Heathkit®

CHRISTMAS 1976

Say "Merry Christmas" with a kit gift from Heath

NEW Low-Priced "Keyboard Kombo" Musical Instrument. See page 103.

NEW Digital Programmable Color TV System. See pages 7-9.

NEW "Super Hi-Fi" Digital Readout Stereo Receiver. See pages 26-27.

NEW Synthesized 2-Meter Transceiver. See page 74.

NEW 2-and-4-channel Amplifiers plus a Matching Stereo FM Tuner. See page 36.

NEW 4-In-1 Electronic TV Game. See pages 3 and 13.

NEW Automatic Scanning Monitors. See page 101.

PLUS: Super CB Specials: Price Cuts on Color TV and Stereo: 104 pages of special buys and bargains!

Simulated TV Picture

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See Index on page 3.

HEATHKIT GIFT CERTIFICATES

See page 51 for details

MAIL ORDER CATALOG 813

New Heathkit electronic digital "Super-Clock"

An electronic digital floor clock with full 3¼" high numerals in a modern, functional etagere cabinet

$139.95

- ***Automatic dimming circuit adjusts to room light for a charming and pleasant glow***
- ***Hour and minute read-out can be seen from anywhere in the room***
- ***Electronic Westminster Chimes build in easily for an authentic, rich "Big Ben" sound***

Add elegance with a "space-age" touch anywhere in your home! The GC-1195 "super-clock" is housed in a stylish cabinet with four smoked glass shelves for plants, books or knick-knacks — and the cabinet is finished in handsome simulated walnut-veneer laminate with anodized aluminum corner pieces.

The 3¼" high clock digits glow brightly enough to be read even in daylight, and an automatic dimming feature adjusts them to diminishing room light for a charming, subtle display in dim or darkened rooms.

The clock displays hours and minutes, with the center colon pulsing each second. A special power failure indicator circuit pulses the display brightness to show that power has been interrupted and clock must be reset. Easy time setting is accomplished by readily accessible, easy-to-use fast and slow time advance switches located on the bottom of the clock chassis.

The GC-1195 is a handsome addition to most any decor, and a great conversation piece. For even more charm and "Old World" distinction, add our electronic clock chimes accessory (described below).

Kit GC-1195, Shpg. wt. 65 lbs. **139.95**

GC-1195 SPECIFICATIONS

Display: 3¼" diffused incandescent readout. **Format:** 3½-digit (12-hour) time readout. **Power requirement:** 108-132 VAC, 50/60 Hz, 30 watts. 216-264 VAC, 50/60 Hz, 30 watts. **Dimensions:** 14" W x 9½" D x 60½" H. **Net Weight:** 48½ lbs.

Westminster Chimes Accessory

$69.95 ***Authentic "Big Ben" chimes sound***

Builds into the GC-1195 or GC-1197 to provide rich, electronically synthesized "Big Ben" chimes: 4 notes on the ¼-hour, 8 notes on the ½-hour; 12 notes on the ¾ hour and the full 16-note passage and hour annunciation on the hour. And you can even turn on a reassuring electronic "tick-tock". Has volume and pitch adjustment, sound-decay control, "tick-tock" volume control, built-in speaker.

Kit GCA-1195-1, Shpg. wt. 3 lbs. **69.95**

Digital Electronic Shelf "Super Clock"

$89.95 ***Has the same great features as our Digital Floor Clock in a handsome Shelf Clock Case***

Uses the same electronics and display as the GC-1195 floor clock, but is housed in a good-looking walnut-veneer cabinet suitable for shelf, table or desk-top use. Adds a touch of timely elegance to your home or office. Accepts optional GCA-1195-1 electronic chimes. Specifications same as GC-1195 above, except dimensions are 6½" H x 12½" W x 6¼" D.

Kit GC-1197, Shpg. wt. 15 lbs. **89.95**

Charge-A-Kit — no money down on any kit — see page 54 for details.

New A TV Game at a Sensational Low Price

Heathkit Solid-State TV owners: Add the fun, excitement and challenge of TV games to your set at about HALF-THE-COST of other models!

Heathkit GD-1380 "Sportscreen™" Electronic TV Game

$49.95

- *Ping-Pong*
- *Squash*
- *Hockey*
- *Practice Game*

Here's family fun at real low cost. Hook up the GD-1380 to your Heath TV and suddenly it's more than a TV set! It's an "action" arena where you can play four different games — each one challenging your skill and coordination again and again! Make skillful volleys past your opponent in tennis (ping-pong)! Slap the puck past the goalie in hockey! "Fake out" your opponent with exciting rebound shots and angles in squash! There's even a practice game you can play to increase your hand and eye coordination!

