# **Communication System**



# KL-900B

# **Analog Communication System**



#### 144MHz VHF FM Transceiver Trainer

KL-900B Analog Communication System discloses the secret of the walky-talky based on the 144MHz VHF band. It breaks the circuit of walky-talky into 4 blocks: receiver block, transmitter block, audio amplifier block and microphone amplifier block.

Block diagrams are printed clearly on the panel of the module, giving students a comprehensive view of how walky-talky works.

#### ► Features

- 144MHz VHF FM transceiver trainer
- 2 modules form basis for over 9 fully documented experiments
- Includes experiment and instructor's manual

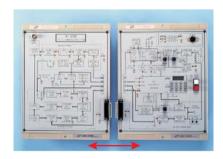
### **▶** Specifications

### **▶** Experiment Modules

- 1. 2mm connection leads are used throughout the system
- 2. The building block diagrams are printed on the surface of each module.
- 3. Modules are secured in plastic housings (297 x 226 x 60mm)

#### **▶** List of Modules

Analog Communication System Module (KL-93051/KL-93052)



#### Analog Communication System Module(KL-93051/KL-93052)

(1) General characteristics

a. Frequency range : 144~146 or 144~148 MHz

b. PLL range : 130~170 MHz

c. Modulation type : FM

d. Channel setting step: 5, 10, 12.5, 20, 25, 50KHz

e. Antenna impedance : 50 Ω

 $\begin{array}{lll} \text{f. Squelch sensitivity} & : 0.16 \ \mu\text{Vmax} \\ \text{g. Audio output} & : 250 \text{mW} \\ \text{h. Maximum offset} & : \pm 5 \text{KHz} \\ \text{i. 1st IF signal} & : 21.8 \text{MHz} \\ \text{j. 2nd IF signal} & : 455 \text{KHz} \\ \end{array}$ 

(2) Key-Pad function

a. SQL : To eliminate the "ZA" noise on FMb. Volume : Power switch/volume control

c. TX/RX LED: Signal transmitter/receiver indicator;

red (transmitting) green (receiving)

d. Channel : Channel selector

e. M.S. socket : External MIC or speaker

f. Function key

g. PTT : Exchange transmitting and receiving

function



#### List of Experiments

#### 1. Introduction to Analog Communication System

- (1) Resetting the transceiver
- (2) Setting the channel frequency
- (3) Expanding frequency range
- (4) Operating two keys
- (5) Operating SET key

#### 2. Microphone Amplifiers

- (1) Measuring PTT DET output
- (2) Measuring transmitted signal
- (3) Measuring MIC-AMP (LIM) output
- (4) Measuring MIC-LPF output

#### 3. Phase-Locked Loops

- (1) Measuring crystal oscillator output
- (2) Measuring data, clock and LE in receiving
- (3) Measuring data, clock and LE in transmitting
- (4) Measuring phase comparator inputs
- (5) Measuring phase comparator output

#### 4. Voltage-Controlled Oscillators

- (1) Measuring RX VCO characteristic
- (2) Measuring TX VCO characteristic

#### 5. RF Power Amplifiers

- (1) Measuring TX POWER AMP input and output
- (2) Measuring APC AMP input and output

#### 6. RF Amplifiers

- (1) Measuring RF AMP input
- (2) Measuring RF AMP output
- (3) Measuring BPF output

#### 7. Mixers and IF Amplifiers

- (1) Measuring RX VCO output
- (2) Measuring 1st MIXER output
- (3) Measuring CRYSTAL BPF output
- (4) Measuring 1st IF AMP output
- (5) Measuring 1st IF AMP input and output

#### 8. FM Demodulators

- (1) Measuring second mixer output
- (2) Measuring 2nd FILTER output
- (3) Measuring S-MET AMP output
- (4) Demonstrating squelch control

#### 9. Audio Amplifiers

- (1) Measuring AF PREAMP input
- (2) Measuring AF PREAMP output
- (3) Measuring AF POWER AMP output

# Accessories (KL-98002)

1. Power Supply Module (SPS-001)

Fixed DC power supply

a. Output voltage : +5V, -5V, +12V, -12V

b. Output current : +5V/3A, -5V/0.3A, +12V/1.5A,

-12V/0.3A

c. Output connector : 5 PIN DIN connector

d. With output overload protection

2. Teacher's guide : 1 pce3. Experiment manual : 1 pce

4. VHF, FM transceiver : 1 set

# **► Equipment Required**

Digital Storage Oscilloscope (DSO):
100MHz bandwidth, 1GS/s sampling rate and FFT function or better

2. FM signal generator:

Capable of generating 130MHz~180MHz FM signal

3. AF signal generator:

Frequency range : 1Hz~10KHz

Waveforms : Sine wave Amplitude : 10Vp-p or better

4. Digital multimeter

Communication System 10102