



# ELENCO

**ELECTRONICS, INC.**



Solder Stations



Cable Testers



Tool Kits



Trainers



Power Supplies



Oscilloscopes



Educational Kits



Multimeters

**TRAINERS**

**OSCILLOSCOPES**

**MULTIMETERS**

**LOGIC PROBES**

**GENERATORS**

**POWER SUPPLIES**

**TOOL KITS**

**NETWORK CABLE TESTERS**

**HAND TOOLS**

**SOLDERING EQUIPMENT**

**SPECIALTY TESTERS**

**KITS**

**BREDBOARD AIDS**

**FIBER OPTICS**

**CATALOG 2000/2001**



# XK-700 DELUXE DIGITAL / ANALOG TRAINER

## DELUXE COMPLETE MINI-LAB FOR BUILDING, TESTING AND PROTOTYPING ANALOG AND DIGITAL CIRCUITS

Elenco's advanced designed Digital/Analog Trainer is specially designed for school projects. It is built on a single PC board for maximum reliability. It includes 5 built-in power supplies, a function generator with continuously variable sine, triangular and square wave forms. All power supplies are regulated and protected against shorts. The trainer is mounted in a professional technician tool case made of reinforced metal with heavy-duty handles and locks. The removable, dual-sided tool pallet has many pockets and elastic retainers to hold a broad line of tools and devices. A special ramp in the case will hold the meter of your choice. Five adjustable dividers are provided if you desire to turn the case into a technician service case.



## Tools in Case

Model **XK-700T** (shown in photo) is a stock trainer with tools and includes tools shown below (**meter, logic probe, and calculator shown are sold separately**).

- **ST-75** - 11 pc. Driver Set
- **SE-1** - Solder Ease Kit
- **SH-1** - Soldering Iron Stand
- **SP-2** - Solder Pump
- **SR-2B** - Deluxe Soldering Iron
- **ST-1** - Diagonal Cutters
- **ST-2** - Long Nose Pliers
- **ST-4** - Solder Tube
- **ST-20** - Safety Goggles
- **ST-30** - Deluxe Wire Stripper
- **SW-3** - Solder Wick
- **TL-8** - Precision Screwdriver Set
- **ET-10** - IC Puller

See page 4 for  
detailed specifications.

## Case Size

(18" x 13" x 6 1/2")

- **Model XK-700 Trainer** - Available fully assembled without tools.
- **Model XK-700-SEMI Trainer** - Trainer kit with PC board fully assembled.
- **Model XK-700K Trainer** - Available as kit.
- **Model XK-700T Trainer** - Available with tools as shown - meter, calculator, and logic probe **sold separately**.
- **Model XK-700T-SEMI Trainer** - Kit with PC board fully assembled - available with tools as shown - meter, calculator, and logic probe **sold separately**.
- **Model XK-700TK** - Available as a kit with tools as shown - meter, calculator, and logic probe **sold separately**.

**Available with Tools & Equipment of Your Choice!**  
**Call or Fax for Quote**

# XK-550 DIGITAL/ANALOG TRAINER

Elenco's advanced designed Digital/Analog Trainer is specially designed for school projects. It is built on a single PC board for maximum reliability. It includes 5 built-in power supplies, a function generator with continuously variable sine, triangular and square wave forms. All power supplies are regulated and protected against shorts.

Shown below is our trainer with our newest organizer case at no extra cost. The tools shown with the trainer are the most commonly used in the educational field or you can make your own selection of tools and meter to go with the trainer.

## Tools in Case

Model **XK-550T** (shown in photo) is a stock trainer with tools shown below (meter shown is sold separately).

- **ST-5** - Screwdriver Slotted 3/16"
- **ST-6** - Screwdriver #1 Phillips
- **ST-1** - Diagonal Pliers
- **ET-10** - IC Puller
- **ST-2** - Long Nose Pliers
- **SP-2** - Solder Pump
- **ST-3** - Wire Stripper
- **JW-140** - Jumper Wire Kit
- Anti-Static Foam Pad

### Case Size

(5.25" H x 16.375" W x 12.25" D)

- When ordering a meter to be used with the **XK-550 Trainer**, specify a PCV-50 kit which will provide you with velcro to hold the meter in place and an anti-static foam pad that fits below the meter for storage of ICs. This is supplied **FREE** with meter order.
- When ordering tools, specify a **TM-30** tool MTG kit. When four or more tools are ordered, the tool MTG kit is supplied **FREE!**

Elenco Electronics can supply the **XK-550 Trainer** complete with any combination of tools or any of the meters shown in our catalog. Call or write for more information.

- **Model XK-550 Trainer** - Available fully assembled without tools.
- **Model XK-550K Trainer** - Available as kit without tools.
- **Model XK-550T Trainer** - Available with tools as shown - meter **sold separately**.
- **Model XK-550TK Trainer** - Available as a kit with tools as shown - meter **sold separately**.
- **Model XK-550-SEMI Trainer** - Kit with PC board fully assembled.
- **Model XK-550T-SEMI Trainer** - Kit with PC board fully assembled available with tools as shown - meter **sold separately**.

# XK-150 DIGITAL / ANALOG TRAINER

A low cost, full-function digital/analog trainer that meets the needs of electronic training programs. Rugged construction, can be used as fixed lab equipment or be portable. An economical zipper case is available.

## SPECIFICATIONS

### DIGITAL SECTION

- Eight data switches.
- Two no bounce logic switches.
- Eight LED readouts, buffered.
- Clock frequency 1Hz, 1kHz, 100kHz, 60Hz.
- Clock amplitude 5Vpp square wave.

### ANALOG SECTION

- Function Generator - Sine, Square Wave
- Frequency adjustable in two ranges from 200 - 40k
- Amplitude Sine 4Vpp
- Square 12Vpp

### POTENTIOMETERS

- 2 undedicated potentiometers 1k $\Omega$  & 100k $\Omega$ .

### POWER SUPPLIES

- Variable Power Supply.
- +1.25V to 15VDC @ .25 amp.
- -1.25V to -15VDC @ .25 amp.
- +5VDC @ .25 amp.
- +30VAC center tapped at 15VAC @ .25 amp.

### CASE

High impact molded case 11" (L) x 11" (W) x 2" (H). With flow-thru cooling to ventilate the power supply.

### BREDBOARDS

- 1 Breadboard, 830 tie points including 2 bus strips.



- Model XK-150 Digital Trainer - Available fully assembled
- Model XK-150K Digital Trainer - Available as a kit

**OPTIONAL ACCESSORY:** C-150 large zipper case with handles (13" x 11 3/4" x 3") to easily carry the XK-150 Digital / Analog Trainer.

## SPECIFICATIONS FOR XK-550 & XK-700 TRAINERS ON PAGES 2 AND 3



### POWER SUPPLIES

- Variable Power Supply
- +1.25V to 20VDC @ .5 amp (+1.25V to 15VDC @ 1 amp)
- -1.25V to -20VDC @ .5 amp (-1.25V to -15VDC @ 1 amp)
- +12VDC @ 1 amp
- -12VDC @ 1 amp
- +5VDC @ 1 amp
- +30VAC center tapped at 15VAC @ 1A

### ANALOG SECTION

- Function Generator - Sine, Triangular, Square wave
- Frequency adjustable in five ranges from 1 to 100kHz
- Fine frequency adjust
- Amplitude adjust
- DC offset

### DIGITAL SECTION

- Eight data switches
- Two no bounce logic switches
- Eight LED readouts, buffered
- Clock frequency 1 to 100kHz
- Clock amplitude 5Vpp square wave

### POTENTIOMETERS

- 2 undedicated potentiometers 1k $\Omega$  & 100k $\Omega$

### BREDBOARDS

- 2 Breadboards, each containing 830 tie points (total 1,660)

### FAST TRACK CONSTRUCTION

Most of the components are on one PC board, eliminating all wires between the PC board, pots, regulators and switches. Makes assembly easier and faster, eliminates errors.

The **XK-550-SEMI** and **XK-700-SEMI** kits require a minimum of construction and are fast and easy to assemble. The PC board that is shown above comes fully assembled and tested. Where lab time is limited, the **SEMI** kit is time and cost effective.

# COMPUTER INTERFACE TRAINERS



## Microprocessor Training System

### Model MP-Z80

The trainer and the manuals will guide the user through the studying and understanding of Z80 instruction sets and assembly language programming. The manuals were specially designed as a learning tool for students and individuals who are interested in practical experiments of assembly language programming. The manuals contain more than 15 hands-on experiments, covering essential microprocessor course contents. Theory is covered to understand the experiments. Includes power pack, user manual, and experimentation manual.

## Micro-Master® - A Basic Computer Training Kit to Learn the Fundamentals of Computers

### Model MM-8000K

Starting from scratch, you build a complete computer system. Our Micro-Master® Trainer teaches you to write into RAMs, ROMs, and run an 8085 microprocessor. You will write the initial instructions in permanent memory in a 2816E<sup>2</sup>PROM. Teaches all about input and output ports and computer timers. Complete with 128 page lesson manual, instructions, and experiments.



Student & Network Versions Available

# EDUCATIONAL CD ROMS

FREE Demo CD Available - CALL!

## The Part Gallery & Electronics Circuits & Components

### Model ECC

- High quality virtual laboratories
- Compatible with Electronics Workbench & Crocodile Clips
- Editable assignments
- Full audio commentary
- Hundreds of photographs, symbols & graphics



#### CD-ROM contains:

##### 1) The Parts Gallery

Many students have a good understanding of electronic theory but still have difficulty recognizing the vast number of different types and makes of electronic components. The parts gallery has been designed to help overcome this problem; it will help students to recognize common electronic components and their corresponding symbols in circuit diagrams. This CD-ROM also incorporates components and symbol quizzes so that students can test their knowledge.

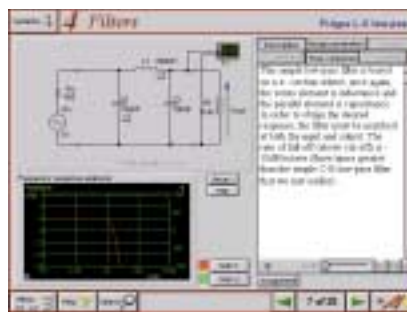
##### 2) Electric Circuits & Components

Electronic circuits and components provides a sound introduction to the principles and application of the most common types of electronic components and how they are used to form complete circuits. Sections on the disk include fundamental electronic theory, active components, passive components, analog circuits and digital circuits. A full set of support materials is included.

## Analog Electronics

### Model ELAN

- Includes SPICE circuit simulator with over 50 circuits
- Unique virtual laboratories
- Editable assignments
- Design parameters for circuits included
- Complete Hi-Fi amplifier case study



Analog Electronics is a complete learning resource for this most difficult branch of electronics. The CD-ROM includes a host of virtual laboratories, animations, diagrams, photographs and text as well as a SPICE electronic circuit simulator with over 50 pre-designed circuits. The component values on all circuits can be edited and the user can use the simulation engine to see how the value of each component affects circuit performance. Sections on the CD include: analog fundamentals, transistors, OP-AMPS, filters, oscillators and analog systems.

## Digital Electronics

### Model DIG

- Circuit simulation carried out on-screen
- Unique virtual laboratories
- Editable assignments
- Full audio commentary
- Pre-designed Crocodile Clips and Electronics Workbench circuits



Digital Electronics provides a broad introduction to the principles and practice of digital electronics, including: binary and hexadecimal, fundamental gates, monostables, JK and D type flip-flops, equivalent logic, specialized logic functions (including parity checkers, multiplexers, half and full adders, scrambling circuits), clocks, counters, BCD, shift registers, A/D and D/A converters, memories and an introduction to microprocessors. A gallery of common digital IC's and photographs of digital circuit applications is also included.

**Also Available:** Analog Filters (Model ELFIL), Digital Works (Model ELDWK), Electronic Projects (Model ELEP), Electronics CADPack (Model ELCPK), Pictutor (Model ELPK), PIC-C (Model ELPCK). See our website for more details.

# ANALOG OSCILLOSCOPES

**100MHz Dual Trace Model S-1390**  
**60MHz Dual Trace Model S-1360**  
**Delayed Sweep & Dual Trace**



S-1390 Shown

- 1mV/div sensitivity.
- Sweep to 2ns/div (S-1390), 10ns/div (S-1360).
- Component Tester (S-1360 only).
- Z axis input.
- Single sweep.
- Beam finder (S-1360).
- Dust cover included.
- 2 free x1, x10 probes.

## SPECIFICATIONS

### VERTICAL AMPLIFIERS (CH 1 and CH 2)

**Sensitivity:** 1mV/div - 5V/div.  
**Attenuator:** 10 cal. steps in 1-2-5 sequence, plus vernier.  
**Accuracy:**  $\pm 3\%$ , 5mV to 5V/div;  $\pm 5\%$ , 1mV, 2mV/div.  
**Input Impedance:** 1M $\Omega$   $\pm 2\%$ , 25pF  $\pm 10\text{pF}$ .  
**Rise Time:** 5.8ns or less.  
**Operating Modes:** CH 1, CH 2, DUAL (ALT/CHOP, ADD).  
**Chop Frequency:** Approximately 500kHz.  
**Polarity Reversal:** CH 2 only.  
**Max. Input Voltage:** 400V (DC + AC peak).  
**Over Shoot:** 5% or less.  
**SWEEP SYSTEM**  
**Operating Modes:** Main, Mix (main sweep: delayed sweep), Delay (only delayed sweep), X-Y.  
**S-1390 Main Time Base:** 0.2 $\mu\text{s}$ /div to 0.5s/div in 1-2-5 sequence, 23 steps plus variable vernier control.  
**S-1360 Main Time Base:** 0.1 $\mu\text{s}$ /div to 0.25s/div in 1-2-5 sequence, 20 steps plus variable vernier control.

**Delayed Time Base:** Same as main.

**Accuracy:**  $\pm 3\%$ . **Sweep Magnification:** x10  $\pm 5\%$ .

**Linearity:** (Center 8 divisions):  $\pm 3\%$ .

**Holdoff:** Con. adjustable from NORM to 5x.

### TRIGGERING

**Trigger Modes:** AUTO, NORM, SINGLE.

**Source:** CH 1, CH 2, ALT (V MODE), EXT, LINE.

### TRIGGER SENSITIVITY

COUPLING	BANDWIDTH	INT	EXT
TV-V (DC)	DC - 1kHz	1.0 div	0.1Vpp
TV-H	1kHz - 100kHz	1.0 div	0.1Vpp
AUTO	100Hz - 100MHz (S-1390)	2.0 div	0.1Vpp
NORM	100Hz - 25MHz (S-1390)	2.0 div	0.1Vpp

**HORIZONTAL AMPLIFIER** (input through CH 2 input)

**X-Y Mode:** CH 1: Y axis. CH 2: X axis.

**Sensitivity:** Same as vertical channel 2.

**Accuracy:**  $\pm 3\%$ , Y axis;  $\pm 5\%$  X axis.

**Input Impedance:** Same as vertical channel 2.

**X-Y Phase Difference:** 3° or less at 50kHz.

**Maximum Input Voltage:** Same as vertical channel 2.

**CH 1 Output:** 50mV/div (nominal, 50 $\Omega$  load), 100mV (no load)

**Output Impedance:** Approximately 50 $\Omega$ .

**Frequency Response:** 20Hz to 20MHz, -3dB, 50 $\Omega$ .

### CRT

**Display Area:** 8 x 10 div (1 div = 1cm).

**Accelerating Voltage:** 2kV (S-1360), 14kV (S-1390)

**Scale Illumination:** Continuously variable.

**Trace Rotation:** Electrical, front panel adjustable.

### COMPONENT TESTER

**Test Voltage:** 6V rms max (open).

**Test Current:** 11mA max (shorted).

**Test Frequency:** Line frequency (60Hz in USA).

### OTHER SPECIFICATIONS

**Probe Calibration:** 0.5Vpp  $\pm 3\%$ , 1kHz square wave.

**Z Modulation:** Positive TTL signal, low level blank intensity, high level unblank any intensity.

**Environment: Within Specified Accuracy:** +10° to +35°C, 85% maximum relative humidity.

**Full Operation:** 0° to +40°C, 85% max. relative humidity.

**Storage:** -20° to +70°C.

**Power Requirements:** 120V/220V  $\pm 10\%$ , 50/60Hz.

**Dimensions:** 13" (W) x 16" (D) x 5.3" (H)  
(324 x 132 x 398)

**Net Weight:** S-1390: 8.5kg (18.7 lbs.)

S-1360: 7.8kg (17.2 lbs.)

### ACCESSORIES SUPPLIED:

Two x1, x10 probes, instruction manual, AC power cord.

# STORAGE OSCILLOSCOPES



DS-303 Shown

**20MHz, 10MS/s Model DS-203**  
**30MHz, 20MS/s Model DS-303**  
**60MHz, 20MS/s Model DS-603**  
 Digital Storage / Analog Oscilloscopes



**2-Channel, 2K Memory Per Channel**  
**1mV Sensitivity, Internally Backed-up**  
**Memory (DS-603 & DS-303)**  
**RS-232 Output (DS-603 & DS-303), and**  
**much more**

**FREE DUST COVER & PROBES**

## SPECIFICATIONS

### VERTICAL AXIS

**Sensitivity:** 5mV-5V/Div  $\pm 3\%$   
**Magnification:** 10 Steps in 1-2-5 seq w/ variable control  
**Bandwidth:** DC: DC to 60MHz (30MHz DS-303) within -3dB  
 AC: 10Hz to 60MHz (30MHz DS-303) within -3dB  
**Rise Time:** 6ns or less DS-603  
 12ns or less DS-303 (18ns or less DS-203)  
**Overshoot:** 3% or less (DS-303)  
**Input Impedance:** 1M $\Omega$  shunted by 25pF  $\pm 10\text{pF}$   
**Max. Input Voltage:** 400V (DC + AC Peak)  
**Operation Mode:** CH1, CH2, Dual (ALT or CHOP) and ADD  
**Chop Frequency:** Approximately 500kHz  
**Polarity Selection:** Possible only in CH2  
**Sweep Time:** .1 $\mu\text{s}$  to .5s/div

### HORIZONTAL AXIS

**(normal):** 21 steps in 1-2-5 seq. w/ variable control  
**Magnification:** x10 to 10ns/div  
**Linearity:** Less than 3%  
**Accuracy:**  $\pm 3\%$   
**Hold off time:** Variable up to 5 times sweep  
**Trigger Signal Source:** CH-1, CH2, Alt, Line, Ext

### TRIGGER

**Trigger Sensitivity Auto:**

30Hz to 60MHz: 1.5 div (INT);  $\geq 0.5\text{Vpp}$  (EXT) (DS-603)  
 30Hz to 40MHz: 1.5 div (INT);  $\geq 0.5\text{Vpp}$  (EXT) (DS-303)

1000Hz to 30MHz: 1.5 div (INT);  $\geq 0.5\text{Vpp}$  (EXT) (DS-203)

**(norm):** DC - 30MHz: 1.5 div (INT);  $\geq 1\text{Vpp}$  (EXT)

**(TV-V):** 20Hz - 1kHz: .5 div (INT);  $\geq 0.05\text{Vpp}$  (EXT)

**(TV-H):** 1kHz-100kHz: .5 div (INT);  $\geq 0.05\text{Vpp}$  (EXT)

**Coupling:** Auto, Norm, TV-V, TV-H

**Sensitivity:** X-Axis: same as CH2, Y-axis: same as CH1

### X - Y OPERATION

**X-axis Bandwidth:** DC to 2MHz (at -3dB)

**Phase Shift:** Less than 3° at DC to approximately 50kHz

**Memory:** 2K words per channel (internally backed up DS-603 & DS-303 only)

### DIGITAL STORAGE FACILITIES

**Maximum Sampling Rate:** 20M samples/sec

**Vertical Resolution:** 8-bit (25 levels/div)

**Horizontal Resolution:** 2,048 points for 10 div

**Operating Mode:** Roll, Save, All, Save CH2, X-Y, Single  
 Pre-trig (0%, 25%, 50%, 75%) RS-232  
**Frequency Response:** DC-60MHz (-3dB) (DS-603)  
 DC-30MHz (-3dB) (DS-303)  
 DC-20MHz (-3dB) (DS-203)  
**Output:** RS-232: 4800, no parity, 8-bit, 1 stop bit  
**Plot:** Epson (24-pin) Compatible printer  
**Calibration Signal:** 0.5Vpp  $\pm 3\%$  1kHz square wave

### GENERAL

**CRT:** 6 inch screen with lighted internal graticule (DS-603 & DS-303 only); P31 phosphor: 8 x 10 divisions; 12V-V (DS-603)

**Acceleration Potential:** Approximately 2.1kV (DS-303)

Approximately 2kV (DS-203)

**Power Requirements:** 90-137VAC or 198-264VAC

50/60Hz, 60W consumption

**Dimensions:** 12.8" W x 5.2" H x 15.6" D

**Weight:** 19 lbs. (DS-603 & DS-303); 22 lbs. (DS-203)

**Standard Accessories:** Operation manual, power cord, spare fuse, 2 switchable x1, x10 probes

# OSCILLOSCOPES

## 25MHz Model S-1330

2-Channel - Delayed Sweep  
Component Tester, Beam Find, Dual Time Base



S-1330 Shown

### SPECIFICATIONS

**VERTICAL AMPLIFIERS (CH 1 and CH 2)**  
**Bandwidth:** DC-25MHz (-3dB).  
**Sensitivity:** 1mV/DIV - 1V/DIV (6MHz, -3dB), x5 gain selected.  
 5mV/DIV - 5V/DIV.  
**Attenuator:** 1-2-5 sequence, 10 step w/ variable control  
**Input Impedance:** 1MΩ ±2%, 25pF ±10%.  
**Max. Input Voltage:** 400V (DC + AC peak).  
**Rise Time:** About 14.0ns.  
**Over Shoot:** Less than 5%.  
**Operating Modes:** CH 1, CH 2, DUAL (ALT, CHOP).  
**Algebraic Addition:** CH 1 + CH 2, CH 1 - CH 2.  
**Inverter:** CH 2 only.

### HORIZONTAL AMPLIFIER

**X-Y Mode:** Switch selectable using X-Y switch  
 CH 1: X axis.  
 CH 2: Y axis.  
**Accuracy:** Y Axis ±3%.  
 X Axis ±6%.  
**Bandwidth:** DC - 1MHz (-3dB).  
**X-Y Phase Difference:** Approx. 3° at 50kHz.  
**SWEEP SYSTEM**  
**Sweep Display Mode:** Main, Mix, Delay (S-1330 only).  
**Hold Off Time:** 5:1 continuously variable.  
**MAIN SWEEP**  
**Sweep Speed:** 0.1μs/DIV - 0.2s/DIV in 1-2-5 sequence, 20 steps.  
**Accuracy:** ±3%.  
**Variable Time Control:** 5:1, uncalibrated, continuously variable between steps.

**Sweep Magnification:** 10X, ±10%, extend sweep speed up to 10ns/DIV.

**DELAY SWEEP (S-1330 only)**  
**Sweep Speed:** 0.1μs/DIV - 0.2s/DIV in 1-2-5 sequence, 20 steps.  
**Accuracy:** ±3%

**Sweep Magnification:** 10X, ±10%, extend sweep speed up to 10ns/DIV.

**Delay Time Position:** Variable control to locate desirable waveform for extending.

### TRIGGERING

**Trigger Coupling:** AUTO, NORM, TV-V, TV-H.  
**Trigger Source:** CH 1, CH 2, ALT, LINE, EXT.

**Slope:** ±

### TRIGGER SENSITIVITY

COUPLING	BANDWIDTH	INT	EXT
TV-V	DC - 1kHz	1.0 DIV	0.1Vpp
TV-H	1kHz - 100kHz	1.0 DIV	0.1Vpp
AUTO	100Hz - 25MHz	1.5 DIV	0.1Vpp
NORM	100Hz - 25MHz	1.5 DIV	0.1Vpp

All Scopes  
UL, CSA,  
TUV, GS  
Approved

## 25MHz Model S-1325

2-Channel - Oscilloscope

- Dual or single trace operation.
- Calibrated 20 step timebase with x10 magnifier.
- AUTO/NORM triggered sweep operation with AC, TVH, TVV and line coupling.
- 1mV/DIV sensitivity.
- Z modulation (S-1330 only).
- Y (CH B) output (S-1330 only).
- Dust cover included.
- 2 free x1, x10 probes.

