

A group of RF Design / Antenna / Microwave Training System

YRFDT-1000 / YMW-1000 / YMW-2000 / YMW-5000 / YRFSG-1000A

YMRAA-1000 / YARPM-1000A / YMATS-1000 / YWATS-2002

These equipments provide trainees with chance to design, manufacture and measure microwave communication system by applying microwave designing theory. Also, experiments on standing wave, fading, wave loss, doppler effect are provided to help trainees understand characteristics and radio patterns of various antennas in addition to wave features in mobile communication.

RF Attenuator / Amplifier Training Kit



YMRAA-1000

Antenna Radiation Pattern



YARPM-1000A

Wave and antenna Training System



YWATS-2002

RF Signal Generator



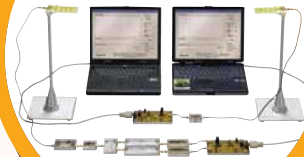
YRFSG-1000A

Antenna Training System



YMATS-1000A

microwave communication Trainer



YMW-2000 / YMW-5000

RF Design Technology Trainer



YRFDT-1000

Microwave Experiment Kit



YMW-1000

RF Design Technology Trainer

Model: YRFDT-1000



YRFDT - 1000 Features

1. Helps users acquire basic RF circuit designing skills.
2. Helps users acquire RF module manufacturing skills.
3. Provides RF circuit measuring practices.
4. Provides chip components' value measuring practices in high frequency band.

YRFDT - 1000 helps users understand basic and important techniques of RF circuit design through theories, manufacturing practices and measuring practices.

YRFDT - 1000 Functions

- 1) Understanding port extension skill.
- 2) Understanding how to measure chip impedance and changes of the impedance.
- 3) Understanding principle of microstrip stub and impedance calculation.
- 4) Understanding RF choke design and characteristic measurement.
- 5) Impedance matching : LC matching converter, Stub matching, LC Matching in transmission line.
- 6) LC filter1 : Understanding types and operation of low pass filter, Implementing them on microstrip lines and measuring characteristic values.
- 7) LC filter2: Designing&manufacturing band pass filter and understand its characteristics.
- 8) Designing, manufacturing and tuning monopole antenna.
- 9) Designing microstrip patch antenna and understanding power feed.

YRFDT - 1000 Training contents

- Chapter 1. Port Extension
- Chapter 2. Measuring Chip Impedance
- Chapter 3. Microstrip stub
- Chapter 4. RF choke
- Chapter 5. Impedance Matching 1
(using lumped element L, C)
- Chapter 6. Impedance matching 2
(using a converter)
- Chapter 7. Impedance matching 3
(using stub matching)
- Chapter 8. Impedance matching 4 (using L and C loaded on transmission line)
- Chapter 9. LC low pass filter
- Chapter 10. LC bandpass filter
- Chapter 11. Monopole Antenna
- Chapter 12. Microstrip Monopole Antenna
- Chapter 13. Microstrip Patch Antenna 1
- Chapter 14. Microstrip Patch Antenna 2
- Chapter 15. Microstrip Patch Antenna 3

YRFDT - 1000 Specifications

Items	Specifications
Frequency Band	20[Mhz] ~ 2[GHz]
Impedance	50[]
Substrate material	FR - 4
PCB thickness	0.8[mm]
Dielectric constant	4.4
Operating Temperature	- 20 ~ 50
Relative Humidity	0% ~95%

YRFDT - 1000 Components

Items	Spec	Q ty
The finished PBA		52 types
Practice and manufacturing RF PCB		56 ea
Chip component (R.LC)	46 kinds	2,300ea (46kinds x 50ea)
Cooper tape	A4	1 ea
Enameled wire	10MT	1 roll
RF Cable		2 ea
Textbook		1 book
Carrying bag		1 ea
Chip components measuring JIG		1 set

Microwave Communication Trainer

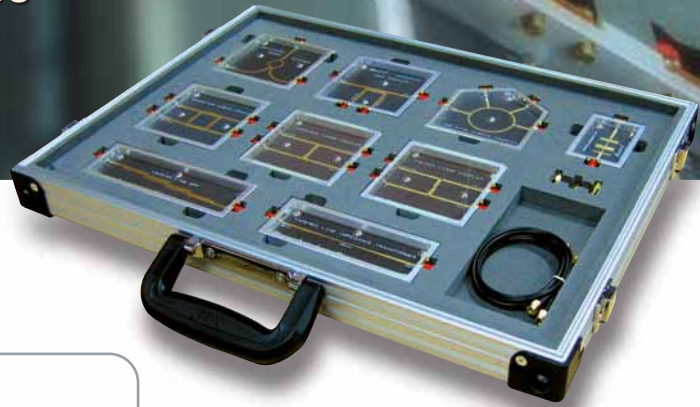
Model: YMW-1000/ YMW-2000 / YMW-5000

An experimental equipment to educate Microwave Component Design, Manufacturing, and Measuring techniques include Microstrip line theory and Microwave device design theory.



