

HomeWorks by Heathkit



An Educational Catalog of Learn-at-Home Electronics

Basic Electronics Courses

Learn the fundamentals through hands-on experiments, video demonstrations and audiovisual aids...page 4

Linear IC Electronics Courses

Everything you need to know about Circuit Analysis, Phase Locked Loops and more...page 11

Digital Techniques Course

The skills you need for the computer age...page 12

Surface Mount Technology Course

Study packaging characteristics, circuit layout and soldering techniques...page 14

Laser Technology Course

Learn to build and use a laser. Learn about present and future applications...page 15

Data Communications and Networks Course

Learn the concepts, techniques and applications...page 16

Amateur Radio Courses

Make friends around the world. Guaranteed success with licensing exams for beginning and advanced operators...page 17

Microprocessor Courses

Start with the basics...advance to interfacing and applications...page 18

Programming Courses

MS-DOS, "C" programming, artificial intelligence, computer graphics and more...page 20

Heathkit Computer Kit

Build your own PC, quickly and easily. Add voice capabilities too!...page 23

Tools and Test Instruments

Quality multimeters, oscilloscopes, frequency generators and more...page 24

Heath Educational Kits

Turn theory into practice as you build an AM radio, burglar alarm, speaker phone and more...page 27

GET AN IMPORTANT EDGE WITH HEATHKIT COURSES

Keeping up with changes in technology is becoming increasingly difficult. New developments occur almost daily. And the cost of equipment and training is escalating just as quickly. That's why Heathkit Individual Learning Programs are so valuable.

Each Heathkit course and trainer is designed to help you keep up with today's important innovations. Yet you pay only a fraction of what a technical school or college course would cost.

What's more, Heathkit courses allow you to develop your skills, in your own time and at your own pace, with simple, logical step-by-step instructions.

And because the courses are developed by Heath, one of the most respected names in electronics, you know you're learning with the best. Whether you're a newcomer to electronics...an avid hobbyist...or a professional, Heathkit Individual Learning Programs are the key to fulfilling your educational goals.

Open a Heath Revolving Charge...learn electronics with easy monthly payments

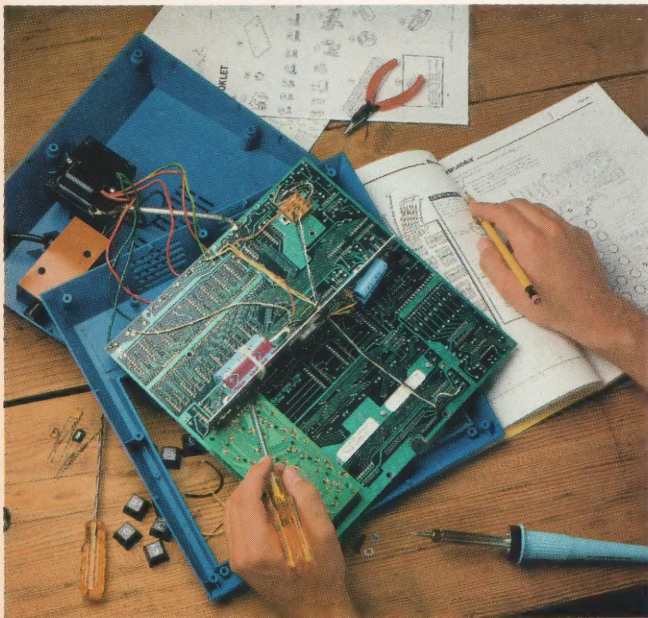
Pay as you learn with the convenient, easy Heath Revolving Charge (HRC). HRC gives you purchasing power so you can get started right away. Charge your courses, trainers and more. See the order form for more information and your HRC application.

Guaranteed success

No matter which Heathkit course you choose, you'll find it an effective learning tool. That's because all our programs are based on proven processes. Each was written by educators who are experts in their areas. And each course leads you through logical sequences with easy-to-follow, step-by-step instructions. Our well-known pledge applies to our courses as well: "We won't let you fail."

And because we know you want to stay current with the latest technological advances, we're constantly revising, updating and expanding our courses.

We're always ready to help if you have a question. Just call our technical consultants at (616) 982-3980, any weekday 8:00 am to 4:30 pm, Eastern time.



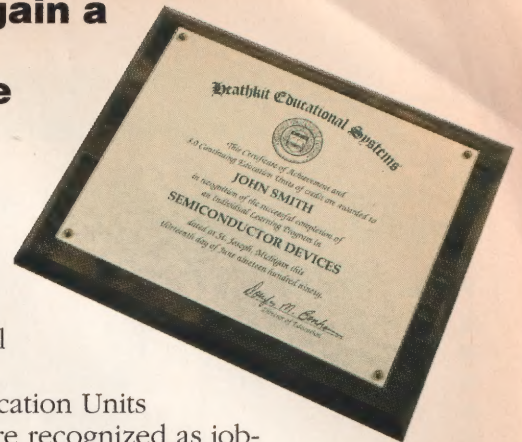
Choose an assembled trainer, or build it yourself

Most Heathkit trainers—the devices you use to perform the course experiments—can be ordered either assembled or in kit form.

If you can't wait to get started, order an assembled trainer. But if you want to understand exactly how your trainer works (and enjoy significant savings) order the kit and build it yourself. Our kits are fun and easy to build, even if you're new to electronics. All you need are a few common hand tools. And nothing can match the satisfaction of knowing you've done it yourself.

Continuing Education Units can help you gain a career advantage

Upon completion of any Heathkit course, you can take an optional final exam and earn Continuing Education Units (CEUs). CEUs are recognized as job-related certification by a growing number of professional and technical organizations. You'll also get a handsome certificate of achievement.



As a service, we keep track of your CEUs. For a \$1.00 handling fee you can request a transcript of your credits at any time.

Display your hard-earned diploma with this high-quality frame of simulated walnut board with a clear plastic covering to keep your diploma dust-free. Holds an 8½" x 11" certificate and hangs vertically or horizontally.

EPP-1 Diploma frame (3 lbs.) **\$13.95** •

Heathkit courses are accredited and licensed

Heathkit courses are accredited by the National Home Study Council and the Council on the Continuing Education Unit. We are also licensed as a school by the State of Michigan.

Because of this, you may be eligible for certain benefits. Many companies reimburse employees for the cost of taking a Heathkit course. Check with your employer. If you are in the Navy, you may be eligible for reimbursement under the Navy's Tuition Assistance Program.

Money-back guarantee

If you're not completely satisfied with any Heathkit course, simply return all components for a full refund. Or, if you wish, you may choose another Heathkit course of equal value in its place.

DEVELOP HANDS-ON ABILITY AS YOU LEARN THE BASICS

We recommend the following sequence in our Basic Electronics Series:

- 1 DC Electronics
- 2 AC Electronics

- 3 Semiconductor Devices
- 4 Electronic Circuits

FUNDAMENTALS OF DC ELECTRONICS COURSE

Master the concepts that open up the world of electronics

What you get:

- Comprehensive 500+ page text
- 21 hands-on experiments
- Parts package with all necessary electronic components
- 5.25" and 3.5" MS-DOS course review disks
- Earn 2.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Multimeter (page 24)

Course Requirements:

- No prerequisites necessary

Supplements:

- Video Learning Package: New! Full-color VHS format with companion workbook (page 8)
- Audiovisual Package: Two lecture tapes and illustrated workbook. Order below.

No previous exposure to electronics? No problem. The Heathkit DC Electronics course will help you quickly and easily develop a working knowledge of the basic principles. By the end of the course, you'll not only understand the concepts, you'll be able to apply them in your own projects.

You'll learn the purpose and operation of such devices as resistors, relays, motors and generators. Learn to construct DC circuits and draw schematic diagrams. Learn to define and solve basic electronic problems related to current, voltage, resistance and power.

Learn by doing

You'll get actual hands-on experience as you perform twenty-one different exciting experiments. Each new experiment will help develop your understanding, ability and confidence. EE-3101-B (7 lbs.) **\$49.95**

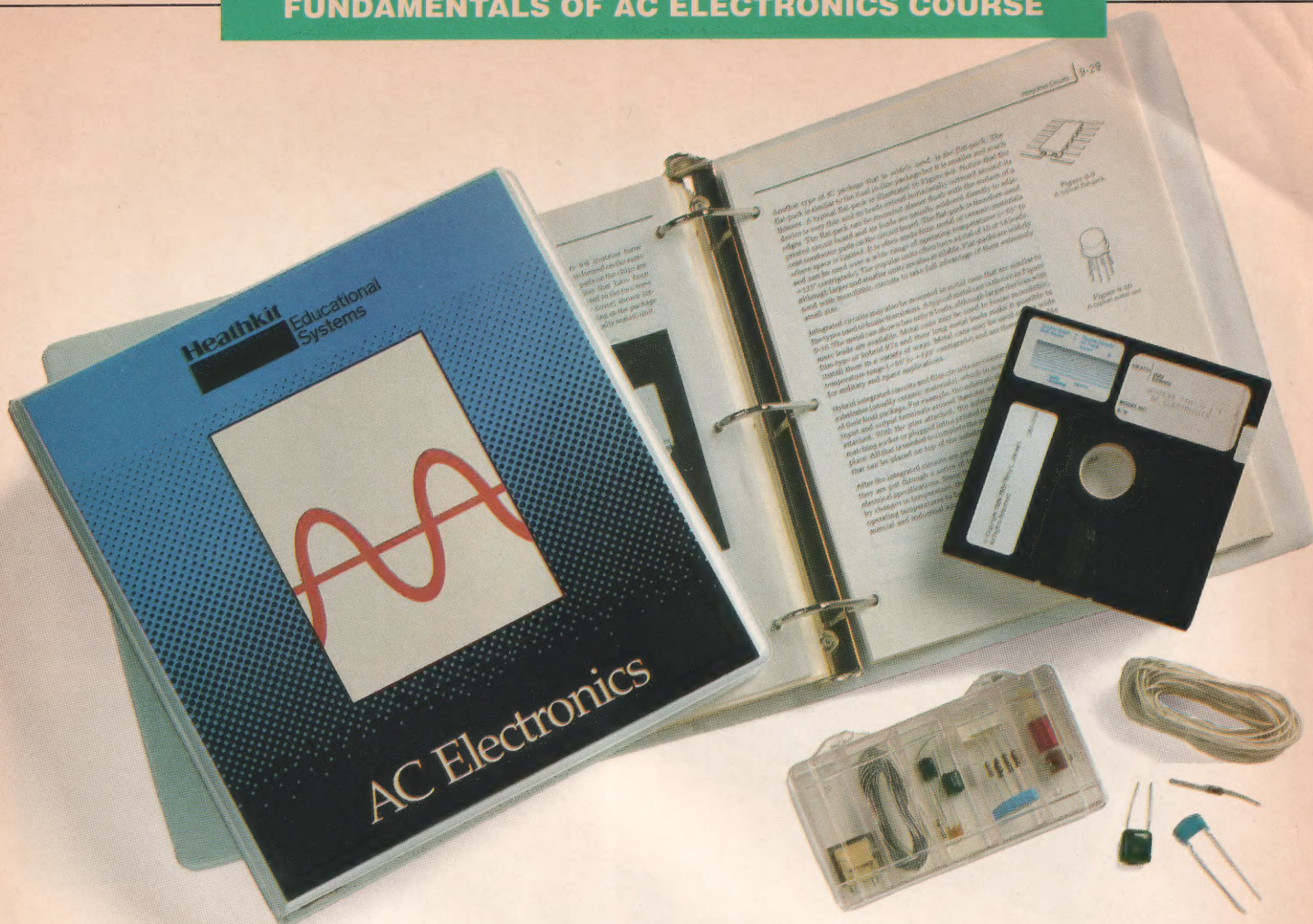
Supplement:

Audiovisual Package: Two lecture tapes reinforce your knowledge and help you review what you have learned. Complete with illustrated workbook. EEA-3101-A (2 lbs.) **\$21.95**

SAVE! Get both the EE-3101-B DC Electronics Course and the ET-3600 Analog Trainer on page 9 for just \$149.90. You save \$30.00! EES-3101-E (13 lbs.) **\$149.90**



FUNDAMENTALS OF AC ELECTRONICS COURSE



Expand your basic understanding

What you get:

- Comprehensive 500+ page text
- 10 hands-on experiments
- Parts package with all necessary electronic components
- 5.25" and 3.5" MS-DOS course review disks
- Earn 1.5 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Oscilloscope (page 26)
- Multimeter (page 24)

Course Requirements:

- DC Electronics (page 4) or equivalent experience

Supplements:

- Video Learning Package: New! Full-color VHS format with companion workbook (page 8)
- Audiovisual Package: Two lecture tapes and illustrated workbook. Order at right.

Building on the knowledge you gained in the DC Electronics Course, AC Electronics will introduce you to the principles and applications of alternating current.

Get a solid foundation

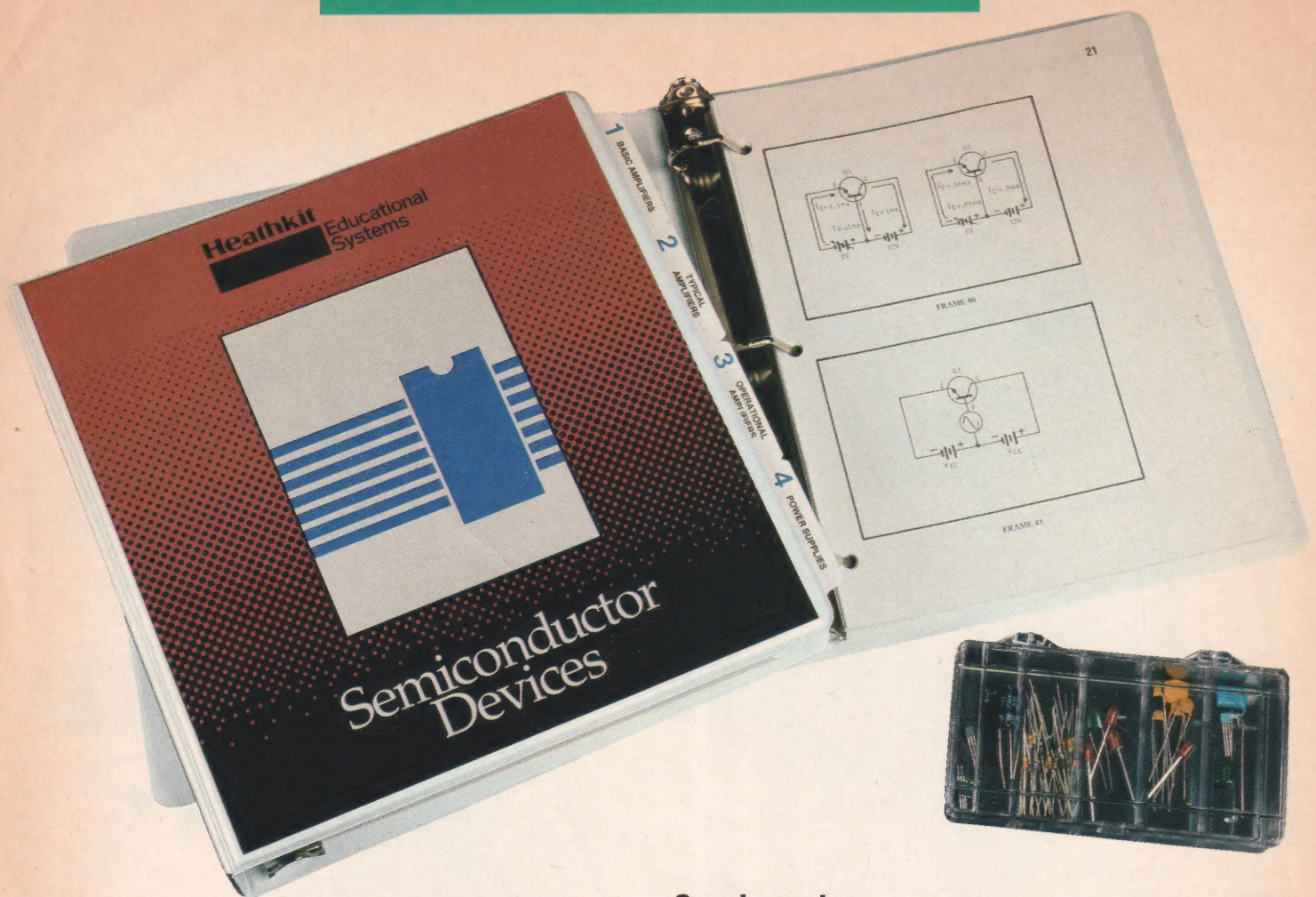
You'll develop an understanding of different types of AC circuits and learn the advantages of AC over DC. You'll learn to convert power requirements between horsepower, watts and current, and to draw a block diagram with current requirements for the electrical loads in your home. You'll learn to analyze AC sine waves and perform critical calculations involving impedance, current, voltage and power ratios.

Ten different step-by-step experiments will help you master the theories, while you develop solid hands-on abilities.
EE-3102-B (7 lbs.) **\$49.95**

Supplement:

EEA-3102-A Audiovisual Package (2 lbs.) **\$21.95**

SEMICONDUCTOR DEVICES COURSE



Develop your knowledge of solid-state technology

What you get:

- Comprehensive 400+ page text
- 13 hands-on experiments
- Parts package with all necessary electronic components
- 5.25" and 3.5" MS-DOS course review disks
- Earn 3.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Oscilloscope (page 26)
- Multimeter (page 24)

Course Requirements:

- DC Electronics (page 4)
- AC Electronics (page 5) or equivalent knowledge

Supplements:

- Video Learning Package: New! Full-color VHS format with companion workbook (page 8)
- Audiovisual Package: Two lecture tapes and illustrated workbook. Order below.