### COMPONENT TEST (S-1330 only)

**Test Voltage:** Max. 6Vrms (open circuit).  
**Test Current:** Max. 11mA (shorted).  
**Test Frequency:** Line Frequency.  
**Components:** Capacitor, Inductor, Diode, Transistor, Zener, etc.

### CH 2 OUTPUT (S-1330 only)

**Output Level:** 100mV/DIV (no load).  
**Bandwidth:** 20Hz - 25MHz (-3dB)

### Z Modulation (S-1330 only):

Positive TTL signal, low level blank intensity at any intensity, high level unblank any intensity.  
**CRT: Type:** Rectangular with internal graticule.  
 Adjustable graticule illumination (S-1330 only).  
**Display Area:** 8 x 10 div (1 div = 1 cm).  
**Accelerating Voltage:** 2kV.  
**Phosphor:** P31

### OTHER SPECIFICATIONS

**Dimensions:** 12 3/4" (W) x 15 3/4" (D) x 5 1/4" (H).  
**Net Weight:** Approximately 16.7 lbs. (7.6kgs.)  
**Calibrator:** Square wave about 1kHz, 2Vpp ±3%.  
**Trace Rotation:** Adjustable front panel.  
**Power Source:** 110V, 125V, 220V, 240VAC, 50/60Hz  
**Power Consumption:** Approximately 38 watts.

### ACCESSORIES SUPPLIED:

Two x1, x10 probes, schematic diagram & parts list, AC power cord, spare fuse, and dust cover.

## 40MHz Model S-1345

2-Channel - Delayed Sweep  
Component Tester, Beam Find, Dual Time Base



S-1345 Shown

### SPECIFICATIONS

**VERTICAL AMPLIFIERS (CH 1 and CH 2)**  
**Bandwidth:** DC-40MHz (-3dB).  
**Sensitivity:** 1mV/DIV - 1V/DIV (6MHz, -3dB), x5 gain selected.  
 5mV/DIV - 5V/DIV.  
**Attenuator:** 1-2-5 sequence, 10 step w/ variable control  
**Input Impedance:** 1MΩ ±2%, 25pF ±10%.  
**Max. Input Voltage:** 400V (DC + AC peak).  
**Rise Time:** About 8.8ns.  
**Over Shoot:** Less than 5%.  
**Operating Modes:** CH 1, CH 2, DUAL (ALT, CHOP).  
**Algebraic Addition:** CH 1 + CH 2, CH 1 - CH 2.  
**Inverter:** CH 2 only.

### HORIZONTAL AMPLIFIER

**X-Y Mode:** Switch selectable using X-Y switch  
 CH 1: X axis.  
 CH 2: Y axis.  
**Accuracy:** Y Axis ±3%.  
 X Axis ±6%.  
**Bandwidth:** DC - 1MHz (-3dB).  
**X-Y Phase Difference:** Approx. 3° at 50kHz.  
**SWEEP SYSTEM**  
**Sweep Display Mode:** Main, Mix, Delay (S-1345 only).  
**Hold Off Time:** 5:1 continuously variable.  
**MAIN SWEEP**  
**Sweep Speed:** 0.1μs/DIV - 0.2s/DIV in 1-2-5 sequence, 20 steps.  
**Accuracy:** ±3%.  
**Variable Time Control:** 5:1, uncalibrated, continuously variable between steps.

**Sweep Magnification:** 10X, ±10%, extend sweep speed up to 10ns/DIV.

**DELAY SWEEP (S-1345 only)**  
**Sweep Speed:** 0.1μs/DIV - 0.2s/DIV in 1-2-5 sequence, 20 steps.  
**Accuracy:** ±3%

**Sweep Magnification:** 10X, ±10%, extend sweep speed up to 10ns/DIV.

**Delay Time Position:** Variable control to locate desirable waveform for extending.

### TRIGGERING

**Trigger Coupling:** AUTO, NORM, TV-V, TV-H.  
**Trigger Source:** CH 1, CH 2, ALT, LINE, EXT.

**Slope:** ±

### TRIGGER SENSITIVITY

COUPLING	BANDWIDTH	INT	EXT
TV-V	DC - 1kHz	1.0 DIV	0.1Vpp
TV-H	1kHz - 100kHz	1.0 DIV	0.1Vpp
AUTO	100Hz - 40MHz	1.5 DIV	0.1Vpp
NORM	100Hz - 40MHz	1.5 DIV	0.1Vpp

All Scopes  
UL, CSA,  
TUV, GS  
Approved

## 40MHz Model S-1340

2-Channel - Oscilloscope

- 1mV/DIV sensitivity.
- Variable hold off.
- X-Y Operation.
- TV sync.
- Beam finder (S-1345 only).
- Sweep Mix (S-1345 only).
- Z Modulation (S-1345 only).
- Component Tester (S-1345).
- Dust Cover Included.
- 2 free x1, x10 probes.

### COMPONENT TEST (S-1345 only)

**Test Voltage:** Max. 6Vrms (open circuit).  
**Test Current:** Max. 11mA (shorted).  
**Test Frequency:** Line Frequency.  
**Components:** Capacitor, Inductor, Diode, Transistor, Zener, etc.

### CH 2 OUTPUT (S-1345 only)

**Output Level:** 100mV/DIV (no load).  
 50mV/DIV (with 50Ω load).  
**Bandwidth:** 20Hz - 25MHz (-3dB)

### Z Modulation (S-1345 only):

Positive TTL signal, low level blank intensity at any intensity, high level unblank any intensity.  
**CRT: Type:** Rectangular with internal graticule.  
 Adjustable graticule illumination (S-1345 only).  
**Display Area:** 8 x 10 div (1 div = 1 cm).  
**Accelerating Voltage:** 12kV.  
**Phosphor:** P31

### OTHER SPECIFICATIONS

**Dimensions:** 12 3/4" (W) x 15 3/4" (D) x 5 1/4" (H).  
**Net Weight:** Approximately 16.7 lbs. (7.6kgs.)  
**Calibrator:** Square wave about 1kHz, 2Vpp ±3%.  
**Trace Rotation:** Adjustable front panel.  
**Power Source:** 110V, 125V, 220V, 240VAC, 50/60Hz  
**Power Consumption:** Approximately 38 watts.

### ACCESSORIES SUPPLIED:

Two x1, x10 probes, schematic diagram & parts list, AC power cord, spare fuse, and dust cover.

# DIGITAL MULTIMETERS



**Model M-1700**

- Frequency to 20MHz
- Capacitance to 20μF
- Diode and Transistor Test
- Audible Continuity
- 3 1/2 Digit LCD
- AC/DC Current to 10A
- Low Cost
- Three Way Overload Protection

SPECIFICATIONS		
AC + DC Volts Accuracy	200mV, 2V, 20V, 200V, 600V DC 0.9%, AC 1.9%	Resolution 100μV
AC + DC Current Accuracy	2mA, 20mA, 200mA, 10A 2.5%	Resolution 100μA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ 1.5Ω	Resolution 0.1Ω
Frequency Accuracy	10Hz - 20MHz Autoranging 0.5%	Resolution 1Hz
Capacitance Accuracy	2nF, 20nF, 200nF, 2μF, 20μF ±5%	Resolution 1pF
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-90, C-17	
Size	2.5" W x 6" L x 1.25" D	



**Model M-2775**

- Extra Large 1" display
- Audible continuity test
- Data Hold
- Frequency to 20MHz
- Capacitance to 20μF
- Transistor / Diode Test
- AC/DC Current to 20A
- Auto Power Off
- **Optional Holster**

SPECIFICATIONS		
AC + DC Volts Accuracy	200mV, 2V, 20V, 200V, 1000V, 750VAC 1/2% DC, 1% AC, 750VAC 1.5%	Resolution .1mV
AC + DC Current Accuracy	200μA (DC only), 2mA, 20mA, 200mA, 20A 1% DC, 1.5% AC, 10A 2%	Resolution .1μA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ .8%, 3% 20MΩ	Resolution .1Ω
Capacitance Accuracy	2nF, 20nF, 200nF, 2μF, 20μF 3%	Resolution .1pF
Frequency Accuracy	2kHz, 20kHz, 200kHz, 2MHz, 20MHz 1%	Resolution 1Hz
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-72, C-90	
Size	3.5" W x 7.5" L x 1.4" D	



**Model M-2760N**

- Extra Large 1" display
- Transistor Test
- Overload Protection
- Capacitance to 20μF
- Diode Test
- AC/DC Current to 20A

SPECIFICATIONS		
AC + DC Volts Accuracy	200mV, 2V, 20V, 200V, 1000V, 750VAC 1/2% DC, 1% AC	Resolution .1mV
AC + DC Current Accuracy	200μA (DC only), 2mA, 200mA, 20A 1% DC, 1.5% AC, 20A 2%	Resolution .1μA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ .8%, 3% 20MΩ	Resolution .1Ω
Capacitance Accuracy	2nF, 20nF, 200nF, 2μF, 20μF 3%	Resolution .1pF
Temperature Accuracy	-20°C to 1,370°C or 0°F to 1,999°F 3%	Resolution 1°
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-90, C-70	
Size	3.5" W x 7.5" L x 1.4" D	



**Model M-3900**

- Extra Large 1" Display
- 20μA and 20A Scales on AC and DC
- Transistor Test
- Audible Continuity Test
- Diode Test
- Case Included

SPECIFICATIONS		
AC + DC Volts Accuracy	200mV, 2V, 20V, 200V, 1000V, 750VAC 1/2% DC, .8% AC	Resolution .1mV
AC + DC Current Accuracy	20μA, 200μA, 2mA, 20mA, 200mA, 2A, 20A 1/2% DC, 1% AC	Resolution .01μA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ .8%	Resolution .1Ω
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265	
Size	3.3" W x 7.3" L x 1.3" D	

# DIGITAL MULTIMETERS

## Model M-1740



- Frequency to 20MHz
- Capacitance to 20 $\mu$ F
- Diode and Transistor Test
- Audible Continuity
- 3 1/2 Digit LCD
- AC/DC Current to 10A
- Low Cost
- Three Way Overload Protection
- Holster Included

### SPECIFICATIONS

AC + DC Volts	200mV, 2V, 20V, 200V, 600V	
Accuracy	DC 0.9%, AC 1.9%	Resolution 100 $\mu$ V
AC + DC Current	2mA, 20mA, 200mA, 10A	
Accuracy	2.5%	Resolution 100 $\mu$ A
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$ , 20M $\Omega$	
Accuracy	1.5%	Resolution 0.1 $\Omega$
Frequency	10Hz - 20MHz Autoranging	
Accuracy	0.5%	Resolution 1Hz
Capacitance	2nF, 20nF, 200nF, 2 $\mu$ F, 20 $\mu$ F	
Accuracy	$\pm$ 5%	Resolution 1pF
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-90, C-17	
Size	2.5" W x 6" L x 1.25" D	

## COMPACT MULTIMETER

### Model M-1000B



- 3 1/2 Digit LCD
- Transistor Test
- Diode Test
- Overload Protection
- Pocket Size
- Low Cost

Available as a kit (M-1005K)

### SPECIFICATIONS

DC Volts	200mV, 2V, 20V, 200V, 1000V	
AC Volts	200V, 750V	
Accuracy	DC 1/2%, AC 1.2%	
Resolution	.1mV	
Input Impedance	1M $\Omega$	
DC Current	200 $\mu$ A, 2mA, 20mA, 200mA, 10A	
Accuracy	$\pm$ 1.2% rdg + 2 digits	
Resolution	.1 $\mu$ A	
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$	
Accuracy	$\pm$ 1.2% rdg + 2 digits	
Resolution	.1 $\Omega$	
Accessories	Test leads, Manual, 9V Batteries included	
Size	2.9" W x 5" L x 1" D	

## Model LCM-1950



- Large 1" 3 3/4 digit LCD
- Autoranging frequency to 4MHz
- Capacitance to 400 $\mu$ F
- Inductance to 40H
- Resistance to 4000M $\Omega$
- Logic test
- Diode and transistor test
- Audible continuity test

### SPECIFICATIONS

AC + DC Volts	400mV, 4V, 40V, 400V, 1000V, 750VAC	
Accuracy	DC 1/2%, AC 1.5%	Resolution 100 $\mu$ V
AC + DC Current	40mA, 400mA, 10A	
Accuracy	1.5% DC 3% 20A, 2% AC 3.5% 10A	Resolution 10 $\mu$ A
Resistance	400 $\Omega$ , 4k $\Omega$ , 40k $\Omega$ , 400k $\Omega$ , 4000k $\Omega$ , 40M $\Omega$ , 4000M $\Omega$	
Accuracy	1% to 4000k $\Omega$ , 3% 40M $\Omega$ , 5% 4000M $\Omega$	Resolution .1 $\Omega$
Capacitance	4000pF, 40nF, 400nF, 4 $\mu$ F, 400 $\mu$ F	
Accuracy	5%	Resolution 1pF
Inductance	4mH, 40mH, 400mH, 4H, 40H	
Accuracy	5%	Resolution 1 $\mu$ H
Frequency	4kHz, 40kHz, 400kHz, 4000kHz	
Accuracy	1/2%	Resolution 1Hz
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-90	
Size	3.5" W x 7.75" L x 1.5" D	

## Model M-2612



- Temperature to 1999 $^{\circ}$ F.
- Large 3 1/2 Digit Display.
- 20 $\mu$ A Range on Current.
- Audible Continuity
- Temperature Probe Included.
- Ideal for HVAC

### SPECIFICATIONS

AC + DC Volts	200mV, 2V, 20V, 200V, 1000V, 750VAC	
Accuracy	1/2% DC, .8% AC	Resolution .1mV
AC + DC Current	200 $\mu$ A, 20mA, 200mA, 10A	
Accuracy	1/2% DC, 1% AC	Resolution .1 $\mu$ A
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$ , 20M $\Omega$	
Accuracy	.8%	Resolution .1 $\Omega$
Temperature	0-1999 $^{\circ}$ F	Probe Included
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C-90, C-71	
Size	3.3" W x 7.3" L x 1.3" D	

# COMPONENT TESTERS

## Digital Capacitance Meter

### Model CM-1555



- Measures capacitors from .1pF to 20,000μF
- 3 1/2 Digit LCD readout with unit indicator
- Zero control for test lead compensation
- Banana jack and special insertion jack included
- Compact size with tilt stand and holster

#### SPECIFICATIONS

Range	200pF, 2,000pF, 20nF, 200nF 2μF, 20μF, 200μF, 2,000μF, 20,000μF
Resolution	.1pF, 1pF, 10pF, 100pF, 1nF, 10nF, 100nF, 1μF, 10μF
Accuracy	1/2% 200pF - 200μF range 2% 2,000μF range 4% 20,000μF range
Accessories	Test leads, Manual, 9V Battery included
Size:	2.7" W x 6" L x 1.2" D

## Digital LCR Meter

### Model LCR-1810



- Capacitance .1pF to 20μF
- Inductance 1μH to 20H
- Resistance .01Ω to 2000MΩ
- Temperature -20°C to 750°C
- DC Volts 0 - 20V
- Frequency up to 15MHz
- Diode/Audible Continuity Test
- Signal Output Function
- 3 1/2 Digit Display

#### SPECIFICATIONS

Capacitance	200pF, 2nF, 20nF, 200nF, 2μF, 20μF, 200μF, 2000μF, 20MF
Accuracy	±2% Resolution .1pF
Inductance	200μH, 2mH, 20mH, 200mH, 2H, 20H
Accuracy	±5% Resolution .1μF
Resistance	20Ω, 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ, 200MΩ, 2000MΩ
Accuracy	±0.3% Resolution .01Ω
Temperature	-20° - 500°C ±2% 500° - 750°C ±3%
Frequency	Autoranging up to 15MHz ±10%
DC Volts	0 - 20VDC +2%
Accessories	Test leads, Manual, 9V Battery included
Options	C-70, C-90
Size:	3.5" W x 6.8" L x 1.4" D

# ANALOG MULTIMETERS

## 20k/V VOM Model M-1250



- 20,000 ohms/volts
- 23 Ranges
- 3 1/2" Meter
- Mirrored scale
- Audible continuity
- Checks transistors/diodes
- 10A DC current
- dB Scale
- Battery test

Available as kit  
Model M-1250K

#### SPECIFICATIONS

DC Volts	.1, .5, 2.5, 10, 50, 250, 1000, 3% FSR
AC Volts	10, 50, 250, 1kV, 4% FSR
DC Current	50μA, 2.5mA, 25mA, 250mA, 10A 3% FDR
Resistance	X1, X10, X100, X1k, X10k
Transistor h <sub>FE</sub> 0-1000	ICEO 150μA, 1.5mA, 15mA, 150mA
Accessories	Test leads, Manual, 9V & (2) 1.5V AA batteries incl.
Size	3.7" L x 5.9" W x 1.25" D

## Compact VOM Model M-104



- Reads volts, amps, ohms
- 10,000 ohm/volt DC, AC
- 14 Ranges
- Mirrored meter
- Pocket size
- Battery test
- Diode protected

#### SPECIFICATIONS

DC Voltage	2.5, 50, 250, 1000 DC volts ±4% FS
AC Voltage	10, 50, 250, 1000, AC volts ±5% FS
DC Current	10MA, 250MA, DC ±4% FS
Ohm Meter	x10, x1k (3.6KΩ mid scale) ±4% FS
Accessories	Test leads, Manual, 1.5V AA batteries included
Size	2.5" L x 4" W x 1.3" D

# SPECIAL METERS

## DMM with Computer Interface

### Model M-6100/PMM208



#### Features:

- True RMS of high speed signals
- Computer interface and software
- Frequency to 200kHz
- Capacitance to 40 $\mu$ F
- Large 3 3/4 LCD display
- Captures & displays max, min, & avg.
- Relative % to reference
- Three hold system
- Analog bar graph and pointer
- Audible continuity
- Auto power off
- Unit indicator
- Diode test
- Optional software upgrade

MaxiGraf™ Model M-6100SFT

#### SPECIFICATIONS

AC + DC Volts	4V, 40V, 400V, 750V (AC only), 1,000V (DC only)	Capacitance	400nF, 4 $\mu$ F, 40 $\mu$ F
Accuracy	$\pm(0.3\% + 2)$	Accuracy	$\pm(3\% + 5)$
AC + DC Current	40mA, 400mA, 4A, 10A	Frequency	200Hz, 2kHz, 20kHz, 200kHz
Accuracy	$\pm(0.75\%+5)$ 4-10 DC A/40-400 ACmA $\pm(1.5\%+5)$ 4-10 AC A	Accuracy	$\pm(0.05\% + 2)$
Resistance	400 $\Omega$ , 4k $\Omega$ , 40k $\Omega$ , 400k $\Omega$ , 4M $\Omega$ , 40M $\Omega$	Size and Weight	3.5" W x 7.5" L x 1.5" D ; 11.3 oz.
Accuracy	$\pm(0.5\% + 5)$ to 4M $\Omega$ , $\pm(1\% + 10)$ 40M $\Omega$	Accessories	RS-232C Basic Software, RS-232C Cable, Test Leads, Manual, 9V Battery
		Options	MaxiGraf™ Software upgrade, ST-265, C-70, C-90

## Temperature Meter

### Model M-502



#### Features:

- 4 1/2 Digit with dual display
- K/J type thermo-couple input selection
- T1 - T2 differential
- Max./min., avg., rel, hold, functions
- High/Lo setting with warning beeper
- Time setting
- C°/F° user-selective
- Auto power off
- Protective holster

#### SPECIFICATIONS

J-Type Range	-328°F - 1922°F
K-Type Range	-328°F - 2498°F
Accuracy (ITS-90)	$\pm 0.05\%$ RDG.
Resolution	0.1°
Size	7.70" x 3.65" x 2.10"
Weight	9 oz.
Accessories	Holster, 2 Probes (K-Type), Manual

## Automotive Meter

### Model M-4000



#### Digital Engine Analyzer for Automotive Diagnostics and Troubleshooting

#### Features:

- 3 1/2 Digit LCD Readout
- Reads tach and dwell
- Diode test
- Audible continuity
- Temperature measurement
- Measures AC and ADC voltage plus resistance

#### SPECIFICATIONS

DC Voltage	200mV, 2V, 20V, 200V Accuracy 1/2%	Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 20M $\Omega$ Accuracy 1%
DC Current	200mA, 2A, 15A Accuracy 1%		
Tachometer	0-8000RPM (4, 5, 6, 8 Cyl)	Resolution	10RPM Accuracy 3%
Dwell	4 cyl. 0-90.0° 5 cyl. 0-72.0° 6 cyl. 0-60.0° 8 cyl. 0-45.0°	Resolution	0.1° Accuracy 1.5%
Duty Cycle	0-100.0%	Resolution	0.1% Accuracy 1.5%
Temperature	-20°C to 1370°C	Resolution	0.1% Accuracy 3%
Size	6.7" L x 3.5" W x 1.5" D		
Accessories	Test leads, Manual, Temp Probe, 9V Battery included		

## Bench Digital Multimeter

### Model M-4500



#### Features:

- 4 1/2 Digit LCD
- Measures DCV, ACA, DCV, DCA, ACA, & Ohms.

#### SPECIFICATIONS

DC, AC Volts	200mV, 2V, 20V, 200V, 1000V, 750VAC
Accuracy	DC .05% $\pm 2$ digit, AC .5% + 10 digits
Resolution	10 $\mu$ V
DC, AC Current	20 $\mu$ A, 2mA, 20mA, 200mA, 2A, 10A
Accuracy	DC .5% $\pm 1$ digit, AC .75% $\pm 10$ digits
Resolution	10nA
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$ , 20M $\Omega$
Accuracy	.15% $\pm 2$ digits
Resolution	.01 $\Omega$
Power Supply	(6) 1.5V "D" size batteries
Battery Life	6000 hrs ON time

# AC CURRENT METERS

## Digital Clamp Meter Model ST-1010



- 3 1/2 Digit LCD
- Reads up to 1000A
- Data hold
- Peak hold
- Audible continuity
- Diode test
- Case Included

### SPECIFICATIONS

AC Voltage	200V, 750V	Accuracy 1.2%	Resolution .1V
DC Voltage	200mV, 20V, 200V, 1000V	Accy 1/2%	Resolution 100mV
AC Current	200A, 1000A	Accuracy 2%	Resolution 100mA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2000kΩ		Resolution .1Ω
Insulation test	20MΩ, 2000MΩ ±2%		
Size	9" L x 2.7" W x 1.5" D		
Accessories	Test leads, Manual, Case, 9V Battery included		

## Analog Clamp Meter Model ST-360



- Reads up to 300A
- Meter lock
- Fuse protected
- Safety test leads
- Compact size
- Case Included
- Low cost
- TP-07 temp probe reads 60°F - 300°F (optional)

### SPECIFICATIONS

AC Voltage	150/300/600V	Accuracy ±3% FS
AC Current	6/15/60/150/300A	Accuracy ±3% FS
DC Voltage	60V	Accuracy ±3% FS
Resistance	2kΩ, 200kΩ, (midscale 38kΩ, 3.8kΩ)	Accuracy +3% FS
Size	6.9" L x 3.3" W x 1.5" D	
Accessories	Test leads, Manual, 1.5V Battery included	

## Video Head Tester Model HT-200



Video head tester for VHS video heads. Bridge circuit determines if head is defective or worn. Three measurement ranges - internal battery check. Complete with test leads, carrying case and built-in easel stand.



## Multimeter Holsters

Absorbs shocks and protects meter from rough handling.

- Model C-17** Fits M-1700, M-1740
- Model C-71** Fits M-2612
- Model C-72** Fits M-2775, M-2760N

## AC Clamp-On Current Meter Model ST-265

Works with all DMMs having a 0-2VAC scale. The Model ST-265 Current Adapter enables clamp-on AC current measurements of up to 1,000 amps to be made with a conventional digital multimeter.



## LED Digital Panel Meter Model PM-129B



- 3 1/2 digit 0.56" LED height
- 200mV full scale sensitivity
- 1% Accuracy
- Auto polarity and auto zero
- Decimal point selectable
- Programmable to read 0 - 200mV, 2V, 20V, 200V or 2,000V.
- Input and 5V power supply have common grounds
- Bezel size 2 3/4" x 1 1/4" x 1/4" • Meter size 2 1/2" x 2 3/4" x 3/4"

## SWR/Watt Meter Model SWR-3P



### SPECIFICATIONS

SWR:	1:1 to 1:3
RF-Power	0-10W and 0-100W
Accuracy	SWR 5%, RF-Power 10% 52Ω
Impedance	52Ω
Frequency Range	1.7MHz to 150MHz
Indicator	200 DC Micro-ammeter
Antenna	5 inch antenna
Dimensions	6" x 2" x 2"
Weight	14 oz.