Microwave Experiment Kit

Model: YMW-1000



YMW-1000 Function

- 1) Study the microstrip line design theory
- 2) Study the basic theory of microwave component
- 3) Microwave component design & simulation
- 4) Microwave component manufacturing
- 5) Microwave component measurement
- 6) Microwave component analysis of characteristics

YMW-1000 Characteristics

Experiment in Microwave component design and Manufacturing & Measurement using microstrip line theory.

An Experimental Kit to educate basic concept of Microstrip Line Design and Microwave Component Design.



* Equipments are option.

YMW-1000 Specifications

Items	Specifications
Frequency	2.0 [GHz] , 2.4 [GHz]
Input Impedance	50 [ohm]
Connecting Loss	0.3 [dB]
Substrate material	Teflon
PCB thickness	0.787 [mm]
Dielectric Constant	2.5

Components

Main Components	9 EA
Carriage bag	1 EA
Textbook	1 EA
RF Cable	2 EA
50ohm terminator	2 EA
Answer Sheet	1 EA

YMW-1000 Training Contents

Part I Introduction

Chapter 1 Microwave Experiment Kit Overview

Part II Experiment of the Microwave passive Component

Chapter 2 Tapered Line Impedance Transformer

Chapter 3 Wilkinson Power Divider

Chapter 4 Quadrature Hybrid Coupler

Chapter 5 Coupled Line Directional Coupler

Chapter 6 Folded Lange Coupler

Chapter 7 Unfolded Lange Coupler

Chapter 8 180° Hybrid

Chapter 9 Stepped Impedance Low Pass Filter

Chapter 10 Coupled Line Band Pass Filter



Microwave Communication Trainer (2.4GHz)

Model: YMW-2000



AN 50178251 0001 [March 30, 2010]

YMW-2000 Features

Allowing students to train themselves about Experiment in microwave components design and manufacturing & Measurement applying microstrip line theory and microwave device design theory.
For these experiment, standard devices and Specification & documents are supplied with software program as reference.

YMW-2000 Functions

- Communication using the Microwave system
- Measurement in Microwave system
- FSK Modulation & Demodulation in Microwave band
- File transfer and data transmission
- Understanding of the microstrip line design theory
- Understanding of the basic theory of microwave devices
- Design and simulation of Microwave devices
- Experiments in manufacturing and measurement of Microwave devices.
- Signal Generator and Spectrum Analyzer can be used for measuring the wave form of all the substrates manufacturing by students.

YMW-2000 Specifications

1) General Specification

Frequency band	2.4[GHz] ~ 2.5[GHz]
Modulation	FSK
Bit rate	4800 ~ 14400[bps]
Output power	+ 4.5 [dBm] Max
Impedence	50 [ohm]
Substrate material	Rogers RO4003C
PCB thickness	0.508 [mm]
Dielectric constant	3.38

2) Module Specification

Low Noise Amplifier	Frequency band	2.4~2.5 [GHz]
	Gain	26 [dB]
	Noise Figure	2.5 [dB]
	Input P1dB	- 25 [dBm]
Power Divider	Type	2 - way, Wilkinson
	Frequency band	2.4~2.5 [GHz]
	Return loss	14 [dB]
Band Pass Filter(2.4GHz)	Insertion loss	0.5 [dB]
	Type	Edge-coupled
	Center Frequency	2.4 [GHz]
Band Pass Filter (2.5GHz)	Return loss	10 [dB]
	Insertion loss	7.0 [dB]
	Type	Edge-coupled
RF Amplifier	Center Frequency	2.5 [GHz]
	Return loss	10 [dB]
	Insertion loss	7.0 [dB]
Antenna (Transmitting & Receiving)	Frequency band	2.4~2.5 [GHz]
	Gain	15 [dB]
	Type	YAGI (PCB type)
	Center Frequency	2.45 [GHz]
	Gain	9 [dBi]
	VSWR	1.5:1



