

DSB SSB TRANSMITTER TRAINER

Scope of learning :

- Study of carrier frequency generation.
- Study of DSB & SSB AM generation & Transmission.
- Study of Transmitter circuits.
- Study of Modulation index.

Technical specifications :

On board :

- 8 Switched Faults.
- Crystal Controlled Carrier Frequency.
- On - board Audio Modulator,
- Carrier Frequency Generation,
- Antenna & Speaker.

Power supply :

- Fixed DC Power Supplies $\pm 15V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode

Salient Features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 2mm Sockets.
- Patch Cords 2mm.
- The trainer is housed in ABS Plastic cabinet/Wooden Cabinet
- Size of the trainer set 12"x10"

Optional accessories :

- CRO

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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DSB SSB RECEIVER TRAINER

Scope of learning :

- Study of DSB & SSB AM reception & detection by diode /product detectors
- Study of AGC
- Study of Receiver tuned circuit
- Study of Sensitivity, Selectivity & Fidelity of Receiver

Technical specifications :

On board :

- Frequency Range : 980 KHz to 2.060 Mhz
- Intermediate Frequency (IF) : 455 KHz
- Input Circuits :
 1. RF amplifier
 2. Mixer
 3. Local oscillator
 4. Beat frequency oscillator
 5. IF amplifier 1
 6. IF amplifier 2
- Tuning: With variable capacitor (ganged) dial marking on board

Power supply :

- Fixed DC Power Supplies $\pm 15V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode

Salient Features :

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- Instruction manual.
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FM TRANSMITTER AND RECEIVER TRAINER

Scope of learning :

- Study of Frequency Modulation using Varactor modulator
- Study of Frequency Modulation Using Reactance Modulator
- Study of Operation of Detuned Resonant Circuit
- Study of Operation of Quadrature Detector
- Study of Operation of Phase-Locked Loop Detector
- Study of Operation of Foster - Seeley Detector
- Study of Operation of Ratio Detector

Technical specifications :

On board :

- 8 switched faults.
- Audio Oscillator : With adjustable amplitude & frequency (300 Hz - 3.4 KHz)
- Two Types of FM Modulator:
 1. Reactance Modulator (with carrier frequency adjustment)
 2. Varactor Modulator (with carrier frequency adjustment)
- Mixer / Amplifier: Allows FM input signal to be amplitude modulated by a noise input prior to demodulation, with gain adjustment.
- Transmitter Output Frequency. : 455 KHz
- Five types of FM demodulator :
 1. Detuned Resonant Detector
 2. Quadrature Detector
 3. Foster - Seeley Detector
 4. Ratio – Detector
 5. Phase Locked Loop Detector
- Low Pass Filter Amplifier: 3.4 KHz cut off frequency. (with adjustable gain)
- Effect of noise on the detection of FM signal may be investigated.

Power supply :

- Fixed DC Power Supplies $\pm 15V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode

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Salient features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 2mm Sockets.
- Patch Cords 2mm.
- The trainer is housed in ABS Plastic cabinet/Wooden Cabinet.
- Size of the trainer set 12"x10"

ANALOG SAMPLING AND RECONSTRUCTION TRAINER

Scope of learning :

- Study the Sample signal and Sample/Hold signal and its reconstruction;
- Study the effects of different Sampling;
- Study the effects of 2nd and 4th Order low pass filters for the reconstruction of the signal frequencies on the reconstructed signal;
- Study the effects of Varying duty cycle of Sampling frequencies on the amplitude of the reconstructed signal

Technical specifications :**Generator :**

- Crystal controlled pulse generator.
- Sine Wave Generator - Provides Synchronized Sine waveform output of Frequency 1 KHz & 2KHz.
- Pulse Generator-Switch selectable sampling frequency of 2,4,8,16, 32 Khz,
- Internal/ External sampling signal selectable

Power supply :

- Fixed DC Power Supplies $\pm 12V, +5V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panels are :

- IC
- Capacitors
- Resistors
- Diodes

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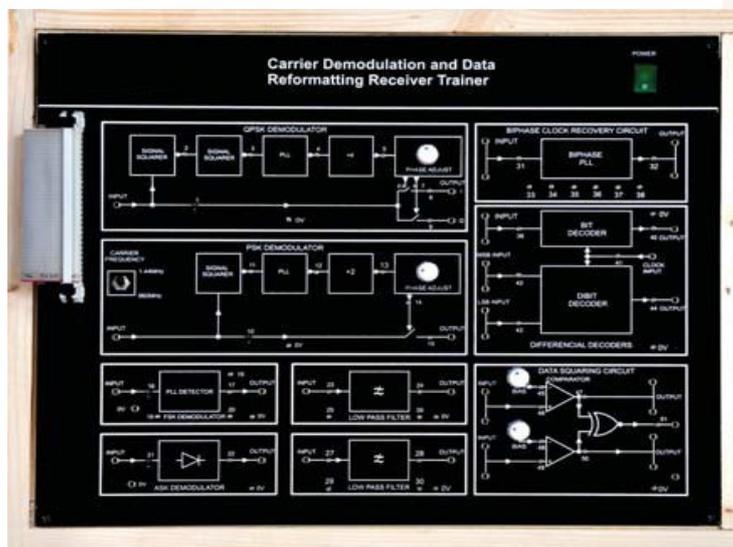