# PROBES AND TEST LEADS

## 65MHz Scope Probe

**P-1C**

Built-in 2 position switch; X1, X10, complete with 4 accessories, 10 Meg ohms input impedance. Fits all scopes with BNC connector. 60" length, compensation range 10 to 35pF. Easily converts to BNC to BNC.



## 100MHz Scope Probe

**P-2C**

Built-in 2 position switch; X1, X10. Complete with 5 accessories. 10 Meg ohms input impedance. Fits all scopes with BNC connector. 60" length, compensation range 10 to 35pF. Easily converts to BNC to BNC.



**TL-3 \***

BNC to Minigrabber.  
Length - 42"



**TL-4 \***

Insulated banana to test probe. Length - 36"



**TL-5 \***

Stackable banana to alligator clip. Length - 36" Also available w/ large alligator clips (TL-16 \*).



**TL-6 \***

Jumper clip lead set (10 pieces, 5 colors). Length - 14". Also available w/ large alligator clips (TL-6LG \*).



**TL-7 \***

BNC to BNC. Length 36"



**TL-9 \***

IC clip test lead set. Length - 36"



**TL-10**

Universal test lead set. Length - 36"



Retail Packaging Standard

**TL-12 \***

Stackable banana to minigrabber. Length - 36"



**TL-15 \***

Heavy-duty test probe set. With screw-on alligator clips. Length - 36"



**TL-17 \***

BNC to alligator clips. Length - 36"



**TL-18 \***

Banana to Banana. Length - 36"



**TL-21 \***

IC test lead set. Jumper minigrabbers. Set includes 5 colors, one each: red, black, yellow, green & white.



# DIGITAL LOGIC AND PULSER PROBES

## Logic Probe Model LP-550



**Audio and visual features**, tests all logic families TTL/LS and CMOS/MOS digital circuits, color coded LEDs indicate high, low or pulsed logic states. The high speed logic probe is capable of capturing pulses of 25nsec. Simultaneous tone output (high, low or both) maximum input frequency of 25MHz.

## Logic Probe Model LP-535K (kit)



Advanced design with **audible sound** for signal detection in logic circuits. It displays logic levels (high or low) pulses and voltage transients down to 10 nanoseconds. High intensity LED readouts provide instant response to the logic state. Simplified circuitry for fast construction. Detailed instructions, illustrations and testing included.

## Logic Pulser Model LP-425K (kit)



The Logic Pulser Kit is a desirable device in the troubleshooting of logic circuits and compliments the logic probe in pulse tracing signals in complex circuits. It injects a signal directly into a circuit without having to disconnect components. It is circuit powered and has a switchable output of .5 or 400Hz at 100mA. Designed for easy construction.

## Logic Probe Model LP-525K (kit)



Digital Logic Probe in kit form provides convenient and precise use in measurement of logic circuits. It displays logic levels (high or low), pulses and voltage transients down to 30 nanoseconds and a maximum input of 20MHz. Large PC board and detailed manual for fast construction.

## Logic Probe & Pulser Model LP-900/625

A unique two-in-one logic probe & pulser for troubleshooting and analyzing logic circuits.

### SPECIFICATIONS - LOGIC PROBE

Input impedance.....	120KΩ
Frequency response.....	Max 50MHz
Response pulse width.....	10nsec
Operating supply voltage.....	4VDC - 18VDC
LED pulse indicators	

### SPECIFICATIONS - LOGIC PULSER

Input Impedance.....	1MΩ
Pulse rate.....	0.5/400Hz
Pulse width.....	10µs
Power supply range.....	5-15VDC
Power supply protection.....	20VDC
External sync input impedance.....	1MΩ



## Logic Pulser Model LP-600

The Logic Pulser is a very effective tool for the inspection and repair of logic circuitry. It can be used to directly inject a signal into a logic circuit without removing the IC or breaking the circuit. The LP-600 produces an output signal of up to 1 amp with a 2µsec pulse width. It's a great help in isolating defective components.



### SPECIFICATIONS

A. Sync Input Impedance.....	1MΩ
B. Pulse repetition rate.....	0.5pps/500pps
C. Pulse width in pulser output at 1000mA load.....	2µs
D. Output current.....	(1) pulser mode 1000mA sink/source (2) 90% pulse mode 20mA sink/source
E. Power supply protection.....	±25V/10 sec
F. Output protection.....	±50V/1 min

## Logic Probe Model LP-700

The LP-700 Logic Probe is a high speed digital troubleshooting tool capable of capturing pulses as narrow as 20nsec. Four LED indicators determine the signal condition. Special memory circuits capture pulses fast oscilloscopes may miss.



- Select TTL-CMOS or Pulse - Pulse memory mode.
- Captures any transient pulse down to 20 NSEC.
- Discriminates between DTL-TTL or CMOS states.

### SPECIFICATIONS

Input Impedance.....	1MΩ
Response, better than.....	20nsec
Logic threshold.....	TTL Hi 2.3V Lo .8V CMOS Hi 70% VCC Lo 30% VCC
Max Input Voltage.....	+50V
Max Supply Voltage.....	30V
Memory.....	latches on first transition

# CALCULATORS

FULL LINE OF TEXAS INSTRUMENTS, CASIO, AND SHARP CALCULATORS

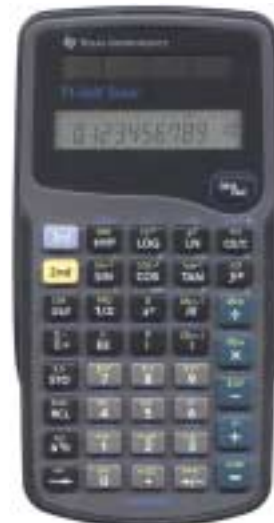
## Texas Instruments Graphing Calculator Model TI-83

Graphing calculator, 28K Ram, up to 99 graphing functions, 15 interactive zoom features, simultaneous graphing of more than one function, additional data types include strings, pictures and vectors, list-based one and two variable statistical analysis, including linear, logarithmic, exponential, power, quadratic polynomial, cubic polynomial, and quantic polynomial regressions, systems of equation solving, polynomial-root solving, and solves for any variable in an equation, link capabilities for data transfer through I/O port, unit to unit link included, compatible with the CBL.



## Texas Instruments Solar Scientific Model TI-36X SLR

- Advanced algebra, trigonometry, chemistry, computer science and statistics
- 10 digit / 2 exponent display
- 8 physical constants
- Performs 164 easy-to-use scientific functions
- 3 memories
- 10 metric/English conversions
- 1 and 2 variable statistical functions include linear regression, mean, standard deviation, sum of entered data and sum of squares
- Binary, octal, decimal or hexadecimal number bases
- Polar/rectangular conversions and trigonometric calculations in degrees, radians or grad
- ANYLITE™ solar power
- Slide case



## Texas Instruments Scientific Calculator Model TI-30XA

- Adds, subtracts, multiplies and divides fractions
- 10 digit display
- One-variable statistical results include standard and mean deviation
- Trigonometric functions, logarithms, roots, powers, reciprocal and factorial
- Converts between fraction and decimals
- Automatic Power Down (APD™)
- Durable slide case



## Texas Instruments Scientific Calculator Model TI-30X IIs

- ANYLITE™ solar power
- Ten-digit display with 2-digit exponent
- One-variable statistics
- Fraction & decimal conversions
- Basic scientific & trigonometric functions
- Degree-minute-second to decimal degree conversions
- Three separate 4-function memories



## Casio Student Scientific Model FX-250HA

- 135 functions
- 10 digit mantissa plus 2 digit exponent
- Hyperbolic functions
- Fraction calculations
- Auto power off
- Standard deviations
- Includes hard case



## Casio Solar Plus Scientific Model FX-115S

10 digit, 154 function scientific calculator, solar powered with battery back-up. Displays symbol indicating selected function. View perfect algebraic method, extra large display size 1 and 2 variable statistics. Boolean logic and number bases, programmed scientific constants, and complex number calculations.



### Additional Calculators Available

**Texas Instruments**  
TI-25x Scientific Solar  
TI-32x Explorer Plus  
TI-34 Scientific

**Casio**  
FX-300W Student Solar plus Scientific  
FX-280 Solar plus Scientific  
FX-270W Science and Math Scientific

**Sharp**  
EL-531LB Student Scientific  
EL-509L Student Scientific with Statistics  
EL-520GL Twin Powered Scientific  
EL-506L Advanced Scientific  
EL-546 Advanced Scientific

OTHER ADVANCED CALCULATORS ARE AVAILABLE . . . CALL FOR INFORMATION & PRICING.

# RF & AUDIO GENERATORS

Models **SG-9500** and **SG-9000** are stable high frequency generators capable of AM modulation. They are primarily designed for work on AM and FM radio receivers, but can be used in any project requiring a modulated RF signal.

Models **SG-9200** and **SG-9300** are low cost audio generators featuring very low distortion sine wave and a rapid-rise square wave. All models have vernier frequency control for easy tuning and switchable high-low output levels.

## Wide Band RF Signal Generators



**Model SG-9000** RF Generator



**Model SG-9500** RF Generator w/ Counter

## Audio Generators



**Model SG-9200** Audio Generator



**Model SG-9300** Audio Generator w/ Counter

Models **SG-9300** and **SG-9500** have built-in frequency counters which is switchable to measure external frequencies up to 150MHz.

### SPECIFICATIONS: SG-9000 & SG-9500

Frequency on 6 ranges	
100kHz to 150MHz (450MHz on harmonics)	
Band A	100kHz - 300kHz
Band B	300kHz - 1000kHz
Band C	1MHz - 3.2MHz
Band D	3MHz - 10MHz
Band E	10MHz - 35MHz
Band F	32MHz - 150MHz
Harmonics	96MHz - 450MHz

### FEATURES SG-9000 / 9500

- RF frequencies continuously variable 100kHz to 450MHz in six ranges.
- Output RF voltage variable and has 20dB attenuator switch.
- Internal AM modulation of 1kHz.
- Audio 1kHz signal available at output.
- External crystal locks oscillator to your frequency between 1-15MHz.
- 455kHz, 4.5MHz and 10.7MHz specially noted for easy setting.

Frequency Accuracy:	
SG-9000	± 3%
SG-9500	1PPM ±1 count
RF Output Approx.	100mV to 35MHz
Crystal Output	1-15MHz uses HC 6/U holder
Output Attenuator	Hi-Lo Sw with fine adjuster
Modulation Internal	1kHz
External	50Hz to 20kHz
Audio Output	1kHz at 1V RMS
Power	120V or 220V 50 or 60Hz
Size	6" H x 10" W x 5 1/4" D
Weight	5.5 lbs.
Accessories: Detachable line cord, RF cable, Instruction manual.	

### SPECIFICATIONS: SG-9200 / SG-9300

SINE WAVE	
Frequency Range	10Hz - 1MHz (5 decade bands)
Accuracy	3% +2Hz
Output Distortion	500Hz to 50Hz less than 0.05%
	50Hz to 500kHz less than .5%
Output Voltage	8V RMS 600 ohm impedance
Output Flatness	± 1dB attenuator plus fine adjust
SQUARE WAVE	
Frequency Range	10Hz to 100kHz (SG-9200)
	20Hz to 20kHz (SG-9300)
Rise Time	.5 µsec.
Output Voltage	15Vpp
POWER	120 or 220VAC 50 or 60Hz
DIMENSION AND WEIGHT 6"H x 10"W x 5 1/4"D 5.5lb.	

### SPECS: SG-9300 / SG-9500 FREQ COUNTER

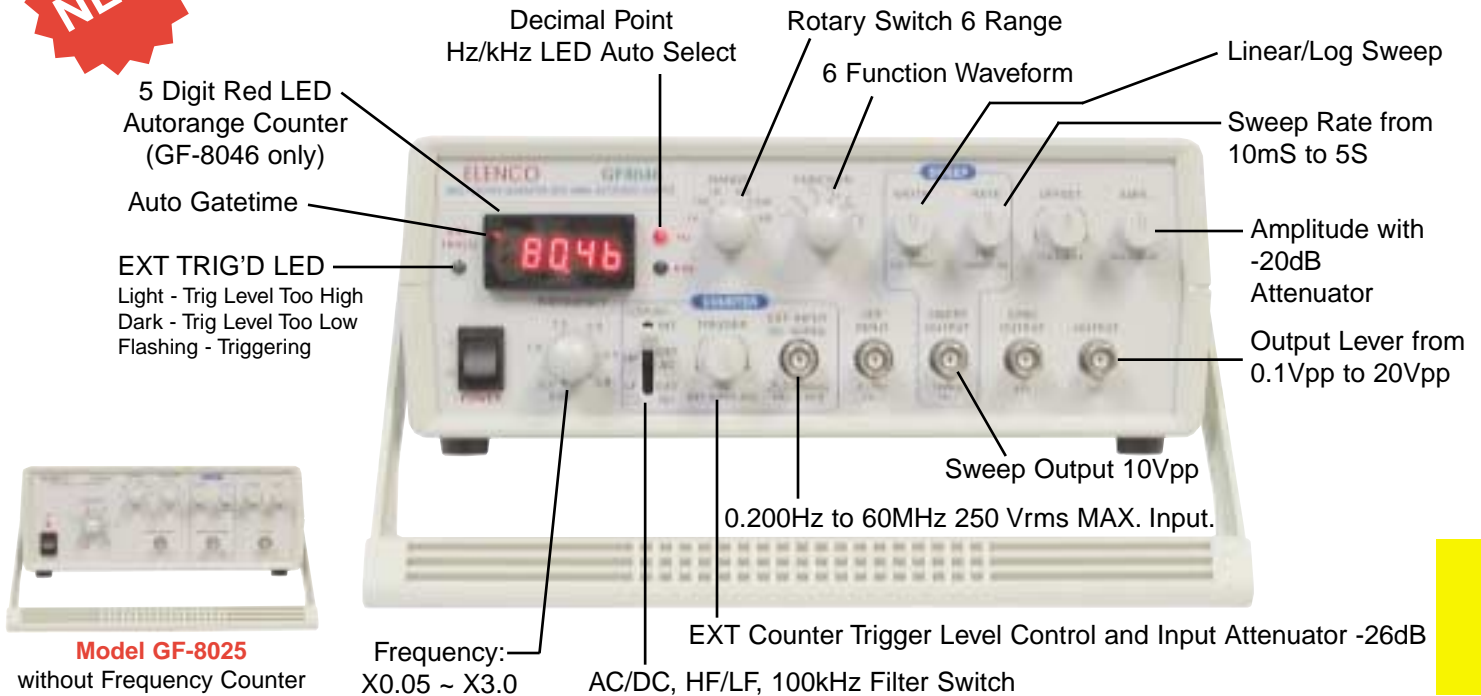
Range	1Hz - 150MHz in 2 ranges
Resolution	1Hz or 10Hz
Gate Time	.1 sec, 1 sec
Input Sensitivity	Less than 50mV RMS
Input Impedance	1MΩ
Accuracy	10PPM ± 1 count
Operation Temp	0-40°C
Digital Display	5 Digit .56" LED

# SWEEP FUNCTION GENERATOR



## Model GF-8046

### with Built-in Frequency Counter



MAIN OUTPUT		COUNTER (GF-8046 only)	
Frequency Range	0.5Hz to 3MHz in 6 Ranges	Display	5 Digit 0.36 Red LED Display with Autorange
Waveforms	6 Waveforms (Sine, Square, Triangle, Ramp, +Pulse, -Pulse)	Gate Time	Auto Select (0.25S ~ 10S)
Amplitude	20Vpp / Open, 10Vpp / 50Ω Load	Resolution	0.001Hz
Attenuator	0dB, -20dB (±2%)	MODE	INT Function Generator / EXT Counter
Output Impedance	50Ω (±2%)	Attenuator	0dB, -26dB (20)
DC Offset	±10V with Pull ADJ Switch	Accuracy	± Time Base Accuracy ± 1 Count
Freq. Accuracy	Counter Accuracy (GF-8046) Sine wave on full scale <3% (GF-8025)	Time Base	20MHz ± 10ppm (23 ± 5°C)
Distortion	<1%, 1Hz to 100kHz	Frequency Range	0.2Hz ~ 60MHz
Rise / Fall Time	<60ns	Sensitivity	25m Vrms at 1MHz
V.C.F. Input	0 to +10V Control Frequency to 1000:1	Max. Input	250 Vrms
<b>SYNC OUTPUT</b>		Input Impedance	1MΩ ± 2%
Rise Time	<40ns	Power Source	AC 115V / 230V ±10%, 50/60Hz, 25W
Level	<3Vpp (open)	Dimensions	10.8" (W) x 3.5" (H) x 11.8" (D)
Waveform	Square, Pulse	Weight	5.5lbs. (GF-8046), 4.8lbs. (GF-8025)
<b>SWEEP</b>		Safety Approvals	UL, CUL, GS, TUV, CE, IEC1010, EN61010
Mode	Linear / Log Sweep		
Width	>100:1 Continuously Variable		
Sweep Output	10Vpp (open)		
Output Impedance	1kΩ + 2%		

## Model GF-800/555 20Hz - 150kHz LOW DISTORTION Sine/Square Wave Audio Generator



- Sine and square wave generator
- Variable output control
- 20Hz to 150kHz in 46 steps
- Low battery indicator
- Low distortion R-C oscillator
- Compact portable, light weight

### SPECIFICATIONS

Frequency Range: x1 range 20Hz to 1.5kHz (23 steps), x100 range 2kHz to 150kHz (23 steps)  
 Accuracy: 20Hz through 100kHz (±3% or less), 120kHz and 150kHz (±5% or less)  
 Output Control: 0dB/-20dB attenuator switch and variable amplitude control  
 Output Impedance: approximately 600Ω  
**SINEWAVE CHARACTERISTICS**  
 Output Voltage: ≥1.2V rms at max. setting (no load)  
 Output Flatness: (short term) 20Hz to 150kHz +0.5dB (reference frequency 1kHz)  
 Distortion: 200Hz - 15kHz <0.05% 15kHz-150kHz <0.3%  
**SQUARE WAVE CHARACTERISTICS**  
 Output Voltage: ≥5V p-p at maximum setting  
 Rise & Fall Time: Less than 0.5μs  
 Sag: Less than 5% at 20Hz (DC coupled)  
 Over Shoot: <2% from maximum output, to 50mV p-p  
 Duty Ratio: 50% ±5%  
**SYNCHRONIZATION CHARACTERISTICS**  
 Output Voltage: ≥1.2 rms (no load)  
 Output Impedance: 1kΩ ±5%  
 Other specifications same as sinewave characteristics

## 100kHz Function Generator Model FG-500

### SPECIFICATIONS

**OUTPUT:**  
 Waveforms: Sine, Square, Triangle  
 Frequency: 1Hz - 1MHz  
 Impedance: 600Ω ±10%  
 Amplitude: Sine/Triangle 0-3V at 12V DC input  
 Squarewave .5-12V (no load)  
 Frequency Variable Range: 100:1 or more  
 Frequency Multiplier: x1, x10, x100  
**SINE WAVE**  
 Distortion: Less than 1%  
 Flatness: ±0.5 dB 1Hz-100kHz  
 Temperature Stability: ±20ppm/°C Typical  
**SQUARE WAVE**  
 Symmetry: Less than 5% (at 1kHz)  
 Rise & fall time: Less than 300ns (at 1kHz)  
**TRIANGLE WAVE**  
 Linearity: Less than 1% (up to 100kHz)  
 Power Requirements: 9 to 18V DC at input



Available in Kit FG-500K

# FREQUENCY COUNTERS

## Hand-Held 2.8GHz Universal Counter

### Model F-2800

A compact, pocket-size test instrument, designed for ease of use and dependable performance. Advanced features such as Field Strength Measurement are incorporated in the F-2800.

#### Features

- 50Ω input for full range 1MHz to 2.8GHz coverage.
- High speed 250MHz direct count with 1Hz per second resolution.
- 10 digit LCD display.
- Ultra-sensitive synchronous detector bargraph with 16 segment display of RF signal strength.
- Low power consumption 6 hour NiCd battery operation.
- Low battery indicator.
- Hold switch locks display.
- Supplied with telescoping whip antenna and AC wall adapter.

#### Specifications

INPUT SENSITIVITY (Typical)	
Amplifier	50Ω
Impedance	50Ω, VSWR<2:1
Range	1MHz - 2.8GHz
Sensitivity	<0.8mV @ 100MHz <6mV @ 250MHz <7mV @ 1GHz <100mV @ 2.4GHz
Maximum Input	15dBm

FREQUENCY DISPLAY RESOLUTION		
Range	Gate Time	LSD
250MHz	0.0625 sec.	10Hz
	0.25 sec.	1Hz
	1 sec.	0.1Hz
	4 sec.	0.1Hz
2.8GHz	0.0625 sec.	1000Hz
	0.25 sec.	100Hz
	1 sec.	10Hz
	4 sec.	10Hz

RF Signal Strength Bargraph		
Frequency	1st Segment	Full Scale
27MHz	7mV	100mV
150MHz	5mV	90mV
800MHz	10mV	200mV



**Cabinet:** Extruded aluminum, black paint finish.

**Display:** 10 Digit Liquid Crystal Display.

**Size:** 6 1/8" (H) x 2 5/8" (W) x 1 1/4" (D)

**Weight:** 0.5lb.

**Battery:** Internal 4 "AA" 600mA NiCd battery pack

**Power:** 9VDC, 500mA wall plug adapter.

**Time Base:** <1ppm typ. at room temperature.

**Optional Accessory:** C-2800 Case with Belt Clip

## 10 Function 1.3GHz Universal Bench Counter

### Model F-1300



The **F-1300** is a modern microcontrolled counter designed for a wide range of service and laboratory applications. The unit features 10 main functions: Frequency, Period, Totalize, RPM, Time (max, min, avg), Math and Pulse Width. All functions are displayed on large green LED digits. It is housed in a rugged lightweight case. This counter features a low pass filter which enables the limitation of high frequency noises from low-frequency measurements.

#### Features:

- Frequency - .05Hz to 1.3GHz  
3 Ranges
- Period - Can read 60Hz to 60.000000 F= 1/T
- Totalize - Counts to 199,999,999
- RPM - 3 to 2099994 RPM
- Duty Cycle
- Max/Min/Avg with Time
- Stop-watch set .2 sec to 100 hrs.
- Math functions
- Timer - 2 sec to 99 days
- Pulse Width - .1ms to 66666.6ms

SPECIFICATIONS	
<b>CH-A</b>	
Frequency	0.05Hz to 120MHz
Impedance	1MΩ shunted by less than 40pF
Sensitivity	20mV RMS
Filter	Low pass, -3dB point of 100kHz
Period	19999999.9μs to 0.0083μs
Totalize	0 - 200MHz
Ratio	CH-A (frequency) / CH-B (frequency)
A-B	CH-A (frequency) - CH-B (frequency)
R.P.M.	3 to 20999994 RPM
Duty	0.01% to 99.99%
Pulse	0.1μs to 66666.6μs
<b>CH-B</b>	
Frequency	10Hz to 2.5MHz
Sensitivity	TTL level
Impedance	<100kΩ shunted by <100pF
<b>CH-C</b>	
Frequency	50MHz to 1.3GHz prescaled by 64
Impedance	50Ω
Sensitivity	15mV (-17.4 dbm)
<b>General</b>	
Time base crystal control	10MHz
Aging rate	< .8PPM/M
Display	9 digit 0.56" seven-segment digits
Power Requirement	115V, 230V (±15%)
Dimensions	3.8" H x 10.8" W x 11.1" D
Weight	5lbs.

# ALL-IN-ONE INSTRUMENT

## Model MX-9300B

### Four Functions in One Instrument

#### Features:

- One instrument with four test and measuring systems:
  - 1.3GHz Frequency Counter
  - 2MHz Sweep Function Generator
  - Digital Multimeter
  - Digital Triple Power Supply
- Ideal for laboratory, production line and R & D Engineer's working bench.
- High accuracy and low cost for specialists and hobbyist.
- Unique performance to save space.
- Light weight and attractive design.
- Simple and easy operation.
- Full overload protection.