YMW-2000 Application Program

- Communication software : Microwave Communication Program V1.0
- Design Simulator : Ansoft Designer SV

YMW-2000 Training Contents

- Chapter 1 Introduction to Microwave Communication Trainer
- Chapter 2 FSK Modulator
- Chapter 3 RF Amplifier
- Chapter 4 Antenna
- Chapter 5 Low Noise Amplifier
- Chapter 6 Power Divider
- Chapter 7 Band Pass Filter
- Chapter 8 Detector
- Chapter 9 FSK Demodulator
- Chapter 10 Microwave Communication Experiments



YMW-2000 Components

Device	FSK Modulator	1EA
	FSK Demodulator	1EA
	RF Amplifier	2EA
	Detector	2EA
	Band Pass Filter 2.4GHz	1EA
	Band Pass Filter 2.5GHz	1EA
	Power Divider	1EA
	Low Noise Amplifier	1EA
	Yagi Antenna	2EA
	DC Power Adaptor(1.2V / 1.5A)	2EA
	DC Power Cable	2EA
	RS - 232C Cable	2EA
	RF Cable	3EA
	Carriage bag	1EA
	Antenna Cable(75cm)	2EA
	Antenna Supporter	2set
	SMA Adaptor	6EA
	50 ohm Terminator	1EA
	Software program	1EA
	Textbook	1EA
	Answer sheet (Included in CD)	1EA
	Program CD	1EA

Microwave Communication Trainer (5.8GHz)

Model: YMW-5000



YMW-5000 Features

Allowing students to train themselves in microwave components design and manufacturing & measuring by using Passive and Active devices and program at 5.8GHz. For these experiment, standard devices and specification & documents are supplied with software program as reference.

YMW-5000 Specifications

1) General Specification

Frequency band	5.75[GHz] ~ 5.85[GHz]
Modulation	FSK
Bit rate	4800 ~ 14400[bps]
Output power	+ 4.5 [dBm] Max
Impedence	50 [ohm]
Substrate material	TLY - 5A - 0200 - CH/CH
PCB thickness	0.508 [mm]
Dielectric constant	2.17

2) Module Specification

Low Noise Amplifier	Frequency band	5.75~5.85 [GHz]
	Gain	26 [dB]
	Noise Figure	2.5 [dB]
Power Divider	Type	2 - way, Wilkinson
	Frequency band	5.7~5.9 [GHz]
	Return loss	14 [dB]
Band Pass Filter(5.7GHz)	Type	Edge - coupled
	Center Frequency	5.7 [GHz]
	Return loss	14 [dB]
Band Pass Filter (5.8GHz)	Type	Edge - coupled
	Center Frequency	5.8 [GHz]
	Return loss	10 [dB]
RF Amplifier	Frequency band	5.75 ~ 5.85 [GHz]
	Gain	14 ± 1 [dB]
	Input	- 5 [dBm]
Antenna (Transmitting & Receiving)	Type	YAGI (PCB type)
	Center Frequency	5.8 [GHz]
	Gain	9 [dBi]
	VSWR	1.5:1

YMW-5000 Functions

- Communication using the Microwave system
- Measurement in Microwave system
- FSK Modulation & Demodulation in Microwave band
- File transfer and data transmission at 5.8GHz
- Understanding of the microstrip line design theory
- Understanding of the basic theory of microwave devices
- Design and simulation of Microwave devices
- Experiments in manufacturing and measurement of Microwave devices.
- Signal Generator and Spectrum Analyzer can be used for measuring the wave form of all the substrates manufacturing by students.

YMW-5000 Application Program

- Communication software : Microwave Communication Program V1.0
- Design Simulator : Ansoft Designer SV

YMW-5000 Training Contents

- Chapter 1 Introduction of Microwave Communication Trainer
- Chapter 2 FSK Modulator
- Chapter 3 RF Amplifier
- Chapter 4 Antenna
- Chapter 5 Low Noise Amplifier
- Chapter 6 Power Divider
- Chapter 7 Band Pass Filter
- Chapter 8 Detector
- Chapter 9 FSK Demodulator
- Chapter 10 Microwave Communication Experiments

