advanced antenna design.

AntennaLab uses hardware modelling at frequencies of 650-4400MHz to demonstrate the theoretical principles and practical performance of a wide range of antenna types and systems. AntennaLab is fully supported by assignments and textbooks to cover a wide range of teaching and project work. AntennaLab is complete and requires no additional instrumentation or external power supplies. The system is PC-based, with all measurements for the hardware experimental work being performed by the PC. Signal levels, frequency response, azimuth and elevation plots, return loss and 3-D visualisations are available.

Specification

Espial Software Environment

AntennaLab is provided with Espial Software to perform the assignments. Introductory information about AntennaLab's approach to the subject is followed by details of the available application windows:

- Real time signal level monitor
- Radiation pattern in 2D and 3D in polar and Cartesian formats
- Signal level vs frequency graph window
- Return loss vs frequency graph window

Additional guidance is given on the installation of the hardware and the formatting and configuration of the graphing applications.
Espial Software products offer a more interactive alternative to the traditional assignment manuals.
AntennaLab comes complete with Espial software manual and two reference textbooks.

A PC is required is required to operate AntennaLab with Windows XP or higher (32 or 64 bit) with a USB interface.

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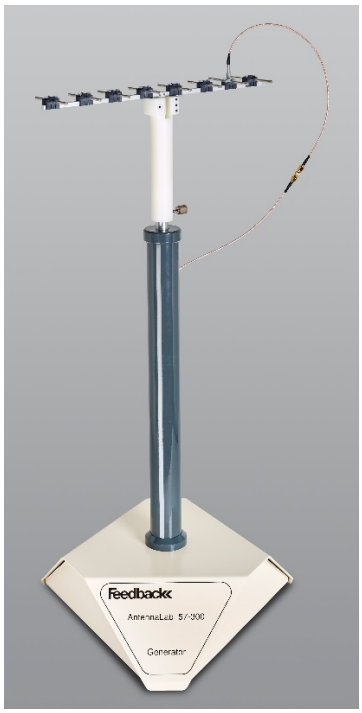

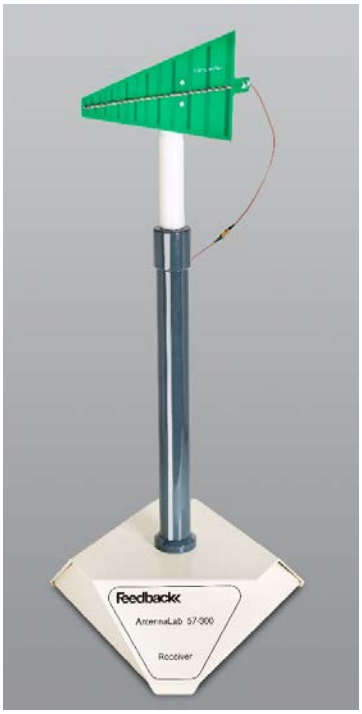

Curriculum Coverage

Assignments covered are:

- Familiarisation
- The Dipole in Free Space
- Effects of the Surroundings
- Two Sources
- Ground Reflections
- Monopoles
- Phased Monopoles
- Measuring Antenna
- Input Impedance
- Parasitic Elements
- Multi-Element Yagi Arrays
- Stacked and Bayed Yagi Arrays
- The Log Periodic Antenna
- The Horn Antenna
- The Dish Antenna

Polar Plot Return Loss Plot
Multiple Polar Plots
Frequency Plot Multiple Frequency Plots
Signal amplitude bar graph
Multiple Polar Plots

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Specification

Modelling Hardware

- Operating frequency 650 - 4400MHz
- Smallest frequency step 1MHz
- Transmitter power
- Maximum 10mW
- Normal 1mW
- Receiver bandwidth 10MHz
- Receiver dynamic range 70dB
- Receiver dB output precision 8-bit
- Transmitter output impedance 50 ohms
- Receiver input impedance 50 ohms
- Receiver linearity ±1dB
- Maximum frequency step rate 25 per second
- Transmitter frequency accuracy ±100kHz
- Maximum antenna rotation speed 90 degrees/second
- Antenna position resolution 1 degree
- Receiver input for 1dB compression 5mW
- Transmitter output power variation over full frequency range 6dB
- Transmitter mismatch capability Infinite
- RF connection system SMA
- Normal receiving antenna log periodic
- Height of antenna towers 1 metre
- Tower spacing 2 to 5 metres
- Computer connection USB

Antenna characteristics measured

- Foward gain
- E & H plane polar plots
- 3dB beamwidth
- Maximum side lobe
- Front to back ratio
- Polarization isolation
- Return loss

All of these parameters are measured with respect to frequency.

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Tender Specification

A computer controlled trainer comprising two towers, each approximately one metre high, one of which should be a low power generator, controlled by a frequency synthesizer, and a motor/shaft encoder assembly to rotate the antenna under test through at least 360°. The antenna system to be investigated should be mounted on top of this tower. The second tower should contain a receiver, controlled by a frequency synthesiser, which produces a dc output representing the received signal intensity. The system should operate in conjunction with a PC with USB interface to display E & H plane polar diagrams and frequency responses over the range 650MHz to 4400MHz. The whole system should easily be accommodated on a normal laboratory bench. Computer delivered teaching material and two reference textbooks should be provided with the system.

Feedback

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