SPECIFICATIONS		FUNCTION 2: FUNCTION GEN. (CON'T)	FUNCTION 3: DMM (CON'T)																												
<b>FUNCTION 1: FREQUENCY COUNTER</b>		<ul style="list-style-type: none"> <li>• Output Impedance: Selectable 50Ω ±10%, 600Ω ±10%</li> <li>• Output Amplitude: 2Vpp to 20Vpp open load 1Vpp to 10Vpp (50Ω load)</li> <li>• Attenuator: -20dB</li> <li>• Sine Wave: Distortion less than 1% (at 1kHz), Flatness +.3dB</li> <li>• Square Wave: Symmetry less than +3% (at 1kHz) Rise &amp; Fall Time less than 150ns (at 1kHz)</li> <li>• Triangle Wave Linearity: Less than 1% (up to 100kHz), 5% (100kHz to 2MHz)</li> <li>• TTL Output: Rise &amp; Fall Time - less than 30ns (at 1kHz) Output Level - More than 3V</li> <li>• Frequency Sweep: Sweep time 20ms to 2s Internal Sweep Mode Linear, Logarithmic. Sweep Width - More than 100:1</li> </ul>	<ul style="list-style-type: none"> <li>• Capacitance: 3 (4nF to 400nF) 2.0% + 3 dgt. 3 (4μF to 400μF) 3.0% + 5 dgt.</li> <li>• Inductance: 40mH 3.0% + 20 dgt.</li> <li>• Diode</li> </ul>																												
<ul style="list-style-type: none"> <li>• Range: Channels A&amp;B: 5Hz - 100MHz Channel C: 100MHz - 1.3GHz</li> <li>• Sensitivity: Channels A&amp;B: 70mV RMS Sinewave Channel C: 35mV RMS Sinewave</li> <li>• Maximum Input Voltage: 3V</li> <li>• Input Impedance: Channels A&amp;B: 1MΩ Channel C: 50MΩ</li> <li>• Selectable Time Base: Switch Selectable</li> <li>• Period Measurement Range: 0.1 sec. to 10 sec.</li> <li>• Totalize (A or B): 0 to 99999999</li> <li>• Radio A/B Measurement: 5Hz to 100MHz</li> <li>• A-B (Difference), A+B (Addition) 5kHz to 100MHz</li> <li>• Time Interval A→B: 100ns to 10 sec.</li> </ul>		<ul style="list-style-type: none"> <li>• Triangle Wave Linearity: Less than 1% (up to 100kHz), 5% (100kHz to 2MHz)</li> <li>• TTL Output: Rise &amp; Fall Time - less than 30ns (at 1kHz) Output Level - More than 3V</li> <li>• Frequency Sweep: Sweep time 20ms to 2s Internal Sweep Mode Linear, Logarithmic. Sweep Width - More than 100:1</li> </ul>	<b>FUNCTION 4: POWER SUPPLY</b> <table border="1"> <thead> <tr> <th></th> <th>Terminal 1</th> <th>Terminal 2</th> <th>Terminal 3</th> </tr> </thead> <tbody> <tr> <td>Output Voltage</td> <td>0-30V</td> <td>5V Fixed</td> <td>15V Fixed</td> </tr> <tr> <td>Output Amps</td> <td>0-2A</td> <td>2A</td> <td>1A</td> </tr> <tr> <td>Ripple</td> <td>1mV max</td> <td>2mV max</td> <td>2mV max</td> </tr> <tr> <td>Load Regulation</td> <td>0.1% +5mV</td> <td>70mV</td> <td>0.1% +5mV</td> </tr> <tr> <td>Line Regulation</td> <td>0.1% +5mV</td> <td>70mV</td> <td>0.1% +5mV</td> </tr> <tr> <td>Output Current (Maximum)</td> <td>2A (current limit)</td> <td>2.2A (fold back)</td> <td>1.2A (fold back)</td> </tr> </tbody> </table>		Terminal 1	Terminal 2	Terminal 3	Output Voltage	0-30V	5V Fixed	15V Fixed	Output Amps	0-2A	2A	1A	Ripple	1mV max	2mV max	2mV max	Load Regulation	0.1% +5mV	70mV	0.1% +5mV	Line Regulation	0.1% +5mV	70mV	0.1% +5mV	Output Current (Maximum)	2A (current limit)	2.2A (fold back)	1.2A (fold back)
	Terminal 1	Terminal 2	Terminal 3																												
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Ripple	1mV max	2mV max	2mV max																												
Load Regulation	0.1% +5mV	70mV	0.1% +5mV																												
Line Regulation	0.1% +5mV	70mV	0.1% +5mV																												
Output Current (Maximum)	2A (current limit)	2.2A (fold back)	1.2A (fold back)																												
<b>FUNCTION 2: FUNCTION GENERATOR</b>		<b>FUNCTION 3: DIGITAL MULTIMETER</b>	<b>GENERAL</b>																												
<ul style="list-style-type: none"> <li>• Output Waveforms: Sine, Square, Triangle, Skewed Sine, Ramp, Pulse, TTL Level Square</li> <li>• Frequency: 0.02Hz - 2MHz</li> <li>• VCF Voltage Level: 0 to 10VDC</li> </ul>		<ul style="list-style-type: none"> <li>• DC Voltage: 4 (400mV to 400V) 0.3% + 1 dgt. 1 (1,000V) 0.5% + 1 dgt.</li> <li>• AC Voltage: 4 (400mV to 400V) 0.8% + 3 dgt. 1 (750V) 1.0% + 3 dgt.</li> <li>• DC Current: 2 (40mA to 400mA) 0.8% + 3 dgt. 1 (20A) 1.0% + 3 dgt.</li> <li>• AC Current: 2 (40mA to 400mA) 1.5% + 3 dgt. 1 (20A) 2.0% + 5 dgt.</li> <li>• Resistance: 5 (400Ω to 4MΩ) 0.5% + 1 dgt. 1 (40MΩ) 1.0% + 2 dgt.</li> </ul>	<ul style="list-style-type: none"> <li>• Power Source: Line voltage 110V/60Hz or 240V/50Hz - DMM Section: Single 9V battery</li> <li>• Dimensions: 14 1/2" (W) x 6 1/2" (H) x 12 1/2" (D)</li> <li>• Weight: 39lbs. (Approx.)</li> <li>• Comes with AC power cord, Test leads for DMM and Owner's manual.</li> <li>• Optional items are Coaxial Cable w/BNC Connector and RS232C Cable &amp; Software Disc.</li> </ul>																												

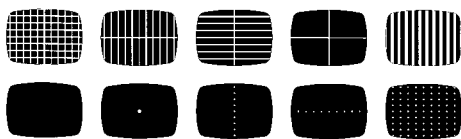
# COLOR BAR GENERATORS

## Deluxe Digital Color Convergence Generator Model SG-250



Available in Kit SG-250K.

### 10 ROCK-STEADY PATTERNS



#### SPECIFICATIONS

Color Osc Frequency.....	3563.81kHz ±.001%
Horizontal Frequency.....	15769Hz
Vertical Frequency.....	.60.18Hz ±.006 cycles
Linearity.....	Better than .1%
Video Output.....	3/4 P-P at 75Ω load
RF Frequency.....	Adjustable Ch 2-5
Power Requirements.....	.9V Battery w/ optional AC adapter
Weight.....	19 oz.

Ten solid patterns, including both gated and full color rainbow, plus the strongest case ever. It's virtually indestructible, all solid state, using one quartz crystal master oscillator. Both RF and video output. Portable battery operated. AC adapter available.

## Handheld Portable NTSC Convergence Generator Model SG-300



Optional Battery Pack  
Model SG-300BP  
Requires 10 "AA" Batteries

#### Features:

- NTSC color bars and full field - IWQ.
- Dots and crosshatch patterns, black burst.
- Full field RGB raster
- Split reverse NTSC color bars.
- 1kHz audio tone.
- Two crystal controlled RF channels, IF, and a variable channel.
- RGB output and composite video output.
- Interlace and progressive scanning control.

#### SPECIFICATIONS

<b>Patterns:</b>	<b>Outputs:</b>
<ul style="list-style-type: none"> <li>• NTSC color bars with -IQW:</li> <li>• NTSC color bars, full field</li> <li>• NTSC color bars with reverse split field -IWQ:</li> <li>• -IWQ: Full field.</li> <li>• Rasters: red, green, blue, and black burst.</li> <li>• Crosshatch: 1x1, 1x6,</li> </ul>	<ul style="list-style-type: none"> <li>• Video: 1 volt peak to peak into 75 ohms</li> <li>• RF/IF Freq: Crystal controlled</li> <li>• Level: 5mV RMS min. into 75 ohms</li> <li>• RGB: Video: TTL level or 1 volt switchable. 7x11Connector: 9 pins D type.</li> </ul>
<b>Sound:</b>	<b>General:</b>
<ul style="list-style-type: none"> <li>• 1kHz, 4.5MHz FM, switchable audio</li> </ul>	<ul style="list-style-type: none"> <li>• Power: AC Adapter, supplied; or external DC 12 to 18 volts. 100mA typical. 140mA with RGB loads.</li> <li>• Dimensions: 1 3/8" x 3 3/4" x 6 3/4"</li> <li>• Weight: 1lb.</li> </ul>

# VARIABLE VOLTAGE SUPPLIES

The Elenco variable voltage supplies all feature fail-safe automatic overload protection with output current externally adjustable. Special circuit protects equipment, user and itself. Current limiting adjustment is easy. Simply short output and adjust limit control to read desired maximum current. The output voltage is continuously variable and precisely held to your setting. Ideal for use in labs, service shops, schools, home and industry.

**Model XP-660**



**Model XP-760**



**Dual 0-20V at 1A • 5V at 5A**

The XP-660 and XP-760 contain three fully regulated power supplies. Two are 0-20V at 1 amp and a fixed 5V at 5A. All three are isolated from each other so that they can be stacked to produce up to 45V at 1 amp. All supplies are protected against short circuit. The 0-20V supply incorporates externally controlled current cutoff circuits with an LED indicating current overload. The Model XP-660 has two analog meters which can read voltage or current. The Model XP-760 has two high accuracy 3-digit LED Volt / Current meters.

**Model XP-650**



**Model XP-750**



**0-40V @ 1 1/2A or 0-20V @ 3A**

The XP-650 and XP-750 are continuously variable regulated power supplies which deliver 0-20V at 3A or 0-40V at 1.5A. Both supplies are protected against short circuit and have externally controlled current cutoff. The Model XP-650 has two analog meters. The Model XP-750 has 2 digital meters which read voltage and current.

Specifications	XP-650	XP-750	XP-660	XP-760
Input Voltage	120/240VAC	120/240VAC	120VAC	120VAC
Output Voltage	0-40VDC	0-40VDC	0-20, 0-20, 5	0-20, 0-20, 5
Output Current	1.5/3A	1.5/3A	1A, 1A, 5A	1A, 1A, 5A
Load Regulation	.1V	.1V	.1V	.1V
Line Regulation	.1V	.1V	.1V	.1V
Ripple Max. RMS	.005V	.005V	.005V	.005V
Current Protection	.05-3A lim	.05-3A lim	.05-3A lim	.05-3A lim
Short Protection	.05-3A lim	.05-3A lim	.05-3A lim	.05-3A lim
Output Impedance	.025Ω	.025Ω	.025Ω	.025Ω
Meter	40V, 3A 5%	Dig. 1/2%	20V, 1A	Dig. 1/2%
Dimensions (W" x D" x H")	10.5 x 10 x 3.75	10.5 x 10 x 3.75	14 x 8 x 3.5	14 x 8 x 3.5
Weight (lbs.)	11	11	18	18

# VARIABLE VOLTAGE SUPPLIES

Economical fully regulated variable power supplies. Ideal for technical institutions. **Models XP-620 and XP-720** are also available in kit form. All supplies are guaranteed for two years.

## Model XP-720



The **Model XP-720** has 3 fully regulated supplies; 1.5-15V @1A, -1.5 to -15V @1A, or (3-30V @1A) and 5V @3A. It also has 6.3VAC @1A and 12.6 center tapped @1A. It features short circuit protection on all supplies.

Available in kit XP-720K

## Model XP-620



The **Model XP-620** has 3 fully regulated supplies; 1.5-15V @ 1A, -1.5 to -15V @ 1A or (3-30V @ 1A) and 5V @ 3A. It features short circuit protection on all supplies.

Available in kit XP-620K

## Model XP-85



The **Model XP-85** is a fully regulated 5-15V output @ 2.5A. It features short circuit protection and variable current cutoff.

## Model XP-603



The **Model XP-603** is a solid-state DC power supply providing the exact output voltage no matter what current you use. It contains one fully regulated power supply.

SPECIFICATIONS	XP-85	XP-603	XP-720	XP-620
Input Voltage	120VAC	120VAC	120VAC	120VAC
Output Voltage	5-15VDC	0-30VDC	1.5 - 15, 1.5 - 15, 5 DC 6.3 - 12.6 CTAC	1.5 - 15, -1.5 - 15 5V
Output Current	2.5A	3A	1A, 1A, 3A, 1A, 1A	1A, 1A, 3A
Load Regulation	0.1V	less than 1%	0.1V	0.1V
Line Regulation	0.1V	0.1V	0.1V	0.1V
Ripple Max. RMS	0.005V	30mV	0.005V	0.005V
Current Protection	0.05 - 2.5A lim	3A fuse	1A, 3A, lim	1A, 3A, lim
Short Protection	0.05 - 2.5A lim	current limiting	1A, 3A, lim	1A, 3A, lim
Output Impedance	0.025Ω	0.025Ω	0.025Ω	0.025Ω
Meter	Analog 15V, 3A	Analog 30V, .5A	None	None
Dimensions	3 1/2" x 10" x 9"	6 1/8" x 9" x 4 3/4"	3 1/2" x 8" x 6 1/2"	3 1/2" x 8" x 6 1/2"
Weight	8 Lbs.	9 Lbs.	7 Lbs.	7 Lbs.

# VARIABLE AC POWER SUPPLIES

## Isolated Variable AC Power Supply

### Model XP-810

#### Features:

- Variable Isolated Output (0 - 140VAC)
- Power Line Leakage Test
- Circuit Breaker
- Overload Protection
- Built-in Soldering Iron Temperature Control
- 2 Meter Range of 2A and 4A for Accurate Readings
- Built-in 4" Meter

The **XP-810** is an isolated-variable AC power supply. The voltage output is 0 - 140VAC at 3 amps continuous or up to 4 amps intermittently. The unit has a built-in isolation transformer for safe servicing of "hot chassis sets". The unit features a four inch meter to monitor voltage and current. The Model XP-810 also has a triac circuit to vary the voltage to a soldering iron, keeping it at any desired temperature.

SPECIFICATIONS	
Input Voltage	105 to 130 VAC.
Output Voltage Range	0 - 140 VAC at 120 VAC input.
Output Current	3 amp continuously or 4 amp intermittently. Intermittent current should not exceed 10 minutes on followed by 10 minutes off.
Output Isolation	Leakage less than 100 micro amps at 25° C, 50% related humidity.
METER SCALES	
Voltage	0 - 150 V. Volt-Amps 0 - 240 VA, 0 - 480 VA.
Current	0 - 2 A, 0 - 4 A. Leakage 0 to 5 mA (5,000 μA), expandable scale.
METER ACCURACY (25° C)	
Volts	±3% of full scale (calibrated @ 120 VAC).
Current	±5% of full scale.
Leakage	±5% @ 500 μA.
Soldering Iron Temperature control - 60% to 99% of AC power line , 100 watts max.	
Operating temperature	0° C to +40° C.
Storage Temperature	- 30° C to +60° C.
Dimensions (W x H x D)	11 1/2" x 5 1/2" x 7 3/4"
Weight	20 lbs (5.44 kg).



## High Current Variable Power Supply

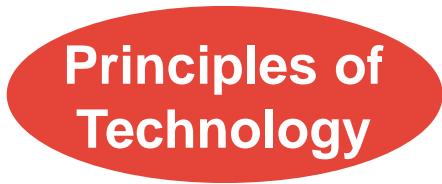
### Model XP-800

The **XP-800** is a high current power supply with 3 variable outputs. Choose from either 0 - 120VAC @ 2A, 0 - 40VAC @ 7A or 0 - 28VDC @ up to 10A. The precision LED displays allow for exact readout of volts and current. The XP-800 is ideal for Principles of Technology experiments in schools or it can be used as a bench power supply in OEM labs.



#### Features:

- 3 variable outputs
- Precision LED readouts
- Circuit breaker protection
- Ideal for schools or OEM's



SPECIFICATIONS	
<b>Input</b>	
Input Voltage	120VAC
Current Protection	5A Fuse
<b>28VDC Supply</b>	
Output Current	10A max.
Output Voltage	28VDC max. for light loads 20VDC max. for 10A load
Ripple	Less than 0.2V rms at 10A load
Current Protection	10A Circuit Breaker
Meter	0 to 28VDC, 0.1V resolution 0 to 10A, 0.1A resolution
<b>40VAC Supply</b>	
Output Current	7A max.
Output Voltage	40VAC max. for light loads 38VAC max. for 5A load
Ripple	Less than 0.2V rms at 10A load
Current Protection	3A Circuit Breaker (on transformer primary)
Meter	0 to 40VAC, 0.1V resolution 0 to 7A, 0.1A resolution
<b>120VAC Supply</b>	
Output Current	2A max.
Output Voltage	120VAC max.
Current Protection	3A Circuit Breaker
Meter	0 to 120VAC, 1V resolution 0 to 2A, 0.1A resolution

# POWER SUPPLIES

## 4 Fully Regulated Power Supplies in One Unit Model XP-581



### Features:

- 4 DC voltages
  - 3 fixed: +5V @ 3A
  - +12V @ 1A
  - -12V @ 1A
  - 1 variable: 2.5 - 20V @ 2A
- Fully regulated and short protected
- Voltage and current meters
- All metal case
- Ideal for laboratory, service shops and hobbyists.
- Low cost and high value

SPECIFICATIONS				
Input Voltage	120VAC 60Hz			
Current Protection	2A Fuse			
Output Voltage	Fixed +5V	Fixed +12V	Fixed -12V	Variable 2.5-20V
Output Current	3A	1A	1A	1.5A @ 20V 2A @ 15V 1.5V @ 5V
Load Regulation	.1V	.1V	.1V	.1V
Line Regulation	.1V	.1V	.1V	.1V
Ripple RMS	.01V	.01V	.01V	.01V
Current Protection	Foldback	Thermal	Thermal	Foldback

## Fixed Voltage Supplies Model XR-35 / XR-36



Model XR-35/36 are 13.8VDC regulated power supplies capable of delivering up to 3 amps of continuous current. These are ideal for mobile radio, cellular phones, CB or ham radio equipment. The XR-35 has a female cigarette socket in the front panel in addition to the binding post outputs.

UL/CSA approved (XR-36 only)

SPECIFICATIONS	
Input Voltage	120VAC
Output Voltage	13.8VDC
Output Current	3 Amps Continuous, 5 Amps Surge
Size / Weight	7 3/4" x 3 1/8" x 4 3/4" 5.6 lbs.

## Spectrum Tube Power Supply Model STPS-1

This power supply provides safe and reliable operation for 10 spectrum tubes. The unique design supplies a voltage that prolongs the life of the spectrum tubes. Specially designed sockets eliminate electrical shock hazards. The unit operates at 120V @ 60Hz. Output voltage is 5,000V, 10mA. (Tube not included).



## Deluxe Battery Eliminator Model XP-100

SPECIFICATIONS	
Input Voltage	120VAC
Output Voltage	1.5, 2.2, 3, 4.5, 5, 6, 7.2, 9, 10, 15, 21.25VDC
Output Current	1 Amp Max.
Accuracy	± 2%



This power supply is an ideal bench top battery eliminator. Substitutes a wide variety of batteries including AA, AAA, C, D, and 9 volt types. The voltage is conveniently selected by a rotary switch. Advanced, solid-state electronics provide both LINE and LOAD regulation of the output voltage. The voltage selector switch is precision-designed so that the output voltage does not increase during adjustment between voltage ranges.

# DELUXE ELECTRONIC TOOL KIT

## Tool Kit Model TK-3000



A professional technician service tool kit in a metal reinforced tool case with heavy-duty handle and locks. A removable, double-sided pallet handles most of the tools listed below with more room for tools and parts in the lower half. A special ramp in the tool case will lock your meter of choice in place.

### Tools Included in Case:

- **SR-2B** - Deluxe Soldering Iron
- **SH-1** - Soldering Iron Stand
- **ST-1** - Diagonal Pliers
- **ST-2** - Long Nose Pliers
- **ST-30** - Deluxe Wire Stripper
- **SE-1** - Solder Ease Kit
- **TL-8** - Precision Screwdriver Set
- **SW-3** - Solder Wick
- **ST-72** - Screwdriver Slotted 3/16"
- **ST-71** - Screwdriver #1 Phillips
- **ET-10** - IC Puller
- **SP-2** - Solder Pump
- **ST-20** - Safety Goggles
- **ST-9** - Pocket Screwdriver
- **ST-4** - Solder Tube
- **ST-75** - 11 pc. Driver Set  
(3 Nut Drivers, 2 Slotted, 2 Phillips, & 3 Star)
- **Meter and Calculator Shown are Sold Separately.**



**Case Size:**  
6 1/2" (H) x  
18" (W) x  
13" (D)

## Tool Kit Model TK-1000

New in the electronics educational field. A professional organizer tool kit at affordable prices. No student should be without this unique tool kit that holds all of the tools you need (meter, experiments, etc.).

### Tools Included in Case:

- **ET-10** - IC Puller
- **SE-1** - Solder Ease Kit
- **SH-1** - Soldering Iron Stand
- **SP-2** - Solder Pump
- **SR-2B** - Deluxe Soldering Iron
- **ST-1** - Diagonal Pliers
- **ST-2** - Long Nose Pliers
- **ST-3** - Wire Stripper
- **ST-4** - Solder Tube
- **ST-20** - Safety Goggles
- **ST-75** - 11 pc. Driver Set
- **SW-3** - Solder Wick
- **TL-8** - Precision Screwdriver Set
- **TM-40** - Tool Mounting Kit
- **Meter Shown is Sold Separately.**



**Case Size:** 5 1/4" (H) x 16 3/8" (W) x 12 1/4" (D)

Other Tool Kit packages available - custom made to your specifications at the same low prices.