Features two remote player control boxes, so you can control the movement of the paddles right from your easy chair. The on-screen scoring adds excitement and drama as the game is played, with each score instantly recorded in bright white numerals from 0-15. The ultra-realistic ball sounds will make you think you're playing with the Pros. And automatic or manual ball service gives you complete game control!

The GD-1380 keeps up the excitement too! After you develop your skills on the basic games — increase the speed of the ball for even more challenge; adjust the angle of rebound and even decrease the size of the paddles!

The control unit is housed in a handsome low-profile cabinet and sits right on your TV. Hooks up to Heath solid-state TV's with five easy clip-on connections to the chassis. A cable connector lets you remove the game control unit without removing chassis connections. Has touch controls for manual serve and game reset; game selector switch; size, angle and speed selectors; volume control for ball sounds. The two remote player controls feature positive action lever controls for paddle movement, and they connect to the control unit with 10 ft. cable. Build the GD-1380 for exciting sports fun right in your own home. It's the easy, low-cost way to add real entertainment versatility to your Heath TV.

Kit GD-1380, Shpg. wt. 4 lbs. **49.95**

GD-1380 SPECIFICATIONS

Control Unit Dimensions: 11¼" W x 6¾" D x 2¾" H. **Power Input:** Draws power from Heath TV set. **Maximum Power Dissipation:** For any Heath solid-state TV, 3½ watts. **For use with Heathkit Solid-State Color and B/W TV's only:** Model Nos. GR-104, GR-104A, B, C; GR-169; GR-269; GR-270; GR-271; GR-300; GR-370; GR-371; GR-400; GR-500; GR-900; GR-1900; GR-2000; GR-2001; GR-2050.

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Heath "Space Age" Weather Electronics

Monitor the weather with electronic accuracy and precision!

$69.95

1 Digital Electronic Wind Speed and Direction Indicator

Outstanding accuracy and easy-to-read digital display make this kit a "must" for pilots, boaters — anyone whose activities are affected by the wind. And you can customize it to suit your particular needs! During construction, you pick the two readout modes you want from the three available: miles, knots or kilometers per hour. Switches select mode and front-panel lights show which is in use. Incandescent bulbs mark the 8 principal compass points, providing 16-point resolution. The transmitter boom clamps on to any 1 to 1½" rooftop TV antenna mast and connects to the receiver with optional cable. Rugged Cycolac® plastic case with teak-grain vinyl insert matches our GC-1094 Digital Clock and ID-1390 Thermometer.

Kit ID-1590, Shpg. wt. 6 lbs. **69.95**
IDA-1290-1, 50 ft. cable, Shpg. wt. 2 lbs. **7.50**
IDA-1290-2, 100 ft. cable, Shpg. wt. 4 lbs. **13.50**
IDA-1290-3, 150 ft. cable, Shpg. wt. 5 lbs. **18.50**

ID-1590 SPECIFICATIONS: **Wind Speed:** 0-99 in miles per hour, knots or kilometers per hour (choice of two). **Response Threshold:** 3 mph. **Accuracy:** ±1 digit or ±10%, whichever is greater. **Direction Response Threshold:** approx. 2 mph. **Operating Temperature:** Remote transmitter, −40 to +120°F; Receiver, 0 to 150°F. **Power Requirement:** 120 VAC, 50/60 Hz, 6.5 watts. **Dimensions:** Receiver, 2½" H x 7" W x 5" D; Remote transmitter, 30" boom.

$59.95

2 Digital Electronic Indoor/Outdoor Thermometer

You'll never have to "gauge-guess" again! This fun-to-build kit monitors indoor/outdoor (or any two temperatures) with a big, bright, ½" to 11 digital readout. The readout includes plus and minus signs as well as indoor and outdoor indicator lights, so you know at a glance which temperature is being monitored. Switches select Fahrenheit or Celsius and let you choose continuous readings of one temperature or alternate readings of both. The 85' of cable included lets you place the temperature sensors just about anywhere for a variety of custom applications — home freezer, hot house, garage, basement, pump house, swimming pool, aquarium, almost any temperature. Black Cycolac® plastic case with teak-grain vinyl inserts matches the GC-1094 digital clock and ID-1590 digital wind speed/direction monitor — looks great on desk, shelf or table. Easy kit assembly with modular circuit boards, plug-in IC's and color-coded wiring harnesses makes the ID-1390 a simple project even for first-time builders.

