**DIGITAL COMMUNICATION TRAINERS**

**Pulse Amplitude Modulation and Demodulation Trainer**

 Built in fixed power supplies of +12V

 555 IC –timer as a RF generator with 400 KHz fixed frequency

 The modulation is controlled with a CMOS sampling switch 4016 IC

 BC 107 is used for demodulation in CE configuration

**Pulse width modulation and Demodulation Trainer**

 Built in fixed power supply of +12V -12V

 555 IC is used as clock generator with fixed frequency of 20KHz and fixed amplitude.

 LM 324 IC is used as AF generator with fixed frequency of 500Hz and Variable amplitude

 555 IC is used as modulator and Op-Amp 324 IC is used a demodulator.

**Pulse Position Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12V,-12V

 555 IC is used as clk generator with fixed frequency of 20KHz & fixed amplitude.

 LM 324 IC is used as AF generator with fixed freq. of 500Hz and Variable amplitude

 555 IC is used as modulator and Op-Amp 324 IC is used a demodulator

**Frequency Shift Keying Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12V,-12V, +5V,-5V

 4051 IC for modulator circuit.8038 IC for carrier generator .

 7490 IC for data generator 324 IC for Demodulator

**Pulse Code Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12V,-12V ,+ 5V

 Variable AF generator 20Hz to 150Hz

 Clock generator with fixed frequency of 10KHz

 Data output with LED variations Variable DC voltage – 5V to +5V

 ADC 800 IC, 74 LS 165 IC are used in modulation

 74 LS 164 IC, 74 LS 374 IC (buffer) , DAC 800IC & LPF are used in Demodulation

**Differential Phase Shift Keying Modulation and Demodulation Trainer**

 Built in fixed power supplies of +12V, -12V , +5V

 8038 IC is used as data generator

 7490 IC is used as data generator .4051 IC, 7474 IC, 741 IC   
    are used in modulator 7486 IC is used in demodulator circuit

**Delta Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12V,-12V , +5V

 555 IC is used as clock generator TL084 IC is used as AF generator

**Phase Shift Keying Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12V,-12V, +5V

 8038 IC is used as carrier generator and 7490 IC is used as data generator

 4051 IC, 324 IC are used in modulator circuit

 7486 IC is used in demodulator circuit

**Differential Pulse Code Modulation & Demodulation Trainer**

 Variable AF generator 15Hz to 30Hz.

 Variable DC voltage -5V to +5V.

**Ask Modulation & Demodulation Trainer**

 Built in fixed power supplies of +12v,-12v, +5v, -5v.

 8038 IC is used as carrier generator and 7490 IC is used as data generator.

 4051 IC, 324 IC are used in modulator circuit.

 7486 IC is used in demodulator circuit

**Time Division Multiplexing & De-multiplexing Trainer**

 In built carrier generator

 3 different frequency data signals are generated by using 74163 IC

 Built in fixed power supply +5V, -5V .Modulation & demodulation   
    are individually provided on board by using 4051 IC

**Sampling Theorem Verification Trainer**

 Built in fixed power supplies of +12V,-12V

 Variable clock frequency 3-30KHz (low) and 6-60 KHz (High)

 4016 IC is used for sampling and LM 324 IC is used for reconstructing the signal

 Additional Op-Amp and CMOS are provided for external

**QPSK modulation and demodulation Trainer**

 In built fixed power supply of +5V @ 250mA.

 In built carrier generator and data generator.

 To change data signal a switch is provided on board

 Modulator, phase detector, bit pair detector, demodulator are provided on board.

### Companding Trainer

### Frequency Division Multiplexing & Demultiplexing Trainer