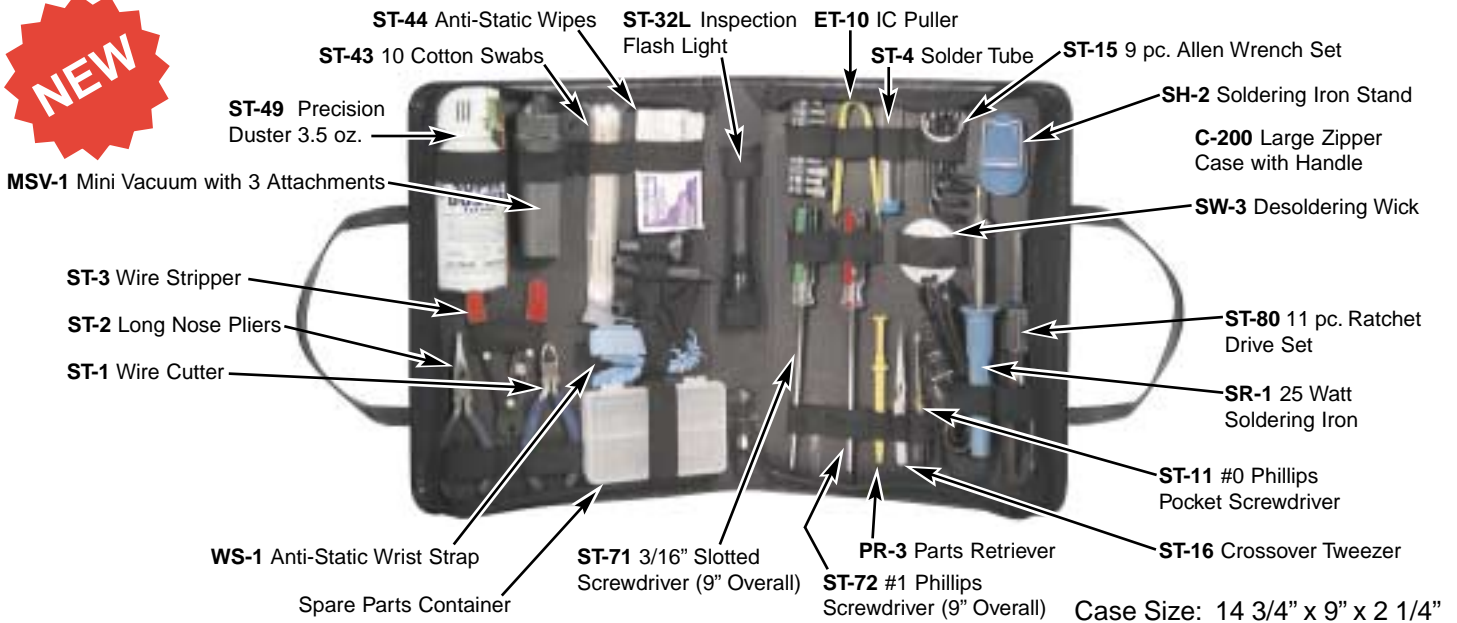
2 YEAR WARRANTY  
ANY TOOL IN THIS KIT

# COMPUTER TOOL KITS

## Deluxe 50pc. Computer Technician Service Tool Kit

Model TK-1700

A complete tool kit for the repairing and maintaining of computers and electronic devices. Included in this kit is a powerful mini-vacuum with attachments and a pressurized canned duster to remove debris or dust. **OVER 50 ITEMS.**



## Deluxe 29pc. Computer Service Tool Kit

Model TK-1200

### Includes:

- Deluxe Soldering Iron
- Solder Tube
- 5" Needle Nose Pliers
- 4 1/2" Diagonal Pliers
- Spare Parts Tube
- 3-prong Parts Retriever
- 11 pc. Screwdriver Bit Set (3 Nut Drivers, 2 Slotted, 2 Phillips, 3 Star)
- Soldering Iron Stand (Wire Form)
- 4 pc. Soldering Ease with Heat Sink
- Deluxe Wire Stripper
- IC Inserter 14-16 pin
- IC Extractor
- 1/8" Slotted Screwdriver
- #0 Phillips Screwdriver
- Desoldering Pump
- Tweezer

All contained in a black vinyl zippered case.



Case Size: 13" x 7" x 2"

## 12pc. Computer Service Tool Kit

Model TK-1100

### Includes:

- 3/16" Nut Driver
- 1/4" Nut Driver
- Driver Handle - Fits all bits
- Reversible Screwdriver Bits T10 & T-15
- Reversible Screwdriver Bits 3/16" & 1/4"
- Reversible Screwdriver Bits #1 & #2 Phillips
- Tweezer
- IC Inserter 14-16 pin
- IC Extractor
- 1/8" Flat Screwdriver
- #0 Phillips Screwdriver
- 3-prong Parts Retriever

All contained in a black vinyl zippered case.

Model TK-1100A - Same TK-1100 w/ spare parts tube, without IC inserter.



Case Size: 8 3/8" x 6" x 1 3/8"

Other Tool Kit packages available - custom made to your specifications at the same low prices.

2 Year Warranty on all tools.

# CABLE TESTERS & TOOL KITS

## Multi-Network Cable Tester

**Model TCT-255**

**NEW**

This tester is a convenient instrument for testing different unshielded wiring schemed telephone cables with RJ-11 and RJ-45 connectors and coax cables. Cables can be tested before and after they are installed.

### Features:

- Testing cables before or after their installation.
- Mapping Function
- Cable Identification (straight or reverse)
- Pair Identification (straight or reverse)
- Open or Short Testing
- Low Battery Indicator
- Auto Power-Off Function (30 s.)

*Soft Vinyl Zippered Case (Model C-90) Included. (5 1/2" x 7" x 1 3/4")*

Vinyl Case Included



Available as  
Kit TCT-255K



## Network Service Tool Kit

**Model TK-4000**

**NEW**

A service and installation tool kit for networks, modems, and telephones. Includes quality, heavy-duty tools and a tester that will handle unshielded telephone cables with RJ-11 and RJ-45 connectors. Ethernet 10 (100) Base-T, Token Ring, EIA/TIA-568A, EIA/TIA-568B, AT&T 258A, and USOC. 50 or 75Ω coaxial cable with F connectors and 50 or 75Ω coaxial cable with BNC connectors.

### Includes the Following:

- TCT-200 Cable Tester
- LD-100 Cable Tester Terminator
- ST-38 AC Receptacle Tester
- TCT-100 Telephone Line Tester
- ST-35 Coax Cable Stripper
- ST-568 Modular Crimping Tool
- ST-50 Hex Type Crimping Tool
- ST-75 11 pc. Screwdriver Bit Socket Set
- ST-620 Punch Down Tool
- ST-205 Heavy-Duty Cable Cutter
- C-10 Parts Case

All contained in a black vinyl zippered case with handles.



## Telephone Line Analyzer

**Model TT-400**



A telephone line analyzer that provides fast indication of telephone line polarity, ring and line voltage levels, condition of phone line from user's telephone to central telephone office - also can check basic telephone functions and condition of telephone line cord.

Available Assembled Model TT-400K

## Telephone Line Analyzer

**Model TWT-1**

**NEW**



A telephone line analyzer that tests active phone lines with RJ-11 or RJ-45 modular jacks.

Available in kit Model TWT-1K

# ELECTRONIC TECHNICIAN SERVICE TOOLS

## Deluxe 32pc. Technician Tool Kit

**Model TK-1500**



(Case Size: 14 3/4" x 9" x 2 1/4")

Includes:

- M-1000B Digital Multimeter
- Deluxe Soldering Iron
- Solder Ease Kit
- Desoldering Pump
- Diagonal Pliers
- Long Nose Pliers
- Parts Box
- 11pc. Screwdriver Bit Set (3 Nut Drivers, 2 Phillips, 2 Slotted, 3 Star)
- Deluxe Wire Stripper
- IC Puller
- Soldering Iron Stand (Wireform)
- Precision Screwdriver Set
- Solder Tube
- Solder Wick

**Model TK-1600** - Same as above but without meter.

All contained in a black vinyl zippered case with handles.

## 15pc. Basic Technician Tool Kit

**Model TK-1350**

Includes:

- Deluxe Soldering Iron
- 5" Needle Nose Pliers
- 4 1/2" Diagonal Pliers
- Deluxe Wire Stripper
- Screwdriver 3/16" Slotted
- Screwdriver 1/8" Slotted
- Screwdriver #1 Phillips
- Screwdriver #0 Phillips
- Desoldering Pump
- Soldering Iron Stand (Wire Form)
- Solder Tube
- Nut Driver 3/16"
- Nut Driver 5/16"
- Nut Driver 1/4"

(Case Size: 13" x 7" x 2")



**Model TK-1300** - Same as above except includes standard soldering iron and standard wire stripper.

High quality tools in black vinyl zippered case.

## 9 Piece Electronic Technician Starter Tool Kit

**Model TK-14**

Consists of:

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| <b>SR-1</b> Soldering Iron 25W      | <b>SH-2</b> Soldering Iron Holder |
| <b>ST-2</b> Long Nose Pliers        | <b>SW-3</b> Solder Wick           |
| <b>ST-3</b> Wire Strippers          | <b>ST-4</b> Solder                |
| <b>ST-5</b> Screwdriver Slotted     | <b>ST-23</b> Heat Sink            |
| <b>ST-6</b> Screwdriver #1 Phillips |                                   |



## 15 Piece VCR Service Tool Kit

**Model TK-1400**

Consists of:

- Inclined Base Screwdriver
- Eccentric Screwdriver
- Post Adjustment Screwdriver
- 2 Fine Adjust Screwdrivers (2mm & 3mm)
- VHS VCR Head Puller
- Retaining Ring Remover
- 3 Reversible Screwdrivers
- Spring Hook Tool
- Micro Screwdriver
- Hex Wrench Set



## Hand Tool Kit

**Model ST-10\***

Consists of:

- ST-1** - Diagonal Cutter
- ST-2** - Long Nose Pliers
- ST-3** - Wire Strippers
- ST-5** - Screwdriver Slotted
- ST-6** - Screwdriver #1 Phillips



\* Available in Retail Packaging

## Solder Tool Kit

**Model ST-12 \***

Consists of:

- SR-1** - Soldering Iron 25W
- SP-2** - Desoldering Pump
- SW-3** - Solder Wick
- ST-4** - Solder

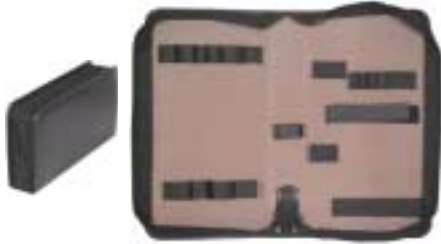


\* Available in Retail Packaging

**2 YEAR WARRANTY ON ALL TOOLS**

# TOOL CASES / PARTS BOXES

Top quality cases to meet your educational requirements.



**C-100** - Large zipper case.  
(13" x 7" x 2 1/4")  
See TK-1200 and TK-1350 for tool array.



**C-200** - Large zipper case with handles.  
(14 3/4" x 9" x 2 1/4")  
See TK-1500 for suggested tool array.



**C-300** - Molded durable plastic case.  
(16" x 12" x 5 1/2")  
See TK-1000 for suggested tool array.



**C-400** - Deluxe Case - Metal reinforced with handle and locks. Includes tool pallet, meter ramp and dividers. (18" x 13" x 5 1/2")  
See TK-3000 for suggested tool array.



**C-500** - Spacious tool box with two lift up trays having 18 fixed compartments. Deep bottom storage area.  
(13 3/4" x 8 1/4" x 6 3/4")



**C-800** - Deluxe, heavy-duty black canvas zipper case. Three outside pockets for meters, testers, and manuals.  
(17" x 12" x 4")

**C-400B** - Deluxe case shown above but with interior filled with pre-cut foam. Bottom with 1/2" cushion and lid with 3" convoluted (egg crate) type foam. Pallet and dividers are optional.



**C-20** - Small zipper case.  
(12 1/2" x 8 1/2" x 1 1/4")  
See TK-1100 for tool array.



**C-65** - Roll-up, durable vinyl tool kit pouch. Ideal to pack basic tools.  
(15" x 14")



**C-90** - Small padded zipper case. Used to carry and protect meters & telecommunication testers.  
(7 1/4" x 5" x 1 1/2")



**C-900** - Parts box. 6 to 18 adjustable compartments. Includes 12 adjustable dividers. Made from durable, see-through plastic. (11" x 7 1/4" x 1 3/4")



**C-10** - Parts box. Five fixed compartments made from durable, see-through plastic.  
(6 1/2" x 3 3/4" x 1 1/8")



**PT-1** - Transparent Parts Tube  
Ideal for storing small parts. 5" length.

# KUMAS TOOLS

## 46 pc. Cordless Screwdriver Set Model KD-280AK46



3.6V Screwdriver  
Removable Battery  
3 hrs. Charge  
6 Stage Adj. Torque  
170 RPM  
Torque to 21 in. lbs.

### Contents:

- 1 pc. 3.6V Screwdriver (#KD-280A)
- 1 pc. 3.6V Battery Pack (#BP-36B)
- 1 pc. 3.6V Charge Adapter (#AD-36)
- 14 pc. Sockets: 6-12mm, 3/16" - 1/2"
- 1 pc. Bit Holder
- 1 pc. Socket Adapter
- 26 pc. Driver Bits:
  - 3 pc. Flat: 3/16", 1/4", 9/32"
  - 3 pc. Phillips: #1, #2, #3
  - 3 pc. Robertson: S1, S2, S3
  - 12 pc. Hex: 2-6mm, 3/32" - 1/4"
  - 5 pc. Torks: T10, T15, T20, T25, T35

## Rotary Motor Tool Model MG-012



Polish, Grind, Sand,  
Sharpen, Deburr,  
Scrape, Buff, Cut,  
Carve, Drill, Mill and  
More!  
Adjustable Speed  
5,000 to 20,000 RPM

### Contents:

- 1 pc. 1mm Carbide Drill
- 1 pc. 2.3mm Carbide Cutter
- 1 pc. 1.8mm Diamond Grinder
- 5 pc. Shape Grinders
- 1 pc. Copper Brush
- 1 pc. Connection Rod
- 1 pc. Saw Blade
- 4 pc. 3.3mm T Grinding Bits
- 10 pc. 0.6mm T Grinding Bits
- 1 pc. 2.35mm Bit Chuck
- 1 pc. 3mm Bit Chuck

## 58 pc. Cordless Screwdriver Set Model KD-363K58



7.2V Drill/Driver  
Keyed Chuck  
Built-in Battery  
3 hrs. Charge  
6 Stage Adj. Torque  
600 RPM  
Torque to 65 in. lbs.

### Contents:

- 1 pc. 7.2V Drill/Driver (#KD-363)
- 1 pc. 7.2V Charge Adapter (#AD-72)
- 1 pc. Soldering Iron • 2 pc. 4" Pliers
- 1 pc. Solder • 5 pc. Grinder Tips
- 2 pc. Insulation Drivers
- 5 pc. Drill Bits (for wood)
- 24 pc. Driver Bits (25mm L)
- 1 pc. Chuck Key • 1 pc. Bit Holder
- 1 pc. Driver Handle (3 way)
- 4 pc. Driver Bits (50mm L)
- 7 pc. Sockets 3/16" - 1/2"
- 1 pc. Socket Adapter • 1 pc. Case

## 42 pc. Cordless Drill/Driver Set Model KD-379A-42



9.6V Drill/Driver  
Keyless Chuck  
Removable Battery  
1 hr. Charge  
6 Stage Adj. Torque  
0 - 750 RPM  
Torque to 87 in. lbs.

### Contents:

- 1 pc. 9.6V Drill/Driver (#KD-379AVL)
- 1 pc. 9.6V Battery Pack (#BP-96TA)
- 1 pc. 9.6V Charger (#BC-96A)
- 5 pc. HSS Drill Bits: 5/64", 7/64", 5/32", 13/64", 15/64"
- 14 pc. Sockets: 6-12mm, 3/16"-1/2"
- 18 pc. Driver Bits (25mm L):  
Phillips #1, 2, 3; Flat 1/8", 5/32", 3/16", 7/32", 1/4", 9/32"; Robertson S1, S2, S3; Hex 3/32", 1/8", 5/32", 3/16", 7/32", 1/4"
- 1 pc. Bit Holder • 1 pc. Socket Adpt.

## 4 pc. Cordless Drill/Driver Set Model KD-398A-4



12V Drill/Driver  
Keyless Chuck  
2-Speed H-L Range  
Removable Battery  
1 hr. Charge  
6 Stage Adj. Torque  
0-400/0-1,200 RPM  
Torque to 174 in. lbs.

## 4 pc. Cordless Drill/Driver Set Model KD-368A-4



7.2V Drill/Driver  
Keyed Chuck  
Removable Battery  
1 hr. Charge  
6 Stage Adj. Torque  
0-300/0-800 RPM  
Torque to 88 in. lbs.

# TOOLS FOR THE ELECTRONIC INDUSTRY

## PLIERS

<p><b>Mini Diagonal Cutter</b> Drop Forged Steel, Return Spring, Cushion Grip - 4 1/2" Long</p>  <p><b>ST-1 *</b></p>	<p><b>Mini Long Nose Plier</b> Drop Forged Steel, Return Spring, Cushion Grip - 5" Long</p>  <p><b>ST-2 *</b></p>	<p><b>Diagonal Cutter</b> Drop Forged Steel, Cushion Grip 6" Long</p>  <p><b>ST-26</b></p>	<p><b>Long Nose Plier</b> Drop Forged Steel, Cushion Grip 6" Long</p>  <p><b>ST-34</b></p>
<p><b>Wire Stripper</b> Adjustable Wire Stripper, Return Spring, Cushion Grip - 5" Long</p>  <p><b>ST-3</b></p>	<p><b>7-in-1 All Purpose Wire Stripper, Cutter, Plier, &amp; Crimper</b> Wire loop. AWG 16 - 26. 6 1/2" Long</p>  <p><b>ST-30</b></p> <p>Same as above except wire strips AWG 10 - 18. <b>Model HT-104A</b></p>	<p><b>Deluxe Wire Stripper</b> Knife type blade cuts, strips AWG 12 - 24; cushion grip, return spring. 6" Long.</p>  <p><b>ST-30Y</b></p>	<p><b>Slip Joint Plier</b> Drop Forged Steel, Chrome Plated, Cushion Grip - 6 1/2" Long</p>  <p><b>ST-8</b></p>

## SCREWDRIVERS AND NUT DRIVERS

<p><b>Pocket Screwdriver</b> Slotted 1/8" x 2" with Clip.</p>  <p><b>ST-9</b> Overall 4 1/4"</p>	<p><b>Screwdriver</b> Slotted 1/8" x 3".</p>  <p><b>ST-101A</b> Overall 5 1/4"</p>	<p><b>Screwdriver</b> Slotted 3/16" x 3" Chrome Vanadium</p>  <p>Overall 6"</p> <p><b>ST-5</b></p>	<p><b>Screwdriver</b> Phillips #1 x 3" Chrome Vanadium</p>  <p>Overall 6"</p> <p><b>ST-6</b></p>
<p><b>Pocket Screwdriver</b> Phillips #0 x 2" with Clip.</p>  <p><b>ST-11</b> Overall 4 1/4"</p>	<p><b>Screwdriver</b> Phillips #0 x 3".</p>  <p><b>ST-101B</b> Overall 5 1/4"</p>	<p><b>Screwdriver</b> Phillips #2 x 4" Chrome Vanadium</p>  <p>Overall 7 1/2"</p> <p><b>ST-7</b></p>	<p><b>Screwdriver</b> Slotted 1/4" x 4" Chrome Vanadium</p>  <p>Overall 7 1/2"</p> <p><b>ST-40</b></p>
<p><b>Screwdriver</b> Chrome Vanadium Shaft</p>  <p>Overall 9"</p> <p><b>ST-71: #1 Phillips</b> <b>ST-71A: #2 Phillips</b></p>	<p><b>Screwdriver</b> Slotted 3/16" x 6" Chrome Vanadium</p>  <p>Overall 9"</p> <p><b>ST-72</b></p>	<p><b>Screwdriver</b> Phillips #2 x 4" Chrome Vanadium</p>  <p>Overall 7 1/2"</p> <p><b>ST-7</b></p>	<p><b>Screwdriver</b> Slotted 1/4" x 4" Chrome Vanadium</p>  <p>Overall 7 1/2"</p> <p><b>ST-40</b></p>
<p><b>Magnetizer / Demagnetizer</b> Easily magnetize or demagnetize screwdrivers or other tools.</p>  <p><b>ST-51</b></p>	<p><b>Precision Screwdriver Set</b> 6 Piece in Case.</p>  <p><b>TL-8</b></p>	<p><b>Inspection Mirror</b></p>  <p><b>ST-55</b></p>	<p><b>Magnetic Pick-Up Tool</b> Telescopic with pocket clip.</p>  <p><b>ST-45</b></p>

# TOOLS FOR THE ELECTRONIC INDUSTRY

## SPECIAL TOOLS

<p><b>IC Puller</b> Stainless Steel Construction for Removing IC's. Insulated Vinyl Grip.</p>  <p><b>ET-10</b></p>	<p><b>IC Inserter</b> 14/16 Pin.</p>  <p><b>ET-14</b></p>	<p><b>Parts Retriever</b> 3 Prong. Pick Up Parts in Hard-to-Reach Places.</p>  <p><b>PR-3</b></p>	<p><b>Tweezer Crossover</b> With Pointed Tip. 4 1/2" Long.</p>  <p><b>ST-16</b></p>
<p><b>Tweezer</b> 6" Straight. Insulated with Blunt Serrated Ends.</p>  <p><b>ST-17</b></p>	<p><b>Electrician Knife</b> 2 Blades, Spear and Screwdriver with Shackle at End.</p>  <p><b>ST-36</b></p>	<p><b>Allen Wrench Set</b> 8pc. Ring Set with Springs - Twist Off, Twist On.</p>  <p><b>ST-15</b></p>	<p><b>Hemostat</b> Straight 6" Insulated Handle - Use as a Clamp to Hold Parts in Place.</p>  <p><b>ST-19</b></p>
<p><b>6" Ruler</b> Etched Metal. Inch and Metric Divisions with Pocket Clip.</p>  <p><b>ST-14</b></p>	<p><b>11 Piece Screwdriver Bit Socket Set</b></p> <ul style="list-style-type: none"> <li>• 3 Nut Drivers</li> <li>• 2 Slotted</li> <li>• 2 Phillips</li> <li>• 3 Star</li> </ul>  <p><b>ST-75</b></p> <hr/> <p>Same as above with ratchet drive</p>  <p><b>ST-80</b></p>	<p><b>Nut Driver Set</b> 3pc. Color-Coded Handles - 3/16", 1/4", and 5/16".</p>  <p><b>ND-3</b></p>	<p><b>Inspection Flashlight</b></p>  <p><b>ST-32</b></p> <p><b>Flashlight / Lantern</b> <b>ST-32L</b> (Requires 2 "AA" batteries, part # 590001)</p>
<p><b>Universal Alignment Tool Set</b> 6pc. Set in Plastic Pouch.</p>  <p><b>ST-13</b></p>	<p><b>Deluxe Alignment Tool</b> Metal non-magnetic tip.</p>  <p><b>ST-41</b></p>	<p><b>Blow Brush</b> Removes microscopic dust, lint, and other particles by blowing air into hard to reach areas.</p>  <p><b>ST-53</b></p>	<p><b>Mini-Vacuum Cleaner</b> Includes three attachments. Requires 4 "AA" batteries (part # 590001).</p>  <p><b>MSV-1</b></p>
<p><b>Anti-Static Shoe Grounding Assembly</b> <b>Elastic Ankle Strap</b></p>  <p><b>WS-4</b></p>	<p><b>Anti-Static Wrist Strap</b> Protects ICs and Other Equipment from Static Discharges. <i>Adjustable</i></p>  <p><b>WS-1</b> Anti-static wrist strap velcro adjustable - <b>Model WS-1Y</b></p>	<p><b>Anti-Static Work Mat</b> Protect Your Work Station from Static Discharge. Made of Semiconductive Vinyl. Size: 11" x 22".</p>  <p><b>WS-2</b> Mat Size: 19" x 23". <b>Model WS-3</b></p>	<p><b>Precision Duster</b> Pressurized blaster removes microscopic dust, lint, and other particles. Net Weight: 3.5 oz.</p>  <p><b>ST-49</b></p> <p><b>Air Blaster</b> Net Weight: 10 oz. <b>ST-52</b></p>

# TELECOMMUNICATION TOOLS

Impacters, Cutters, Strippers, & Slitters

NEW

## Deluxe Punch Down Tool Impact Type Model ST-630



Adjustable pressure control. Suitable for 66 and 110 or KRONE terminal blocks. Includes (1) type 66 blade. Storage for 1 spare blade in handle.  
**Replacement Blades:** Type 66 (ST-601), Type 110 (ST-602), KRONE Type (ST-603)

NEW

## Punch Down Tool Model ST-620



Non-impact tool with a 66 blade. Spare blade storage in handle included.  
**Replacement Blades:** Type 66 (ST-601), Type 110 (ST-602), KRONE Type (ST-603)

NEW

## Multi-Function Wire Stripper Model ST-302



Cuts, strips RG-58, RG-59, and RG-62. Precision strips 16 to 26 gauge wire.

## Coaxial Cable Stripper Model ST-35



Three-step coaxial cable stripper. Strips RG/U 6, 58, 59, 62 and 3C2V, 5C2V. Replacement Blade Cartridge part # ST-331.

NEW

## Round Cable Cutter Model ST-211



The 100 pair group cutter is rated for ethernet, 100 pair group telephone cable, and RG-174/RG-9 coax. Spring return with safety lock.

NEW

## Round Cable Cutter Model ST-205



Cuts multi-conductor cable up to 1/2" and solid or stranded wire up to 8 AWG. Spring return with safety lock.

NEW

## Ceramic Kevlar® Cutter Model ST-340



Easily trim the Kevlar® strength member in fiber optic cable. Ceramic blade for long life.

NEW

## Crimping & Cutting Pliers Model ST-208



For communication electronics. Designed to seat UG, UR and UY.

