

Communication Trainer Analog



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- ✓ Digital Communication Trainers
- ✓ Optical Fibers Communication Trainers
- ✓ Digital and Analog Communication Trainers
- ✓ Communication Electronic Trainers
- ✓ Function Generator and Power Supply
- ✓ Multiple Signal Generator

CTA300

DESCRIPTION

Curriculum Outlines:

- Design and implementation of second order active filters and RF oscillators.
- Design and implementation of AM and FM modulator and demodulator.
- Design and implementation of DSB/SC and SSB modulator and demodulator.
- Design and implementation of TDM and FDM multiplexer and demultiplexer.
- Design and implementation of frequency converter and signal recovery circuits.

FEATURES

Curriculum Objectives:

- To understand the basic theory of analog communication system.
- Design and implementation ability training of analog modulator and demodulator.
- To understand the applications of analog modulator and demodulator.



CTA300-1 Second Order Active Filter, RF Oscillator



Second Order Active Filters

Experiment 1: Second Order Active Low-pass Filter

(Low-pass -3dB Frequency: 1kHz ~ 3kHz)

Experiment 2: Second Order Active High-pass Filter

(High-pass -3dB Frequency: 5kHz ~ 10kHz)

Experiment 3: Second Order Active Band-pass Filter

(Center Frequency: 10kHz ~ 100kHz, Bandwidth: 6kHz ~ 60kHz)

Experiment 4: Second Order Active Band-stop Filter

(Cutoff Frequency: 10kHz ~ 100kHz, Bandwidth: 6kHz ~ 60kHz)

RF Oscillators

Experiment 1: Colpitts Oscillator

(Oscillation Frequency: 1MHz ~ 9MHz)

Experiment 2: Hartley Oscillator

(Oscillation Frequency: 500kHz ~ 1.8MHz)

Experiment 3: Crystal Oscillator

(Oscillation Frequency: 500kHz ~ 1.8MHz)

Experiment 4: Voltage Controlled Oscillator

(Oscillation Frequency: 3.5MHz ~ 4MHz)

CTA300-2 Module AM



AM Modulator

Experiment 1: Transistor AM Modulator

(Carrier Signal: 1.5kHz ~ 2kHz, Audio Signal: 500Hz ~ 1kHz)

Experiment 2: MC1496 AM Modulator

(Carrier Signal: 500kHz ~ 1MHz, Audio Signal: 500Hz ~ 1kHz)

AM Demodulator

Experiment 1: AM Diode Detector

(Carrier Signal: 300 kHz, Audio Signal: 500Hz ~ 2kHz)

Experiment 2: AM Product Detector

(Carrier Signal: 500kHz ~ 1MHz, Audio Signal: 500Hz ~ 1kHz)

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CTA300-3 Module DSB-SC and SSB

DSB-SC and SSB Modulator

Experiment 1: DSB-SC Modulator
(Carrier Signal: 100kHz ~ 500kHz,
Audio Signal: 500Hz ~ 1kHz)
Experiment 2: SSB Modulator
(Carrier Signal: 200kHz, Audio
Signal: 500Hz ~ 1kHz)

DSB-SC and SSB Demodulator

Experiment 1: DSB-SC Product
Detector
(Carrier Signal: 100kHz ~ 500kHz,
Audio Signal: 500Hz ~ 1kHz)
Experiment 2: SSB Product
Detector
(Carrier Signal: 200kHz, Audio
Signal: 500Hz ~ 1kHz)



CTA300-4 Module FM

FM Modulator

Experiment 1: MC4046 FM
Modulator
(Carrier Signal: 20kHz, Audio
Signal: 1kHz)
Experiment 2: LM566 FM
Modulator
(Carrier Signal: 20kHz, Audio
Signal: 500Hz ~ 700Hz)

FM Demodulator

Experiment 1: MC4046 FM
Demodulator
(Carrier Signal: 20kHz, Audio
Signal: 1kHz)
Experiment 2: LM565 FM
Demodulator
(Carrier Signal: 20kHz, Audio
Signal: 500Hz ~ 700Hz)



CTA300-5 Module TDM

TDM Multiplexer

Experiment 1: Waveform Generator
(Sine Wave Signal Generator: 13kHz,
Triangle Wave Signal Generator:
2.3kHz, Square Wave Signal
Generator: 2.3 kHz)
Experiment 2: TDM Multiplexer
(Transmission Channels: 3 Channels, S
witching Time: 500ms ~ 50ms)

TDM Demultiplexer

Experiment 1: TDM
Demultiplexer
(Transmission Channels: 3
Channels,
Switching Time: 500ms ~
50ms)



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CTA300-6 Module FDM

FDM Multiplexer

Experiment 1: FDM Signal Generator
(Carrier Signal: 500kHz ~ 1.5MHz, Audio Signal: 500Hz ~ 1.5kHz)
Experiment 2: DSB-SC Modulated Signal Generator
(Carrier Signal: 500kHz ~ 1.5MHz, Audio Signal: 500Hz ~ 1.5kHz)
(Modulation Type: DSB-SC Signal, Transmission Bandwidth: 2MHz)