In this third course of the Basic Electronics curriculum, you'll explore the world of semiconductors, the basis of much of today's modern technology.

You'll learn how semiconductor devices are constructed and how to handle them, how various devices operate and how to use them in practical circuits. You'll learn to analyze semiconductor circuits and how to verify their proper operation.

Have fun while you learn

As in the first two Basic Electronics courses, you learn through experiments that are both fascinating and fun. But, most importantly, they will help you develop the skills necessary for a virtually limitless range of electronics projects.

EE-3103-B (6 lbs.) **\$64.95**

Supplement:

EEA 3103-A Audiovisual Package (2 lbs.) **\$21.95**

ELECTRONIC CIRCUITS COURSE

Gain practical experience and expertise

What you get:

- Comprehensive 700+ page text
- 18 hands-on experiments
- Parts package with all necessary electronic components
- 5.25" and 3.5" MS-DOS course review disks
- Earn 3.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Oscilloscope (page 26)
- Multimeter (page 24)

Course Requirements:

- DC Electronics (page 4)
- AC Electronics (page 5)
- Semiconductor Devices (page 6) or equivalent knowledge

Supplements:

- Video Learning Package: New! Full-color VHS format with companion workbook (page 8)
- Audiovisual Package: Two lecture tapes and illustrated workbook. Order at right.

You'll see the electronic products in your home in a whole new light once you get involved in the fourth course in the Basic Electronics curriculum.

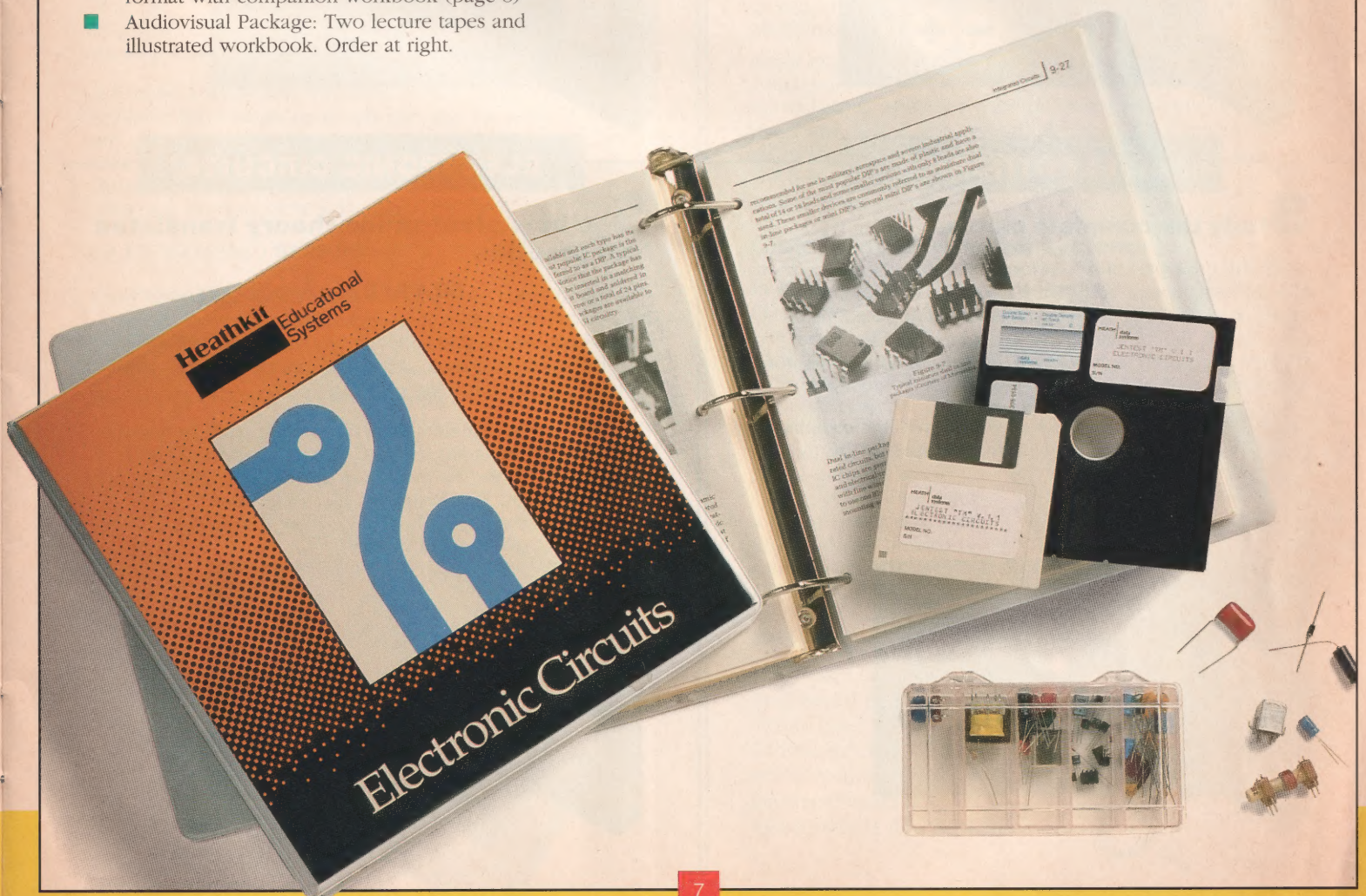
The course, which concentrates on how electronic circuits are used in everyday appliances, will help you make the leap from theory to practical application. The eighteen progressive experiments will enhance both your skills and your comprehension.

Get a deeper understanding

You'll analyze and design simple inverting and noninverting amplifiers. You'll build transistor and integrated circuit amplifiers, oscillators, active filters and more. You'll gain a deeper understanding of concepts such as voltage regulation, oscillation, amplitude and frequency modulation. By the time you complete Electronic Circuits, you will be ready to tackle some of the most fascinating of Heathkit's advanced electronics course offerings. EE-3104-B (7 lbs.) **\$69.95**

Supplement:

EEA-3104-A Audiovisual Package (2 lbs.) **\$21.95**



SEE ELECTRONICS FUNDAMENTALS DEMONSTRATED AND EXPLAINED ON FULL-COLOR VIDEO!

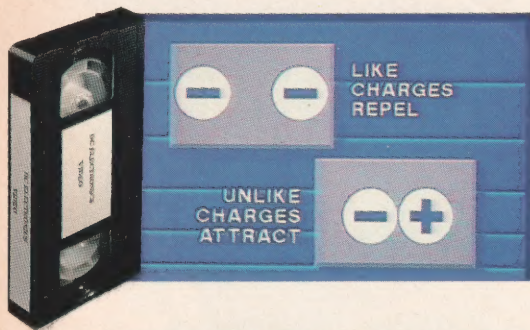
Watch and learn as our new instructional videos use full-color animation to vividly illustrate important electronic concepts. Each video comes with an activity-packed student workbook and explanations of all the answers to the problems presented. Each is approximately 1-hour in length. Use the videos to supplement our Basic Electronics Series courses on pages 4-7.

DC ELECTRONICS

Sit back, relax and watch basic electronics theory come to life

You'll start with a thorough explanation—and animated demonstration—of electron movement. From there, your DC Electronics video takes you through an introduction to DC current and voltage, resistance, inductance, capacitance, Ohm's law, magnetism and DC electrical measurement. By the end of the video, you'll understand the proper use of actual test equipment for troubleshooting and repairing a simple electronic circuit. No previous electronics knowledge is required.

EV-3101-A (2 lbs.) **\$39.95**



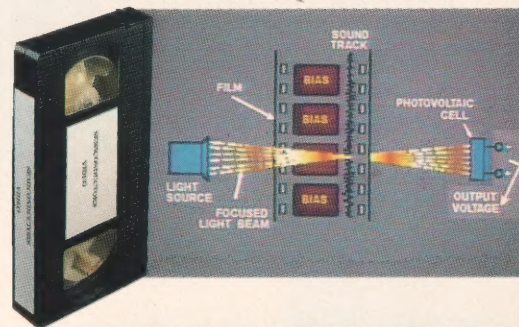
SEMICONDUCTORS

Get an overview of the theories and principles

Much of today's technology depends on semiconductors. In this video, you'll get a detailed view of the fundamentals. You'll see how semiconductor devices are made. You'll learn the principles behind discreet devices, integrated circuits, optoelectronic devices and much more. You'll find out what a PN junction is and discover its role in electronic theory.

To get the most from this video, you should first complete the DC and AC Electronics videos shown on this page or have equivalent knowledge.

EV-3103-A (2 lbs.) **\$39.95**



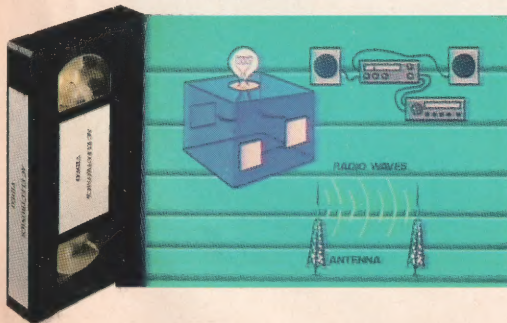
AC ELECTRONICS

Study the complete picture

Learn the principles of AC current and voltage in the comfort of your living room. You'll learn about AC electrical measurements. You'll be introduced to AC applications of capacitance, inductance and transformers. You'll explore waveform generation, waveform analysis, motors, generators and test instrument meter movements.

To get the most from this course, you should first complete the DC video or be familiar with the principles of DC electronics.

EV-3102-A (2 lbs.) **\$39.95**



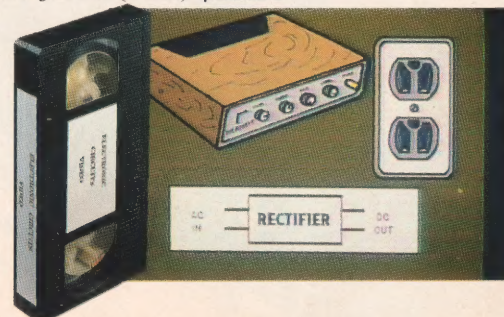
ELECTRONIC CIRCUITS

See how electronics theory translates into practice

Our fourth video takes you inside the circuit and shows you how electronic devices and simple appliances work. You'll learn about biasing and coupling. You'll explore various amplifiers—audio, video, differential and operational—and their configurations.

By the time you complete this video series, you'll have a thorough understanding of basic electronic principles and applications. To get the most from this video, you should first complete the DC Electronics, AC Electronics and Semiconductor videos or have equivalent knowledge.

EV-3104-A (2 lbs.) **\$39.95**



SAVE \$50.00

ON COMPLETE BASIC ELECTRONICS SERIES PLUS TRAINER!

Package includes all four basic courses shown on pages 4-7 (DC Electronics, AC Electronics, Semiconductor Devices and Electronic Circuits) plus the ET-3600 Analog Trainer. EES-3101-H (33 lbs.) **\$314.75**

THE ET-3600 ANALOG TRAINER

The tool that brings electronics theory to life

Use to perform experiments for the following courses:

- DC Electronics (page 4)
- AC Electronics (page 5)
- Semiconductor Devices (page 6)
- Electronic Circuits (page 7)
- Electronic Communications (this page)
- Concepts of Electronics (page 10)
- Linear IC Electronics (page 11)
- Electronic Test Equipment (page 13)

This powerful trainer gives you hands-on experience with electronic circuits. It's essential for many of the Heathkit electronics courses. And it couldn't be simpler to put together with our step-by-step, "we won't let you fail" instructions. Or, if you prefer, you may order it assembled.

With the ET-3600 Analog Trainer you'll see abstract electronic concepts covered into action as you perform dozens of exciting experiments.

It features a removable solderless breadboard for easy circuit building, that accepts up to #20 wire and the leads of almost any standard component. Its connector blocks are recessed for extra durability. And its power supply is protected against short circuits and overloads. Operates on 120/220 VAC, 50/60 Hz. 4¹/₄"H x 12"W x 11³/₈"D.

Kit ET-3600 (6 lbs.) **\$129.95**

Assembled ETW-3600 (6 lbs.) **\$199.95**

Accessory:

Extra breadboard block to save experiments
Assembled ETA-3600-1 (1 lb.) **\$19.95**



ELECTRONIC COMMUNICATIONS COURSE

Get an in-depth look at modern communications technology

What you get:

- Comprehensive self-instruction text
- 7 hands-on experiments
- Parts package with all necessary electronic components
- Earn 4.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (this page)
- Oscilloscope (page 26)
- Multimeter (page 24)

Course Requirements:

- Basic Electronics series (pages 4-7) or equivalent knowledge

Supplement:

- Audiovisual package (order below)

Whether you're interested in updating your professional skills, or you simply wish to develop a deeper understanding of electronic communications, this course is for you.

You'll examine the technology that makes all electronic communication possible—from TV and radio to FAX and data transmissions. You'll learn the principles of amplitude, frequency, phase, and pulse modulation. You'll explore the technologies of transmitters, receivers and antennas. And you'll learn how everything links together to form communications systems.

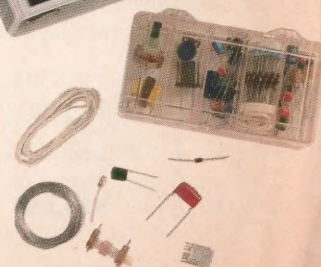
Create actual working systems

In seven fun and exciting experiments, theory translates into reality.

You'll build an AM transmitter, an FM transmitter, an FM receiver, a data communications modem and more. By the end of the course, you will be ready to apply your new skills in your career or home communications projects. EE-3106-A (7 lbs.) **\$69.95**

Supplement:

Electronic Communications Audiovisual Package: Two lecture tapes reinforce your knowledge and help review what you've learned. Complete with illustrated workbook. EEA-3106-A (2 lbs.) **\$21.95**



NEED HELP WITH ASSEMBLY? JUST CALL (616) 982-3980, ANY WEEKDAY, 8:00 AM TO 4:30 PM, EASTERN TIME

BEGINNING ELECTRICITY COURSE

Gain a working knowledge of electricity

What you get:

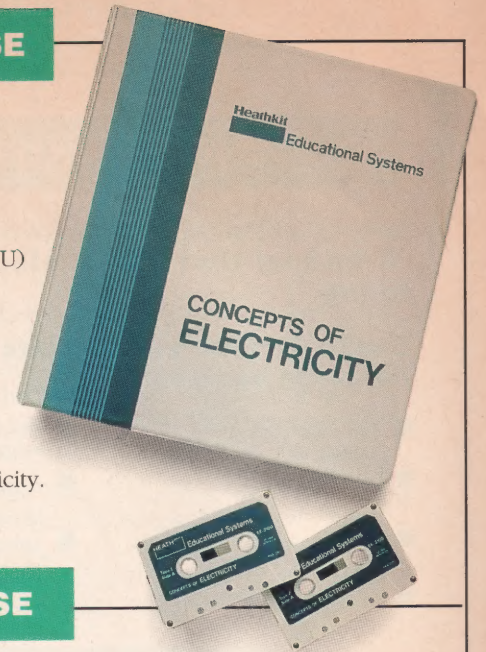
- Complete 400+ page text
- 5.25" and 3.5" MS-DOS course review disks
- Two instructional audio cassettes
- Earn 1.0 Continuing Education Unit (CEU)

What you'll need: No special equipment or course prerequisites necessary

Before you can begin an electronics project, you need a clear understanding of the properties of electricity. This course gives you that fundamental knowledge.

You'll learn about alternating and direct current, circuit theory and electro-mechanical systems.

You'll also learn what makes electrical devices work and how to solve basic problems in electricity.
EE-3100 (5 lbs.) **\$34.95**



CONCEPTS OF ELECTRONICS COURSE

Get a fast track overview of the basics

What you get:

- Comprehensive 800+ page text
- Parts package with all necessary electronic components
- 26 hands-on experiments
- Earn 4.0 Continuing Education Units (CEUs)

What you'll need: ■ ET-3600 Analog Trainer (page 9)
■ Multimeter (page 24) ■ Oscilloscope (page 26)

The course gives you an overview of a wide range of electronic principles from electron theory to digital computer technology.

You'll learn about alternating and direct current, electronic theories, measurements and components. You'll also perform hands-on experiments that will broaden your understanding.
EE-3140-A (9 lbs.) **\$59.95**



ELECTRONIC FUNDAMENTALS

Use as a reference guide or complete course

What you get:

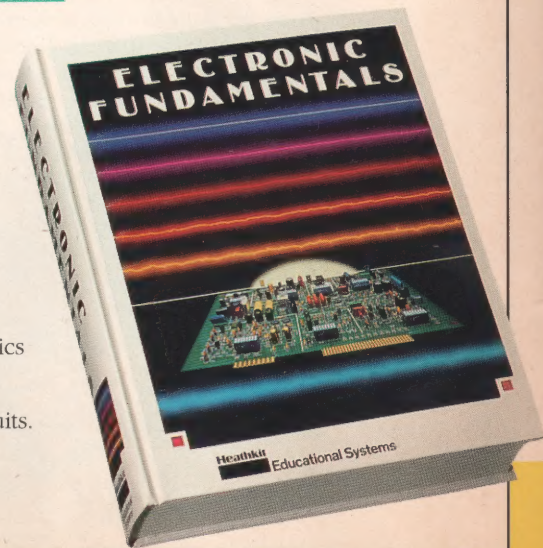
- Complete, 30-chapter hardbound Basic Electronics series text

To use as a course text you'll need:

- ET-3600 Analog Trainer (page 9)
- Multimeter (page 24)
- Oscilloscope (page 26)
- Student Workbook (order below)
- Experiments Parts Package (order below)

Whether you get this highly readable text as a reference guide or a complete basic electronics course, you'll find it one of the best education investments you'll ever make.