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Salient features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 4mm Sockets.
- Patch Cords 4mm.
- The trainer is housed in ABS Plastic cabinet.
- Size of the trainer set 12"x8"

DATA FORMATTING AND CARRIER MODULATION TRAINER



Scope of learning :

- Study of Conversion of NRZ data to other data formats NRZ(L), NRZ(M) RZ, AMI, RB, Biphasic (Manchester), Biphasic (Mark), Differentially encoded dibit pair
- Study of following Carrier Modulation Techniques and their comparison - **ASK, FSK, PSK & QPSK**

Technical specifications :

Generator :

- On-board Carrier generation circuit (Sine waves synchronized to transmitter data).
- On-board in phase and quadrature phase carrier for QPSK modulation. Different data conditioning formats NRZ (L), NRZ (M), RZ, Biphasic. (Manchester), Biphasic (Mark), AMI, RB, differentially encoded dibit pair.
- FSK, PSK, ASK, DPSK & QPSK carrier modulation. Variable carrier and modulation Off-Set. Variable carrier gain.
- On-board Unipolar to Bipolar conversion. On-board data inverter.

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Power supply :

- Fixed DC Power Supplies $\pm 12V, +5V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

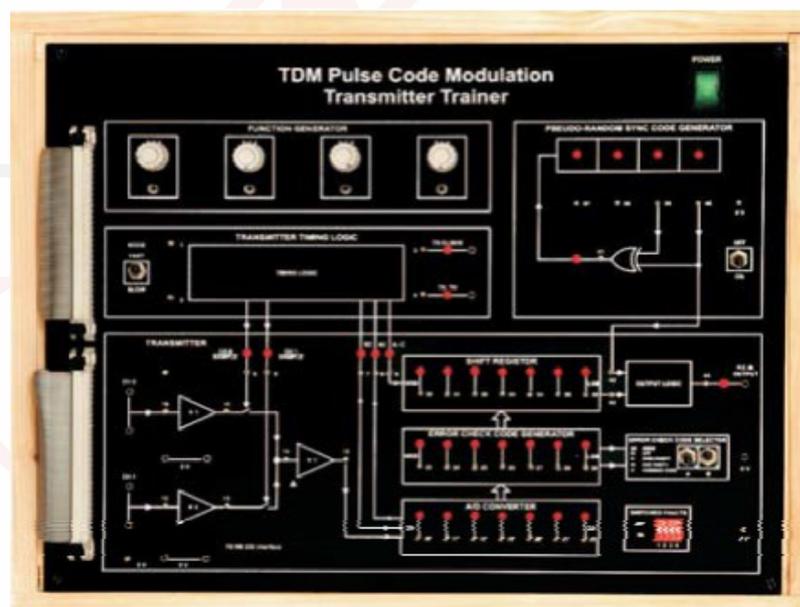
Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode

Salient features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 4mm Sockets.
- Patch Cords 4mm.
- The trainer is housed in ABS Plastic cabinet.
- Size of the trainer set 12" * 10"

TDM PULSE CODE MODULATION TRANSMITTER TRAINER



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Scope of learning :

- Study of Pulse Code Modulation. Study the principles of ADC & DAC Study of Pseudo Random Sequences
- Study of effect of faults in Modulation & Demodulation Techniques.
- **Study of Error Check Code Logic:**
 1. -None Parity Coding.
 2. -Odd Parity Coding
 3. -Even Parity Coding
 4. -Hamming Coding

Technical specifications :

- Crystal Controlled Clock.
- On-board Sine wave generator (Synchronized)

Power supply :

- Fixed DC Power Supplies $\pm 12V, +5V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode
- PCM Transmitter.
- Fast & Slow modes for real time operation and data flow examination. Error check code options (odd-even parity, Hamming Code).
- 4 Switched faults allow different Error Check Options.
- PC - PC Communication via RS 232 interface

Salient Features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 4mm Sockets.
- Patch Cords 4mm.
- The trainer is housed in ABS Plastic cabinet
- Size of the trainer set 12"x10"

Optional accessories :

