

Educational Training Kits

Atten Electronics is a pioneer in manufacturing RF Training kits which is widely used in Universities and Educational Institutions. The training kits are designed and manufactured keeping in mind the simple theory of easy operation and understanding. These kits enable the students to understand and know the technical working of the RF products in the real world.

Students can perform various experiments and understand the fundamentals of the RF Technology. AT3000 Waveguide Training System, AT3200 Antenna Training Kit and AT RF3030/RF3020 RF Training kits are ideal learning tools for the aspiring engineers.



11 Waveguide Experiments

AT3000 Waveguide Training System



20 RF Experiments

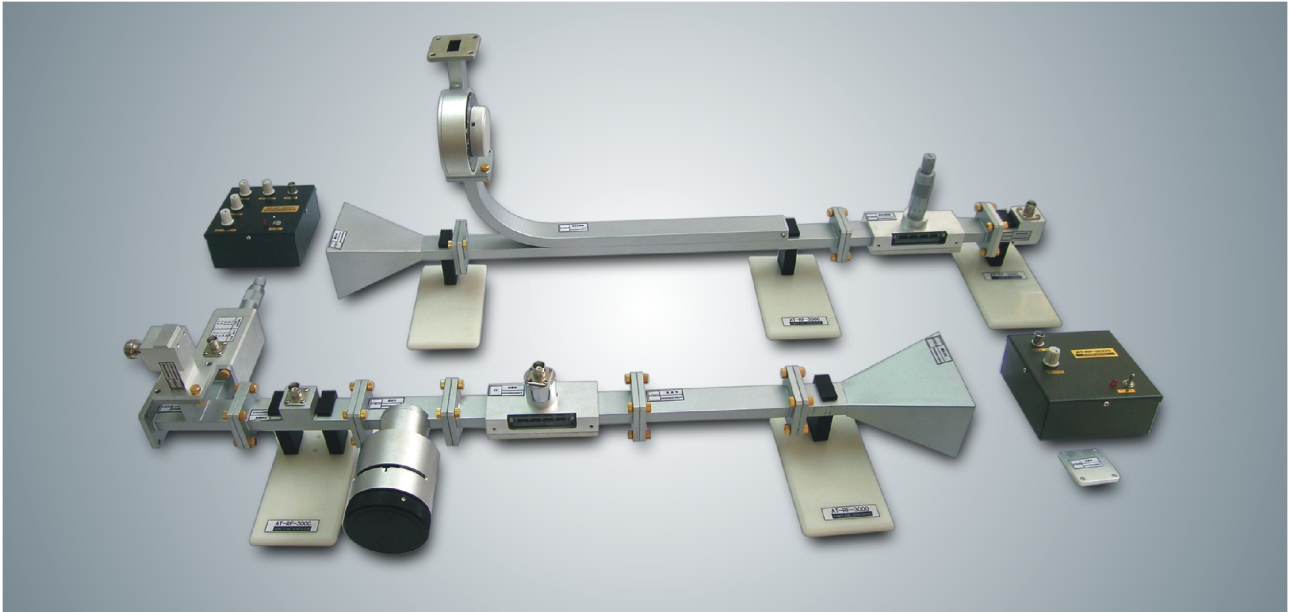
AT3030 RF Training System



12 Antenna Experiments

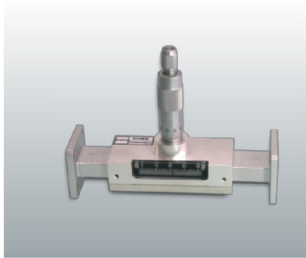
AT3200 Educational Training kits

AT3000 Waveguide Training System

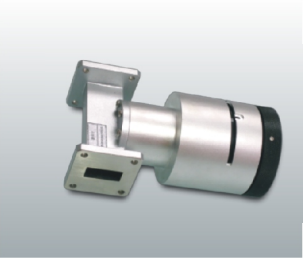


AT3000 Three Centimeters Waveguide Training System to provide users an in-depth training on microwave waveguide device. This training kit can be used in under standing the transmission characteristics of the frequency and all-round understanding of the way in the use of universal frequency bandwidth in the X series.This experimental demonstration of frequency can be done in most simple method using this kit. Microwave radio communication network is very important in our daily life. For example, high-quality long-distance calls,sometimes through satellite, radio communication system. A special performance of the microwave system is based on the high frequency microwave propagation direction, this feature is very similar