Electronic Fundamentals covers DC and AC electronics, semiconductors and electronic circuits. A glossary and several useful appendixes make this a must for your bookshelf.
EB-200 (6 lbs.) **\$39.95** Student Workbook EB-200-40 (1 lb.) **\$21.95**
Experiment Parts Package EB-200-30 (1 lb.) **\$59.95**





Fine tune your knowledge with these specialized courses

What you get:

- Comprehensive text covering the subject(s) you select
- Complete parts package with all necessary electronic components
- Hands-on experiments

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Multimeter (page 24)
- Oscilloscope (page 26)

This series lets you study the precise areas that interest you. Choose a single course or take the whole series for a thorough grounding in linear electronics. Each course includes practical experiments to enhance and reinforce theory through hands-on experience.

Fundamentals of Circuit Analysis

Learn the concepts of input and output impedance, voltage sources, current sources and gain. Review analysis techniques of Thevenin and Norton equivalent circuits. The Z parameter analysis technique for amplifier circuit analysis is also included. EE-115-1 (1 lb.) **\$14.95**

Operational Amplifiers

This course will investigate the properties and features of the operational amplifier. The study will include the fundamental operational amplifier circuits, a variety of comparator circuits, as well as a few special type amplifier circuits. Also included are three in-depth hands-on practical experiments with parts. EE-115-2 (1 lb.) **\$14.95**

IC Voltage Regulators

Get an in-depth look at this IC chip that can take the place of several discrete components. Study various IC voltage regulator circuits and learn two different methods of current limiting protection. Also included are three practical hands-on experiments with parts. EE-115-3 (1 lb.) **\$14.95**

IC Linear Amplifiers

Learn how linear amplifiers work and how to use them. Take an in-depth look at the various configurations. Areas covered include basic linear, low frequency, high frequency, wideband and special amplifier circuits. Three in-depth hands-on experiments are included. EE-115-4 (1 lb.) **\$14.95**

IC Oscillators

This fifth course in the series takes you inside IC oscillators and shows you how they work. You'll get in-depth training with the RC, LC, VCO and crystal oscillator. Includes an in-depth, hands-on experiment, with parts. EE-115-5 (1 lb.) **\$14.95**

Wave Shapes and Generators

Get an in-depth understanding of the circuits that can generate, enhance or change the shape of existing waves. Topics covered include signal generators, wave shapers and filters. Three in-depth experiments, plus parts, are also included. EE-115-6 (1 lb.) **\$14.95**

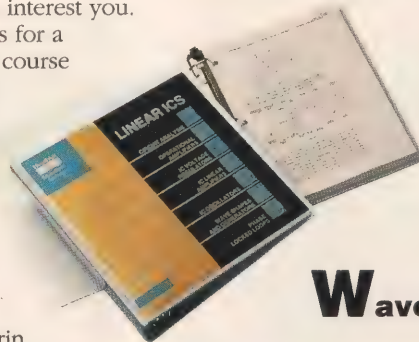
Phase Locked Loops

This specialized chip is widely used to sense differences or changes in frequency parameters and to provide a means of correcting the change. Learn about its operation and construction. Four hands-on experiments, with parts, are included. EE-115-7 (1 lb.) **\$14.95**

Series Binder

Keep your courses neat and accessible with this handy 2" binder. EE-115-8 (3 lbs.) **\$9.95**

SAVE! The complete IC Electronic Series, seven courses plus binder. Save \$14.65. EES-115 (10 lbs.) **\$99.95**



DIGITAL TECHNIQUES COURSE

Develop expertise in digital circuitry

What you get:

- Comprehensive 900+ page text
- 26 hands-on experiments
- Parts package with all necessary electronic components
- 5.25" and 3.5" MS-DOS course review disks
- Earn 4.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3700 Digital Trainer (this page)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

- Basic Electronics series or equivalent knowledge (pages 4-7)

Supplement:

- Audiovisual Package: Two lecture tapes and illustrated workbook. Order at right.

The Digital Techniques course introduces you to the technological principles of logic circuits, digital integrated circuits, Boolean algebra, memory devices and more. The course provides a major stepping stone into advanced electronics.

Through performing 26 hands-on experiments, you'll gain confidence and knowledge.



You'll design, build and analyze a wide variety of digital circuits. And you'll learn to troubleshoot digital circuits

using standard test equipment.

EE-3201-A (7 lbs.) **\$99.95**

Supplement:

EEA-3201-A Audiovisual Package (2 lbs.) **\$21.95**

SAVE! Order EE-3201-A Digital Techniques course with the ET-3700 Digital Trainer and save \$50.00.

EES-3201-C (17 lbs.) **\$179.90**

DIGITAL TRAINER

Design circuits more efficiently

Use to perform experiments for the following courses:

- Digital Techniques (this page)
- Fiber Optics (page 14)

The versatile ET-3700 Digital Trainer speeds and simplifies digital circuit design and experimentation. It enables you to apply course material in a practical way—through both experiments and by building and testing your own prototypes. It has a removable solderless breadboard that accepts up to #20 solid wire and the leads of almost any standard electronic component.

And it's remarkably quick and easy to build. Or, if you prefer, you may order it assembled.

A powerful learning tool

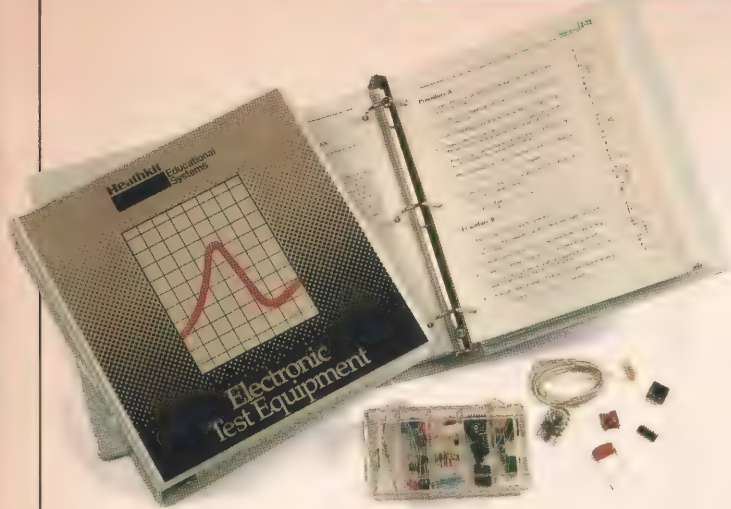
Features include three built-in regulated power supplies: positive and negative 12-volt DC and positive 5-volt DC voltages to both digital and linear circuits. In addition, the ET-3700 supplies a line-frequency square wave (60 or 50 Hz). And a great deal more. But even with all its features, the ET-3700 is lightweight, compact and portable.

Kit ET-3700 (6 lbs.) **\$129.95**

Assembled ETW-3700 (6 lbs.) **\$199.95**



ELECTRONIC TEST EQUIPMENT COURSE



Do your own troubleshooting and repair

What you get:

- Comprehensive 600+ page text
- 15 hands-on experiments
- Parts package with all necessary components
- Earn 6.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3600 Analog Trainer (page 9)
- Multimeter (page 24)
- Function generator (page 25)
- Oscilloscope (page 26)

Course Requirements:

- Basic Electronics series (page 4-7) and Digital Techniques (page 12) or equivalent knowledge

A glitch in your equipment can cause major frustration. But, after mastering the concepts of this course, you'll be prepared to find and eliminate the bugs in both home and industrial electronics.

Through the performance of 15 practical experiments you'll become proficient with both bench and field equipment. You'll learn to check circuits and take measurements using digital and analog volt meters, ammeters, ohmmeters and oscilloscopes.

You'll progress to in-depth studies of the oscilloscope, oscilloscope circuits and the cathode ray tube. You'll learn to recognize sources of error in electronic counter readings and to increase the frequency range of electronic counters. You'll also check the output frequency and amplitude calibration of a signal generator and the bandwidth, vertical gain and time base calibration of your oscilloscope.

EE-3105-A (9 lbs.) **\$69.95**

Supplement:

EEA-3105-A Audiovisual Package (2 lbs.) **\$21.95**

DIGITAL TEST SET

Troubleshoot your own circuits

What you get:

- Comprehensive 90+ page text
- Pulser/probe set
- Four spring-loaded IC clips with gold-plated pins

Engineers, scientists, technicians and electronics hobbyists all need to know how to test and troubleshoot the precision circuits of today. The key to digital troubleshooting is to do it quickly and efficiently. And the Heathkit Digital Test Set gives you both the tools and the know-how to accomplish this.

Learn to identify and correct common problems

You get a pulser/prober set and four spring-loaded IC clips with gold-plated pins. The clips fit virtually any common integrated circuit and give you easy access to IC pins. The accompanying text shows you how to use the logic pulser and probe to test and troubleshoot digital circuits quickly, easily and safely. You'll also learn how to troubleshoot using other common test instruments such as the VOM, DMM and the oscilloscope.

ETI-7510 (2 lbs.) **\$79.95**



FIBER OPTICS COURSE

Explore this exciting technology

What you get:

- Comprehensive 400+ page text
- 4 hands-on experiments
- Parts package with all necessary electronic components
- Earn 3.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3700 Digital Trainer (page 12)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

- DC and AC Electronics (page 4-5)
- Digital Techniques recommended (page 12)

Experiments broaden your understanding

Explore the nature of light and its characteristics as a transmission medium. You'll go on to study fiber types and the active devices used to generate and detect fiber optic transmission light. You'll learn about laser emissions and the principles associated with the injection laser diode used in fiber optic circuits.

When you complete the course, you'll be thoroughly familiar with the electromagnetic spectrum and understand fiber optic interconnection devices, cost and performance. EE-4201 (6 lbs.) **\$99.95**

FUNDAMENTALS OF SURFACE MOUNT TECHNOLOGY

Master the "how to's" of miniaturized electronics

What you get:

- Comprehensive 400+ page text
- 3 hands-on experiments
- Parts package with all necessary components
- Earn 3.0 Continuing Education Units (CEUs)

What you'll need:

- Low wattage soldering iron (see order form)

Course Requirements:

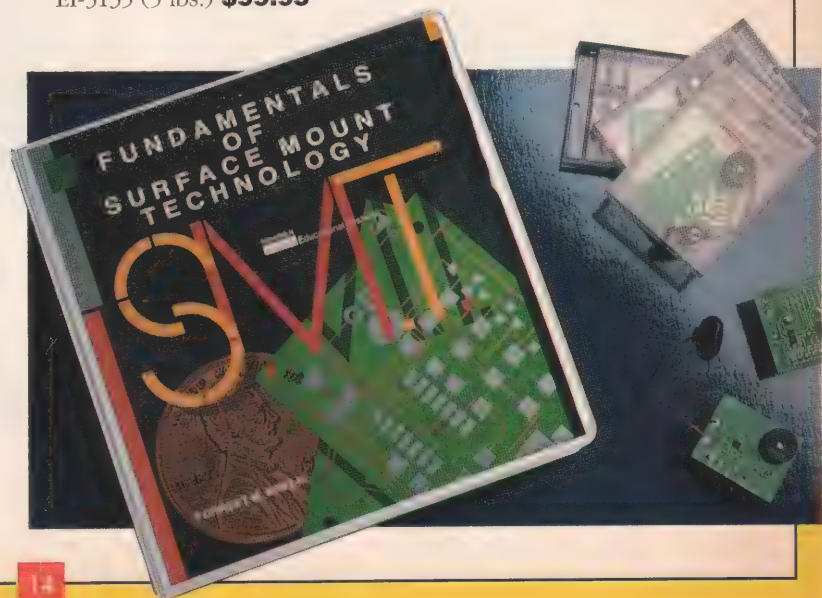
- A basic knowledge of electronics principles

Surface mount technology makes a whole range of miniaturized electronics possible, from pocket TVs and cassette recorders to laptop computers. But to properly plan and design SMT circuit boards, you must become familiar with unique methods of assembly, soldering, desoldering and more.

Heathkit's Surface Mount Technology course was written by noted SMT expert and author, Forrest Mims. It will familiarize you with every aspect of SMT—from theory to application.

Learn through practical experience

You'll begin by working with surface mount resistors, capacitors, light-emitting diodes and integrated circuits. You'll practice several methods of soldering and desoldering surface mount components (SMCs) to a practice printed circuit board. Next you'll assemble an audio frequency oscillator from SMCs and experiment with it. And finally, you'll build a more complex circuit: an 8-element bar graph. EI-3135 (5 lbs.) **\$99.95**



CALL TOLL-FREE 24 HOURS A DAY 1-800-253-0570

LASER TECHNOLOGY COURSE

Get involved with one of today's most far-reaching technologies

What you get:

- Comprehensive 400+ page text
- 15 hands-on experiments
- Complete parts package with mirrors, lenses, filters, cables and mounts
- Earn 3.0 Continuing Education Units (CEUs)

What you'll need:

- Laser Training System (this page)

Course Requirements:

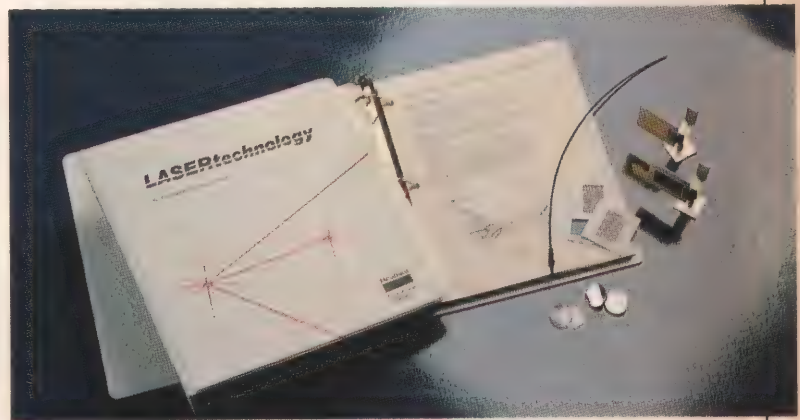
- Basic Electronics series (page 4-7) or equivalent experience, and basic knowledge of algebra

Lasers—once dedicated primarily to military applications—are now used to transmit information over long distances, melt metals, cut materials, inscribe information, perform surgery and more. And new applications are being discovered daily.

Explore laser principles and applications

You'll discover how laser light is generated and how it can be modulated. You'll study laser design, types and components, and learn the effects and potential hazards of laser light and study the effects of infrared radiation. You'll transmit and reproduce sound over a laser beam and work with a laser to measure radiometric light and to transmit data. Fifteen fascinating experiments will give you a solid understanding of the laser's current uses and future possibilities.

EE-110 (7 lbs.) **\$99.95**



LASER TRAINING SYSTEM

Perform hands-on experiments with a working commercial quality laser

This powerful trainer gives you first-hand experience with an actual laser. And you can quickly and easily build the trainer yourself, using Heathkit's step-by-step "we won't let you fail" instructions.



Safe and sturdy

Commercial grade components are used in the Laser Training System to ensure long life and durability. The transmitter features a helium neon gas laser that generates an intense, easy-to-see red light. And it has a pilot light and mechanical beam shutter for extra safety. A tripod mount and signal input jacks to use with an external source are included.

The trainer is equipped with modulation circuitry to demonstrate the latest communications technology. The laser receiver has a built-in power meter to measure the beam's intensity, and a built-in detector, audio amplifier and speaker. UL and CSA (Canadian Standards Association) listed. Requires 120 VAC, 60 Hz 15 watts power.

Kit ETS-4200 (12 lbs.) **\$304.95**

Assembled EWS-4200-A (5 lbs.) **\$425.00**

SAVE! Order the EE-110 Laser Technology course and the ETS-4200 Laser Trainer together and save \$40.00.
EES-110 (19 lbs.) **\$364.90**



DATA COMMUNICATIONS AND NETWORKS COURSE

Build your communications knowledge

What you get:

- Comprehensive 1000+ page text
- 11 hands-on experiments
- Parts package with all necessary electronic components and telephone cable
- Earn 7.0 Continuing Education Units (CEUs)

What you'll need:

- ET-1000 Digital Circuit Design Trainer (this page)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

- DC and AC Electronics (page 4-5) and Digital Techniques (page 12) or equivalent knowledge

Data communications—the near instantaneous transmission of information over long distances—is revolutionizing the way we live. In this course, you'll gain an understanding of the concepts, terminology, equipment and techniques of today's data communications system.

The course provides you with an overview of current digital data networks, communications protocols and phone circuits, as well as communications channels for both analog and digital transmissions. You'll also learn about digital and analog signaling techniques, terminals and codes, modulation and multiplexing, and transmission media telephone networks.

Work with real-world applications

You'll discover what causes transmission errors—and how to correct them. And, with security becoming an increasingly important issue, you'll learn how to analyze a system and protect it from unauthorized access.