YMW-5000 Components

Device	FSK Modulator	1EA
	FSK Demodulator	1EA
	RF Amplifier	3EA
	Detector	2EA
	Band Pass Filter 5.7GHz	1EA
	Band Pass Filter 5.8GHz	1EA
	Power Divider	1EA
	Low Noise Amplifier	1EA
	Yagi Antenna	2EA
	DC Power Adaptor	2EA
	DC Power Cable	2EA
	RS-232C Cable	2EA
	RF Cable	3EA
	Carriage bag	1EA
	Antenna Cable	2EA
	Antenna Supporter	2set
	SMA Adaptor	7EA
	50 ohm Terminator	1EA
	Software program	1EA
	Textbook	1EA
	Answer sheet (Included in CD)	1EA
	Program CD	1EA

RF Signal Generator

Model: YRFSG-1000A



YRFSG - 1000A Features

1. Signal Generator has wide frequency band.
2. Output frequency and power level is controlled by knob.
3. MENU is displayed in Graphic LCD(128x64 dots).

YRFSG - 1000A Specification

Frequency	0.1 ~ 6.0 GHz (Variable 1MHz Step)
Output Power	-10 ~ +5 dBm, 1dBm Step
Oscillation	PLL frequency synthesized
Impedance	50[ohm]
Supply Power	AC Max 264V
Harmonics	100~2000MHz -30dBc
	2000~3000 MHz -22dBc
	3000~5000 MHz -25dBc
	5000~6000 MHz -30dBc
Sub - harmonic	4401~6000 MHz -20dBc

YRFSG - 1000A System configuration

- Main body with Hardware
- Operating software

YRFSG - 1000A Components

Main Equipment	1
Accessory Carrying Bag	1
Manual	1
RF Coaxial Cable	2
Power Cable	1



RF Attenuator / Amplifier Training Kit

Model: YMRAA-1000



YMRAA - 1000 features

1. To amplify or attenuate the frequency in the high frequency bands.

YMRAA - 1000 composition

Items	Q'ty
Main System	1set
USB Cable (A to B)	2EA
CD (ATT/Amp Program, User Manual)	1EA
SMA RF Cable(75cm)	4EA

YMRAA - 1000 specification

Attenuated Part	Spec	
Frequency Range	10-4000MHz	
Max Input RF Power	+33dBm(2W)	
VSWR	1.65(Max)	
Attenuator	0-63.5dB(0.25 step)	
Setting Time	100us	
Insertion Loss	10-100MHz	-2.0dB
	101-500MHz	-2.2dB
	501-3000MHz	-2.9dB
	3001-4000MHz	-3.8dB
Connector	Power / Interface	USB
	FR IN / OUT	SMA (F)

Amplified part	Spec	
Frequency Range	20MHz-6000MHz, 5MHz step	
Gain	5-25dB, 5dB step	
Accuracy	± 0.5dB (SMA - SMA)	
Gain BW	50MHz (Calibrated)	
Power/Interface	USB	

Antenna Radiation Pattern Measurement

Model: YARPM-1000A



Y ARPM - 1000A Features

- RF signal generator is not included in ARPM - 1000A
- Signal generator should be prepared as external equipment.
- Practice of Antenna characteristics is possible
- Suitable for training Antenna designing, manufacturing, measuring.
- Radiation pattern can be measured without extra equipment
- Auto calibration function is used to set maximum input power position

Y ARPM - 1000A Functions

1. Practice for Antenna Characteristics
 - 1) Practice for the Radiation pattern [Supplying Antenna]
 - Yagi antenna,
 - Chip antenna,
 - Dipole antenna,
 - Monopole antenna,
 - Loop antenna,
 - Patch antenna,
 - Inverted - F antenna,
 - Array Patch antenna
 - 2) Practice for the Antenna characteristics by varying source frequency
 - Resonance frequency
 - Gain
 - 3) Practice for Designing, Manufacturing and Measuring
 - Yagi antenna,
 - Loop antenna,
 - Dipole antenna
2. Practice in GUI Environment



Contents of Y ARPM - 1000A Textbook

- Part 1. Introduction and Installation of Program
 - Chapter 1. Introduction of system
 - Chapter 2. Program Installation and Instruction
- Part 2. Practice for Antenna characteristics
 - Chapter 3. Practice for Dipole antenna
 - Chapter 4. Practice for Yagi antenna
 - Chapter 5. Practice for Monopole antenna
 - Chapter 6. Practice for Loop antenna
 - Chapter 7. Practice for Ceramic Chip antenna
 - Chapter 8. Practice for Inverted F antenna
 - Chapter 9. Practice for Patch and Array Patch antenna
- Part 3. Practice for antenna Impedance matching and antenna Gain measurement.
 - Chapter 10. Practice for antenna Impedance matching
 - Chapter 11. Practice for antenna Gain measurement
- Part 4. Practice for antenna Design and Manufacture
 - Chapter 12. Manufacture of Dipole antenna
 - Chapter 13. Manufacture of Loop antenna
 - Chapter 14. Manufacture of Yagi antenna