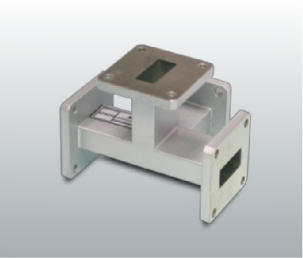
to light. In addition, The immune function which reduces the High-intensity microwave frequency noise is an important aspect of microwave communication during long-distance transmission. AT3000 Three Centimeters Waveguide Training System is a very effective learning tool: The advantage of the following waveguide transmission is providing a wide variety of functional Demonstration Experiment , also related to the applications of spectrum, horn antenna transmitting and receiving. The modular structure of the practical experiments is in a very simple and flexible installation component, which can be incorporated in an equipment box which is easy to carry and transport.



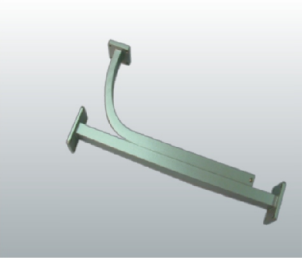
Slide Crew Turner



Frequency Meter



Thybird Tee



Directional Coupler

Exp.No	Title of Exp.	Purposes of Exp.	Remarks
Exp.1	Microwave Test System understanding and debugging	Understanding the overall concept of Microwave Test System,understanding and the effects to output signal source by changing the power supply and cavity length	Basic Experiment
Exp.2	Slotted line adjusting and crystal calibration	Learn how to correctly adjust and use of slotted line,be familiar with methods of Crystal calibration and Detector Law, the measurement of frequency wavelength in the waveguide.	Basic Experiment
Exp.3	Measurement of voltage standing wave ratio	Learn how to correctly adjust and use of slotted line, be familiar with methods of Crystal calibration and detector Law,the measurement of frequency wavelength in the waveguide.	Basic Experiment
Exp.4	Technology of Impedance measurement and deployment	Be familiar with the principle and method of the measurement of the standing wave ratio and impedance,Learning matching technology, be familiar with the Smith Chart	Basic Experiment
Exp.5	Measurement and application of Directional coupling	Be familiar with the main features of the directional coupler,Master the main parameters and measuring method of directional coupler,the basic principles and measuring methods of attenuation	Basic Experiment
Exp.6	Hybrid tee matching test	Be familiar with characteristics and the corresponding measuring method of hybrid tee	Basic Experiment
Exp.7	Crystal detector calibration	Understanding Theory and Application of crystal detector.	Basic Experiment
Exp.8	Horn antenna gain and the vertical direction measuring	Understanding the principle,gain,principle of direction chart,Concept and the measuring methods of horn antenna.	Basic Experiment
Exp.9	The measurement of two ports microwave network parameters	The arbitrary two-port network scattering parameters measurement	Basic Experiment
Exp.10	Measuring attenuation and phase shift	Understanding the characteristics and applications of attenuation and phase shifter	Add phase shifter
Exp.11	8.2~12.4GHz Time-domain waveform measurement	Understanding the concept of time-domain microwave spectrum,Square wave of microwave spectrum,the impact of the Repetition frequency and pulse width to the wave	Add AT8073 frequency mixer and 8.2-12.4GHz signal generator

AT3030/AT3020 RF Training System Kit



AT-RF3030 RF Training System settings is training to enable students through increased access to the radio frequency system's basic structure, working principle, simulation analysis,test equipment and measurement skills in a rational and perceptual knowledge. To master the concept of time domain and frequency domain, the transmission lines, radio wave propagation, antennas, R F modules, and radio frequency communications, and other basic concepts, and learn how to use important therefore test instruments.

AT-RF3030 Training system uses Radio Frequency Modular Training for the structural design of experiments in the training provided a very simple, flexible assembly, while equipment can be integrated in a box, easy to carry and transport. The module circuit use all microstrip circuit design, have transparent plexiglass on the cover and can be clearly observed that the structure of all microstrip circuit.