NEW

## Round Cable Slitting Tool Model ST-300



Cuts around cable jacket, slits the length of jacket for easy removal. Single or multiple conductor cable from 3/16" to 1" overall diameter.  
**ST-305:** Same as above, but for 1" to 1 1/2" overall diameter cables.

NEW

## Cable Tie Gun Model ST-375



Speeds up cable tie applications. Insures correct tension and provides automatic cutoff.

# TELECOMMUNICATION CRIMPING TOOLS

**NEW**

## Ergonomic Crimp Tool Model ST-800



Die set shown optional  
Ratchet crimp action provides repeatable and reliable terminations. Pressure adjustment for activation force. Dies change quickly - 16 dies available (sold separately). Cushion grip. Length 9".

## Multi-Function Telephone Tool Model ST-500

**NEW**



Crimps, cuts, and strips. Steel frame gives long term durability. Ratchet construction for RJ-45/11/22 modular connectors. Cushion grip. 8 1/2" long.

### Die Sets

The following die sets are for the Model ST-800 Crimp Tool.

- Model DS-801:** For RG-58, RG-174 and RG 8218 for both 50Ω & 75Ω cables.
- Model DS-802:** For RG-59, RG-6 and 8281 for both 50Ω & 75Ω cables.
- Model DS-803:** For RG-58, RG-59/62 BNC/TNC coax connectors.
- Model DS-804:** For RG-58 BNC/TNC 3 piece coax connector.
- Model DS-805:** For RG-59/62 AU BNC/TNC 3 piece coax connectors.
- Model DS-806:** For RG-58 & RG-59/62 AU BNC/TNC 3 piece coax connectors.
- Model DS-807:** Die set for RJ-11 two, four and six position modular plugs.
- Model DS-808:** Die set for RJ-45 ten position modular plugs.

Others available - see price sheet.

## Hex Type Crimping Tool Model ST-60



For use on RG-58 and RG-59 connectors. Cushion grip. 9" long.  
**Model ST-50** - For use on RG-59 and RG-6 connectors. Cushion grip. 9" long.

## Modular Crimping Tool Model HT-568



Cuts, strips, and crimps modular plugs 8P/RJ45 and 6P/RJ12, RJ11. Cushion grip. 7 1/2" long.

## Snap & Seal Connector Crimping Tool Model ST-54

**NEW**



For use on SNS-59/59QS/59HEC, SNS-6/6Q6, and Snap-n-seal security shield F connectors. Cushion grip. 8" long.

## Economy Crimping Tool Model ST-560

**NEW**



Multi-function telephone tool crimps, cuts, and strips for 4, 6, and 8 pole modular connectors. Plastic construction. 8" long.

## Multi-Purpose Wire Stripper Model ST-230

**NEW**



Self-adjusting wire stripper. Cuts or strips 12 to 20 gauge wire. Hardened steel blades for long life. Easy grip. 7 1/2" long.

## Crimping Tool / Wire Stripper Model ST-24



Cuts, strips, and crimps 10 - 22 gauge wire. Cushion grip. 8" long.

## Can Wrench Model ST-670

**NEW**



An easy-to-use tool that allows access to telephone boxes and pedestals. 3/8" and 7/16" hex double end, plastic handle.

# SOLDER STATION & SURFACE MOUNT SOLDERING

## Model SL-5 Series Soldering Stations



The **SL-5 Soldering Station** is electronically controlled to provide 5 to 40 or 60 watts and is ideal for professionals, students, and hobbyists. The unit includes a holder funnel for the iron, sponge pad for cleaning the tip and an on/off indicator light. It is available assembled or in kit form.

### Features:

- **Ground Fault Safety Circuit**  
LED turns on when the following problems are present at the power source.
  1. Open Ground.
  2. Hot and Ground Reversed (Bright when Switch is Off, Dim with Switch On).
  3. Hot and Neutral Reversed.
- Cushion Grip Handle Soldering Iron with Grounded Tip for Soldering Static-Sensitive Devices. Easily Replaceable. Uses Long-Life, Plated Conical Tip.
- Heavy Steel, Non-Slip Base.
- Iron Holder Funnel - Reversible, left or right side.
- Steel Tray for Sponge Pad.
- Sponge Pad.
- Power On/Off with Indicator Light.

The Elenco Deluxe Soldering Station comes in many different models. They are listed below:

### ASSEMBLED SOLDERING STATIONS

**Model SL-5** is the station that comes without a soldering iron. You may plug in any iron and obtain variable heat. It is suggested that you use 40 watt or 60 watt irons.

**Model SL-5-40** - This station comes complete with a 40 watt soldering iron providing you with variable heat - 5 watts to 40 watts. For general soldering requirements.

**Model SL-5-60** includes a 60 watt iron to provide you variable heat - 5 watts to 60 watts. For more heavy-duty soldering.

**Model SL-5-SPL** is a custom station that is supplied with an iron of your choice, Weller, Ungar, etc., and can include accessories of your choice.

### SOLDER STATION KITS

**Model SL-5K** is a solder station in kit form. The soldering iron is not included. You build the station with your own soldering iron (40 watt iron suggested). Ideal for student projects.

**Model SL-5K-40** - A solder station in kit form using a 40 watt soldering iron that is included to build the station. The 40 watt soldering iron then becomes part of the station.

**Model SL-5K-60** is in kit form but uses a 60 watt soldering iron to build the station. The 60 watt iron becomes part of the station.

**Model SL-5K-SPL** is a custom solder station that is in kit form - you construct the station. You can include soldering irons of your choice, Weller, Ungar, etc., and other selected accessories.

## Surface Mount Technology Solder Practice Kit with Training Course Model SM-200K

The future of electronics is headed for miniaturization through surface mount technology (SMT). Taking our course of training will prepare you for the future. Includes all parts and instructions to give you experience on working with surface mount components. The finished project is a decision maker with 6 flashing LEDs to help you make vital decisions.



SM-200K PCB board showing practice areas & mounted components

SM-200K in its final assembly as a decision maker



Requires 9 volt battery . . . Part # 590009

## Learn Surface Mounting Techniques Function Generator Kits with Training Courses

### Model FG-600K

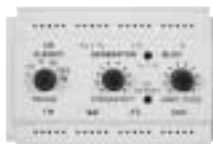
These versatile function generators include surface mount components such as IC's, resistors and capacitors. When completed, they provide Sine, Square and Sawtooth waveforms, continuously variable to 1MHz. Amplitude adjustable. Complete with all parts and PC board. Both include case and extensive training manual.



Requires 9 volt battery  
Part # 590009

SPECIFICATIONS	
<b>OUTPUT:</b>	
Waveforms: Sine, Square, Triangle	
Frequency: 0.1-1MHz	
Impedance: 600Ω ±10%	
Amplitude: Sine/Triangle 0-3V at 12V DC input Squarewave .5-12V (no load)	
Frequency Variable Range: 100:1 or more	
Frequency Multiplier: x1, x10, x100	
<b>SINE WAVE</b>	
Distortion: Less than 1%	
Flatness: ±0.5 dB 1Hz-100kHz	
Temperature Stability: ±20ppm/°C Typical	
<b>SQUARE WAVE</b>	
Symmetry: Less than 5% (at 1kHz)	
Rise & fall time: Less than 300ns (at 1kHz)	
<b>TRIANGLE WAVE</b>	
Linearity: Less than 1% (up to 100kHz)	
Power Requirements: 9 to 18V DC at input	

### Model 9600K



SPECIFICATIONS	
<b>MAIN GENERATOR</b>	
<b>Sinewave</b>	
Frequency range	1Hz to 1MHz
Sinewave output max	2 volts P-P
	1% max Typical 2% max
<b>Triangle Waveform</b>	
Frequency range	1Hz to 1MHz
Sawtooth output max	4 volts P-P
<b>Amplitude Variation</b>	
1Hz to 100kHz	0.1dB max
100kHz to 1kHz	4dB max
<b>Squarewave TTL</b>	
Frequency range	1Hz to 1MHz
Squarewave output	5 volts P-P
Rise time	250nsec
Fall time	50nsec
<b>Squarewave</b>	
Frequency range	1Hz to 1MHz
Squarewave output	-5V to +5V
Rise time	250nsec
Fall time	50nsec
Output impedance	600Ω
<b>AM or FM Modulation</b>	
Input impedance	200kΩ

# SOLDER STATIONS AND DESOLDERING SYSTEMS



## Hot Air SMD Rework Station

**Model SR-979**



The workstation is engineered to meet the needs of today's electronic industry. Wide range of adjustments of air volume and temperature (212°F to 754°F) permits soldering of most surface mount devices.

Comes with an A1138 nozzle QFP 28 x 28mm (1.1 x 1.1").

### Optional Hot Air Nozzles Available

A1124 - Single 2.5mm	A1134 - SOP 7.5 x 18mm
A1125 - QFP 10 x 10mm	A1135 - PLCC 17.5 x 17.5mm 44 pins
A1126 - QFP 14 x 14mm	A1136 - QFP 10 x 10mm 52 pins
A1127 - QFP 17.5 x 17.5mm	A1137 - QFP 14 x 14mm 68 pins
A1128 - QFP 14 x 20mm	A1138 - QFP 17.5 x 17.5mm 84 pins
A1129 - QFP 28 x 28mm	
A1130 - Single 4.4mm	
A1131 - SOP 4.4 x 10mm	
A1132 - SOP 5.6 x 13mm	
A1133 - SOP 17.5 x 15mm	

## Repair System Soldering and Desoldering

**Model SL-916**

Top of the line repair system will handle desoldering. Temperature controlled soldering from 300°F to 790°F (150°C to 420°C), desoldering temperature range 410°F to 900°F (210°C to 480°C). The system is based on principle of vacuum absorption of the solder from the PC board.



Replacement Desoldering Tip - SL-916DT

Replacement Soldering Iron Tip - SL-916ST

## Desoldering System with Digital Display

**Model SL-928**

Top of the line desoldering system will handle virtually all electronic repair and rework. Temperature controlled from 410°F to 900°F (210°C to 480°C) gun type handle. The SL-928 is based on the principle of vacuum absorption of the solder from the PC board.



Replacement Desoldering Tip - SL-928DT

## Deluxe Temperature Controlled Soldering Stations

LED Readout for greater accuracy (SL-30 only) • Temperature range 300°F to 900°F

**Model SL-30**  
Digital Display

This hi-tech soldering station incorporates a sophisticated electronic circuit which enables the user to change the tip temperature from 300°F (150°C) to 900°F (480°C). The temperature is maintained within ±10°F of its preset temperature. The tip is isolated from the AC line by a 24V transformer. The tip is grounded to eliminate static charges.

**Model SL-10**



Replacement Tips:	SL-30T	SL-30T3	SL-30T5	SL-30T6	
					1/32"
					1/64"
					1/8"
					3/64"

# SOLDERING EQUIPMENT

(Butane Soldering Irons Available) SR-10 & SR-20, Call for information.

## Deluxe 25W Soldering Iron

Model SR-2B \*



3 wire grounded plug • Screw-in tip  
Rubber sleeve handle with long-life plated tip  
Replacement Tips: Conical - SR-2BT2, Wedge - SR-2BT

## Standard Soldering Iron

Model SR-1 \*

25W Pencil Soldering Iron Stand Included



Conical Replacement Tip SR-1T

## Professional Soldering Iron

Model SR-3B \*



25 Watts • Ceramic Element • Long-life Tip •  
Light Weight • Rubber Sleeve • Conical Replacement Tip: SR-3T

## Deluxe 40W Soldering Iron

Model SR-6



3 wire grounded plug • Screw-in tip  
Rubber sleeve handle with long-life plated tip  
Replacement Tips: Conical - SR-2BT2, Wedge - SR-2BT

Deluxe 60W Soldering Iron - Model SR-7

## Solder

Model ST-4 \* - 5 ft.  
Model ST-4A \* - 10 ft.



63/37 Rosin Core .032 dia.

## Desoldering Wick

Model SW-3 \*



Solder removal braid removes solder from all types of connections.  
5 ft. roll in handy dispenser.

## Soldering Iron Tip Package



Model TIPK-1  
For SR-2B, SR-6 and SR-7



## Tip Tinner, Cleaner

Model TTC-1



Prevents oxide build-up. Prolongs tip life and heat transfer.

## Soldering Iron Holder with Sponge

Model SH-1



## Soldering Iron Stand

Model SH-2 \*



Small Stand w/ Flip-up Wire Form

## Desoldering Pump

Model SP-2

Aluminum housing with Teflon tip



SP-2T Replacement Tip



## Solder Ease Kit

Model SE-1



4 pc. Set • Brush, Scraper, Probe, and Heatsink in Pouch

## Panavise® Work Vice

Model PV-201



Tilt, turn, and rotate projects to the exact position you want. Jaws open to 2 7/8".  
Made of fiber reinforced thermal plastic alloy, base is die cast aluminum.

## Helping Hands

With Magnifying Glass

Model HH-55



For soldering or making fine adjustments. Adjustable arms can hold objects in any position.

HH-50 - w/o magnifying glass.

## Safety Goggles

Model ST-20



Contours to head • Soft vinyl frame • ventilated  
(Safety Approved)

## Safety Spectacles

Model ST-22



Features wide upper frame. It can also fit over prescription glasses.  
(Safety Approved)

# SOLDER PRACTICE KITS & TRAINING VIDEOS

## Practical Soldering Project Kit

### Model SP-1A



Working with printed circuit boards is in the future of every electronic technician. Almost every electronic device today has a printed circuit board and whether you are assembling a PC board or repairing it, you must understand the basics of working with these boards.

Good soldering requires practice and an understanding of soldering principles. This solder practice project will help you achieve good soldering techniques, help you become familiar with a variety of electronic components, and provide you with dynamic results.

Requires 1 9V battery (part # 590009)

SP-1A Solder Kit with Soldering Iron & Side Cutters AK-100



## Practical Soldering Project Kit

### Model SP-3B

Elenco Electronics is proud to present another superb solder practice kit designed to meet the ever increasing demands on proper soldering procedures. Some of the features of this kit are as follows:

- Identifying components
- Color code reading exercises, resistors, capacitors, and inductors. **Includes color code calculator.**
- 163 solder points, standard soldering connections, close-tolerance soldering, and tack soldering.
- Desoldering exercise
- Evaluation exam of performed soldering connections. Written & visual.
- Complete voltage and resistance analysis of circuit.



Requires 1 9V battery (part # 590009)



## Soldering Techniques Training Video

### Model VID-901 VHS

### Model VID-901 CD

### VHS Cassette

### CD ROM



This video has been prepared to introduce the student or technician to basic soldering techniques. You'll learn to solder the easy way by watching step-by-step in how to properly solder and desolder a variety of solder connections. You will learn about different soldering irons, soldering equipment and tools that are used in the electronic industry. The program is approximately 45 minutes with an overview booklet. Suggest using the video in conjunction with solder practice kits SP-1A, SP-3B, SM-200K, or FG-600K.

## Space War Gun K-10

Rapid fire or single shot with 2 flashing LEDs.

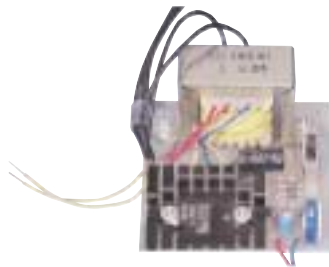


Speaker Incl.

Requires 9V Battery (P/N 590009)

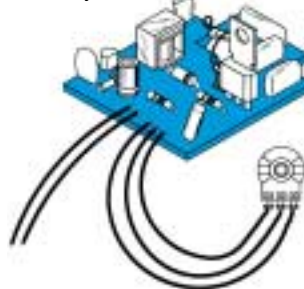
## 0-15V Power Supply K-11

A low-cost way to supply voltage to electronic games, etc. 0-15VDC @ 300mA.



## Strobe Light K-12A

Produces a bright flash via xenon flash tube. The flashing rate is adjustable.



Requires 2 "C" Batteries

## Automatic Siren K-13

Can be used with a burglar alarm or as an attention getter.



Speaker Incl.

Requires 9V Battery (P/N 590009)

## Christmas Tree K-14

Produces flashing colored LEDs and three popular Christmas melodies.



Requires 9V Battery (P/N 590009)

## Fish Caller K-15

Makes a sound that should attract hungry fish.



Requires 9V Battery (P/N 590009)

## Electronic Cricket K-16

Your friends will go crazy trying to find it.



Speaker Incl.

Requires 9V Battery (P/N 590009)

## LED Robot Blinker AK-400/K-17

You'll have fun displaying the PC board robot. Learn about free running oscillators.



Requires 9V Battery (P/N 590009)

## Telephone Hold Button K-18

Put all incoming and outgoing calls on hold at the press of a button.



## Digital Bird K-19

You probably have never heard a bird sing this way before.

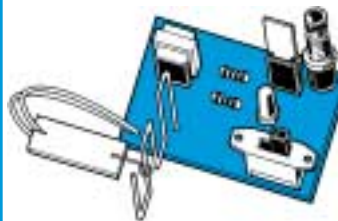


Speaker Incl.

Requires 9V Battery (P/N 590009)

## Nerve Tester K-20

Test your ability to remain calm. Indicates failure by lit LED or mild shock.



Requires 9V Battery (P/N 590009)

## 2 IC AM Radio Kit AM-780

New Design - Easy-to-Build complete radio on a single PC board.



Requires 9V Battery (P/N 590009)

## Yap Box K-22A

Makes six exciting sounds:

- Laser gun
- Diesel horn
- Siren
- Wolf whistle
- Puppy bark
- Machine gun

Case included.  
Available assembled YAP-10



Requires 9V Battery (P/N 590009)

## Burglar Alarm K-23

Alarm for your car, house, room or closet.



Buzzer Incl.

Requires 9V Battery (P/N 590009)

## Whooper Alarm K-24

Can be used as a sander or siren.



Speaker Incl.

Requires 9V Battery (P/N 590009)

## Digital Roulette AK-300/K-25

Sure winner with your friends. 32 LEDs as arranged in a 5" circle.



Requires 9V Battery (P/N 590009)

### Metal Detector K-26

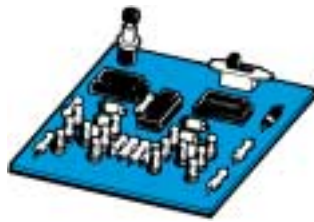
Find new money and old treasure. Get started in this fascinating hobby.



Requires 9V Battery (P/N 590009)

### Pocket Dice K-28

To be used with any game of chance.



Requires 9V Battery (P/N 590009)

### TV / FM Oscillator K-29

Learn about oscillators and FM transmitters. Use as FM transmitter.



Requires 9V Battery (P/N 590009)

### FM Mic AK-710/K-30

Learn about microphones, audio amplifiers, and RF oscillators.

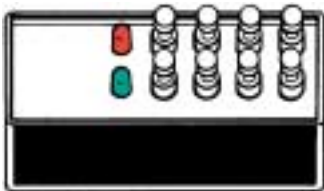


With training course

Requires 9V Battery (P/N 590009)

### Digital Lock K-31

Program your combination from thousands of different choices.



Requires 9V Battery (P/N 590009)

### One Button Bandit K-34

Press the button and away she goes, if 3 LEDs light, you win. Our version of Vegas one arm bandit.



Requires 9V Battery (P/N 590009)

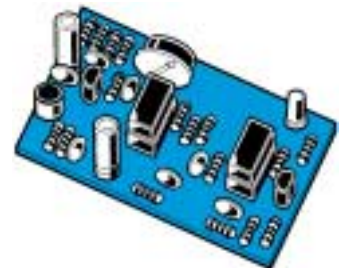
### Telephone Bug K-35

Size of a dime yet transmits both sides of a phone conversation to any FM radio. No battery needed.



### Sound Activated Switch K-36

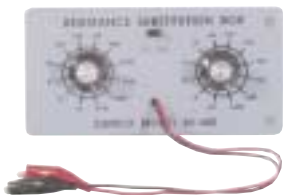
Clap and the light comes on, clap again and it goes off.



Requires 9V Battery (P/N 590009)

### Resistor Substitution Box K-37

Contains 24 different value resistors from 10Ω to 1 meg.



### Capacitor Substitution Box K-38

Contains 12 different value capacitors from 100pF to 1μF.



### Love Tester AK-500/K-39

Test your sex appeal with this exciting kit.



Requires 9V Battery (P/N 590009)

### Temperature Adapter Kit K-40/TA-12

Converts any digital multimeter\* into a temperature probe. Range: -20°F to 150°F high accuracy. \* Requires 2VDC range.



### Decision Maker K-43

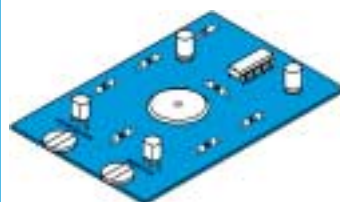
Need help in making up your mind? The Decision Maker will do it for you!



Requires 9V Battery (P/N 590009)

### Lie Detector K-44

The sound will tell if you are lying. The sound gets louder the more you lie. Fun at parties!



Requires 9V Battery (P/N 590009)

### Color Code Calculator for resistors, capacitors, and inductors CC-100

Pocket-sized calculator is easy-to-use in determining values of resistors, capacitors, and inductors. Match colors and get a fast reading of values.



### Telephone Line Analyzer TWT-1K

A telephone line analyzer kit that tests active phone lines with RJ-11 or RJ-45 modular jacks.



# POWER SUPPLY KITS

The largest selection of variable and fixed voltage power supply kits in the electronics industry. Ideal as school projects for breadboarding, prototyping, and training. The regulated supplies are protected against damage from short circuits.

## Power Supply Kit

### Model XP-720K



Model **XP-720K** has 3 fully regulated DC supplies plus a 12.6VAC center tapped to 6.3VAC.

#### SPECIFICATIONS

Input Voltage	120VAC
Output Voltage	1) 1.5VDC - 15VDC @ 1A 2) -1.5VDC - --15VDC 3) 5VDC @ 3A 4) 6.3VAC @ 1A and 12.6VAC Center Tapped @ 1A
It features short circuit protection on all supplies.	
Note: Variable outputs can be stacked to get 3 - 30VDC @ 1A	

Available Assembled Model XP-720

## Power Supply Kit

### Model XP-620K

Model **XP-620K** has 3 fully regulated DC supplies.

#### SPECIFICATIONS

Input Voltage	120VAC
Output Voltage	1) 1.5VDC - 15VDC @ 1A 2) -1.5VDC - --15VDC 3) 5VDC @ 3A
It features short circuit protection on all supplies.	
Note: Variable outputs can be stacked to get 3 - 30VDC @ 1A	



Available Assembled Model XP-620

## Variable Voltage Power Supply Kit

### Model XP-15K

#### SPECIFICATIONS

Input voltage:	120VAC
Output voltage:	1.25 - 15VDC
Output Current:	0.5A @ 8V; 0.3A @ 12V 0.2A @ 15V
Short Protected IC Thermo	



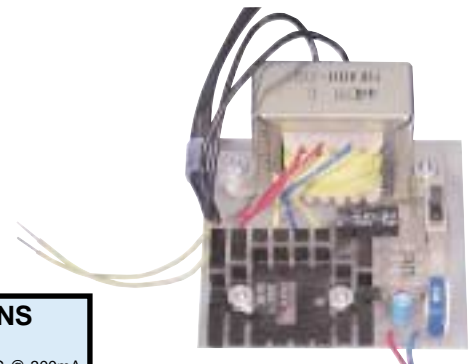
## Variable Voltage Power Supply Kit

### Model K-11

A low-cost way to supply voltage to electronic devices, games, etc.

#### SPECIFICATIONS

Input voltage:	120VAC
Output voltage:	0 - 15VDC @ 300mA



# MULTIMETER KITS

If you are using or planning to use a digital or analog meter in your training programs, consider one of the meter kits below - easy construction, detailed assembly manuals.