Y ARPM - 1000A Specification

Items	Specifications	
RF	Frequency	range of ARPM - 1000A DC ~ 8 GHz (by using external signal source)
	Supplied Antenna types	450 MHz : Dipole x2(PCB)
		915 MHz : Dipole x2, Monopole
		2.4 GHz : Dipole x2, Chip, Patch, Yagi x2, Inverted F, Array Patch, Loop
		5.6 GHz : Horn[Option]
Practice for Antenna design & Manufacturing	Yagi, Loop, Dipole	
Control	Control Method	Micro - Controller
	Antenna Angle Control	360 ° , 3600 step 0.1 ° / Step
	Angle Control Range	0~360 °
	Motor Rotation	Front, Back, Step

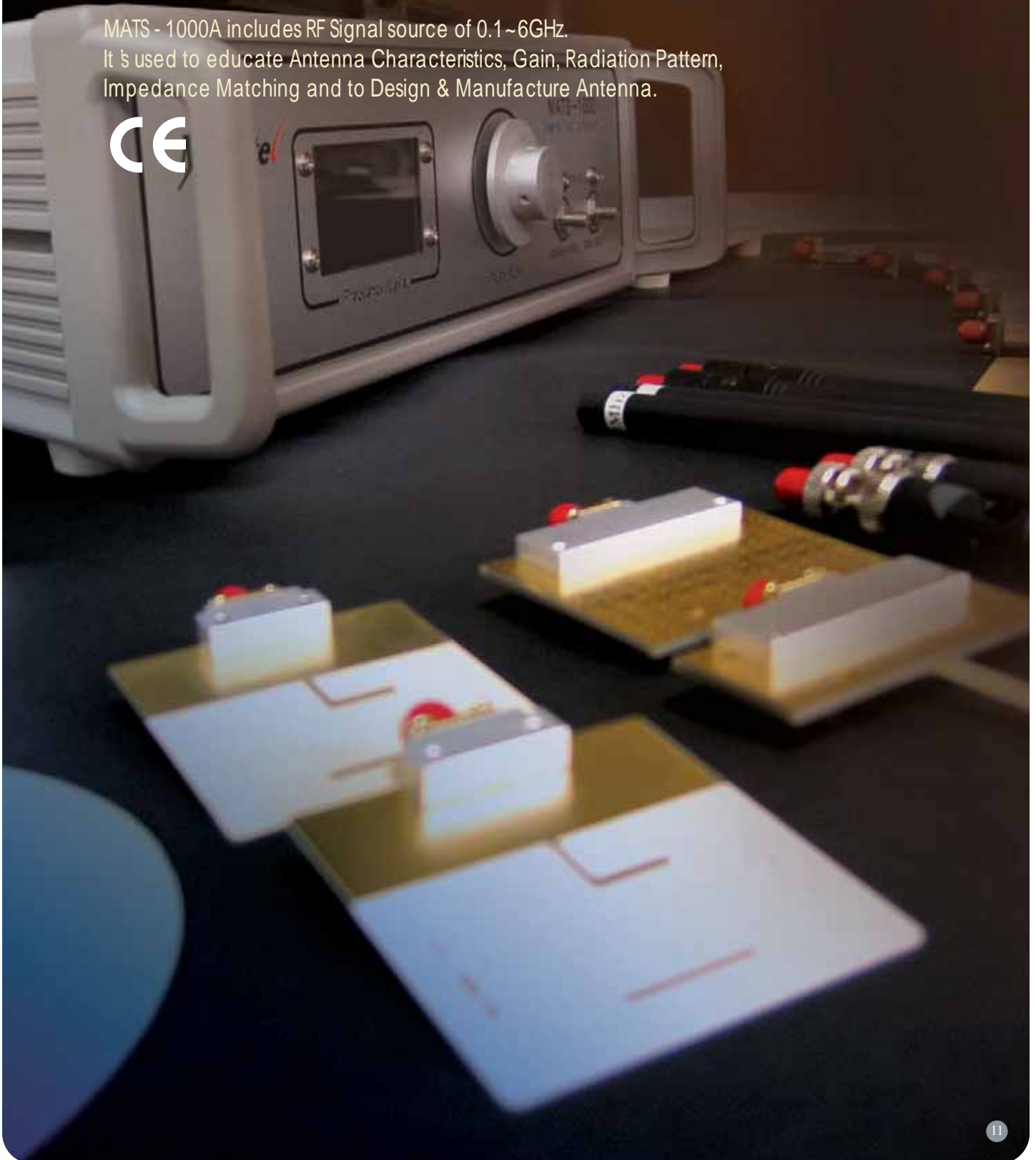
Y ARPM - 1000A Components

MAIN System	1	Textbook	1book
Manufacturing antenna	3	Antenna	18
Antenna base	2	Program CD	1
Wrench set	1set	Antenna Fixing Bracket	2
Carrying bag	1	Horn antenna (Option)	1

Antenna Training System

Model: YMATS-1000A

MATS - 1000A includes RF Signal source of 0.1~6GHz.
It is used to educate Antenna Characteristics, Gain, Radiation Pattern,
Impedance Matching and to Design & Manufacture Antenna.



Antenna Training System

Model: YMATS-1000A

YMATS-1000A Features

1. RF signal generator is included
2. Practice for Antenna characteristics is possible
3. Signal frequency and Output power is variable.
4. Suitable for training Antenna design, manufacturing, measurement.
5. Practice is possible without extra measuring equipment
6. Auto calibration is included to set maximum input power position.

YMATS-1000A Functions

1. Practice for Antenna characteristics
 - 1) Practice for the Radiation pattern [Supplying Antenna]
 - Yagi antenna
 - Chip antenna
 - Dipole antenna
 - Monopole antenna
 - Loop antenna
 - Patch antenna
 - Inverted F antenna
 - Array Patch antenna
 - 2) Practice for the Antenna characteristics by varying source frequency
 - Resonance frequency
 - Gain
 - 3) Practice for Designing, Manufacturing and Measuring the following;