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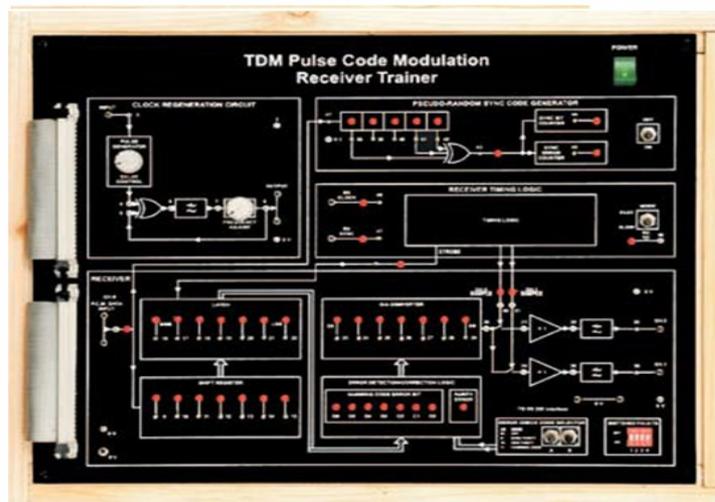


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TDM PULSE CODE DEMODULATION RECEIVER TRAINER



Scope of learning :

- Study of PCM Demodulation Technique
- Study of Time Division Demultiplexing of PCM data
- Study of Clock Regeneration by PLL Study of Detection & Correction of Error induced by switched faults in the transmitter.
- Study of signal recovery in 3 connecting modes between transmitter & receiver
- Study of Importance of Clock and Frame Synchronization in PCM system Study of the effect of induced faults in receiver.

Technical specifications :

Generator :

- On board PLL for clock regeneration.
- On board sync code detector.

Power supply :

- Fixed DC Power Supplies $\pm 12V, +5V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors
- Diode
- Input accepts two channel multiplexed data. On board De--multiplexed PCM Receiver. On board L.P. Filter.
- Fast & Slow modes for real time operation and data flow examination.

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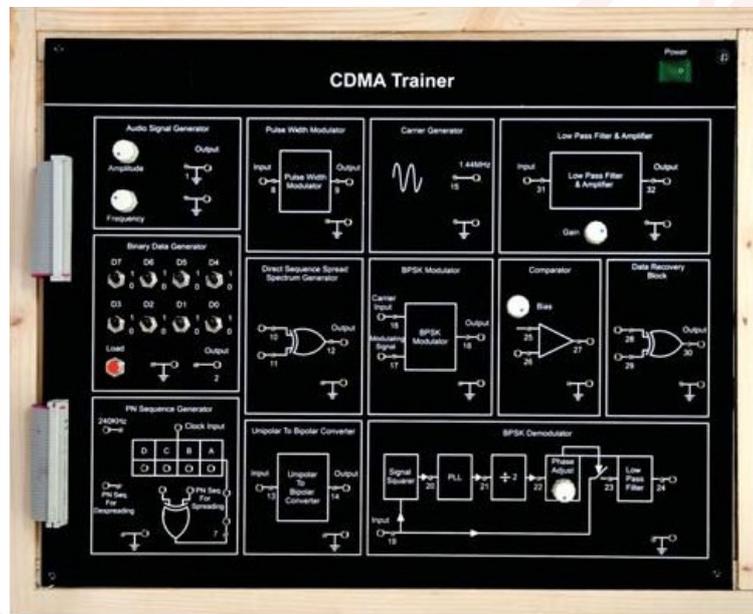
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- Error check code options.
- Odd or Even Parity--Single bit error detection.

Salient Features :

- Front panel built with high class insulated Printed Circuit Board sheet with well printed circuits and symbols.
- Instruction manual.
- Connections are brought out through 4mm Sockets.
- Patch Cords 4mm.
- The trainer is housed in ABS Plastic cabinet.
- Size of the trainer set 12"x10"

CDMA TRAINER



Scope of learning :

- To study theory of CDMA DSSS Modulation & Demodulation
- To generate CDMA-DSSS signal
- To demodulate CDMA-DSSS signal using BPS
- To study pseudo random bit sequence generation.

Technical specifications :

Generator :

- Direct Sequence Spread Spectrum (DSSS) generator and decoder
- Analog Modulators :
 1. Binary Phase Shift Keying (BPSK)Modulator

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2. Pulse Width Modulator

● Analog Demodulators :

1. Binary Phase Shift Keying (BPSK) Demodulator
2. Pulse Width Demodulator

Power supply :

- Fixed DC Power Supplies $\pm 12V, +5V$ DC, 250mA
- Operated on Mains power 230V, 50Hz $\pm 10\%$

Components mounted on the panel are :

- IC
- Capacitors
- Resistors

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