EE-8090 (11 lbs.) **\$99.95**

SAVE! Order the EE-8090 Data Communications and Networks course with the ET-1000 Circuit Design Trainer and save \$50.00.

EES-8090 (25 lbs.) **\$279.90**

ANALOG/DIGITAL CIRCUIT DESIGN TRAINER

Design, build, test your own circuits

This powerful trainer is a regular mini-lab that gives you hands-on experience building and troubleshooting circuits of your own design. You can enjoy the satisfaction of building it yourself or, if you prefer, you may order it assembled.

Multi-featured design provides flexibility

The ET-1000 features two solderless breadboards for quick, easy circuit assembly and testing, and connector blocks which allow solderless connections between parts and wires. It also has variable and regulated positive and negative DC power supplies. It includes a built-in function generator for producing sine, square, triangle and pulse waveforms from 1 Hz to 100KHz in five switch-selectable ranges, plus a built-in logic probe.

Other features include two "no-bounce" logic switches, variable 1k and 100k ohm resistors, eight switches for selecting logic lows or highs, and eight LED logic-state indicators. Yet, with all these features, it's still a compact 4³/₄" H x 15³/₄" W x 10³/₄" D.

The ET-1000 is UL and CSA approved. Uses 105-130 volts or 210-260 volts rms at 50/60 Hz.

Kit ET-1000 (14 lbs.) **\$229.95**

Assembled ETW-1000 (13 lbs.) **\$299.95**

Accessory:

Extra removable breadboard ET-1000-1 (1 lb.) **\$29.95**

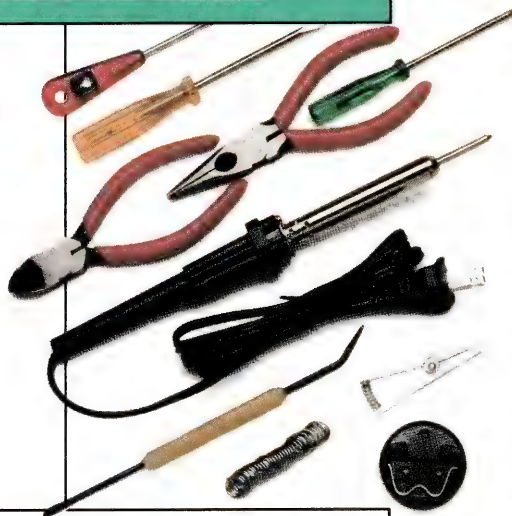


TOOLS OF THE TRADE



Weller Soldering Station: get the complete system for easier soldering

This soldering station with advanced safety features makes your job faster and simpler. The lightweight soldering pencil features low voltage, 700 °F closed loop temperature control for steady, fast soldering. And it has a component protecting grounded tip. Detachable stand contains a water reservoir.
GDP-1108 (5 lbs.) \$89.95
 Accessory:
 5 assorted tips
GDP-1109 (1 lb.) \$17.95



Tool Kit: complete tool set at an unbelievable price

Use this 10-piece tool kit for building any of your electronic projects. You'll save plenty on the cost of buying each tool separately. And you'll be able to proceed on your projects confidently, because you'll always have the right tool for the job at hand.

Included in the kit is a 30-watt UL listed soldering iron, complete with solder, stand, soldering helper and clip-on heat sink. Plus 3 screwdrivers, needle nose pliers and diagonal cutters. **ST-100 Tool Kit (2 lbs.) \$15.95**



Soldering Course: learn to solder like a pro

Soldering is critical in electronic equipment. One faulty connection can cause major equipment failure. Learn everything you need to know about making the right connections in this clear, concise course.

You'll learn the techniques of soldering, proper soldering iron size and temperature. You'll learn how to make strong connections, how to avoid solder bridges—and even how to de-solder.

Six hands-on experiments help you develop the skills and experience necessary to become proficient.

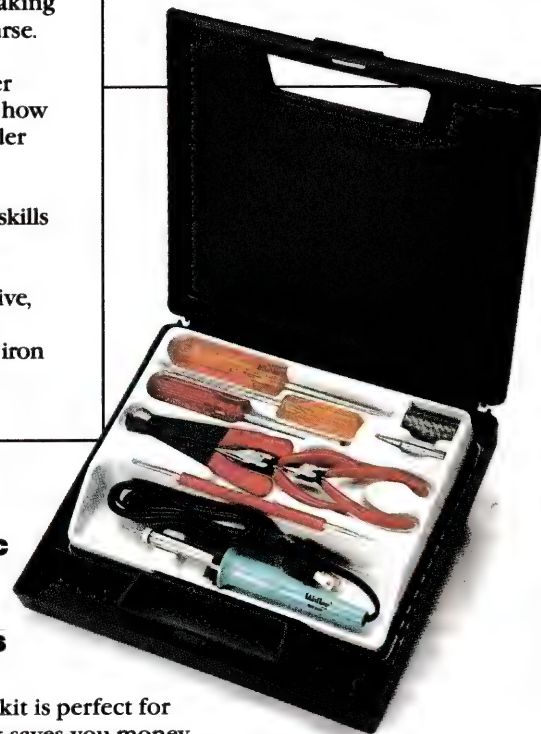
The course comes complete with a comprehensive, well-illustrated text and all the parts you'll need to perform the experiments. Purchase soldering iron separately (this page).
EI-3133 (3 lbs.) \$21.95

Ungar 25-Watt Soldering Iron: enjoy good quality at a great price

Ungar irons perform well for all types of jobs, whether at home or at work. Yet they are surprisingly economical. This 4-ounce unit is ideal for electronics, hobbies and delicate repairs. And its replaceable tip design, which can accommodate a variety of tips, allows for great versatility. Comfortably molded heat-resistant handle. UL listed. Iron holder included.
GDP-3125 (1 lb.) \$9.95
 Accessory:
 Replacement tips — 2 pencil tips, 2 small chisel tips, 2 long taper chisel tips. **GDP-3100 (1 lb.) \$7.95**

Electronic Tool Kit with Case: all the tools you need

This handy tool kit is perfect for the kit builder. It saves you money over buying each tool separately. And everything comes already organized in a molded tray inside the carrying case. You get a Weller 20-watt soldering iron with two interchangeable tips, a soldering aid, a 4-ounce spool of solder, wire strippers, diagonal cutters, 4" needle nose pliers, ¼" nut driver, and both slotted and Phillips screwdrivers. Carrying case has built-in handle. Measures 3"H x 10¾"W x 10"D.
GHP-1270 (2 lbs.) \$49.95



ORDER BY PHONE: 1-800-253-0570

Use your VISA, MasterCard, American Express or Heath Revolving Charge. Our operators are ready to serve you 24-hours a day. For efficient handling of your order, please fill out your order form before you call.

ORDER BY FAX: 1-616-982-5577

Use our new 24-hour fax hotline to transmit your credit card order in only seconds. For fastest service, complete the order form and fax us a copy.

ORDER BY COMPUTER

Enjoy the ease and convenience of shopping by computer with the Heathkit Online Catalog through COMPUSERVE. Just type GO HTH at any / or OK prompt for access to exciting electronic products.

ORDER BY MAIL

Please follow these steps so we can process your order quickly:

1. Use the same name each time you order.
2. Give your full address, including apartment number if any. Include zip code and daytime phone number.
3. Include quantity, model number, description, price and ship weight (listed in parentheses following each product) for each item you order. Figure shipping and handling charges from the rate chart.
4. Please attach a separate sheet to order replacement parts, or for any correspondence.

CREDIT CARD PURCHASES

Use VISA, MasterCard or American Express to charge Heathkit products. Include your card number, expiration date and signature in the space provided. You can also charge replacement parts.

HEATH REVOLVING CHARGE

It's easy to open a Heath Revolving Charge. Complete the Heath Preferred Customer Credit Application (next page), and mail to: Heath Co., P.O. Box 8589, Benton Harbor, MI 49022.

ASSISTANCE AND INFORMATION

Replacement parts orders
(Please have Heath part number available when you call) **(616) 982-3571**

Overseas orders **(616) 982-3512**

General Office
(non-order calls) **(616) 982-3200**

TECHNICAL ASSISTANCE

If you need assistance assembling your kit, or if you have a technical question about any of our products, simply pick up the phone and dial. Help is just a phone call away. Our technical experts will give you the guidance and support you need. Call any weekday, 8:00 am to 4:30 pm, Eastern time.

Educational products **(616) 982-3980**

Electronic kits **(616) 982-3496**

Computer hardware **(616) 982-3309**

Test equipment **(616) 982-3315**

Fair Credit Billing Act

YOUR BILLING RIGHTS
KEEP THIS NOTICE FOR FUTURE USE

This notice contains important information about your rights and our responsibilities under the Fair Credit Billing Act.

NOTIFY US IN CASE OF ERRORS OR QUESTIONS ABOUT YOUR BILL

If you think your bill is wrong, or if you need more information about a transaction on your bill, write us (on a separate sheet) at the address listed on your bill. Write to us as soon as possible. We must hear from you no later than 60 days after we sent you the first bill on which the error or problem appeared. You can telephone us, but doing so will not preserve your rights.

In your letter, give us the following information:

- Your name and account number.
- The dollar amount of the suspected error.
- Describe the error and explain, if you can, why you believe there is an error. If you need more information, describe the item you are not sure about.

If you have authorized us to pay your credit card bill automatically from your savings or checking account, you can stop the payment on any amount you think is wrong. To stop the payment your letter must reach us three business days before the automatic payment is scheduled to occur.

YOUR RIGHTS AND OUR RESPONSIBILITIES AFTER WE RECEIVE YOUR WRITTEN NOTICE

We must acknowledge your letter within 30 days, unless we have corrected the error by then. Within 90 days, we must either correct the error or explain why we believe the bill was correct.

After we receive your letter, we cannot try to collect any amount you question, or report you as delinquent. We can continue to bill you for the amount you question, including finance charges, and we

SHIPPING INFORMATION:

1. Find your zone number using the zone chart below.
2. Locate the shipping weight of each item ordered in the first column of the rate chart.
3. Determine the shipping charge for each item.

Please note: Heath shipping charges are based on carton weight. For multiple orders, total the shipping costs of products requested.

Shipping weights for single products shipped in more than one carton, or of excess length, have been adjusted to provide correct postage.

Air freight shipments: See rate chart for 2nd day air charges. Next day air may also be available in your area. Call 1-800-253-0570 for information. Service is based on number of business days after shipment's departure.

APO/FPO shipments: Military overseas shipments use Zone A charges for West Coast, Zone B charges for East Coast and Miami shipments.

Rural route and P.O. box addresses: Use Zone A.

Hawaii, Alaska, Puerto Rico addresses: Use air freight service and cost. Add \$10 surcharge.

RATE CHART

Shpg. wt.	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone A	Zone B	2nd Day Air
1	\$1.47	\$1.59	\$1.75	\$1.83	\$1.91	\$2.01	\$2.10	\$2.40	\$2.40	\$6.00
2	1.48	1.61	1.96	2.08	2.25	2.41	2.60	2.40	2.40	6.00
3	1.56	1.75	2.13	2.31	2.55	2.80	3.05	3.45	4.32	6.00
4	1.64	1.89	2.31	2.49	2.81	3.12	3.46	4.13	5.33	6.00
5	1.73	1.98	2.40	2.63	3.01	3.39	3.79	4.86	6.37	6.00
6	1.82	2.05	2.49	2.74	3.14	3.58	4.04	5.71	7.66	7.50
7	1.90	2.12	2.59	2.86	3.32	3.82	4.32	6.39	8.67	8.50
8	1.99	2.18	2.70	3.08	3.61	4.16	4.74	7.07	9.68	9.50
9	2.09	2.31	2.87	3.29	3.90	4.51	5.17	7.76	10.69	10.50
10	2.17	2.43	3.03	3.50	4.17	4.87	5.58	8.44	11.70	11.50
11	2.27	2.57	3.20	3.74	4.45	5.22	6.02	9.12	12.71	12.50
12	2.38	2.71	3.37	3.95	4.74	5.56	6.44	9.81	13.72	13.50
13	2.46	2.83	3.54	4.17	5.03	5.93	6.86	10.49	14.73	14.50
14	2.51	2.96	3.73	4.38	5.31	6.27	7.29	11.17	15.74	15.50
15	2.59	3.08	3.89	4.60	5.58	6.63	7.71	11.86	16.75	16.50
16	2.67	3.21	4.06	4.83	5.88	6.98	8.14	12.54	17.75	17.50
17	2.74	3.34	4.23	5.04	6.16	7.33	8.56	13.22	18.76	18.50
18	2.84	3.46	4.40	5.26	6.44	7.68	8.98	13.90	19.77	19.50
19	2.97	3.60	4.57	5.47	6.73	8.04	9.41	14.59	20.78	20.50
20	3.12	3.73	4.74	5.69	7.01	8.38	9.83	15.27	21.79	21.50
21	3.27	3.86	4.92	5.92	7.29	8.74	10.26	15.95	22.80	22.50
22	3.37	3.99	5.09	6.13	7.57	9.09	10.68	16.64	23.81	23.50
23	3.47	4.11	5.26	6.35	7.86	9.44	11.10	17.32	24.82	24.50
24	3.56	4.24	5.43	6.56	8.15	9.79	11.53	18.00	25.83	25.50
25	3.66	4.36	5.59	6.78	8.42	10.15	11.95	18.69	26.84	26.50

For weights over 25 lbs. CALL 1-800-253-0570 for rates.

ZONE CHART

Your zone is indicated by the first three digits of your ZIP Code.

Zip Code Prefixes	UPS Zone	Zip Code Prefixes	UPS Zone	Zip Code Prefixes	UPS Zone	Zip Code Prefixes	UPS Zone	Zip Code Prefixes	UPS Zone	Zip Code Prefixes	UPS Zone
004-005	5	200-232	4	342-346	5	470-472	3	600-609	2	820	5
010-069	5	233-237	5	349	6	473	2	610-619	3	821	6
070-083	4	238-259	4	350-353	4	474-475	3	620-623	4	822	5
084	5	260-261	3	354	5	476-477	4	624-628	3	823-826	6
085-089	4	262-278	4	355-359	4	478	3	629-668	4	827	5
		279	5	360-361	5	479-496	2	669-679	5	828-832	6
100-104	4	280-283	4	362	4	497-499	3	680-687	4	833	7
105-108	5	284-285	5	363-369	5			688-699	5	834	6
109-113	4	286-289	4	370-386	4	500-516	4			835-838	7
114-115	5	290-292	5	387	5	520-524	3	700-722	5	840-847	6
116	4	293	4	388	4	525	4	723-727	4	850-864	7
117-119	5	294-295	5	389-397	5	526-528	3	728-732	5	865-885	6
120-123	4	296-297	4	399	4	530-534	2	733	6	889-898	7
124-126	5	298-299	5			535-539	3	734-768	5		
127-128	4			400-406	3	540	4	769	6	900-921	8
129	5	300-303	4	407-409	4	541-546	3	770-778	5	922-925	7
130-149	4	304	5	410-412	3	547-548	4	779-789	6	926-934	8
150-153	3	305-307	4	413-426	4	549	3	790-792	5	935	7
154-160	4	308-310	5	427-432	3	550-566	4	793-799	6	936-960	8
161	3	311	4	433-436	2	567	5			961	7
162-163	4	312-329	5	437-457	3	570-572	4	800-802	5	970-976	8
164-165	3	330-334	6	458	2	573-588	5	803-805	6	977-984	7
166-199	4	335-338	5	459-462	3	590-597	6	806-807	5	985-986	8
		339	6	463-469	2	598-599	7	808-816	6	988-994	7

can apply any unpaid amount against your credit limit. You do not have to pay any questioned amount while we are investigating, but you are still obligated to pay the parts of your bill that are not in question.

If we find that we made a mistake on your bill, you will not have to pay any finance charges related to any questioned amount. If we didn't make a mistake, you may have to pay finance charges, and you will have to make up any missed payments on the questioned amount. In either case, we will send you a statement of the amount you owe and the date that it is due.

If you fail to pay the amount that we think you owe, we may report you as delinquent. However, if our explanation does not satisfy you and you write to us within ten days telling us that you still refuse to pay, we must tell anyone we report you to that you have a question about your bill. And, we must tell you the name of anyone we reported you to. We must tell anyone we report you to that the matter has been settled between us when it finally is.

If we don't follow these rules, we can't collect the first \$50 of the questioned amount, even if your bill was correct.

SPECIAL RULE FOR CREDIT CARD PURCHASES

If you have a problem with the quality of property or services that you purchased with a credit card, and you have tried in good faith to correct the problem with the merchant, you may have the right not to pay the remaining amount due on the property or services. There are two limitations on this right:

- (a) You must have made the purchase in your home state or, if not within your home state, within 100 miles of your current mailing address; and
- (b) The purchase price must have been more than \$50.

These limitations do not apply if we own or operate the merchant, or if we mailed you the advertisement for the property or services.

HEATH PREFERRED CUSTOMER CREDIT APPLICATION

**TO: Heath Company, P.O. Box 8589,
Benton Harbor, Michigan 49022**

I hereby purchase the total amount of merchandise listed on the reverse side plus shipping charges and tax, if any, less down payment, if any, plus the FINANCE CHARGE which, in lieu of being added to this contract in total as of the date hereof will be added monthly to the previous month's ending balance of my account before deducting payments and credits or adding purchases made during the current billing period. FINANCE CHARGE will be assessed on the balance according to the following schedule or in accordance with the laws of the State of my residence whichever is the lesser.