## Deluxe Full Function Digital Multimeter Kit

### Model M-2665K

- Extra Large 1" Display
- Transistor Test
- Overload Protection
- Capacitance to 20 $\mu$ F
- Diode Test
- AC/DC Current to 20A
- Low Battery Indicator
- Tilt Stand
- Safety Input Sockets and Test Leads

Available assembled as M-2760N



### SPECIFICATIONS

AC + DC Volts	200mV, 2V, 20V, 200V, 1000V, 750VAC	
Accuracy	1/2% DC, 1% AC	Resolution .1mV
AC + DC Current	200 $\mu$ A (DC only), 2mA, 200mA, 20A	
Accuracy	1% DC, 1.5% AC, 20A 2%	Resolution .1 $\mu$ A
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$	
Accuracy	.8%, 3% 20M $\Omega$	Resolution .1 $\Omega$
Capacitance	2nF, 20nF, 200nF, 2 $\mu$ F, 20 $\mu$ F	
Accuracy	3%	Resolution .1pF
Temperature	-20°C to 1370°C or 0°F to 1999°F	
Accuracy	3%	Resolution 1°
Size	3.5" W x 7.5" L x 1.4" D	
Accessories	Test leads, Manual, 9V Battery included	
Options	ST-265, C70, C-90, M-110CF	

## 20K/V VOM Model M-1250K



- 20,000 $\Omega$ /V
- 23 Ranges
- 3 1/2" Meter
- Mirrored Scale
- Audible Continuity
- Checks Transistors/Diodes
- Safety Input Sockets and Test Leads
- 10A DC Current
- dB Scale
- Battery Test
- Tilt Stand



### DSR-85

Dial Scale Reading Kit Included

Available assembled as Model M-1250

### SPECIFICATIONS

DC Volts	.1, .5, 2.5, 10, 50, 250, 1000, 3% FSR
AC Volts	10, 50, 250, 1kV, 4% FSR
DC Current	50 $\mu$ A, 2.5mA, 25mA, 250mA, 10A 3% FDR
Resistance	X1, X10, X100, X1k, X10k
Transistor $h_{FE}$ 0-1000	ICEO 150 $\mu$ A, 1.5mA, 15MA, 150MA
Size	3.7"L x 5.9"W x 1.25"D
Accessories	Test leads, Manual, 9V and (2) 1.5V AA batteries

## Digital Multimeter Kit Model M-1005K



- Low Cost
- 3 1/2 digit LCD
- 18 ranges
- Transistor test
- Diode test
- Overload protection
- Pocket size

Available assembled as M-1000B

### SPECIFICATIONS

DC Volts	200mV, 2V, 20V, 200V, 1000V	
AC Volts	200V, 750V	
Accuracy	DC 1/2%, AC 1.2%	Resolution .1mV
Input Impedance	1M $\Omega$	
DC Current	200 $\mu$ A, 2mA, 20mA, 200mA, 10A	
Accuracy	$\pm 1.2\%$ rdg + 2 digits	Resolution .1 $\mu$ A
Resistance	200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$	
Accuracy	$\pm 1.2\%$ rdg + 2 digits	Resolution .1 $\Omega$
Size	2.9" W x 5" L x 1" D	
Accessories	Test leads, Manual	

# DELUXE KITS

## Motion Detector Kit

**Model AK-510**



Learn the basics of motion detector technology while building this motion detector kit that uses an infrared sensor. Use as a burglar alarm, message minder, room detector, or entry to home or business.

Requires 1 9V battery (part # 590009)

## Strobe Light Kit

**Model AK-520**



Strobe Lights are used in many places. Airplanes, boats, cameras, special effects, and concerts. This kit will teach you how to make your own. With a variable flash rate, this xenon flash tube will produce some amazing effects.

Requires 4 "C" batteries

## Color Bar Generator Kit

**Model SG-250K**

Ten solid patterns, including both gated and full color rainbow, plus the strongest case ever. It's virtually indestructible, all solid-state, using one quartz crystal master oscillator. Both RF and video output. Portable battery operated. AC adapter available.



Available Assembled Model SG-250

## FM Wireless Microphone Kit

**Model AK-710**

Now you can hear your voice on the radio! This kit will have you singing in no time at all. After following our easy assemble manual, you'll be ready to transmit your voice on an actual FM Radio. Range up to 100 feet.

Requires 2 "AA" batteries (part # 590001)



## Function Generator

**Model FG-500K**



Provides sine, square or saw tooth waveforms continuously variable 1Hz to 100kHz. Amplitude adjustable to 2.5V peak to peak. Complete with all parts, PC board, schematic, deluxe case with handle and extensive assembly manual.

Available Assembled Model FG-500

## Diode/Transistor Tester Kit

**Model DT-100K**



This dynamic tester allows checking of transistors and diodes in circuit. Identifies NPN or PNP transistors. Checks all types, small or large power. Identifies anode or cathode of diodes.

Available Assembled Model DT-100

## Telephone Line Analyzer Kit

**Model TT-400K**

A telephone line analyzer that provides fast indication of telephone line polarity, ring and line voltage levels, condition of phone line from user's telephone to central telephone office - also can check basic telephone functions and condition of telephone line cord.



Available Assembled Model TT-400

## Amateur Radio Receiver Kit

**Model AR-2N6K Kit**

FM Receiver Kit and training course, ideal for beginners. Easy to build and learn about amateur radio.

- Covers both 2 meter (144-148MHz) and 6 meter (50-54MHz) FM.



Requires 1 9V battery (part # 590009)

All Kits on this Page Require Soldering

# DELUXE KITS

## Telephone Kit

**Model PT-323K / AK-700**

**Clear, See-Through Case  
with Training Course**



The Elenco PT-323K / AK-700 is a push button electronic telephone. It is equipped with the following features: Pulse/tone dialing, automatic redial, a ringer turn off switch, 4 neon bulbs for visual indication of telephone ringing, clear see-through case to show the total inner workings of the phone. Sectionalized construction and testing makes construction easy. Wall mounting cradle included.

Now available in non-soldering version:

**Model AK-870  
with training course**

## Radio Controlled Race Car

**Model RCC-7K  
with Training Course**



Requires 4 "AA" Batteries (part # 590001)  
and 1 9V battery (part # 590009)

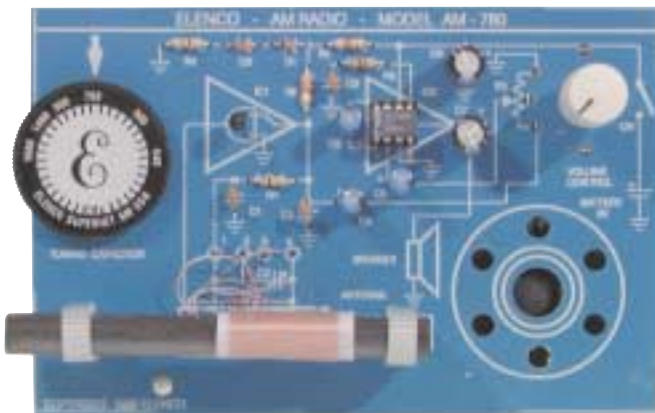
The purpose of this project is to expand your understanding of basic transmitters, receivers and electronic switching theories. Your Turbo King Car will be built from the ground up. You'll learn all about gears, motors, printed circuit boards, and integrated circuits from our detailed assembly and training manual. You will construct each section, explore the circuitry and troubleshoot it.

### Features:

- 7 Remote Functions
- Single Channel Operation
- Flashing Top Light
- Remote Control Included
- Full Color Assembly Manual (non-soldering AK-870 only).

## 2 IC AM Radio Kit

**MODEL AM-780K**



New Design - Easy-to-Build complete radio on a single PC board. Unique design allows you to place parts over its corresponding symbol on the PC board. Teaches the basic theory of AM radio operation. Detailed instructions and illustrations make it an easy and educationally sound project.

Requires 1 9V battery (part # 590009)

All Kits on this Page Require Soldering

# RADIO KIT WITH TRAINING COURSE

## MODEL AM/FM-108K

### AM/FM Radio Kit and Training Course 1 Integrated Circuit, 9 Transistors and 4 Diodes

Training course of 56 pages is divided into 9 lessons; Audio Amplifier, AM Detector, AM IF, AM Amplifier, AM Mixer & Oscillator, FM Detector, 1st FM IF, 2nd FM IF, FM RF Stages. Integrated circuit technology now included. "Superheterodyne" receiver of standard AM (amplitude Modulated) and FM (frequency modulated) broadcast frequencies. Includes radio mounting stand.

**Also Available**  
**Model**  
**AM/FM-108TK**  
14 Transistor, 5 Diode  
Version (without IC)



Requires 1 9V battery (part # 590009)

(PC Board 11 5/8" x 5 1/4")

## MODEL AM-550K

### AM Radio Kit and Training Course 1 Integrated Circuit, 3 Transistors and 1 Diode

Training course divided into 5 lessons: Audio Amplifier, Detector, IF Amplifier, Oscillator, and Mixer - integrated circuit now included. "Superheterodyne receiver of standard AM (amplitude modulation) broadcast frequencies. Includes radio mounting stand.



(PC Board 10 1/2" x 3 1/2")

**Also Available**  
**Model**  
**AM-550TK**  
7 Transistor, 2 Diode  
Version (without IC)

The unique design of these kits allows you to place the parts over its corresponding symbol in the schematic drawing on the surface of the printed circuit board during assembly. This technique maximizes the learning process while keeping the chances for an assembly error at a minimum.

Both kits include an assembly, lesson and theory of operation manual. The actual assembly is broken into simple sections. Each section should be completely tested before moving on. This reduces difficult troubleshooting associated with many similar kits. Both include practical hi-tech blue PC boards with the schematic printed on the surface. The manuals are easy to understand, no previous knowledge of electronics is necessary. Each radio kit PC board has been designed so that no cabinet is necessary. A special molded plastic base provides the necessary support to use the radio in any location, displaying the work achievement of the student.

**MAKES AN EXCELLENT PROJECT FOR CLASSROOM STUDIES**

Requires 1 9V battery (part # 590009)

# SPECIALITY TESTERS

## 1% 1 Watt Resistor Substitution Box

Model RS-500



Any value 1% resistors from 1Ω to 11.111MΩ increments (1 watt resistors).

## Capacitance Substitution Box

Model CS-600



Choose from 20 values between 100pF and 11.111μF. Capacitors are 2% @ 200 volts.

## Diode/Transistor Tester

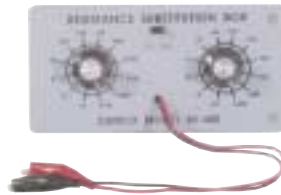
Model DT-100



Checks transistors & diodes in circuit. Identifies NPN or PNP transistors. Checks small or large power types. **Available in kit DT-100K**

## Resistor Substitution Box

Model RS-400



Contains 24 standard value resistors from 10Ω to 1MΩ.

**Available in Kit K-37**

## Capacitor Substitution Box

Model CS-440



Contains 24 different value capacitors from 100pF to 1μF.

**Available in Kit K-38**

## AC Receptacle Tester

Model ST-38



UL Listed. Gives Instant Display of Wiring Conditions of Any Standard 3 Wire 110VAC Outlet.

## RS-232 Check Tester

Model CT-100



Similar to the mini tester, however, this tester gives a better understanding of the status of the data lines. Performs the same tests as MT-100, but in a more detailed manner.

## RS-232 Mini Tester

Model MT-100



Used to monitor the 7 most commonly used data lines to see if equipment has failed. Seven 2-color LEDs check status of TD, RD, RTS, CTS, DSR, CD & DTR.

## Circuit Tester

Model ST-37



UL Listed. AC/DC 80-500 Volts. Bright Neon Indicator, Pocket Clip, Insulated Case.

## Satellite Finder

Model SF-01



- Aligns Satellite Dish
- Range 950-2,050MHz
- Compact Size
- Self Power Check

The Model SF-01 is intended to aid in the alignment of a satellite dish. The unit is connected to the LNB via short coaxial cable. The output must be connected to the satellite receiver in order to supply power. The unit operates from 12-24VDC on the coaxial cable.

## Multi-link Tester & Breakout Box

Model BB-25



Allows cable makers to configure custom cables. The BB-25 will visually let you know the status of lines 2, 3, 4, 5, 6, 8, 20 & 22 on the DTE side by utilizing red/green bi-color LEDs. Provides signal status at a glance (four states: mark, space, clocking, and off). Complete cable "breakout" and reconfiguration exists with 24 in-line switches and 54 in-line machine tool sockets. Includes handy carrying case, 10 jumper wires and a device wiring chart. Cable extends 4" from side of tester.

Connectors: 1 male DB25 & 1 female DB25.

## VCR Troubleshooter Jig

Model ST-225



The VU-thru is a clear test cartridge that allows operation of a VHS player as if a tape were in it. Cuts diagnostic time to a minimum.

# BREDBOARD - PROTOTYPE DESIGN AIDS

A broad array of breadboards that provide unlimited freedom in laying out circuits and prototyping. Breadboards are arrayed from 550 tie points up to 3,220 tie points with colored binding posts that simplify identification of voltage points.



## Model 9440 \*

**TERMINALS:** 3,220 test points, 504 separate 5 point terminals, plus 14 horizontal bus lines of 50 test points each.

**CAPACITY:** Up to 36, 14 pin dip ICs.

**BINDING POSTS:** Four coded black, red, yellow, and green.

**BASE MATERIAL:** Heavy aluminum black anodized.

**SIZE:** 8 1/4" wide, 9 1/2" long.

**MAX WIRE SIZE:** #22 Solid Wire

## Model 9438 \*

**TERMINALS:** 2,390 test points, 378 separate 5 point terminals, plus 10 horizontal bus lines of 50 test points each.

**CAPACITY:** Up to 33, 14 pin or 30, 16 pin dip ICs.

**BINDING POSTS:** Four coded black, red, yellow, and green.

**BASE MATERIAL:** Heavy aluminum black anodized.

**SIZE:** 7" wide, 9" long.

**MAX WIRE SIZE:** #22 Solid Wire



## Model 9433 \*

**TERMINALS:** 1,660 test points, 252 separate 5 point terminals, plus 8 horizontal bus lines of 50 common test points each.

**CAPACITY:** Up to 18, 14 pin or 15, 16 pin dip ICs.

**BINDING POSTS:** Three coded black, red, and green.

**BASE MATERIAL:** Heavy aluminum black anodized.

**SIZE:** 5 1/4" wide, 8 1/2" long.

**MAX WIRE SIZE:** #22 Solid Wire

## Model 9425 \*

**TERMINALS:** 830 test points, 126 separate 5 point terminals, plus 4 horizontal bus lines of 50 test points each.

**CAPACITY:** Up to 11, 14 pin or 30, 16 pin dip ICs.

**BINDING POSTS:** Three coded black, red, and green.

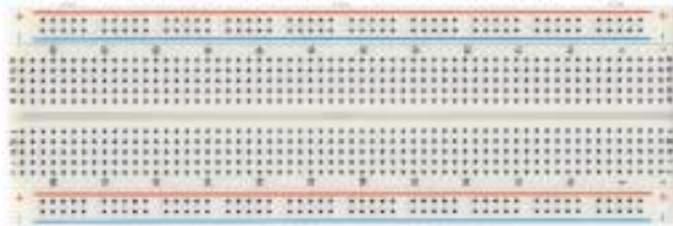
**BASE MATERIAL:** Heavy aluminum black anodized.

**SIZE:** 7 1/4" wide, 3 3/4" long.

**MAX WIRE SIZE:** #22 Solid Wire

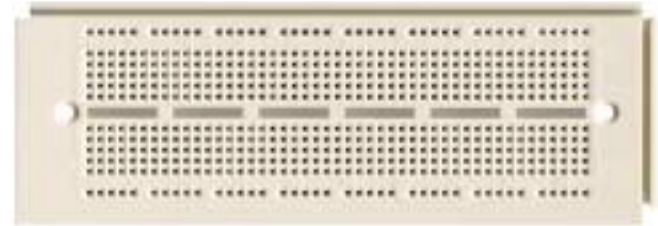


## Model 9830 \*



Our top quality breadbox contains 830 tie points including four independent common bus lines for easy connections to common lines. Numbers and letters are printed in black, bus lines in red and blue. Snap lock permits unlimited interlocking of additional boards. 6 1/2" x 2 1/8" Maximum Wire Size: #22 Solid Wire

## Model 9550 \*



The 9550 contains 550 tie points including 2 power bus lines. This box can be expanded with our interlocking feature and can be snapped into place with our function blox's.

6" x 2 1/8" Maximum Wire Size: #22 Solid Wire

## Jumper Wire Kits for Breadboarding

### Model JW-350 \*



Contains 350 lengths of pre-stripped, pre-formed #22 solid wire in various colors. 14 different lengths of 25 pieces each. Contained in a large 14 compartment plastic case (10 1/2" x 5" x 1 1/4").

### Model JW-140 \*



Contains 140 lengths of pre-stripped, pre-formed #22 solid wire in various colors. Contains 14 different lengths of 10 pieces each. Contained in a plastic case (6 1/2" x 2" x 1/2").

As the primary manufacturer, we can design and manufacture Breadboards with unlimited number of test points and special connectors. Call us for further information and cost.

\* Available in retail packaging - See price sheet

# TRAINING COURSES AND PROTOTYPING

## Basic Electronic Experiments Model PK-101

Transforms any Standard Breadboard into an Electronic Learning Center!

### Perform 50 Experiments

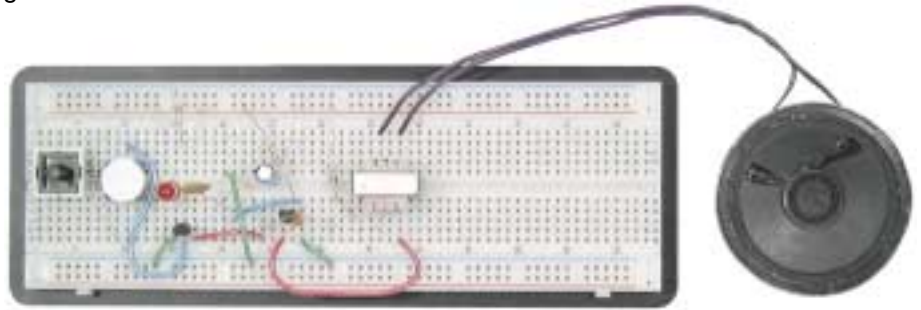
- Electronic Keyboard
- Finger Touch Lamp
- Metal Detector
- Burglar Alarm
- Battery Tester
- Voltmeter
- Water Alarm
- Siren
- Space Gun
- Electronic Kazoo
- Magnetic Bridge
- Morse Code

\* And a Lot More! \*

The experiments in Model PK-101 require a breadboard or can be done on the Elenco XK-150, XK-550 or XK-700 Trainers. No soldering or tools required, all parts included.



72 Page  
Manual  
Included



(Requires breadboard and a 9V battery or power supply.)

## Basic Parts Kit Model CK-1000



### Plastic Parts Container

11" x 7" x 1 1/2" - 18 divisions

### Resistors: 1/4W - 5 each

10Ω, 100Ω, 470Ω, 1kΩ, 2.2kΩ, 4.7kΩ, 8.2kΩ, 10kΩ, 18kΩ, 27kΩ, 47kΩ, 82kΩ, 100kΩ, 220kΩ, 330kΩ, 470kΩ, 1MΩ

### Electrolytic Capacitors:

#### 50V Radial - 2 each

1μF, 4.7μF, 10μF, 47μF, 100μF, 470μF, 1000μF

### Mylar Capacitors: 100V

#### Radial DIP - 2 each

.001μF, .0047μF, .01μF, .047μF, .1μF, .33μF

### Ceramic Disc Capacitors:

#### 500V - 2 each

2.2pF, 4.7pF, 10pF, 1pF, 22pF, 47pF, 100pF, 220pF, 470pF, 680pF

### Inductors: 1 each

4.7μH, 10μH, 47μH, 100μH, 470μH, 1mH, 10mH, 33mH

### Trim pots: Single Turn - 1

#### each

500Ω, 1kΩ, 5kΩ, 50kΩ, 100kΩ, 500kΩ, 1MΩ

### Switches: 2 each

Pushbutton, SPDT slide, DPDT slide, 8-position DIP

### LEDs: Standard T 1 3/4

#### size - 5 each

Red, Green, Yellow

### Displays: 2 each

7-segment common cathode, 7-segment common anode

### Integrated Circuits: 2 each

7805, 7812 Regulators, LM386 Audio Amp, 555 Timer, 741 Op-Amp, 74LS00, 74LS02, 74LS08, 74LS10, 74LS47, 74LS74, 74LS86, CD4013, CD4017

### Transistors: 2 each

PN2222, PN2907, 2N3055, 2N3904, 2N3906, 2N5457

### Diodes: 2 each

1N4148, 1N4001, 1N34, 1N4728, 1N4733, 1N4739, 1N4743, 1N4747

### Miscellaneous:

25' 22AWG Hook-up wire, Alligator lead sets (red and black), 5V DIP relay, Photo cell, Microphone, Speaker, Buzzer, 9V battery snap, 1.5A 100V bridge, 4A 200V SCR

## Parts Storage Box

Part # 623021



7" (H) x 9" (W) x 6.5" (D); 15 drawers

## Hook-Up Wire on Spools

#22 Gauge Solid 25ft.

<b>Black</b>	Part #: 884410
<b>Red</b>	Part #: 884420
<b>Yellow</b>	Part #: 884440
<b>Green</b>	Part #: 884450
<b>White</b>	Part #: 884490

#24 Gauge Stranded 25ft.

<b>Black</b>	Part #: 885210
<b>Red</b>	Part #: 885220
<b>Yellow</b>	Part #: 885240
<b>Green</b>	Part #: 885250
<b>White</b>	Part #: 885290

Solder - 63/37 rosin core .032" dia. • 1lb. spools part #: 551135-1LB

Wire in 1,000 and 5,000 ft. spools (20, 22, and 24 gauge) solid or stranded - all colors - available upon request

# FIBER OPTICS

## Fiber Optics Kit with training course

### Model FO-30K

Learn the basics of fiber optics communications while you build this exciting kit. Transmit your voice or a 1kHz signal through the fiber optic cable to a fiber optic receiver. Comes complete with all of the necessary components, including PC boards, microphone, speaker and fiber optic cable. Transmitter and receiver on separate boards, can be located hundreds of feet apart.



Requires 2 9V batteries (part # 590009)

P/N 810020 - Fiber Optic Cable - Sold in spools of 10 feet.



## Fiber Optic Lab Kit

with training course Model FO-40K

The course includes a 61 page manual and all of the material necessary to conduct nine stimulating experiments related to fiber optic communications. The experiments will give you a better understanding of fiber optics techniques and real fiber optics hardware.



## Fiber Optic Tool Kit

Model TK-50

For use on 1,000µm plastic fiber. With this kit there will be no nicked or damaged fibers. It contains a **no nick fiber stripper**, hot knife cutting tool, termination fixture and carrying case.



## Fiber Optic Splice Kit

Model TK-25



For mending or extending 1,000µm plastic fiber. It contains fiber sleeves and retention clips to complete ten splices. No special tools, polishing or adhesive required. Instructions included.



## Understanding Fiber Optics

Model VT-501



Learn tomorrow's technology today! Fiber optics is changing the way we live, think and communicate. You will learn about fiber optic cables, connectors, couplers, splicers, transmitters and receivers. **58 minutes viewing time.**

## Ceramic Kevlar® Cutter

Model ST-340



Easily trim Kevlar strength member in fiber optic cable. The ceramic blades cut Kevlar quickly and precisely.

*Kevlar® is a registered trademark of the E.I. DuPont Company.*



## Fiber Optic Cable

Part # 810020 - 1,000µm Core Plastic Fiber Optic Cable - Sold per meter.

Part # 810021 - Plastic Fiber Duplex Cable - sold by the foot.

# SOLAR KITS

## Photon Solar Racer Kit

Model AK-590

Learn all about solar energy and how to convert it to useful applications. You will build this exciting sleek solar car that runs on a high efficiency solar cell. Have your friends build one too and have fun racing them. No soldering required.

The solar car comes in clear plastic. The car can be painted any color scheme that you desire (paint is not supplied). Photo is painted to illustrate how your car could look.



## Space Explorer Solar Kit

Model 101-SP

This vehicle is the “sport utility” type of solar car able to slowly rumble like a tank over grass, small stones or obstacles, and up slopes up to 40 degrees. The Space Explorer comes complete with solar panel and 18 exciting experiments. Size is approximately 8” long by 4 1/4” wide. It can also operate on 2 “AA” batteries (not included).



## Solar Sport Racer Kit

Model 110-SO

The Solar Sport Racer Kit is fun and easy to build. This kit has 9 exciting experiments to help you gain practical knowledge of solar power. The kit comes complete with high energy solar panel and can even run on 2 “AA” batteries (not included).



