

500-IN-ONE Electronic Projects Lab – Experiments List

The **500-IN-ONE ELECTRONIC PROJECT LAB** teaches how to identify different electrical parts, how to read a schematic, how to make 500 projects without any soldering or tools, and how all 500 projects work (there are 100 projects teach the basic of programming). This complete electronics course covers the following subjects areas:

1.	Surprise and Fun	6 Experiments
2.	Back to the Basics	17 Experiments
3.	Electronic " Building Blocks "	14 Experiments
4.	Putting Electronics to Work	24 Experiments
5.	Radio Circuit	5 Experiments
6.	Sonic Zoo and Sound Factory	16 Experiments
7.	Electronic Decision-Makers	13 Experiments
8.	Operational Amplifier IC Can Do Many Things	26 Experiments
9.	Introducing The Power Amplifier IC	4 Experiments
10.	A Trip to Digital Land	25 Experiments
11.	More Adventures in Digital Land	30 Experiments
12.	Circuits that Counts	26 Experiments
13.	Amusement in Digital Land	19 Experiments
14.	Surprise and Fun Revisited	20 Experiments
15.	Testing and Measuring Circuits	9 Experiments
16.	Learn Basics More	22 Experiments
17.	Amusement on Sound	14 Experiments
18.	More Radio Circuits	3 Experiments
19.	To The Game World	12 Experiments
20.	More Adventure in OP Amplifier Circuits	11 Experiments
21.	More About Oscillator	14 Experiments
22.	Shake-hands of Analog and Digital	9 Experiments
23.	Getting Closer to Computer	7 Experiments
24.	More Digital Circuits	14 Experiments
25.	Amusement in Electronic Circuits	26 Experiments
26.	Testing and Measuring Circuits	14 Experiments
27.	Software Projects	100 Experiments

The ultimate **500-IN-ONE Electronic Project Lab** contains the following experiments in ADDITION to those listed for our 300-IN-ONE Electronic Project Lab.

Back to the Basics

Capacitors in Series and Parallel

Electronic "Building Blocks"

Low Distortion Sinewave Oscillator

Putting Electronics to Work

Strobe Light
Electronic Grandfather Clock
Electronic Metronome
Twin-T Audio Oscillator
Current Switch
Shot in the Dark
Variable R-C Oscillator
Two-Tone Buzzer
Sawtooth Wave Oscillator

Radio Circuits

Wireless Code Transmitter

Characteristic

Darlington Circuit (Touch Sensor)

Edge-Trigger Circuit
RC Type Differentiating Circuit

Switch Matrix Circuit
Memory Backup Circuit
Power on Reset Circuit
Constant-Voltage Circuit (Fixed Output)

Constant-Voltage Circuit (Variable Output)
A Rectifier Circuit by Diode Bridge

AGC Circuit Using a Single Transistor
Upper/Lower Limiter Circuit
Using OP Amplifier
Window Comparator II

Amusement on Sound

Multi-Tone Siren
Digital Rhythm

Using J-K Flip-Flop

One-Shot Multivibrator
Using OP Amplifier

Shakehands of Analogue and Digital

Pulse Number Modulation
Light Dimmer

Pulse Width Modulation
Light Dimmer

DC-DC Converter Using the C-MOS Oscillator

Photometer with Digital Display

Pulse Width Modulation
Light Dimmer II
Voltmeter

Getting Closer to Computers

Full Adder
Decimal to Binary Encoder
Binary to BCD
Octal to BCD
Hexadecimal to BCD

Tachometer

Battery Checker II
Digital Illuminometer

Software Projects

Light LEDs
Light On/Off LEDs
A Binary Counter-Increment Value by ADD Instruction

A Binary Counter-Decrement Value by SUB Instruction

Light LEDs Sequentially with AND Instruction

Light LEDs Sequentially with OR Instruction

Turn On and Off LEDs Sequentially with XOR Instruction

Moving LEDs Light with ROL Instruction

Moving LEDs Light with ROR Instruction

Night Rider's LEDs with

Logical OR/NOR Gate for Driving External Circuit

Logical XOR/XNOR Gate for Driving External Circuit

Find a Leading Edge of Input Pulse

Finding a Trailing Edge of Input Pulse

Finding a Leading and Trailing Edge of Input Pulse

A Pulse Stretcher
Starting a Delayed Pulse

Pulse Stretcher By Counting a Clock

Counting External Pulse To Advance Decimal Counter

Displays Number 0 To 9 on 7-Segment LED (1)