Account Balance Amount: ALL BALANCES. Periodic Percentage Rate: 1 1/2 % ANNUAL PERCENTAGE RATE: 18%

The minimum FINANCE CHARGE assessed will be 50¢ on any small balances. If within 30 days from my billing date I pay the full outstanding balance shown on my statement, no FINANCE CHARGE on such balance, will be charged on any subsequent statement. The highest level of my balance reflected by the payment chart will govern my monthly

payment, beginning 30 days from the cycle closing date shown on the statement, until such time as the total unpaid balance of each purchase is fully paid (minimum \$10). Regular or Extended Terms are the two plans available for my use. To use the extended plan, the balance of my account must be at least \$500.00. The amount of my monthly installment is determined from charts below.

CHECK PLAN DESIRED

REGULAR REVOLVING CHARGE

Charge up to:	\$150	200	250	300	350	400	450	500
Pay Monthly	\$10	15	20	25	30	35	40	45

Add \$5 per month for every \$50 or fraction thereof over \$500.

EXTENDED REVOLVING CHARGE

Charge up to:	\$600	700	800	900	1000	1100	1200	1300	1400	1500
Pay Monthly:	\$30	35	40	45	50	55	60	65	70	75

Add \$5 per month for every \$100 or fraction thereof over last amount.

IMPORTANT: Please fill in completely if you are a new account or if your old account has been inactive for 12 months or more.

Birth: Mo. Day Year Social Security Number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Account to be in the name of:

First	Initial	Last
-------	---------	------

Present address How long?
yrs.
mos.

City	State	Zip
------	-------	-----

Former address How long?
yrs.
mos.

City	State	Zip
------	-------	-----

<input type="checkbox"/> Rent	Monthly rent or mortgage _____	No. of dependent children _____
<input type="checkbox"/> Own		
<input type="checkbox"/> Board		

Area code & phone no.	Former account no.

COMPLETE FOR PERSON REQUESTING ACCOUNT

Employer's name How long?
yrs.
mos.

Address: street, city, state, zip

Position	Salary/mo.	Business phone ()
----------	------------	-----------------------

Former employer

Address: street, city, state, zip How long?
yrs.
mos.

*Child support, alimony, separate maintenance and other income source(s) need not be revealed if you do not wish to have it considered as a basis for repaying this obligation.

Other income source(s) & amount(s) \$ _____
Amount monthly

Bank branch: name & address checking
 loan
 savings

(1) Credit reference name & address (merchants, lenders, etc.)

(2) Credit reference name & address

(3) Credit reference name & address

Nearest relative name Phone
()

Address: street, city, state, zip

COMPLETE FOR SPOUSE IF JOINT ACCOUNT

Spouse's name Social Security no.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Employer's name & address Salary/mo.

I hereby grant to the above named creditor a security interest in all goods purchased until the purchase price and FINANCE CHARGE have been paid in full. I will not sell, transfer possession of, remove or encumber the property without your written consent. The account may be declared in default and the matters regarding default, right to cure (if any) and acceleration of account balances will be governed by the consumer protection laws of the state of my residence. My installments shall be applied as follows. In case of items purchased on different dates, the first purchase shall be deemed first paid for. We intend to obtain a consumer report in connection with the processing of your credit application. Upon request you will be informed of the name and address of the consumer reporting agency that furnished the report. Subsequent consumer reports may be obtained from time to time in connection with the maintenance of your account.

By signature below I hereby certify that I am of legal age and am allowed to contract by law.

NOTICE TO BUYER: 1. Do not sign this agreement before you read it or if it contains blank spaces. You are entitled to a copy of the agreement you sign. 2. Fair Credit Billing Act is part of this contract. Notice: See this statement for important information regarding your rights to dispute billing errors.

3. NOTICE: ANY HOLDER OF THIS CONSUMER CREDIT CONTRACT IS SUBJECT TO ALL CLAIMS AND DEFENSES WHICH THE DEBTOR COULD ASSERT AGAINST THE SELLER OF GOODS OR SERVICES OBTAINED PURSUANT HERETO OR WITH THE PROCEEDS HEREOF. RECOVERY HEREUNDER BY THE DEBTOR SHALL NOT EXCEED AMOUNTS PAID BY THE DEBTOR HEREUNDER.

Sign here _____

Date _____

Sign here _____

Spouse's signature if joint account

Date _____

Joint account Individual account

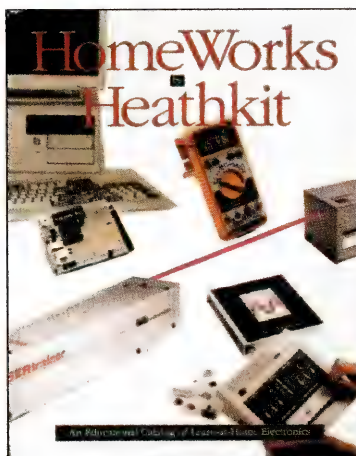
**TO SPEED YOUR ORDER
CALL TOLL-FREE
24 HOURS A DAY**

**1-800-253-0570
OR FAX YOUR CREDIT
CARD ORDER: 616-982-5577**

**When ordering by phone . . .
please provide the operator with
the six-digit code (821-XXX) that
appears near your name and address.**

**INTRODUCE YOUR
FRIENDS TO THE
FASCINATING WORLD
OF ELECTRONICS**

May we send your friends a free
HomeWorks by Heathkit[®]
Catalog? Simply fill in their names
and addresses
below and mail today.



Name _____

Street Address _____

Apt/Lot/Bldg _____

City _____ State _____ Zip _____

Name _____

Street Address _____

Apt/Lot/Bldg _____

City _____ State _____ Zip _____

Name _____

Street Address _____

Apt/Lot/Bldg _____

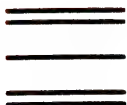
City _____ State _____ Zip _____

Dept. 760-821

PLEASE DETACH BEFORE MAILING

- Sign and enclose your check, or complete charge card information.
- Print your name, address and zip clearly.
- Print model numbers and product description clearly. Thank you for your order.

Be sure to:



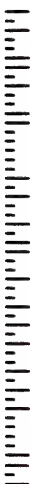
PLACE
STAMP
HERE

Name _____
Address _____
City & State _____
Zip _____

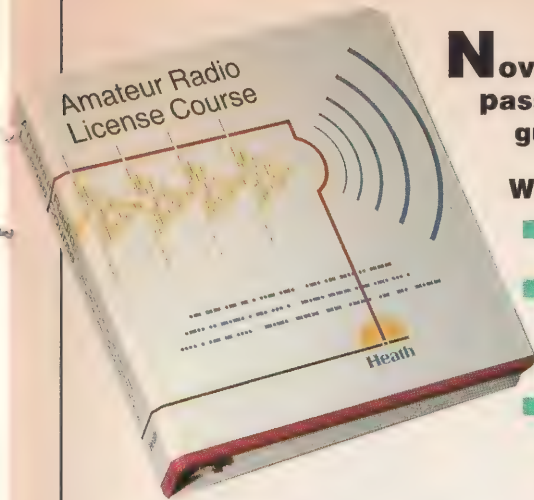
Heath Company

P.O. BOX 8589

BENTON HARBOR, MI 49022-8589



AMATEUR RADIO



Novice Ham Radio: pass your exams—guaranteed!

What you get:

- Comprehensive 500+ page text
- Complete FCC listing of actual questions and answers
- Audio cassette tape for international Morse code

What you'll need:

- CW Code Oscillator (this page)

The comprehensive study package gives you the latest information on how to apply to take the novice class license test. You'll learn everything you need to know, step-by-step. Practice exams help you review what you've learned. And a final exam prepares you for the novice class license test.

You'll also receive a cassette tape to help you learn international Morse code, frequency allocation chart, call area map and a 10% certificate good for up to \$10.00 off any Heathkit amateur radio product.

And you're guaranteed to succeed at the licensing test—or we'll refund your money.

HR-3701 (6 lbs.) **\$49.95**

SAVE! Order the HR-3701 Novice Ham Radio License course with the HD-1416-H CW Code Oscillator.

HRS-3701-1 (7 lbs.) **\$59.95**

General Class: enjoy greater operating privileges

What you get:

- Comprehensive 1000+ page text
- 4 sample tests to prepare you for the actual exam
- Earn 5.0 Continuing Education Units (CEUs)

Expand your amateur radio privileges: more frequencies to operate on, radio teletype, slow scan TV, facsimile and satellite activity.

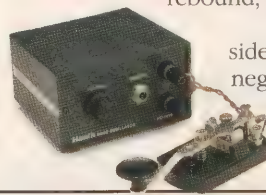
The General Class course takes you, step-by-step, through the information you need to pass either the technician or the general class exam. Extra code practice teaches from 0 to 15 words per minute (wpm), giving you a two-word edge on the 13 wpm requirement.

ERS-3702-C (26 lbs.) **\$64.95**

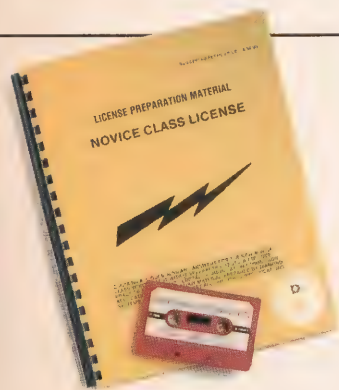


CW Code Oscillator: build up your Morse code speed

Increase your ability to receive and transmit Morse code (CW) easily and inexpensively with the CW Code Oscillator. This handy oscillator features a telegraph key with adjustable rebound, built-in speaker, headphone jack, volume and tone controls. It can even serve as a side tone oscillator for any transmitter using negative-grid block keying. Operates on one 9 volt transistor battery (not included).



Kit HD-1416-H (1 lb.) **\$24.95**



Get every question—and all the correct answers—in the FCC pool!

What you get:

- Booklet with all questions and answers
- Audio cassette practice tape for exams requiring a code element

These booklets not only give you all the questions with all the right answers for every element of each exam, they also show you the "wrong" or distractor multiple choice answers—so you can choose correctly every time.

Novice bookware HDP-1611 (1 lb.) **\$19.95**

Technician bookware HDP-1612-T (1 lb.) **\$19.95**

General bookware HDP-1612-G (1 lb.) **\$24.95**

Advanced bookware HDP-1613 (1 lb.) **\$19.95**

Extra bookware HDP-1614 (1 lb.) **\$24.95**

Use the power of your PC: study for your exams

What you get:

- FCC approved questions for all five exams on 5.25" and 3.5" diskettes

What you'll need:

- IBM PC compatible Heath or Zenith computer (see page 23)

This software is continually updated with the latest questions for all five exams. You get both a CW practice program and all multiple choice questions from the FCC pool used for actual exams.

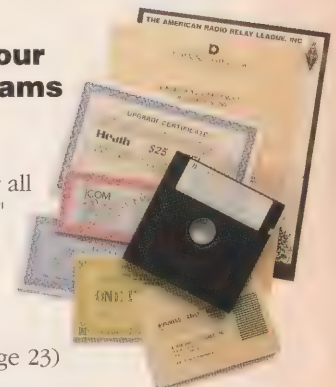
Novice software HDP-1601 (1 lb.) **\$39.95**

Technician software HDP-1602-T (1 lb.) **\$34.95**

General software HDP-1602-G (1 lb.) **\$34.95**

Advanced software HDP-1603 (1 lb.) **\$49.95**

Extra software HDP-1604 (1 lb.) **\$49.95**



MICROPROCESSORS COURSE

Gain command of the fundamentals

What you get:

- Comprehensive text including 150 pages of programming experiments and 110 of hardware interfacing experiments
- Earn 8.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3400-A trainer (page 19)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

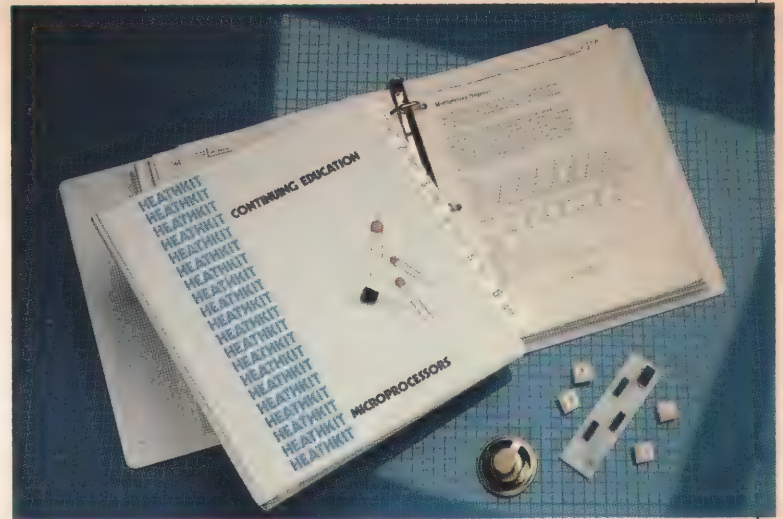
- Digital Techniques (page 12) or equivalent knowledge

Knowledge of microprocessor theory and operation is becoming essential in many fields.

Ready yourself for the future with this first of the Heathkit Microprocessor courses, designed to give you a solid foundation in the basics.

Learn by experience

You'll start by reviewing number systems and codes. From there you'll develop an understanding of computer arithmetic and programming. You'll build your knowledge of programming and hardware by performing fascinating lab experiments.



You'll find out how to interface microprocessors to RAM, ROM and various input/output devices such as Peripheral Interface Adaptors (PIA).

EE-3401-A (10 lbs.) **\$99.95**

SAVE! Order the EE-3401-A Microprocessors course with the ET-3400-A Microprocessor Trainer and save \$60.00.

EES-3401-A (17 lbs.) **\$319.90**

MICROPROCESSOR INTERFACING

Advance your knowledge of interfacing techniques

What you get:

- Two volume comprehensive illustrated course
- 10 hands-on experiments
- Earn 7.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3400-A trainer (page 19)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

- Microprocessors Course (this page) or equivalent knowledge

This second course of the series, will help you become adept with interfacing techniques and advanced microprocessors. You'll cover the 6800 family, including the powerful 6809, and continue on to the 68000 microprocessor. You'll delve into advanced PIA interfacing, analog conversion, serial data communications, memory devices and programmable timers.

In 10 experiments, you'll gain an understanding of display multiplexing, I/O control, handshaking and the PIA. You'll practice analog-to-digital conversions and ADC interfacing plus EPROM programming, ROM/EPROM interfacing and much more.

EE-3402 (11 lbs.) **\$99.95**



MICROPROCESSOR APPLICATIONS

Explore the microprocessor's many uses

What you get:

- Two-volume comprehensive illustrated course
- 10 hands-on experiments
- Earn 8.0 Continuing Education Units (CEUs)

What you'll need:

- ET-3400-A trainer (this page)
- Multimeter (page 24)
- Oscilloscope (page 26)

Course Requirements:

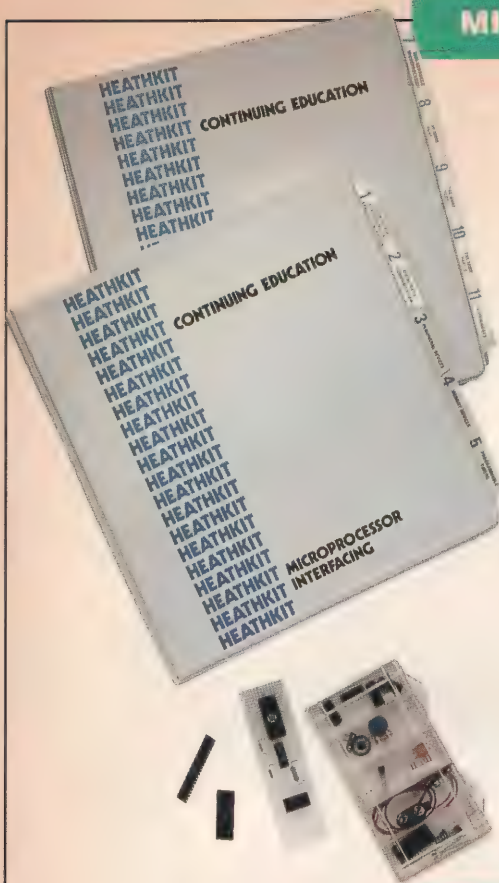
- Microprocessors (page 18) and Microprocessor Interfacing (page 18) or equivalent knowledge

Microprocessors have a seemingly endless range of applications in business, industry and the consumer market. This course will give you insight into the current applications, as well as the possibilities for the future.

Master advanced microprocessor principles

You'll study digital-to-analog and analog-to-digital converters, transducers, phase-locked loops and more. You'll construct several microprocessor controlled devices, including a microprocessor/stepper motor interface with a control circuit and a programmable digital frequency synthesizer. Through 10 experiments, you'll develop a solid understanding of the impact of microprocessors on the world of today—and tomorrow.

EE-3405 (10 lbs.) **\$99.95**



8-BIT MICROPROCESSOR TRAINER

Versatile trainer teaches the art and science of microprocessors

Use for the following courses:

- Microprocessors (page 18)
- Microprocessor Interfacing (page 18)
- Microprocessor Applications (this page)

This flexible, general purpose training unit—designed for the Heathkit Microprocessor course series—can be used anywhere you need a microprocessor-based software development system or as a design aid for developing special interface circuitry. It will give you hands-on experience with microprocessor operation, programming and applications. And you can build it yourself, quickly and easily, with our simple, step-by-step instructions. Or, if you prefer, you may order it assembled.