FDM Demodulator

Experiment 1: FDM Demultiplexer
(Modulation Type: DSB-SC Signal, Demultiplexing Type: Product Demultiplexer)



CTA300-7 A/D – D/A Converter

Analog-to-digital Converter

Experiment 1: ADC0804 Analog-to-digital Converter
(Resolution: 8 bits, Analog Input Voltage: 0V ~ 5V)
Experiment 2: ADC0809 Analog-to-digital Converter
(Resolution: 8 bits, Analog Input Voltage: 0V ~ 5V, Clock Frequency: 12 kHz)

Digital-to-analog Converter

Experiment 1: R-2R Digital-to-analog Converter
(Digital Input: 4 bits, Analog Output: 0V ~ 5V)
Experiment 2: Unipolar DAC 0800 Digital-to-analog Converter (Digital Input: 8 bits, Analog Output: 0V ~ 5V, Step Value: 0.019V)
Experiment 3: Bipolar DAC 0800 Digital-to-analog Converter (Digital Input: 8 bits, Analog Output: -5V ~ 5V, Step Value: 0.038V)



CTA300-8 Frequency Converter Signal Recovery

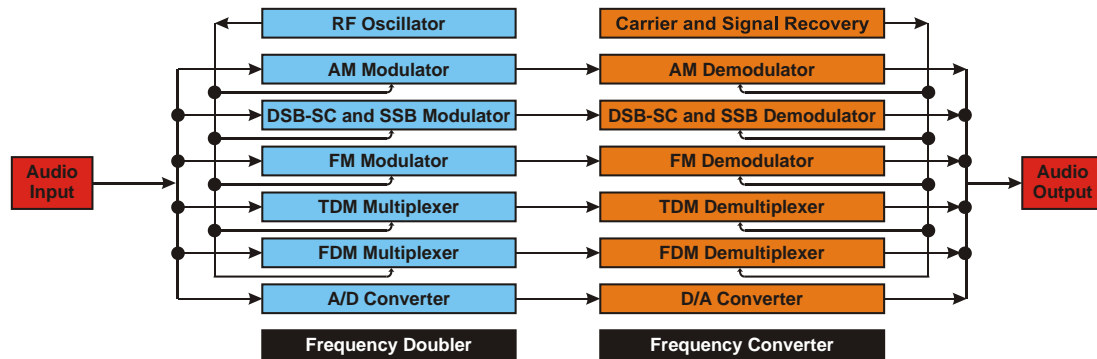
Frequency Converter

Experiment 1: Frequency Multiplier (Carrier Signal: 10kHz)
Experiment 2: Up/Down Frequency Converter
(Carrier Signal @ LO port: 100kHz; Carrier Signal @ RF port: 120kHz)

Signal Recovery

Experiment 1: Carrier Signal Recovery Circuit
(Carrier Signal: 10kHz)
Experiment 2: Clock Recovery Circuit
(Clock Signal: TTL, Encoded Signal: Manchester, Clock Frequency: 5kHz ~ 10kHz)





Experiment Contents

Experiment 1: Second Order Active Low-pass Filter
Experiment 2: Second Order Active High-pass Filter
Experiment 3: Second Order Active Band-pass Filter
Experiment 4: Second Order Active Band-stop Filter
Experiment 5: Colpitts Oscillator
Experiment 6: Hartley Oscillator
Experiment 7: Crystal Oscillator
Experiment 8: Voltage Controlled Oscillator
Experiment 9: Transistor AM Modulator
Experiment 10: MC1496 AM Modulator
Experiment 11: AM Diode Detector
Experiment 12: AM Product Detector
Experiment 13: DSB-SC Modulator
Experiment 14: SSB Modulator
Experiment 15: DSB-SC Product Detector
Experiment 16: SSB Product Detector
Experiment 17: MC4046 FM Modulator
Experiment 18: LM566 FM Modulator
Experiment 19: MC4046 FM Demodulator
Experiment 20: LM565 FM Demodulator
Experiment 21: Waveform Generator
Experiment 22: TDM Multiplexe
Experiment 23: TDM Demultiplexer
Experiment 24: FDM Signal Generator
Experiment 25: DSB-SC Modulated Signal Generator
Experiment 26: FDM Multiplexer
Experiment 27: FDM Demultiplexer
Experiment 28: ADC0804 Analog-to-digital Converter
Experiment 29: ADC0809 Analog-to-digital Converter
Experiment 30: R-2R Digital-to-analog Converter
Experiment 31: Unipolar DAC 0800 Digital-to-analog Converter
Experiment 32: Bipolar DAC 0800 Digital-to-analog Converter
Experiment 33: Frequency Multiplier
Experiment 34: Up/Down Frequency Converter