## Solar Educational Kit

Model AK-530



Now you can experiment with solar energy . . . the energy source of the future. Our solar educational kit is designed to let you build your own solar models. This kit comes complete with:

- Solar cell module
- Solar energy booklet explaining the whys and hows of solar energy.
- Small DC motor
- Screws and nuts
- Wire with motor clips
- Colored spinner discs
- Paper airplane and bird models
- Plastic turntables with 4 sizes: 5/8”, 1”, 1 1/2” and 2”
- Plastic fan-spinner

The solar cell modules, when placed in direct sunlight or close to incandescent light, provide the electrical energy for countless practical applications. Solar energy uses are limited only by your imagination!

## Solar Power Training Course

Model SK-20

Learn the why's and how's of solar energy. Find out how you can harness the power of the sun to convert light into electricity into a multitude of uses: light a bulb, sound a buzzer, power a fan and many others. The solar cell comes complete with 8 solar cells, electric motor, propeller, buzzer, light bulb, wires and hardware. Training manual included.



# OWI ROBOT KITS

None of our OWI Kits require soldering (unless otherwise noted).

## HYPER PEPPY MV-969 (Sound/Touch Sensor)

Explore the fundamentals of robotics with this informative, intelligent and entertaining robot kit. If it comes in contact with an object or hears a loud noise (such as hands clapping) via its touch/sound sensor, Hyper Peppy will automatically reverse, then turn left before embarking on a new course.  
Assembled Electronic Printed Circuit Board.  
Movement: 3 wheels driven by a DC motor, ratchet mechanism. Control: Sound sensor including condenser microphone/transistor.  
"AA" x 2 each (not included).

OWI - 969K (PCB Unassembled) - Soldering Req'd



## Soccer Robot MV-982 (Wired Control)

There will be many hours scoring goals on the living room coffee table with SOCCER ROBOT. SOCCER ROBOT has six operational kicking mechanisms and includes a control box and ball. It runs forward, backward, turns left or right, and executes 360 degree turns. It will even help develop your hand/eye coordination skills.  
Assembled Electronic Printed Circuit Board.  
Movement: 6 legs driven by 2 DC motors in a crank motion. Control: Wire remote.  
"AA" x 2 each (not included).



## SUMO ROBOT OWI-9647 (Infrared Sensor)

Now OWIKIT brings the Sumo tradition to your home. The super warrior, SUMO ROBOT, can be controlled to assault and overpower its opponent or retreat to prepare for battle. An infrared sensor beam is emitted when detecting an opponent. Upon detection, it instructs the brain of SUMO to "charge", thereby creating a bonafide wrestling match!  
Movement: 2 tractor style wheels powered by 1 DC motor. Control: Infrared sensor/detectable range: approx. 350mm (max.). "AA" x 2 each (electronic circuit), "AA" x 2 each (mechanical) (not included).



## MOON WALKER II MV-979 (Light & Sound Sensor)

Moon Walker II begins to walk when it detects a change in light intensity or sound commands, and continues its four-legged voyage until instructed by an internal timer to stop. This kit presents an engaging opportunity to learn about some of the mechanics, operation and history of robots. When assembled, this robot uses a phototransistor to sense changes in light (such as turning on a lamp) and a condenser microphone to sense changes in sound (such as clapping). It converts those stimuli into electrical signals to power a motor, and the robot walks forward for a preset time. When it stops, affecting another change in area light or sound may activate it again. The sensors may be adjusted for different sensitivity levels. Printed circuit board pre-assembled. "AA" x 1 (not included).



OWI - 979K (PCB Unassembled) - Soldering Req'd

## CYCLONE MV-965 (Wireless Remote Control)

Powered by a wireless remote radio controller, Cyclone responds instantly to commands of 'spin', 'swivel', 'forward', 'backward', 'left', or 'right'. Six different frequency settings offer a multitude of challenges, including speed races or timed, maze competitions. Control sticks afford the user complete control even as Cyclone swivels wildly from left to right. Cyclone provides basic knowledge of wireless remote controllers, principles of gear mechanism and is destined to windstorm users to a world of fun!  
"AA" x 4 each (body), "AA" x 2 each (controller) (not included).



## SPIDER III OWI-9727 (Infrared Beam)

With its radical walking style, this intelligent robot avoids interference by emitting an infrared beam which detects obstacles in its path. It then sends command signals in the form of electronic pulses to alter the rotating direction of its motor to evade these obstacles. Printed circuit board pre-assembled.  
"AA" x 2 each, 9V x 1 each (not included).



OWI - 972K (PCB Unassembled) - Soldering Req'd

## HYPER LINE TRACKER OWI-9737 (Infrared Sensor)

This cyber bug possesses a sonic tracking system, and is fortified with a multitude of sensors: photo transistors to detect a black line, tracking memory to memorize its last track of the black line, and two red LEDs that to tell you which side of the light sensor is activated.  
Hyper Line Tracker follows a designed course. By using an infrared emitter, light sensor circuitry, and tracking memory, it demonstrates how robots "see" a pathway. Make a path with a black felt tip marker or black tape and watch how infrared sensors enable the robot's motors to make course corrections. Printed circuit board pre-assembled.  
"AA" x 4 each (not included).



OWI - 973K (PCB Unassembled) - Soldering Req'd

## TURBO 2000 OWI-6567 (Optional Solar Power)

This OWIKIT explores propulsion principles and includes mini-construction projects that teach the basic principles of electricity and solar energy (optional).  
Put the pedal to the metal and be amazed with this lightning fast speedster. You'll be blown away by its serious air propeller and its direct motor drive for "speed" - or by its "power/torque" when down shifting. The solar panel (sold separately) is juiced with a 1.4V, 350mA source of pure power. For the educationally-minded guardians, this fire plug kit includes mini-construction projects that teach basic principles of electricity and solar energy (optional).  
"AA" x 2 each (not included).



## KNIGHT INVADER OWI-6577 (Solar Power)

Knight Invader is a super race car that includes mini-construction projects, teaches the basic principles of electricity, and demonstrates three different modes of propulsion.  
This sleek super racer has it all and a little more. KNIGHT INVADER can blow a fierce force of air to propel it off the starting line and challenges any contender to try and keep up with it when changed into direct motor drive. When on a mission, KNIGHT INVADER can secretly change its transportation mode to solar power (sold separately).  
"AA" x 2 each (not included).



## SOLAR CAR OWI-6577 (Triple Action)

Sleek, powerful, unearthly, and very cool . . . this futuristic solar car is an exciting way to demonstrate the use of alternative energy. It features and aerodynamic sports car shell design, a 4-wheel chassis, a powerful 1.4V, 350mA solar cell (included) and a transparent plastic body that can be painted or left clear to display the car's inner mechanical construction. The steerable front axle, rear wheel and adjustable (directional/angle) solar panel mount are all independent parts, allowing for separate solar projects.  
The Triple Action Solar Car Kit is also available: (1) The two-way battery source allows for battery or solar power; (2) the kit design is an aerodynamic racer or tractor; and (3) it features a multi-speed transmission. "AA" x 1 pc. (not incl.).



## ELEMENTARY TECHNOLOGY CURRICULUM (Beginner Experience Series Only) OWI-ELEM

A "teacher-friendly" learning guide about robotics and/or electrical technology that provides activities, concepts, and research assignments. Over 30-page curriculum.



## OWIKIT TEACHKIT OWI-RETC

A complete teacher resource written by teachers for student experimentation with all OWIKIT robots (except 007 Arm)! Capture students interest in simple and advanced robotics. Over 110 pages long, complete with answer keys, appendix and teacher guides.



## ROBOTICS TECHNOLOGY CURRICULUM for ROBOTIC ARM TRAINER RTC-007

This curriculum combines reproducible, printed student activities for OWI's Robotic Arm Trainer with PC/Mac computer Concepts of Robotics in Worldwide Web format. Includes software and over 25 pages.



## SOCIETAL IMPACTS of COMPUTERIZATION TEACHKIT OWI-SIC

A must for grades 6-12 computer teachers who try to help their computer students understand value conflicts and ethical choices associated with electronics communication. Over 40 pages & 1 diskette that is PC/PowerMac compatible.



# OWI ROBOT KITS

None of our OWI Kits require soldering (unless otherwise noted).

## AMPHIBIOUS SOLAR VEHICLE OWI-688 (Solar Power)

This kit introduces the fundamentals of solar power through hands-on experiments. The sun or any intense mobile light can power the solar battery (included). A multiple function switch (solar [1.4V, 350mA] or battery) allows this kit to be energized day or night, indoors or outdoors. The user can explore different types of energy and energy conversion with this land and water vehicle. Learn what materials solar batteries are made from and the characteristics of solar batteries, advantages, and disadvantages of solar power.



## SOLAR BATTERY OWI-608 (Solar Power)

Have fun in the sun with our safe, encapsulated mini-solar panel. This sturdy panel will endure handling without breakage or cell damage traditionally associated with solar cells. Create various experiments by exposing and positioning the panel at the energy source. Intended for use to familiarize students or hobbyists with fundamental silicon solar cell principles, and practical applications of solar cells. Mounting bracket not included.  
Current: 350mA. Voltage: 1.4. Compatible with: OWI-654, OWI-655, OWI-6567, OWI-6577.



## ROBOTIC ARM TRAINER OWI-007 (Wired Control)

The Robotic Arm Trainer teaches the basic robotic sensing and locomotion principles while testing your motor skills as you build and control the arm. You can command this unit with its five switch wired controller with lights to grab, release, lift, lower, rotate wrist, and pivot sideways 350 degrees. After assembly, observe the dynamics of gear mechanisms through the transparent arm. Five motors and five joints allow for flexibility and fun! For educators and home schoolers, you'll find the robotics technology curriculum and personal computer interface useful tools.  
"D" x 4 each (not included).  
IBM PC Interface - (IBM-007) • Curriculum - (RTC-007)



## NAVIUS MV-938 (Programmable)

Navius is controlled by black and white patterns on a disk, which are read by an infrared sensor. Particular patterns activate either of two wheels or make the robot pause. These on/off commands illustrate the basic principles of binary coding. To change a movement program, the operator simply creates a new disk pattern.  
Printed Circuit Board Movement: 2 Wheels driven by 2 DC motors. Control: Infrared sensor, infrared photo interrupter, transistors, and IC.  
"AA" x 2 each, 9V x 1 each (not included).



## WAO II MV-961 (Programmable)

WAO II is an intelligent robot with a four-bit micro-computer. Through its 26 keys, you can input a motion program. There are 8 movement command keys, 4 program keys, and 3 demonstration keys. WAO II also has a pen mechanism in the middle of its body which allows it to draw simple letters and designs.  
Assembled Printed Circuit Board Movement: Programmable through keyboard or personal computer by utilizing an optional interface (sold separately).  
"AA" x 3 each, 9V x 1 each (not included).



IBM PC Interface - (WII-IBM) • Apple II Interface - (WII-AP)

## WAO G MV-968 (Limited Edition)

By building and programming WAO G, you can set up membership functions and learn basic logic control principles. Also, WAO G can draw straight lines, circles, and even words by putting a pen into its penholder.  
The keyboard consists of 26 switches, which are used to input a series of commands. There are 8 movement command keys, 4 program keys, and 3 demonstration keys.  
"AA" x 3 each, 9V x 1 each (not included).  
Limited Edition IBM PC Interface - (WII-IBM)



## BEAMSTER OWI-209K (Beginner Soldering)

Beamster is a new Beginner Soldering Series kit requiring only a soldering iron and a few tools to create a multi-functional flashlight. BEAMSTER is ideal for emergency or everyday use aboard a boat, during camping, or while at a scout meeting. Activating the light is as easy as adjusting the four position slide switch: Beam or halogen light, fluorescent lamp (full power), fluorescent lamp (energy saving power), or off. It also features a 90 degree adjustable halogen light head, and a magnet on the back so you can mount it in a hands-free position.  
Specifications: Power: "AA" x 4 each (not included). Fluorescent Tube: U tube 5W, Bulb: Halogen Bulb 5.2V - 0.5A. Dimensions: 180mm x 54mm x 38mm



## AM RADIO OWI-215K (Beginner Soldering)

Make it, then listen to your favorite radio station and appreciate your accomplishment. Students and hobbyists place electronic components and learn basic principles of radio wave technology and soldering skills with this hands-on AM RADIO circuit board kit. Place your components/resistors, condensers, and integrated circuits together, then solder them on a functional circuit and 'voila', an AM RADIO!  
Specifications: Control: 2 AM radio frequencies 535kHz - 1605kHz. Power Source: "AA" x 2 each (not included). Body size: 235mm x 80mm x 240mm.



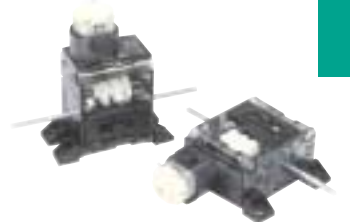
## S-CARGO OWI-936K (Limited Edition - Soldering)

A condenser microphone and a printed circuit board control this OWIKIT. Each time its sound sensor hears your command, it reacts. Command it to spin left, stop, proceed forward, and stop.  
S-Cargo is a sequential command, two-wheeled robot. Using the hand-held sound activator, clapping your hands or making any other loud sound controls it. For each sound S-Cargo will begin a new action. The sequences of commands are forward, stop, clockwise spin, and stop.  
"AA" x 1 each, 9V x 1 each (not included).



## SELECTABLE GEAR BOX OWI-GB25 (One Touch Selector)

A great Science Fair project item! If you need speed variations, then look no further. Drive pulleys, cars, wheels, or fans with high torque or speed. Adjustable mounting brackets allow for flexibility in project application. With one touch of the slide switch, three gear ratios are possible: 6.8:1, 45.97:1, 310.74:1 or 17.68:1, 119.52:1, 807.93:1.  
Motor Performance at maximum efficiency: Voltage: 1.5 - 3.0. Speed: 6,992 RPM. Current: 0.663A. Voltage: 6.02GCM 0.591MM. Size: 60mm (L) x 25mm (H) x 35mm (H). Weight: 143 g.



## COMPUTER INTERFACES

### WII-IBM - PC Interface & Software for WAO II or WAO G

Connects to an IBM compatible computer's parallel port; download routines from BASIC programs. Eliminates repetitive code entry.

### WII-AP - Apple II Interface & Software for WAO II

Connects to an Apple II, IIe, II+ or GS computer. Software allows programming in BASIC (Applesoft II Basic required). Edit, transfer, save and load any movement program.

### IBM-007 - Interface & Software for Robotic Arm Trainer

Features programming, saving, editing, and downloading capabilities. Computer or manual control. System Requirements DOS: PC 386 (or better), parallel port, DOS 4.2 (or higher), 2MB RAM min., and 300k hard disk free space. System Requirements for Windows: Windows compatible mouse, Windows 95 or 98, 4MB RAM min, 4MB hard disk free space.

# NON-SOLDERING KITS

## Deluxe Telephone Kit

**Model AK-750**

- Fully modular
- Last number redial
- Desk/wall mount
- Tone/pulse switchable
- Ringer with ON/OFF switch
- Neon lights flash when phone rings.
- Hearing aid compatible
- Full color assembly manual
- Lighted dial keypad
- Transparent blue case
- FCC approved



## Talking Clock Kit

**Model AK-220**



These easy-to-build kit will teach you how electronic voices are made. No soldering is required and our full color assembly manual takes you step by step in putting it together. Features hourly reports and rooster crow for alarm.

Requires 2 "AA" batteries (part # 590001)

## Electronic Stapler Kit

**Model AK-920**

- Crystal clear case lets you see the multi-colored gears.
- Motor driven for quiet operation.
- Learn how gears work.
- Uses standard staples.
- Staples up to 12 sheets.
- Full color, easy-to-understand assembly manual.

Requires 4 "AA" batteries (part # 590001)



## 35mm Camera Kit

**Model AK-540**

**with Training Course**



Now you can learn all about photography with our new Camera Kit. Our training manual will teach you everything you need to know about light, film, speed, exposure, development, and much more. And best of all, you have a working camera "you built" when your finished.

# NON-SOLDERING KITS

## Electronic Crystal Radio Kit

Model MX-901

- Safe, Solderless, Educational, and Fun!
- Easy-to-read Instructions Included.
- Crystal Diode Converts RF to Audio
- Tune in Your Favorite AM Stations!
- Learn How Radios Work
- Includes Earphone
- For Ages 10 and up.

No Batteries Required!



## Action Kit Lab

Model MX-902



- Safe, Solderless, Educational, and Fun!
- Easy-to-read, Illustrated, Lab-Style Manual Included.
- Discover how an electric bell is constructed and how it's made to ring.
- Build your own operating motor - It's easy, it's fun, it's Safe!
- Find out how a generator makes the electricity that makes things work.
- Meter measures the amount of electricity used in your experiments.
- For Ages 10 and up.

Requires 2 "AA" batteries (part # 590001)

### Just a Few of the Many Exciting Experiments

- Controlling motor's forward/reverse rotation with generator.
- Fan using motor and generator.
- Electromagnet and reverse polarity.
- Operating the electric bell with generator.
- Color mixing with rotating color disc.

## Electronic Keyboard Kit

with Training Course

Model AK-900

Have you ever wondered how musical instruments work? Well now we can teach you. Our new Electronic Keyboard Kit has 37 mini keys, 8 different tempo's and timbers, 4 custom drummers and even a demonstration song. After following our detailed assembly manual, you will be ready to play all of your favorite songs.



Requires 4 "AA" batteries (part # 590001)

## Stereo Cassette Player Kit

with Training Course

Model AK-250

### Features:

- Transparent Case
- High Resolution
- Includes Headphones
- Belt Clip
- Full Color Assembly Instructions (Model AK-250 only).

Easy-to-build kit teaches you basic mechanical and electronic circuits. You will have fun building this kit and learning how a tape player works. Lesson manual teaches magnetic recording, audio amplifier theory, speed control, mechanical switching and much more. Comes complete with all parts including Stereo Head Phones. Clear plastic case allows you to show your friends your accomplishments.

Requires 2 "AA" batteries (part # 590001)

Also available in soldering version: Model AK-200



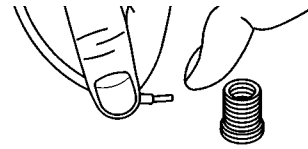
# ELECTRONIC SCIENCE & PROJECT LABS

## NO TOOLS OR SOLDERING REQUIRED!

These “Electronic Science Labs” will teach you about electronics from A-Z. With these all-in-one labs, you’ll learn about electronic parts, how to read schematics, and wiring diagrams. All this while building up to **500** different projects. These kits use two quick and easy hook-up methods:

## Spring Method:

Simply slip pre-cut wires and components into special springs for a safe, secure connection.



## Model EP-50

Over 50 Electronic Projects

### Build these exciting circuits:

- Finger touch lamp
- Magnetic bridge
- Voltmeter
- Morse code
- Alarm
- Electronic noisemaker
- Electronic kazoo
- Electronic keyboard
- Transistor radio
- Radio announcer
- Metal detector

### Learn about:

- Voltage
- Current
- Resistors
- Capacitors
- Transistors
- Diodes
- Transformers
- Speakers
- Antennas

IDEAL FOR  
MIDDLE  
SCHOOLS

### OVER 50 EXPERIMENTS

Specifically Designed for Beginners.

(Spanish Manual Available)

Requires 1 9V battery (part # 590009)



Uses spring hook-up method

## 75-IN-ONE Electronic Project Lab

### Model MX-905

- Easy-to-read, illustrated, lab-style manual included.
- Learn basic principles of electricity, electronics, physics and magnetism!



Uses spring hook-up method

Requires 4 “AA” batteries (part # 590001)

### Everything You Need to Build:

- |                        |                          |                         |
|------------------------|--------------------------|-------------------------|
| • Timer Buzzer         | • Electronic Organ       | • Sound-sensor Timer    |
| • Sound Alarm          | • Motion Detector        | • Four-level Photometer |
| • Burglar Alarm        | • First-Aid Siren        | • Two Stage Timer Sound |
| • Photo-level Alarm    | • Pulse Width Modulation | • Voltage Detector      |
| • Logic Tester         | • Water Level Alarm      | • Conductivity Tester   |
| • Electronic Coin Toss | • Sound Level Meter      | • Optical Volume        |
| • Motion LED           | • DC to DC Converter     | • AND MANY, MANY MORE!  |

## 130-IN-ONE Electronic Project Lab

### Model MX-906

- Easy-to-read, illustrated, lab-style manual included.
- Learn basic principles of electricity, electronics, physics and magnetism!
- Comes with built-in speaker, 7-segment LED display, two fully integrated circuits and rotary controls.

### Everything You Need to Build:

- |                        |                  |
|------------------------|------------------|
| • AM Broadcast Station | • Timer          |
| • Electronic Organ     | • Logic Circuits |
| • Strobe Lights        | • AND MUCH MORE  |

Requires 6 “AA” batteries (part # 590001)



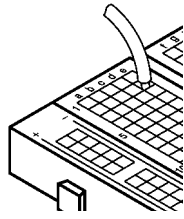
Uses spring hook-up method

(Portuguese & French Manuals Available)

# ELECTRONIC SCIENCE & PROJECT LABS

## Breadboard Method:

Featured in our advanced kits, this system is used by professionals and engineers. Just plug the components and wires into the special breadboard socket holes.



**No soldering is required.** Everything uses safe battery power - no dangerous AC is required, so it's

safe for all ages. Labs come with all components and wires needed to build each project. **NO TOOLS ARE REQUIRED.** No prior knowledge is needed to assemble and build these exciting projects. Easy-to-read, illustrated, lab-style manuals take you through each electronic experiment step-by-step. All are designed for ages 10 & up, so these are ideal for **MIDDLE SCHOOLS** and **HIGH SCHOOLS**.

## 500-IN-ONE Electronic Project Lab

**Model MX-909**

- Everything you need to build 500 Exciting Electronic Projects:
  - Learn the basics of electronics and put your knowledge to work creating 500 different electronic experiments, special lighting effects, radio transmitter and receivers, amazing electronic sound effects, cool games and MORE!
  - Includes built-in breadboard for easy wiring and connection of components, and an LCD (Liquid Crystal Display) indicates the information during the experiments in process!
  - Build your knowledge by exploring amplifiers, analog and digital circuits plus how to read schematic diagrams.
  - Includes transistors, transformers, diodes, resistors, capacitors, phototransistors, CDs, integrated circuits, speaker, earphone, LEDs, LED digit display!
- Fact-filled, illustrated, lab-style manual included.

Requires 6 "AA" batteries.



**Uses breadboard and spring hook-up methods**

(Japanese & Portuguese Manuals)

## 300-IN-ONE Electronic Project Lab

**Model MX-908**

### Everything You Need to Build 300 Exciting Electronic Projects:

- A Transistor Radio
- IC Organ
- Burglar Alarm
- Delayed Timer
- Electronic Game
- Optical Volume
- Multiplier
- Easy-to-read, illustrated, lab-style manual included.
- Multiple Counter
- Digital Light Dimmer
- Tone Burst Generator
- Audio Signal Tracer
- Electronic Candle
- Voice Level Meter
- Metal Detector
- Rain Detector
- Voltage Drop Alarm
- Logic Checker
- Function Generator
- Voltage Controlled Amplifier
- AND MANY, MANY MORE!



**Uses spring and breadboard hook-up methods**

Requires 6 "AA" batteries.

(Portuguese, Dutch, & French Manuals Available)



## 200-IN-ONE Electronic Project Lab

**Model MX-907**

- Easy-to-read, illustrated, lab-style manual included.
- Learn about transistors, transformers, diodes, capacitors, oscillators, basic electronic circuits, and schematic symbols.
- Build your own Radio, AM Broadcast Station, Burglar Alarm, Electronic Game, Ohmmeter, Telegraph, Rain Detector, Amazing Sound Effects, and Much More!
- With built-in speaker, earphone, meter, seven-segment LED digital display, out-front controls, and more!

Requires 6 "AA" batteries.



**Uses spring hook-up method**

(French Manual Available)

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e-mail: [info@mainelectronics.com](mailto:info@mainelectronics.com)

**For All International Inquiries Please Contact Our International Department**

Elenco specializes in building kits for many of the largest schools in the country. Tell us what PC board, transformer, resistors, capacitors, semiconductors and hardware your school needs and we will package them for you. We also do custom design, complete with PC board layout and special cabinet or case.

## WARRANTY

All Elenco models are guaranteed for one full year on all parts and service. For the first three months you receive full coverage at absolutely no charge. For the remaining 21 months, a nominal service charge is required to cover mailing and handling.

**Distributor:**