Compact yet powerful

The Microprocessor Trainer is built around the popular 6808 microprocessor unit and gives you 512 bytes of user-accessible RAM and a 1K monitor ROM. It features a solderless breadboard that lets you build prototype logic circuitry. And it has a 17-key hexadecimal-based keypad and six 7-segment LED display digits for easy data entry, data review and troubleshooting.

Requires 120 VAC, 50/60 Hz at 30 watts maximum power. 3½"H x 12⅛"W x 11¼"D.

Kit ET-3400-A (7 lbs.) **\$279.95**

Assembled ETW-3400-A (6 lbs.) **\$399.95**



**NEED HELP WITH ASSEMBLY? JUST CALL (616) 982-3980,
ANY WEEKDAY, 8:00 AM TO 4:30 PM, EASTERN TIME**

MICROCOMPUTER PROFESSOR PC INTRODUCTORY COURSE

How to choose—and use—your personal computer

What you get:

- Instructional text and quick reference guide
- 5.25" and 3.5" experiment disks
- Earn 2.0 Continuing Education Units (CEUs)

What you'll need:

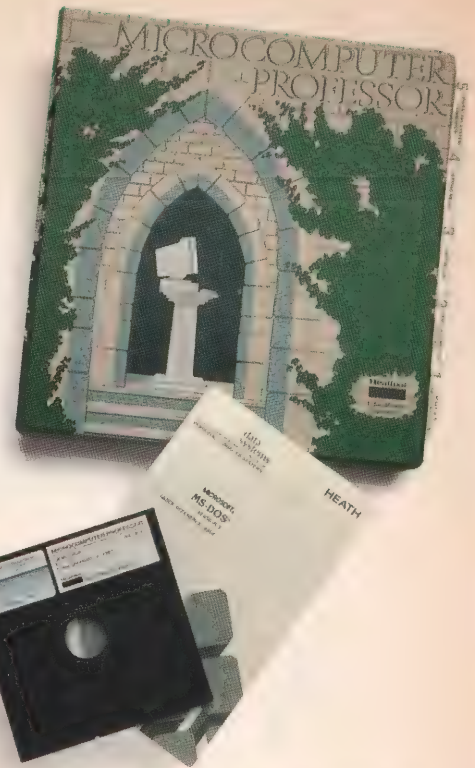
- Heath/Zenith, IBM or compatible PC using the MS-DOS operating system

How do you decide which system is right for you if you're new to computers? Simple, with this comprehensive course. You'll get help in determining precisely what your needs are and what kind of computer and peripherals will best fulfill them. You'll learn how to choose software as well as hardware. And you'll learn how to set up and connect the system—even how to decide on the best place to put it.

Valuable tips on making the most of your system

Once your system is set up, the Microcomputer Professor course will show you how to program and operate it. You'll also learn how to troubleshoot, should anything go wrong. The course includes orientation for single, dual and hard disk drives, plus 5.25" and 3.5" disks.

EC-1123 (5 lbs.) **\$34.95**



MS-DOS® COURSE

Get more out of your computer by learning its operating system

What you get:

- Comprehensive illustrated text
- 33 hands-on experiments
- 5.25" and 3.5" program disks
- Earn 4.0 Continuing Education Units (CEUs)

What you'll need:

- MS-DOS-based PC with a minimum 256K memory and two floppy disk drives

Before you can take advantage of all your computer can do for you, you must first understand the computer's disk operating system. This course will give you the inside scoop on MS-DOS, the most widely used operating system for PCs.

Configure your system, debug and more...

The course comes with 33 different experiments that lead you, step-by-step, into a deeper understanding of your computer's inner workings. You'll learn to recover from common disk errors, create and use subdirectories, and create and use batch files. You'll find out how to use the Edlin editor, and you'll develop an understanding of the uses of input/output redirection.

By the time you complete the course, you'll be ready to take your first step toward programming. EC-1121-A (6 lbs.) **\$69.95**

* MS-DOS is a registered trademark of Microsoft Corp.

'C' PROGRAMMING COURSE

Advance beyond BASIC

What you get:

- Comprehensive illustrated text
- 9 hands-on experiments
- Bonus! Ecosoft C Compiler and CED Editor software—a \$59.95 value—absolutely free with course
- Earn 3.0 Continuing Education Units (CEUs)



What you'll need:

- Heath/Zenith or IBM compatible PC with at least 384K RAM (a hard disk drive is recommended), PC or MS-DOS version 2.0 or higher and at least one 5.25" floppy disk drive. Does not operate with MS-DOS and PC-DOS 4.0 or higher.

Course Requirements:

- Basic knowledge of PC or MS-DOS commands and familiarity with at least one high-level programming language

Whether you want to advance your career, or simply get more from your computer, C is the language to learn. And with this carefully paced Heathkit course, you'll quickly and easily master the essentials.

C is quickly becoming the standard language of the computer industry—and with good reason. With the C Programming course, you'll learn how to gain complete control over your computer and write programs on one computer and transport them to another. You'll learn more capabilities than BASIC, PASCAL, FORTRAN or COBOL can give you. Yet C is easy for the less technically oriented programmer to grasp.

Get free software

Included is Ecosoft's C Compiler and CED Editor software. This \$59.95 value comes absolutely free with the C Programming course.
EC-1124 (3 lbs.) **\$99.95**

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS COURSE

Get the latest on smart machines

What you get:

- Two volume comprehensive illustrated course
- 13 hands-on experiments on two 5.25" disks
- Bonus! Two-disk demonstration of Texas Instruments' PC Easy Expert Systems program
- Earn 6.0 Continuing Education Units (CEUs)

What you'll need:

- Heath/Zenith or IBM compatible PC with one disk drive and 512K RAM

Course Requirements:

- Basic knowledge of computer operations in at least one programming language

Today artificially intelligent (AI) systems are being developed and used in a wide array of industries. And the future applications for AI are virtually limitless. As a result, AI literacy is becoming increasingly important for engineers, technical managers and programmers.

Learn development, design, applications, more

You'll learn what expert systems are and how they work. You'll learn the ten steps to creating an expert system, including the computation of return on investment. You'll gain a practical understanding of robotics, natural language processing, voice recognition and more plus an overview of AI programming and special AI hardware. Thirteen AI experiments will help you develop a solid practical understanding of this rapidly expanding technology.

EC-1126 (6 lbs.) **\$74.95**



COMPUTER GRAPHICS COURSE

Create your own graphics programs

What you get:

- Comprehensive illustrated text
- 5.25" experiment disk
- Earn 6.0 Continuing Education Units (CEUs)

What you'll need:

- Heath/Zenith PC or Advanced 100 series computer with color graphics card
- Microsoft BASIC or BASICA for IBM PC

Course Requirements:

- Knowledge of Microsoft Basic, understanding of simple algebra and familiarity with your PC's operating system.

Today's computer users are becoming more and more reliant on graphic representations of computer operations. Although many graphics programs are available for purchase, using them limits you to their parameters. With this exciting Heathkit course, however, you can give your imagination free rein as you create high-resolution graphics on your PC. you create high-resolution graphics on your PC.

Learn animation...merging text with graphics...more

You'll get a broad overview of computer graphics that will enable you to create your own unique programs. You'll learn

to draw lines using pixels, use advanced color graphic commands and merge text with graphics. You will also discover how to animate graphics.

You'll even find out how to photograph graphics on-screen using ordinary camera equipment.
EC-3000 (6 lbs.) **\$39.95**



CAD/CAM COURSE



Bring your career skills up-to-date

What you get:

- Comprehensive illustrated text
- Two 5.25" experiment disks
- Earn 6.0 Continuing Education Units (CEUs)

What you'll need:

- Heath/Zenith or IBM compatible PC with 256K RAM, two

5.25" disk drives and CGA or Hercules video capability (will not operate with EGA or VGA video)

Course Requirements:

- No prerequisites necessary

The days of the pencil, paper and T-square are behind us. Today's designs—from pop-up toasters to airplanes—are created graphically, using CAD (computer aided design). That same design is then translated into CAM (computer-aided manufacturing). This in-depth Heathkit course will give you the knowledge and competitive skills you need for the CAD/CAM age.

Learn real-world techniques and applications

Beginning with the fundamental concepts, you'll advance quickly to study numerically controlled machinery, data communications and robotics. You'll also learn about cost parameters, factory management and manufacturers' automated protocol. You'll work with user-friendly AutoCAD™ software on seven progressive experiments, that will help build your expertise. You'll learn to create and modify CAD drawings, zoom in for microscopic detail and zoom out for the macroscopic view. By the time you complete the course, you'll be ready to apply your new skills to real-world situations.

EES-109 (12 lbs.) **\$54.95**

HEATHKIT COMPUTER

Build your own upgradable computer

What you get:

- All components and chassis including a processor you simply plug in. (Choose the 286 or the faster, more powerful 386SX.)
- 286 processor can easily be upgraded later to 386SX!
- Comes complete with 1.4 MB floppy drive, 1 MB RAM, VGA video, five expansion slots and MS-DOS.
- 3 FREE software: Integrated 7+, Diagnostix and MS-Windows.

Get the computing power you need now—with the option to upgrade economically later. The Heath HS-5100 gives you a choice of the reliable, industry-standard 286 processor or the super-charged 386SX.

Nothing can match the satisfaction of knowing you've built your computer yourself. You don't even need any prior kit-building experience!

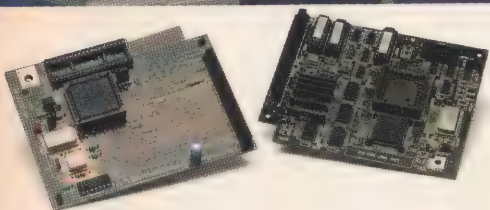
Tailor your computer to your exact specifications

The differences between 286- and 386SX-based computers are in their chips, not in the other system components. So upgrading is a simple matter of plugging in a new processor board. Customize your computer to your needs by adding memory, optional floppy and hard drives, co-processors and more!

HS-5100-A with 286 processor **Call for price!**

HS-5100-X with 386SX processor **Call for price!**

HA-63 386SX processor board for upgrading 286 model **Call for price!**



Specifications:

Microprocessor: 80286 or 80386SX
Clock speed: 12 MHz (286) or 16 MHz (386)
Memory: Standard: 1 MB Optional: 8 MB max.
EMS memory: yes
Floppy disk drive: 1.4 MB 3.5"
Expansion slots: 5

Video card: Built-in VGA
Standard ports: 1 parallel, 2 serial
Keyboard: 101 keys
Co-processor slot: yes
Clock/calendar: yes
Operating system: MS-DOS 4.0
Power Supply: 115/230 VAC, 50-60 Hz, 125 W
Dimensions: 6 1/4" H x 14" W x 15 1/2" D

COMPUTER VOICE CARD

Give your computer the power of speech

Now your computer can talk to you, sing to you and "communicate" with a host of unique sound effects you create yourself! It's easy to give your PC its own distinctive range of voices with this voice card synthesizer. Add vocal prompts to your files, or have your PC speak the contents of any ASCII or WordStar™ file.

Free software makes it incredibly easy... incredibly versatile

You get extensive software that makes this the most versatile synthesizer you can buy. Add a voice to modem communications, or for amateur radio applications add a voice to sent and received RTTY messages. Interface to DOS and high level languages. Speaker options can be enabled or disabled automatically to boot-up and/or as text is being spoken. Use with an IBM PC, Heath or Zenith Computer with minimum 256K.

Kit HV-2000 (2 lbs.) **\$89.95**



Specifications:

Inflection modes: Immediate and transitioned. No. of phonemes: 64.
Phoneme durations: 4. Speech rates: 16. Inflection levels: 4096.
Transitioned inflection rates: 8.
Music: 4 octaves. Level settings: 16.
Filter frequencies: 250+. Outputs: 4 Ohm speaker (500 mW.); 10K Ohm line

DIGITAL MULTIMETERS

Take frequency measurements up to 20 MHz with pocket-sized DMM

Slip this versatile DMM into your pocket and take it with you wherever the job happens to be. You'll enjoy the features of a full test bench packed into a single handheld unit.

This portable DMM gives you 0.5% basic accuracy and an amazing list of features: frequency measurements to 20 MHz (200 mV to 3.5 VAC) or to 2 MHz (35 mV to 3.5 VAC); resistance up to 2000 Megohms; capacitance, transistor hFE and LED tests. The SM-2372 even works as a logic probe up to 20 MHz. Test leads included.

Assembled SM-2372 (2 lbs.) **\$89.95**

Specifications:

VOLTS DC: Ranges (5) 200 mV-1000V. Accuracy: $\pm(0.5\% \text{ rdg} + 1 \text{ digit})$. VOLTS AC: Accuracy*: $\pm(1.0\% \text{ rdg} + 4 \text{ digits})$. AMPS DC: Ranges: (5) 200 μ A to 10A. Accuracy*: $\pm(1.0\% \text{ rdg} + 1 \text{ digit})$.

AMPS AC: Accuracy*: $\pm(1.2\% \text{ rdg} + 4 \text{ digits})$. RESISTANCE: Ranges (7) 200 Ω -2000 M Ω . Accuracy*: $\pm(.8\% + 2 \text{ dgt})$. CAPACITANCE: Ranges (5) 2000 pf-20 μ F. Accuracy: $\pm(3\% \text{ rdg} + 10 \text{ digits})$. FREQUENCY: Ranges (5): 2 kHz-20 MHz. Accuracy*: $\pm(1.0\% \text{ rdg} + 1 \text{ digit})$. GENERAL: Power: 9 volt alkaline battery included. Battery Life: 20-100 hours (alkaline battery).

* Accuracy specifications apply to most ranges.



Enjoy expanded features in an economical, compact unit

This handy DMM gives you the capabilities you'll need for lab, workbench or portable jobs. The 3 1/2 digit display gives you readings to 1999 and automatic polarity indications. Functions include resistance, capacitance, transistor DC gain and diode test. Current ranges—except for the 10A range—are fuse protected. Continuity function alerts to low resistance between the probes. Leads included. Assembled SM-2311 (1 lb.) **\$59.95**

Specifications:

VOLTS DC: Ranges (5) 200 mV-1000V. Accuracy: $\pm(0.5\% \text{ rdg} + 1 \text{ count})$. VOLTS AC: Ranges: (5) 200 mV-750V. Accuracy*: $\pm(1.0\% \text{ rdg} + 4 \text{ counts})$. AMPS DC: Ranges: (5) 200 μ A-10A. Accuracy*: $\pm(1.0\% \text{ rdg} + 1 \text{ count})$. AMPS AC: Accuracy*: $\pm(1.0\% \text{ rdg} + 1 \text{ count})$. CAPACITANCE: Ranges: (5) 2000 pF-20 μ F. Accuracy: $\pm(3\% + 10 \text{ counts})$. RESISTANCE: Ranges (6) 200 Ω -20 M Ω . Accuracy*: $\pm(.8\% \text{ rdg} + 1 \text{ count})$. GENERAL: Power: 9 volt battery included. Battery Life: 400 hours.

* Accuracy specifications apply to most ranges.

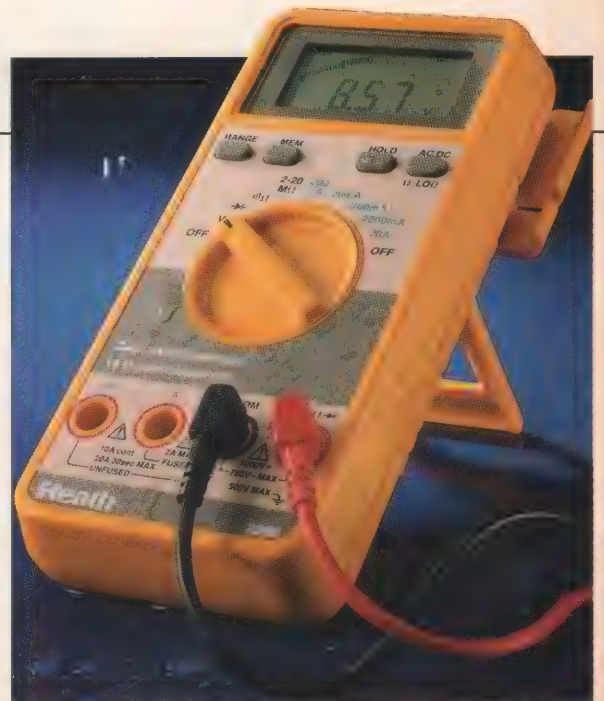
Get the autoranging DMM that performs under the toughest conditions

It's shock-resistant, water-resistant and housed in an industrial grade safety-yellow case. Our ruggedized autoranging DMM will give you years of reliable, trouble-free service. The LCD display features large, easy-to-read 3 1/2 digit numerals and a 40-segment analog bar graph for easy nulling and peaking. Display also shows polarity, overrange, display hold and measurement unit annunciators. This handy DMM measures AC and DC voltages, AC and DC current, resistance, continuity and diode test. Current ranges are fuse protected. Safety-enhanced test probes included.