 - Yagi antenna
 - Loop antenna
 - Dipole antenna
 - Practice in GUI Environment
2. Practice in GUI Environment

YMATS-1000A Specifications

Items	Specifications	
RF	Frequency	Variable in 100MHz~6GHz,
	Output power	- 10dBm ~ +5dBm
	AGC	25 [dB]
	Oscillation	PLL frequency synthesized
	Impedance	50[ohm]
	Supplied	450 MHz : Dipole x2(PCB)
	Antenna Types	915 MHz : Dipole x2, Monopole
		2.4 GHz : Dipole x2, Chip, Patch, Yagi x2, Inverted F, Array Patch, Loop
		5.6 GHz : Horn[Option], 5.8GHz Yagi x2
	Practice for Antenna Manufacturing	Yagi, Loop, Dipole
Control	Control Method	Micro - Controller
	Antenna Angle Control	360° : 3600 step 0.1° / Step
	Angle Control Range	0~360°
	Motor Rotation	Front, Back, Step



YMATS-1000A Training contents

- Part 1. Introduction and Installation of Program
 - Chapter 1. Introduction of system
 - Chapter 2. Program Installation and Instruction
- Part 2. Practice for Antenna characteristics
 - Chapter 3. Practice for Dipole antenna
 - Chapter 4. Practice for Yagi antenna
 - Chapter 5. Practice for Monopole antenna
 - Chapter 6. Practice for Loop antenna
 - Chapter 7. Practice for Ceramic Chip antenna
 - Chapter 8. Practice for Inverted F antenna
 - Chapter 9. Practice for Patch and Array Patch antenna
- Part 3. Practice for antenna Impedance matching and antenna Gain measurement
 - Chapter 10. Practice for antenna Impedance matching
 - Chapter 11. Practice for antenna Gain measurement
- Part 4. Practice for antenna Design and Manufacture
 - Chapter 12. Manufacture of Dipole antenna
 - Chapter 13. Manufacture of Loop antenna
 - Chapter 14. Manufacture of Yagi antenna

YMATS-1000A Components

MAIN System	1Set	Text Book	1EA
Manufacturing antenna	3EA	Antenna	18EA
Antenna Base	2EA	Program CD	1EA
Wrench set	1Set	Antenna Fixing Bracket	2EA
Carrying Bag	1EA	Horn Antenna [Option]	1EA