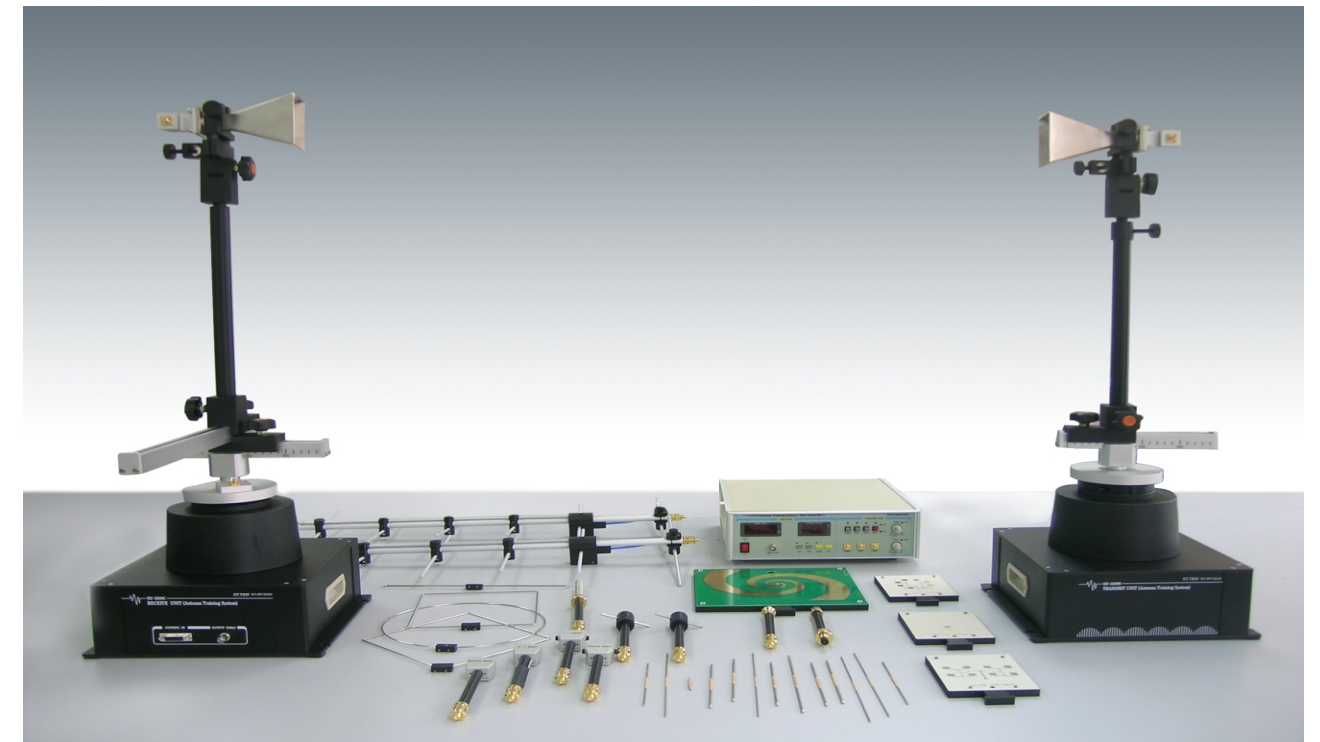
Name	Quantity
SMA-50 Ω Terminal load	3
SMA Open circuit load	1
SMA Short circuit load	1
SMA-50JJ Connector	3
SMA-50KK-1 Connector	2
SMB-C-TKW1.5-3X300 Power cables linking	4
SFF-1.5-50-1Shielding Line	13
BNC-SMAtransformer	2
Coaxial attenuator 10dB	1
Coaxial attenuator 20dB	1
SMB-JJ Connector	9
SMB-50kkk Connector	3
SYV-50-2-1 Shielding Line	6
Technical notes	1
Experimental reference books	1