Change Order of Numbers Display on 7-Segment (2)

Counts an External Clock (1)
Counts an External Clock (2)

Sonic Zoo and Sound Factory

Two-Tone Patrol Car Siren
Pencil Lead Organ
Electronic Motorcycle
Machine Gun Pulse
Detector
Electronic Siren
Electronic Cat
Electronic Organ

Electronic Decision-Makers

Majority Logic Gate
Electronic Coin Toss
Electronic Coin Toss II
Electronic Coin Toss III
Even or Odd
Quick Draw Game
Close-In
ESP Tester
The Light Fantastic
Shooting Game
Marching LEDs
Electronic Dice
Electronic Roulette

Operational Amplifier IC Can Do Many Things

Integrating Circuit
Pitch Doubling Circuit
Pitch Doubling Circuit II
Comparator
Schmitt Trigger Circuit
Delayed Timer
Pulse Frequency Doubler
Touch Switch Using OP Amplifier

Surprise and Fun Revisited

Experiment of Electromagnetic Induction
Winking LEDs
Voice Level Meter
Buzzin' LED
Son of Buzzin' LED

Testing and Measuring Circuits

Audio Signal Tracer
Metal Detector
Rain Detector
Burglar Alarm
Temperature-Sensitive
Audio Amplifier

Learn Basics More

A Basic of Control Volume
Emitter Follower
Basic Operation of Zener Diode
Zener Voltage Checker
Zener Voltage Checker II
Basic Photo-Transistor Operation
Voltage Drop Circuit by Means of Diodes
Experimentation of Capacitor Temperature

Two-IC Electronic Organ
A Water Service Pipe Sound
Electronic Klaxon
Sound Machine III
Sound Wave Varying with Light Intensity
Player Organ
Sound of Passing Siren
Light Source Sensing Circuit by Sound
Electronic Piano Circuit
Whistle Generating Circuit
Space Gun
Car Horn

More Radio Circuits

Morse Code Transmitter
Broadcasting Organ
FM Transmitter (FM
Wireless Microphone

To The Game World

Quiz Winner Detector
Reflex Nerve Test Game
Shooting Game II
Shot In The Dark II
Sound Quiz
Stop the Seven
High-Power Switch
"Lockout, Mr. Blackbeard!" Game
Russian Roulette
Mole Hitting Game
"Janken" Game
Ping-Pong Game

More Adventures in OP

Amplifier Circuits
Voltage Controlled Amplifier
V-F Converter
F-V Converter
F-V Converter II
White Noise Generator
Sweep Generator
Multiple-Function IC Project
Sound Alarm
A Sound of Ripples
Photo Organ
Vibrato Organ

More About Oscillation

Phase Shift Oscillator
Wide Range Audio
Frequency Oscillator
Sawtooth Wave Oscillator II
Three Phase Oscillator
Wien-Bridge Oscillator
Ramp Wave Generator
Digital Sine Wave Generator
Frequency-Variable Sine Wave Generator
Sine Wave Oscillator Using D-A Converter
RC Phase-Shift Oscillator
Two Sine Waves with Different Phases
One-Shot Multivibrator
Using IC 555
One-Shot Multivibrator

3-Bit Shift Register
BCD-To-Decimal Decoder
More Digital Circuits
4-Input Data Selector
AND/OR Circuit Using OP Amplifier
XOR Using OP Amplifier
Time Sharing Display of LEDs
LED Lighting-Duty Varying Circuit Using One-Shot Multivibrator
LED Blinking-Cycle Varying Circuit Using Astable Multivibrator
LCD Static Drive Circuit
LCD Dynamic Drive Circuit
Testing LCD Display Response
LED Drive by 4 Switches
Flashing LED by Preset Number
Digital Timer (1 to 7 Minutes)
Sound Timer
Programmable Timer with Down Counter