YMATS-1000A Amplifier [Option]

Frequency band	450[MHz]~2.45[GHz] 5.8[GHz]
Amplification rate	450[MHz]~2.45[GHz] : 10~13[dBm] 5.8[GHz] Single - stage configuration : 5~8[dBm] 5.8[GHz] Two - stage configuration : 10~13[dBm]
450[MHz]~2.45[GHz] RF Amp	DC 5[V] : 1ea
5.8[GHz] RF Amp	Single - stage configuration : 5.8[GHz] RF Amp -> 1ea Two - stage configuration : 1) 5.8[GHz] RF Amp(NR - RFPA20) - -> 1ea 2) 5.8[GHz] RF Amp(NR - RFPA355) - -> 1ea
DC - DC Converter	1ea
Adapter(12[V])	1ea

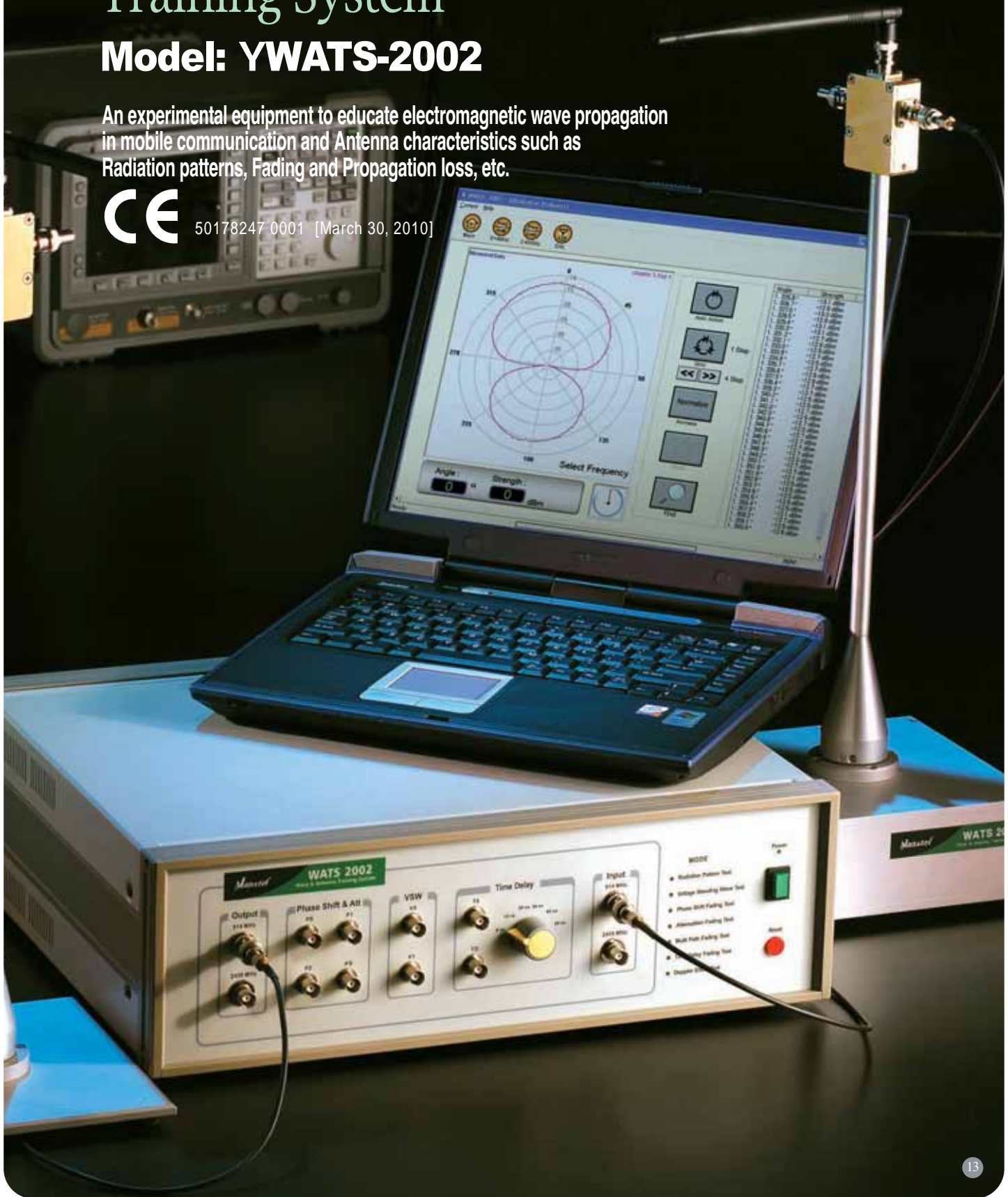
Wave and Antenna Training System

Model: YWATS-2002

An experimental equipment to educate electromagnetic wave propagation in mobile communication and Antenna characteristics such as Radiation patterns, Fading and Propagation loss, etc.