AT-RF3030: 3.0GHz
 AT-RF3020: 1.0GHz



Parts in AT-RF3020 Kit

AT3200 Antenna Training System



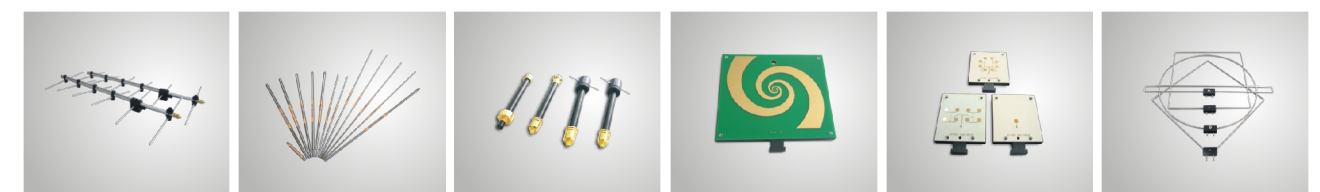
AT3200 Antenna Training System is including the transmission mode and augmented antenna. According to the different types of operation there is different antenna. RF signal generator controls the direction of the antenna and provide 500MHz, 2GHz, 10GHz RF signal.

Since the Antenna Training System using higher-frequency, it is possible to do experiments of the propagation velocity in the narrow band, and it is also make the relocation and safekeeping much easier. Especially, after the radio transponder transmitting and receiving antenna appeared. This antenna is used for satellite reception; it is used more for practical training.

The quantity and distance of Dipole and anode is under control. You can gain characteristics and the right direction for independent design.

This System Consists of

- a Half-wave Dipole Antenna
- Folded Dipole Antenna
- $\lambda/4$ Grounding Antenna
- Full-Wave Loop Antenna
- Drooping Antenna
- Yagi Antenna
- Spiral Antenna
- Helical Antenna
- Horn Antenna
- Single Patch Antenna
- 2 Dimension Array Antenna
- Circle Arranging Antenna.
- The frequency range from 500MHz-10GHz.



Yagi Ant.

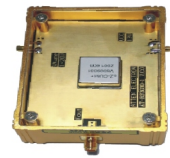
Monopole/Dipole Ant.

Drooping Antenna.

Spiral Ant.

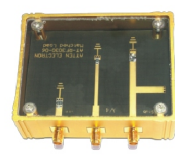
MicroStrip Planar Array Ant.

Loops



VCO

F=1300-2350MHz、
Po \geq 5dBm
Adjustable Voltage:0~20V



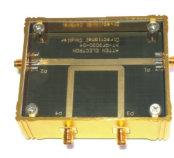
Matching Load

50 Ω Matching Load、
50 Ω -100 Ω
1/4Wavelength Matching Load、
50 Ω -100+j80 Ω



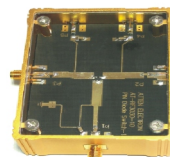
Microstrip ring

Fo=2000MHz \pm 50MHz
 Δ F \geq 400MHz、
Insertion loss L \leq 3dB
Insertion loss I \geq 15dB



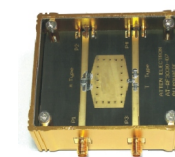
Directional couplers

Single-directional coupling
Fo=2000MHz \pm 50MHz
 Δ F \geq 800MHz、
C=10 \pm 2dB I \geq 20dB



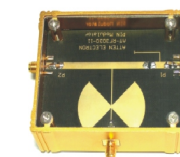
PIN RF switching

Use PIN Diodes F=750-2500MHz
Insertion loss L=3dB M
any 1 election for the choice of 2



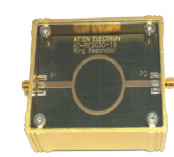
Attenuator

T/ π type、
F: 1000-2500MHz
L=10 \pm 1dB



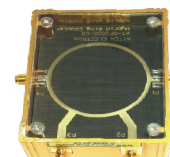
PIN Modulator

1KHz Square wave modulation,
Modulation m=30%-90%



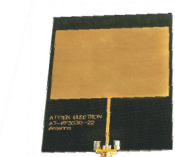
Round resonator

Fo=2000 \pm 50MHz
Insertion loss L \leq 7dB
 Δ F \geq 30MHz



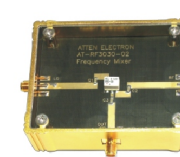
Hybrid Ring

Fo=2100 \pm 50 MHz
 Δ F \geq 450MHz
[Σ / Δ \geq 20 dB]