Amusement in Electronic Circuits

Revolving Light
Photo Switch
Door Chime
Visitor Sensing Chime
Using Photo-Transistor
Touch VCO
Sound Tuning Circuit
Crossing-Bell Sound Generator
Turn Indicator
Staircase Light Switching Control Circuit
Pseudo Candle Circuit
Lie Detector
Light Sensing Circuit
Automatic Lighting LED
Sound Sensing LED
Illumination Lamp
Intercom
PIP Sound Interphone
Electronic Volume
Pedestrian Signal
Time Counter
Led Display Counting
Up/Down Circuit
An Electronic Pendulum
Staircase Light Switching Control Circuit II
Lamp Brightness Control Circuit
Illumination Circuit with 4-LEDs
A Simulated Car Winkers

Testing and Measuring Circuits

Battery Checker
Conductivity Tester
Transistor Checker
Three-Step Water Level Indicator

ROL/ROR Instructions (1)
Night Rider's LEDs with ROL/ROR Instructions (2)
Binary Counter with INC Instruction
Binary Counter with DEC Instruction
Sound Do as Do, Re, Mi
Sound a Series of Musical Scale
Let's Input Data to Program
Hidden Key Triggers Sound and Turns All LEDs On
Stacked MOV Instructions
Changing Order of LEDs by Switch
A Musical Scale Sound by S1 Key
Arithmetic Addition of Two Binary Values
Arithmetic Subtraction of Two Binary Values
Arithmetic Multiplication of Two Binary Values
Arithmetic Division of Two Binary Values
Displays Number 0 to 9 on 7-Segment LED (2)
Change Order of Numbers
Display on 7-Segment LED (2)
Switches S1-S4 Light Hex Number On 7-Seg LED
8-Key Organ
Lighting Spade, Diamond, Heart, and Club on the LCDs Display (Basic)
Lighting Spade/Heart and Diamond/Club on the LCDs Display
Lighting Spade, Diamond, Heart, and Club by Static Drive Circuit
Lighting Spade, Diamond, Heart, and Club by 1/2 Duty-1/2 Bias Circuit
Lighting Spade/Diamond and Heart/Club by 1/2 Duty-1/2 Bias Circuit
Lighting Spade/Diamond and Heart/Club Alternately by 1/2 Duty-1/2 Bias Circuit
Lighting Spade, Diamond, Heart, and Club by 1/2 Duty-1/2 Bias Circuit
Results of Logical Operations AND, NAND, OR, and NOR
Results of Logical Operations XOR and XNOR
Results of Logical Operations AND/NAND with 4-Switch Entry
Results of Logical Operations with OR/NOR
4-Switch Entry
Results of Logical Operations with XOR/XNOR
4-Switch Entry
Logical AND/NAND Gate for Driving External Circuit

Counts an External Clock (3)
Counts an External Clock (4)
Counts an External Clock (5)
Counts an External Clock (6)
3-Minute Timer
Multi-Function Timer (1)
15-Minute Timer with 7-Segment Display
Multi-Function Timer (2)
Digital Organ with PHOTO-TRANSISTOR (1)
Digital Organ with PHOTO-TRANSISTOR (2)
Digital Volume Changer (1)
Digital Volume Changer (2)
Digital Volume Changer (3)
Digital Volume Changer (4)
Digital Volume Changer (5)
Illumination Controlled by PHOTO-TRANSISTOR (1)
Illumination Controlled by PHOTO-TRANSISTOR (2)
Illumination Controlled by Oscillator and PHOTO-TRANSISTOR (1)
Illumination Controlled by Oscillator and PHOTO-TRANSISTOR (2)
Illumination with Speed Control (1)
Illumination with Speed Control (2)
Sawtooth Waveform Generator
Triangular Pulse Generator
Digital Level Indicator
Digital Lux Meter (Display In Binary)
4-Bit A/D Converter (Display In Binary)
4-Bit A/D Converter (Display In Hexadecimal On 7-Segment LED)
Digital Lux Meter (Display In Hexadecimal)
Audio Level Meter
Audio Level Meter with Peak-Holding Capability
Lighting Sign Board
Digital Dice
Digital Roulette
Digital Slot Machine
Up/Down Counter
Digital Metronome
Frequency Counter
Dynamic Lighting of 7-Segment LED
Lighting LED with Pulse Width Modulation
Majority Logic Gate (2)
Lighting LCD Segments by Static Drive
Digital Buzzer
Rhythm Box (1)
Rhythm Box (2)
Rhythm Box (3)
Rhythm Box (3)



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