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Wave and Antenna Training System

Model: YWATS-2002



Antenna & Wave Propagation

* Spectrum Analyzer and Laptop are purchased optionally.

YWATS-2002 Features

- Most experiment is possible without extra measuring equipment.
- Antenna characteristics measurement.
- Mobile communication propagation experiment.
- Propagation modeling & Loss Simulation.
- Auto Calibration.
- User interface with GUI windows.

Wave and Antenna Training System

Model. YWATS-2002

An experimental equipment to educate electromagnetic wave propagation in mobile communication and Antenna characteristics such as Radiation patterns, Standing wave, Fading(Phase delay and attenuation), Doppler frequency and Propagation loss.

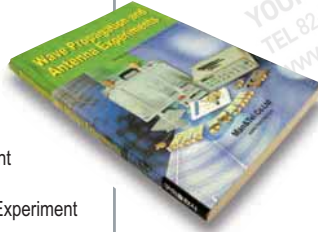


YWATS-2002 Experiment Steps

- 1) Antenna characteristic Experiment
 - Radiation pattern measurement
 - Antenna manufacturing and characteristic measurement
- 2) Mobile communication propagation characteristics experiment
 - Fading experiment (phase delay, power attenuation, multi path)
 - Standing wave experiment
 - Time delay experiment
 - Doppler frequency experiment
- 3) Mobile communication propagation environments simulation
 - Propagation model simulation

WATS-2002 Training Contents

- Part 1. Introduction and Installation of Program
 Chapter 1 Introduction of WATS-2002
 Chapter 2 Program Installation and Instruction
- Part 2. Antenna characteristics Experiment
 Chapter 3 Dipole Antenna Characteristics Experiment
 Chapter 4 Yagi Antenna Characteristics Experiment
 Chapter 5 Monopole Antenna Characteristics Experiment
 Chapter 6 Loop Antenna Characteristics Experiment
 Chapter 7 Ceramic Chip Antenna Characteristics Experiment
 Chapter 8 Inverted F Antenna Characteristics Experiment
 Chapter 9 Patch and Array Patch Antenna Characteristics Experiment
- Part 3. Antenna Design and Manufacturing Experiment
 Chapter 10 Dipole and Yagi Antenna Production and Analysis Experiment
 Chapter 11 Loop Antenna Production and Analysis Experiment
- Part 4. Mobile Communication Propagation Experiment
 Chapter 12 Phase Delay Experiment
 Chapter 13 Power Attenuation Characteristic Experiment
 Chapter 14 Multi-Path Fading Experiment
 Chapter 15 Time Delay and Doppler Effect Experiment
 Chapter 16 Standing Wave Experiment
- Part 5. Mobile Communication Propagation Environments Simulation
 Chapter 17 Propagation Modeling and Propagation Loss Experiment



WATS-2002 Specifications

Items		Specifications
RF	Frequency	914 [MHz] , 2.45 [GHz]
	Output Power	+4.5 [dBm] Max
	Local Oscillation	PLL
	Impedance	50 [ohm]
	AGC Dynamic Range	40 [dB]
	IF	21.7 [MHz]
	Antenna	Yagi, Chip, Dipole, Monopole, Loop, Patch, Inverted F, Array Patch
Control	Control Method	Micro-controller
	Antenna Angle Control	360 ; 400 steps 0.9 ʘ steps
	Angle Control Range	0-360 ʘ
	Position Calibration	Auto Calibration
	Motor Rotation	Front, Back, Step

WATS-2002 Components

- Main body 1 EA
- Carriage Bag 1 EA
- Textbook 1 EA
- Antenna 14 EA
- Training Antenna 3 EA
- Antenna Base 2 EA
- RF Coaxial Cable 3 EA
- RS-232C Cable 2 EA
- Adaptor 1 EA
- Wrench 1 SET
- Program CD(Multi-media CD) 1 EA
- Antenna Fixing Bracket 2 EA