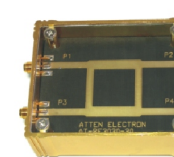
Microstrip Antennas

F=1960 \pm 30MHz
G \geq 5dB
 Δ F=40MHz



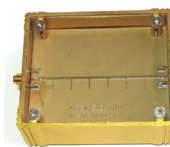
Mixer

RF/LO: F=200-3000MHz、
IF=50-1000MHz、
Loss L \leq 12dB (PLO \geq 7dBm)



Branch coupler

Fo=2050 \pm 50 MHz
 Δ F \geq 300MHz
D \geq 12dB



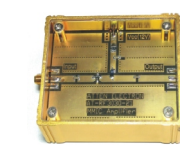
Filter

LPF: Δ F=0-2100MHz \pm 50MHz
L \leq 1.5dB
BPF: Fo=1950 \pm 50 MHz
 Δ F \leq Fo*15%MHz
HPF: F \geq 1800MHz \pm 50MHz
L \leq 1dB
BSF: Fo=1800 \pm 50 MHz
 Δ F \geq 600MHz [L \geq 25dB]
 Δ F \leq 1500MHz [L \leq 3dB]



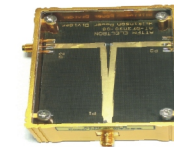
Mismatch load

OPEN、SHOUT、
200 Ω Mismatch load



RF Amplifiers

F=50-3000MHz
G \geq 10dB
NF \leq 4dB



Power Distributor

F=0-3000MHz、
Effective bandwidth
 Δ F=1000-3000MHz
I \geq 10dB

AT437C Power Meter



NEW

(10MHz~12.4/18.0GHz)

AT437C is a low cost high performance microwave power meter for microwave power measurement. It can measure the frequency range from 10 MHz to 12.4/18.0 GHz. It can measure power levels 1uW~100mW. It's a portable design keeping in mind the bench and field service application. AT437C power indicator from its AT11801 power sensors and components.

The high performance and accuracy is obtained by the Power Sensor by chopper and by the linear correction circuit components. Chopper is using high-sensitivity, low-noise MOS-FET switch and components Series chopper. Its main role is to transform through the probe by the power of DC input signal modulation signal into equivalent exchanges, and through the CPU to carry out for the processing.

Microwave power meter have preamplifier as the high-gain transistor and the high-impedance for power. Low-barrier comprising operational amplifier with a gain amplifier exchanges about 600 hybrid amplifier. Its superior performance can fully meet the educational institutions, laboratories and companies, and other units using microwave power measurements.

Specifications

- Frequency Range: 10MHz~12.4/18.0GHz
- Power Range: 1uW~100mW
- Readout Accuracy: DATA±8%
- VSWR: ≤1.25/1.4
- Power Reference: 50MHz 1.00mW±1.5%
- Display Resolution: 0.01 dB
- Recorder Output: 0~1Voltage, Impedance output 1KΩ
- Display: W, mW, uW, dBm, dB
- Line Voltage Range: 220VAC±10%, 50Hz~60Hz, 20W
- Size: 260mm(L)x250mm(W)x110mm(H)
- Weight: about 3.7 Kg.
- Options: RS-232



Power Supply

The R&D department of Shenzhen ATTEN Electronics Co., Ltd has more than 17 years experience in producing the regulated DC power supply, ATTEN designs 17 series and thousand kinds of regulated DC power supplies according to different requirements. Our power supplies are suitable for the production lines, for experiment in any university and research departments. We can provide perfect solution for the stable and safe power supply.

We focus on the power world:

- Production series: 0~300V, 0~900A
- Solutions: Design it according to your requirements
- Quality: Stable & High performance
- Service: We can provide perfect service for you any time

Programmable Power Supply

PPS3201/PPS3202 Programmable Power Supply

NEW