Assembled SM-2380 (2 lbs.) **\$89.95**

Specifications: VOLTS DC: Ranges (5) 200 mV-1000 V. Accuracy: $\pm(0.5\% \text{ rdg} + 1 \text{ digit})$. VOLTS AC: Accuracy: $\pm(1.25\% \text{ rdg} + 5 \text{ digits})$. AMPS DC: Ranges: (5) 200 μ A to 20A. Accuracy*: $\pm(0.75\% \text{ rdg} + 1 \text{ digit})$. AMPS AC: Accuracy*: (40 Hz to 500 Hz) $\pm(1.25\% \text{ rdg} + 5 \text{ digits})$. RESISTANCE/CONTINUITY: Ranges (6) 200 Ω -20 M Ω . Accuracy*: $\pm(0.75\% \text{ rdg} + 1 \text{ digit})$. DIODE CHECK: Ranges: (3) 0-200 mVDC, 0-2.0 VDC, 0-3.0 VDC. Accuracy: $\pm(1.5\% \text{ rdg} + 5 \text{ digits})$. GENERAL: Power: 9 volt battery included. Battery Life: 500 hours.

* Accuracy specifications apply to most ranges.



FUNCTION AND PULSE GENERATOR

Enjoy versatility in a compact design

This general purpose signal source is the right choice for a broad range of service, design, hobby and research applications. Outputs include sine, square, triangle, pulse and ramp signals. Frequency range extends from 0.02 Hz to 2 MHz in seven push button ranges. Other features include variable and fixed attenuators, duty cycle control, variable DC offset control, signal inversion, internal and external sweep and TTL pulse outputs. Assembled SG-1274 (6 lbs.) **\$199.95**

Specifications:

Waveform: Sine, Square, Triangle, Pulse. Frequency: 0.02 Hz-2 MHz in 7 ranges. Scale Error: $\pm 5\%$ of full scale. Output Impedance: 50 ohms. Output: 5mV to 20v P-P continuously variable into an open circuit. Attenuator: 0 dB-20 dB. DC Level: 0 or pull switch for +10V to -10V (open) variable. Duty Cycle: 50% or pull switch for 20%-80% variable. Total Harmonic Distortion: $<1\%$ from 10 Hz to 200 kHz (sine wave). Square Wave Rise/Fall Time: <100 ns. Pulse: $>3V$ P-P (open). Rise/Fall Time <25 ns. Sink: 20 TTL. Internal Frequency Sweep (variable): Frequency to 100: 1 min. Rate: 0.5 Hz (2 sec. period) to 50 Hz (20 ms period). Width: From 1:1 to 100:1. External VCF: ± 10 VDC into 10 K Ω . Power: 100/120/220/240 VAC ($\pm 10\%$), 50/60 Hz. Dimensions: 2 $\frac{1}{2}$ " H x 9 $\frac{1}{2}$ " W x 7 $\frac{1}{2}$ " D.



DIGITAL CLAMP-ON METER

Count on a professional for your heavy-duty applications

This compact, handheld AC current meter, with 1000-amp capability, is the ideal measurement tool for the electrician or service technician. Test lead inputs for AC/DC voltage, resistance and continuity measurements cover all areas of electrical testing and service.

Digital accuracy, rugged construction and a protective hard carrying case with shoulder strap and belt loop make this the right tool for heavy-duty applications. Includes leads. Assembled SM-2374 (2 lbs.) **\$79.95**

Specifications:

DC VOLTAGE: Range: 1000V. Resolution: 1V. Accuracy: $\pm(0.5\% \text{ rdg} + 1 \text{ count})$. AC VOLTAGE: Range: 750V. Resolution: 1V. Accuracy: $\pm(0.5\% \text{ rdg} + 1 \text{ count})$. AC CURRENT: Range: 200A, 1000A. Resolution: 100 mA, 1A. RESISTANCE: Range: 200 Ω , 20K Ω . Resolution: 0.1 Ω , 10 Ω . CONTINUITY: Range: 200 Ω . GENERAL: Power: 9V battery. Dimensions: 1 $\frac{1}{2}$ " H x 2 $\frac{1}{2}$ " W x 9" L.



25 OR 40 MHz DELUXE OSCILLOSCOPES

Get features galore at a great price

When it comes to value, these ergonomically designed oscilloscopes can't be beat. They give accurate measurements, and include a host of time-saving features. Simply put, you just can't buy a better instrument for the money. Virtually identical in most respects, choose the SO-4552 25 MHz oscilloscope or the SO-4554 40 MHz oscilloscope according to your particular needs.

Extra sensitivity...extra capabilities

Both oscilloscopes give you 1 millivolt-per-division sensitivity that lets you measure signals too small for 5 millivolt instruments. The 10X horizontal magnifier lets you expand signals twice as much as ordinary 5X magnifiers. TV horizontal and vertical triggers let you look at TV waveforms that would confuse less sophisticated trigger circuits. And the trigger holdoff function lets you achieve stable triggering on repetitive pulse trains. You can use the A+B mode with B inverted to make differential measurements without ground reference, and the XY mode for Lissajou patterns.

Features that make these scopes a pleasure to use

These instruments operate on 90-264 VAC, 50/60 Hz. Each has a built-in component tester for in-and-out-of-circuit current vs. voltage testing. And a beam finder saves you time by forcing off-screen traces back on screen. The variable graticule illumination makes for easy observation of signals under low light conditions and is essential if you expect to record your measurements with an oscilloscope camera.

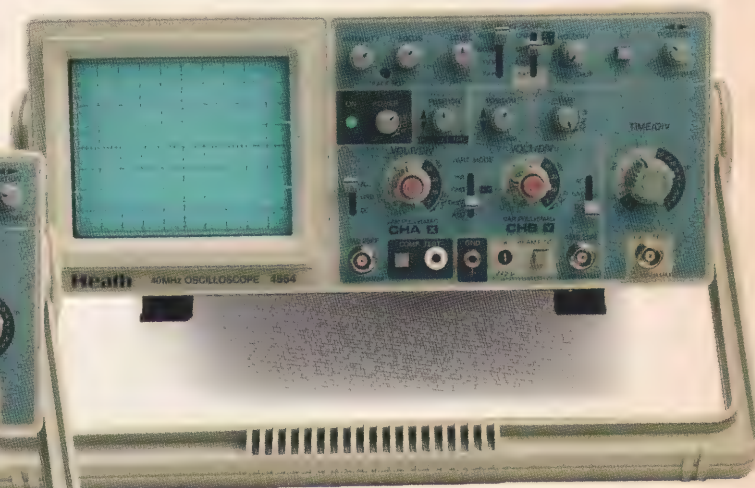
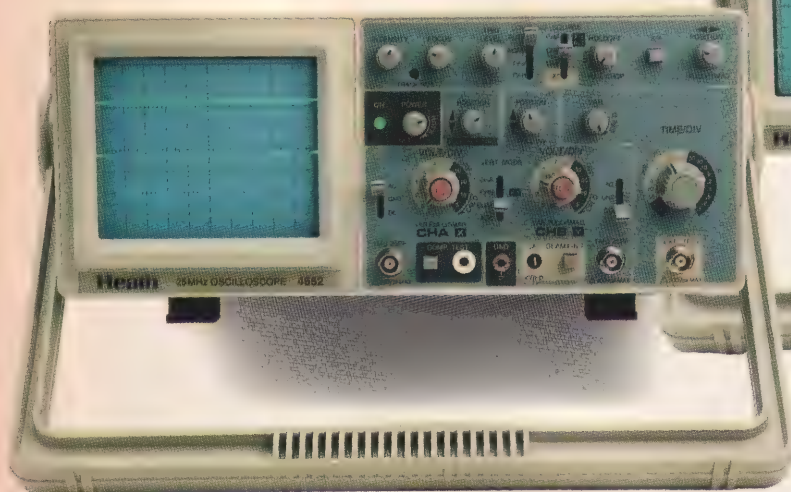
The handle adjusts so that you can tilt the scope at a convenient angle. And a built-in calibrator lets you check instrument accuracy and adjust the compensation of your probes. The SO-4554 even features a 9KV accelerating potential for bright traces at higher sweep speeds.

25 MHz Oscilloscope
Assembled SO-4552 (22 lbs.) **\$399.95**

40 MHz Oscilloscope
Assembled SO-4554 (22 lbs.) **\$579.95**

Specifications:

VERTICAL: Ranges: 5 mV to 5 V/DIV; in 1-2-5 with variable. Magnification: X5. Accuracy (1 kHz): $\pm 3\%$, $\pm 5\%$ for X5 gain. SO-4552 Bandwidth: DC to 25 MHz, DC to 10 MHz on 1 mV/DIV. Rise Time: 18 ns. SO-4554: Bandwidth: DC to 40 MHz, DC to 15 MHz on 1 mV/DIV. Rise Time: 9 ns. Overshoot: 5%. Maximum Input: 400 V. Operating Modes: CHA, CHB, DUAL (ALT or CHOP), and ADD. **HORIZONTAL:** Sweep: .2s to .1 μ s/DIV; in 1-2-5 with variable. Magnification: X10. Accuracy: $\pm 3\%$ for X1, $\pm 6\%$ for X10. **X-Y:** Sensitivity: Same as CHA and CHB. Frequency Response: DC to 1 MHz. **TRIGGER:** Source: CHA, CHB, LINE and EXT. Coupling: AUTO, NORM, TV-V, TV-H. Slope: "+"; pull TRIG LEVEL for "-". External Input: Impedance: 1 M Ω , 30 pF. Maximum Input 300 V. **GENERAL:** Power: 90-132 VAC or 198-264 VAC, 50/60 Hz, 40W. Dimensions: 5 $\frac{1}{4}$ " H x 12 $\frac{3}{4}$ " W x 17 $\frac{1}{4}$ " D. Weight: 17.2 lbs.

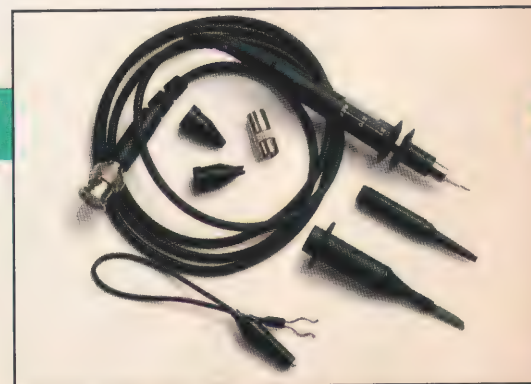


150 MHz PROBE

Enjoy premium performance without the premium price

This feature-packed P150 probe with switchable 10:1 and 1:1 ratios delivers everything you want at an economical price. Advanced design delivers quick pulse response and faster risetime—less than 1.5 ns.

Assembled P-150 (1 lb.) **\$37.95** Assembled PS-150 set of two (2 lbs.) **\$69.95**



Advance from the theoretical to the practical

Take pride in putting together your own electronic devices and see technology in action! Get hands-on experience as you find out how electronic equipment really works. These projects are fun, educational and exciting to build and use. Our detailed step-by-step manuals make them a snap to put together with

just a few simple tools (see our low-cost tool kit on the order form) even if you've had no previous electronics experience. And most can be built in less than an hour. They're not just for adults, either. Use them to introduce your kids to science and technology.



Electronic Dragonfly: watch it flap its wings with no visible mechanism!

Entertain your friends with this interesting little bug. The Heathkit Dragonfly looks like it's really flying with paper-thin wings that move without any visible mechanism. How does this happen? The wings are made of an amazing high-tech material called piezoelectric film that actually changes shape and size when voltage is applied. Learn how piezoelectric material, bimorphs and voltage work together to make your Dragonfly operate. Requires a standard 1.5 volt AA battery (not included).
Kit SK-118 (1 lb.) **\$21.95**

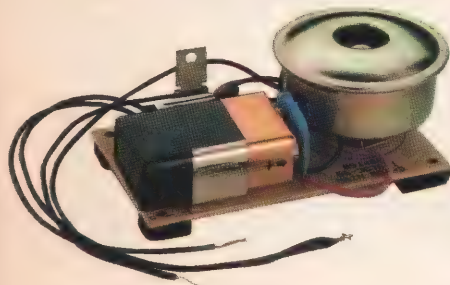
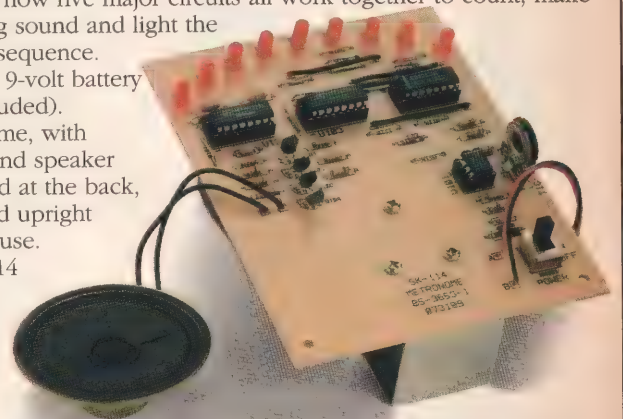
Metronome: keep perfect tempo!

Here's a terrific project for the musically inclined: a build-it-yourself metronome! A curved string of nine LEDs flash back and forth from one end to the other. Set the clicking sound anywhere from 40 to 240 beats per minute and you'll keep perfect time.

As with all Heathkit science projects, you learn about electronics. Find out how five major circuits all work together to count, make a clicking sound and light the LEDs in sequence.

Requires 9-volt battery (not included). Metronome, with battery and speaker contained at the back, will stand upright for easy use.

Kit SK-114 (1 lb.) **\$19.95**



Burglar alarm: keep your belongings safe and secure

This mini-alert system will protect your room or treehouse. Your Heathkit manual shows you how to set up the system in any location as well as how to hook-up an alarm buzzer externally. Its loud squeal sends intruders running.

You not only get a very useful device, you learn exactly how a burglar alarm works—and why silicon-controlled rectifiers are so important. Requires 9-volt battery (not included).
Kit SK-115 (1 lb.) **\$14.95**

Infrared Motion Sensor: sounds alarm automatically when visitors are near

It's an automatic doorbell—or an alarm that tells you intruders are near your room, fort or treehouse. The infrared motion sensor detects movement and body heat, triggering a beeper and an LED to let you know someone is near.

As you build it, you'll learn how infrared detection works, what a Fresnel lens is and how it catches and directs light. You'll also learn how pyroelectric sensors

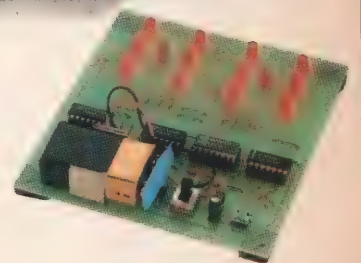


operate as optical devices that detect changes in infrared energy. Requires 9-volt battery (not included).
Kit SK-116 (1 lb.) **\$24.95**

Electronic Dice: "roll" a winning combination—the electronic way!

Learn about integrated circuits, LEDs, counters, clock circuits and more while you play your favorite dice and board games.

Simply push a button and the LEDs light, producing a random combination of the eleven possible patterns. Great fun. Requires 9-volt battery (not included).
Kit SK-117 (1 lb.) **\$19.95**



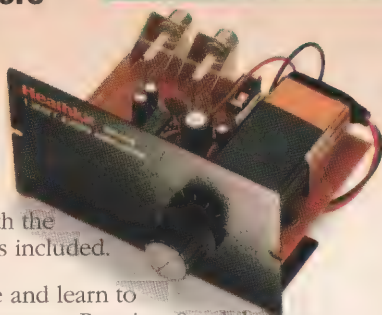
HEATH EDUCATIONAL KITS

Audio Amplifier: get more sound from your radio, cassette player or TV

Crank up the volume on your walkman, TV or radio with this fun and easy-to-use amplifier. Hookup is a snap with the phono input and output sockets included.

Increase your listening pleasure and learn to change gain and frequency responses. Requires 9-volt battery (not included) or battery eliminator (sold at right).
Kit SK-104-H (1 lb.) **\$19.95**

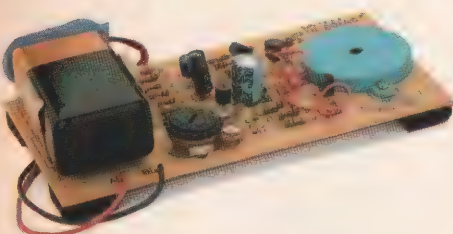
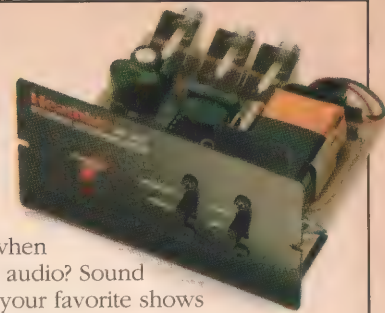
Complete your audio amplifier or stereo synthesizer with an attractive black cabinet (not shown).
Assembled SK-99 (1 lb.) **\$6.95**



Stereo Synthesizer: convert TV's mono sound into dual-channel "stereo" excitement!

Why be content with the ordinary mono sound of your TV's speaker when you can get dual-channel enhanced audio? Sound becomes clearer and sharper, gives your favorite shows and characters a more life-like presence.

And while you put together your project, you'll be learning all about low pass, high pass and band pass filters. Requires 9-volt battery (not included) or the battery eliminator.
Kit SK-107 (1 lb.) **\$19.95**
Accessory: Battery Eliminator, Assembled PS-2350 (1 lb.) **\$7.95**



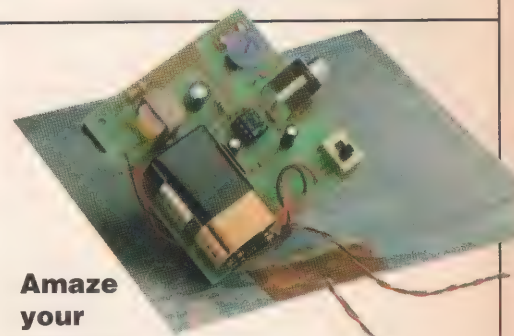
Electronic Cricket: turn lights off, it chirps. Turn lights on—it stops!

By Jiminy, this cricket acts just like the real thing. But why does it only chirp in the dark?

Friends and family will enjoy playing hide-and-seek with your new electronic pet while you all learn how a light-dependent resistor works. Also learn about piezoelectric devices that vibrate to create sound. Great fun! Requires 9-volt battery (not included).
Kit SK-113 (1 lb.) **\$12.95**

DC Power Supply: build yourself a handy source

This bench-type power supply is perfect for your car radio, CB, tape player or hobby kits. And more power to you for building it yourself! It has a variable output from 9 to 14 volts and supplies up to 3 amps of current. Comes with simple step-by-step instructions.
Kit SK-101 (5 lbs.) **\$49.95**



Amaze your friends with the Magical Film Speaker

Use the Magical Film Speaker to liven parties, entertain friends, perform exciting experiments. Piezoelectric film is the key. Simply plug the Magical Film Speaker into your radio, tape the film to a mirror, Mylar balloon or a picture on the wall and listen as the film reproduces sound. Learn how to increase and decrease sound by bending the film, see how it reacts to light and more!
Requires a 9-volt battery (not included).
Kit SK-120 (1 lb.) **\$21.95**



Speaker Phone: enjoy hands-free phone conversations

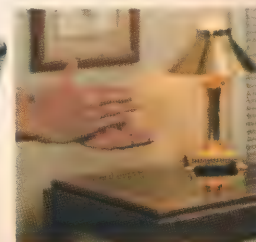
This easy-to-build speaker phone lets you talk all you want—without interrupting your other activities. Gather the whole family around the speaker—everyone can join in the conversation. And you'll have the satisfaction of knowing you built it yourself.

Connects to any standard modular phone jack and includes volume, privacy and answer controls. You'll wonder how you ever did without it.
SK-110 (2 lbs.) **\$44.95**

Sound Activated Switch: clap to turn lights, TV and more on or off!

Learn about flip-flop circuits as you build this useful sound switch. Clap once, the switch turns on whatever lamp or appliance you've attached it to. Clap again and turn it off. Uses 120 VAC.

Kit SK-111 (1 lb.) **\$21.95**



CALL TOLL-FREE 24 HOURS A DAY 1-800-253-0570

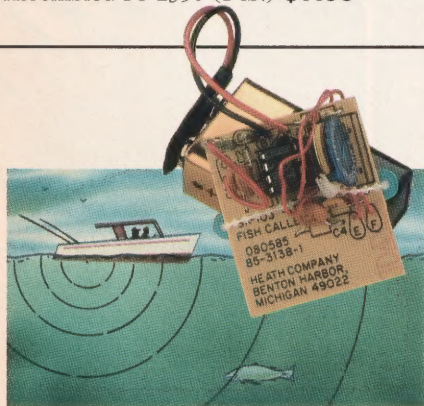
HEATH EDUCATIONAL KITS



Portable Radio: make your first kit-building experience a great one!

This portable AM radio kit couldn't be simpler to build—or more practical to own. Gets great reception with its high-gain antenna. And its 2" dynamic speaker ensures crisp, clear sound. Uses one 9-volt battery (not included). Or you can forget about batteries forever by hooking it up to our battery eliminator.

Kit GR-1009 (2 lbs.) **\$29.95**
 Accessory: Battery Eliminator
 Assembled PS-2350 (1 lb.) **\$7.95**



Fish Caller: watch hungry fish flock to your boat or dock

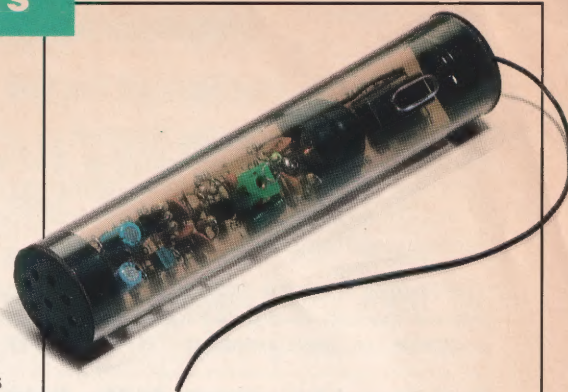
This simple-to-build fish caller works so well, you'll be the envy of the watering hole. The sound travels through the water and convinces fish they'll find a meal nearby. They fall for it—hook, line and sinker.

While you're building this little wonder, designed to help you catch your dinner, you'll be learning all about the 555 IC timer. Requires 9-volt battery (not included).
 Kit SK-105-H (1 lb.) **\$8.95**

Sound Flasher: intrigue your friends—but keep the secret to yourself

Hook up the sound flasher and watch what happens. Lamps and other lights brighten and dim depending on the amount of sound in the room. The sound flasher responds to music, voices and other noises and shows you how pulses control lamp brightness. It's terrific fun. And you can easily build it yourself—in a flash.

Kit SK-109 (1 lb.)
\$21.95



Wireless Microphone: try your hand at being a "DJ"

Learn FM radio theory as you transmit your voice to any radio up to 50 feet away. Create your own radio shows and entertain your friends. Fun and easy to build. And you'll get hours of pleasure using it!

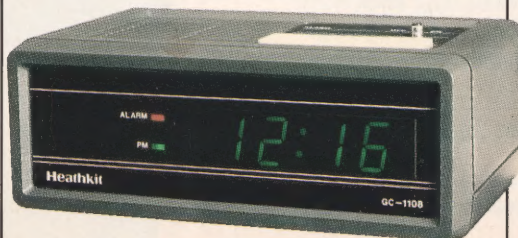
Uses two watch batteries (included).
 Kit SK-106-H (1 lb.) **\$14.95**

Digital Clock: get started in kit building

Build yourself a dependable, digital clock. It's as simple as it is fun with this great beginner's kit. Step-by-step instructions guide you from start to completion. And when you're finished, you'll have a feature-packed clock that displays the date and time in large format and adjusts its brightness automatically according to surrounding light.

Built-in battery back-up keeps it running even in a power failure. Snooze alarm sounds at nine-minute intervals. Handsome cabinet measures 2⁷/₈"H x 7¹/₈"W x 4³/₈"D. Battery not included.

Kit GC-1108 (4 lbs.) **\$29.95**



Intercom: build your own home communication system

Our build-it-yourself intercom is as practical and educational as it is fun. Talk to family members in another room. Or call someone to dinner without shouting. At least two intercoms must be used. Link up to four units with two-conductor wires. Energy-saving features allow units to run up to four months on just one 9-volt battery. Or get the battery eliminator and you'll always have power when you need it.
 Kit SK-108 (2 lbs.) **\$21.95**



CLASSROOM VERSIONS OF HEATHKIT COURSES

Especially configured for the classroom

Heathkit's Individual Learning Programs are always at the leading edge of technology, training students in the latest advances. That's just one of the many reasons educators and school administrators worldwide have relied on Heathkit's hardware and texts for more than a decade.

The courses cover the same material as the home study versions, but are specially configured for use in college, technical and corporate training classes.

Developed by experts in the field

Heathkit Educational Systems is a division of Heath Company, recognized worldwide as a leader in electronics and related hardware.

Heathkit courses are created by the same experts who are responsible for some of today's most important technological advances. And Heathkit trainers are not only the highest quality—designed to take the tough treatment of classroom duty—they are also among the most economical available today.

Tested under actual conditions

Before a Heathkit course is offered, it is routinely beta-tested. The prototype hardware and text materials are used by actual students, who help us determine what works—and what doesn't. The courses are then fine-tuned before being offered to you. In short, user-defined, so you can be certain of their effectiveness and reliability.

Texts provide continuous reinforcement

Student texts and workbooks are written in a clear style that's simple to follow. Concepts are reviewed and reinforced so the student retains more information. Student workbooks further enhance understanding with hands-on experiments that are fun, exciting and enlightening.

Instructor's Guides: most of your preparation is already done for you

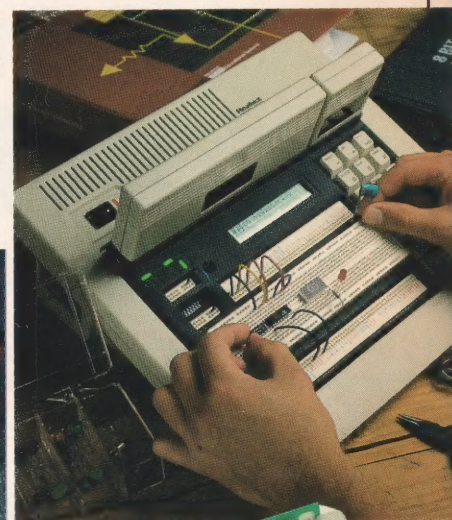
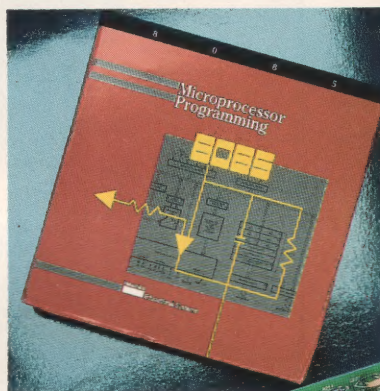
Your job as an educator is a great deal easier when you rely on Heathkit courses. Each course is completely mapped out for you in the Instructor's Guide. And the format has been proven successful, again and again. You get complete lesson plans, exam questions and answers, which means you can concentrate more on teaching and less on preparation.

One-on-one counseling and technical support

Our in-field representatives are exceptionally knowledgeable about the school market. If you need help selecting equipment and texts, they can offer the guidance you need, even arrange on-site training sessions and workshops to familiarize you with hardware and text materials.

No matter what your question, help is just a phone call away.

For the name of the representative in your area, please call (616) 982-3281, 8:00 am to 4:30 pm, Eastern time.



CLASSROOM COURSEWARE

	Course	Text Ship wt 2 lbs.*	Price	Workbook Ship wt 2 lbs.*	Price	Instructor's Guide Ship wt 1 lb.**	Price	Assembled Trainer wt 6 lbs.*	Price	Parts Ship wt 1 lb.*	Price	Video Cassettes Ship wt 2lbs.**	Price	
Introductory	Concepts of Electronics	EB-6140 (3 lbs.)	24.95	EB-6140-40 (1 lb.)	12.95	EB-6140-50	10.95	ETW-3600	199.95	EB-6140-30	29.95	NOT USED		
	Concepts of Electricity	EB-3100	21.95	EB-3100-40	12.95	EB-3100-50	10.95	ETW-3600	199.95	EB-3100-30	34.95	NOT USED		
Basic Electronics	DC Electronics	EB-6101-A	21.95	EB-6101-41 (1 lb.)	12.95	EB-6101-51	10.95	ETW-3600	199.95	EB-6101-31 (2 lbs.)	24.95	EV-3101-A	39.95	
	AC Electronics	EB-6102-A (3 lbs.)	21.95	EB-6102-41	12.95	EB-6102-51 (2 lbs.)	10.95	ETW-3600	199.95	EB-6102-31	19.95	EV-3102-A	39.95	
	Semiconductor Devices	EB-6103-A (3 lbs.)	21.95	EB-6103-41	12.95	EB-6103-51	10.95	ETW-3600	199.95	EB-6103-31	19.95	EV-3103-A	39.95	
	Electronic Circuits	EB-6104-A	21.95	EB-6104-41	12.95	EB-6104-51	10.95	ETW-3600	199.95	EB-6104-31	34.95	EV-3104-A	39.95	
	Electronic Fundamentals	EB-200	39.95	EB-200-40	21.95	EB-200-50	11.95	ETW-3600	199.95	EB-200-30	59.95	NOT USED		
	Test Instruments	EB-6105 (4 lbs.)	21.95	EB-6105-40	12.95	EB-6105-50	10.95	ETW-3600	199.95	EB-6105-30	29.95	NOT USED		
	Electronic Communications	EB-6106	21.95	EB-6106-40 (1 lb.)	12.95	EB-6106-50	10.95	ETW-3600	199.95	EB-6106-30	34.95	NOT USED		
	Digital Techniques	EB-6201-A (3 lbs.)	24.95	EB-6201-41	12.95	EB-6201-51	10.95	ETW-3700	199.95	EB-6201-31	34.95	NOT USED		
	Digital Techniques Additional Exper.	NOT USED			EB-6201-71 (1 lb.)	12.95	EB-6201-52	10.95	ETW-3700	199.95	NOT USED		NOT USED	
	Data Communications and Networks	EB-8090 (5 lbs.)	24.95	EB-8090-40 (1 lb.)	12.95	EB-8090-50	10.95	ETW-1000 (13 lbs.)	299.95	EB-8090-30	19.95	NOT USED		
Advanced Electronics	Operational Amplifiers	EB-601	21.95	EXPERIMENTS IN TEXT		EB-601-50	10.95	ETB-3300	99.95	EB-601-30	24.95	NOT USED		
	Optoelectronics	EB-605	21.95	EB-605-40 (1 lb.)	12.95	EB-605-50	10.95	ETB-3300	99.95	EB-605-30	29.95	NOT USED		
	Laser Technology	EB-610	21.95	EB-610-40 (1 lb.)	12.95	EB-610-50	10.95	EWS-4200-A (5 lbs.)	395.00	EB-610-30 (3 lbs.)	39.95	NOT USED		
	Electro-optics	EB-611	21.95	EB-611-40 (1 lb.)	12.95	EB-611-50	10.95	ETB-3300	99.95	EB-611-30 (2 lbs.)	79.95	NOT USED		
	Linear IC Electronics	EB-615 (3 lbs.)	21.95	EB-615-40 (3 lbs.)	12.95	EB-615-50	10.95	ETW-3600	199.95	EB-615-30 (2 lbs.)	39.95	NOT USED		
SMT	Surface Mount Technology	EB-3135	24.95	EB-3135-40	12.95	EB-3135-50	10.95	NOT USED		EB-3135-30	69.95	NOT USED		
Microprocessor Technology	Microprocessors	EB-6401-A (4 lbs.)	24.95	EB-6401-41 (1 lb.)	12.95	EB-6401-51	10.95	ETW-3400-A	399.95	EB-6401-31	64.95	NOT USED		
	Microprocessor Interfacing	EB-6402 (5 lbs.)	24.95	EB-6402-40 (1 lb.)	12.95	EB-6402-50	10.95	ETW-3400-A	399.95	EB-6402-30	64.95	NOT USED		
	Microprocessor Applications	EB-6405 (3 lbs.)	24.95	EB-6405-40	12.95	EB-6405-50	10.95	ETW-3400-A	399.95	EB-6405-30 (2 lbs.)	54.95	NOT USED		
	8-Bit Microprocessor Programming	EB-6810	24.95	EB-6810-40	12.95	EB-6810-50	10.95	EWS-6811	695.00	EB-6810-30	29.95	NOT USED		
	8-Bit Interfacing Applications	EB-6820	24.95	EB-6820-40	12.95	EB-6820-50	10.95	EWS-6811	695.00	EB-6820-30	74.95	NOT USED		
	8085 Microprocessor Programming	EB-8085	24.95	EB-8085-40	12.95	EB-8085-50	10.95	EWS-8085	695.00	EB-8085-30	49.95	NOT USED		
	8085 Microprocessor Interfacing and Applications	EBI-8085	24.95	EBI-8085-40	12.95	EBI-8085-50	10.95	EWS-8085	695.00	EBI-8085-30	99.95	NOT USED		
	Advanced 16-bit Microprocessors	EB-8088 (4 lbs.)	24.95	EB-8088-40	12.95	EB-8088-50	10.95	ETW-100 (33 lbs.)	799.00	EB-8088-30	59.95	NOT USED		
Computer Servicing	Computer Fundamentals	EB-2001 (3 lbs.)	21.95	EB-2001-40	12.95	EB-2001-50	10.95	ETW-100 (33 lbs.)	799.00	EB-2001-30	39.95	NOT USED		
	Computer Peripherals	EB-2002	21.95	EB-2002-40 (1 lb.)	12.95	EB-2002-50	10.95	ETW-100 (33 lbs.)	799.00	EB-2002-30	39.95	NOT USED		
	Computer Maintenance	EB-2003	21.95	EB-2003-40 (1 lb.)	12.95	EB-2003-50	10.95	ETW-100 (33 lbs.)	799.00	EB-2003-30	29.95	NOT USED		
Microcomputer Servicing	Microcomputer Servicing Textbook	EB-150	24.95	EB-150-40	12.95	NOT USED		**EWS-150	4500.00	NOT USED		NOT USED		
CAD	AutoCAD	EB-609 (6 lbs.)	39.95	NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		
Applied Physics	Mechanisms: Fundamentals of Mechanical Devices	EW-4300	24.95	EW-4300-40	17.95	EW-4300-50	10.95	ET-4400	649.00	NOT USED		NOT USED		
Telecommunications	Telephone Systems	EB-5010	24.95	EB-5010-40	12.95	EB-5010-50	11.95	EWS-5000 (14 lbs.)	699.90	ETB-5010 Exper. Modules	449.95	NOT USED		
	Comm. Systems	EB-5020	24.95	EB-5020-40	12.95	EB-5020-50	11.95	EWS-5000 (14 lbs.)	699.90	ETB-5020 Exper. Module	249.95	NOT USED		

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