Kit ID-1390, Shpg. wt. 5 lbs. **59.95**

ID-1390 SPECIFICATIONS: **Temperature Range:** Fahrenheit −40 to +120°; Celsius, −40 to +50°. **Accuracy:** Celsius, ±1°C from −15° to +50°C, ±2°C from −30° to −15°C. Fahrenheit, ±1°F from +20° to +120°F, ±2° from −30° to +20°F. **Display:** 2½-digit planar gas discharge with + and − sign. **Power Requirement:** 110-130 VAC, 60 Hz, 4 to 6 watts approx. **Dimensions:** 2½" H x 7" W x 5" D.

3 Stay "on top" of conditions with this five-function weather station

The Heathkit ID-1290 Weather Station monitors indoor and outdoor temperatures, barometric pressure, wind speed and direction — all with electronic accuracy and reliability. The barometer lets you observe changes as small as 0.02 inches of mercury. The thermometer is calibrated in two degree increments from −40 to −120°F and a switch selects indoor or outdoor readings. The windspeed indicator has two ranges — 0-30 mph or 0-90 mph and 8 wind direction lights offer true 16-point resolution.

The ID-1290's walnut-grained plastic cabinet can be hung vertically or horizontally; or used as a desk set with the stands included. The remote transmitter assembly (windcups, weather vane and outdoor temperature sensor) clamps onto any TV antenna mast and is connected to the plaque with optional 8-wire cable (below). Includes comprehensive weather book.

Kit ID-1290, Shpg. wt. 8 lbs. **89.95**
IDA-1290-1, 50 ft. cable, 2 lbs. **7.50**
IDA-1290-2, 100 ft. cable, 4 lbs. **13.50**
IDA-1290-3, 150 ft. cable, 5 lbs. **18.50**

ID-1290 SPECIFICATIONS: **Wind Speed:** 0-30 mph, ±2 mph; 0-90 mph, ±5 mph. **Direction:** 8-point readout over 360°. **Temperature:** 0° to +120°F, ±2°F (typ. INDOOR); −40° to +120°F, ±2°F (typ. OUTDOOR). **Barometric Pressure:** 29-31 inches of mercury within .05 inches, accurate up to altitudes of 10,000 ft. **Operating Temperature:** Receiver, −32° to 100°F; Transmitter, −40° to +120°F. **Power requirement:** 110-130 VAC, 50/60 Hz, 3.5 watts. **Dimensions:** Wall mount, 20½" W x 7" H x 2" D; Desk, 20½" W x 7" H x 6¾" D. **Net Weight:** 7 lbs.

Remote Transmitter

3

Learn more about the fascinating electronic clocks on page 5

Electronic Clocks and Watches — a complete guide to electronic timekeeping with sections on digital circuits, time-bases and more. Includes instructions for two projects.

EDP-201 ..... **6.50**

See page 52 for book-ordering information.

Delightful Digitals for discriminating gift-givers!

[1] Digital Electronic Clock/Thermometer

We've combined two of our most popular kits — our digital alarm clock and our indoor/outdoor temperature thermometer, AND included a practical temperature alarm. All in a single compact and stylish cabinet. The time and alternating indoor and outdoor temperatures (or any two temperatures you wish) are displayed in bright, orange digits. It's ideal for home or office.

Has a full-feature electronic alarm clock with a 10-minute "snooze" alarm for "catnaps" up to an hour and an instant-reset alarm bar (just touch it to reset alarm for the same time tomorrow!). Exclusive temperature alarm sounds whenever the temperature goes above or below any temperature you preset — great for monitoring greenhouses, orchards, refrigerated areas, etc.

Has easy-to-use time advance and alarm set switches, adjustable display brightness, PM time indicators; + and −, indoor and outdoor temperature lights. The factory-assembled temperature sensors come with 75′ (outdoor) and 10′ (indoor) cables so you can custom mount the sensors just about anywhere! Has a sleek, low-profile cabinet with simulated wood-grain top and trim. The ID-1490 is an easy-to-build kit, too — just 3 circuit boards, and a wiring harness simplifies assembly. You can build the ID-1490 in just a few evenings, use it for awhile and you'll wonder how you ever got along without it!

Kit ID-1490, Shpg. wt. 8 lbs. **124.95**

[1]

New

ID-1490 SPECIFICATIONS: CLOCK. Format: 12 or 24 hour. **Accuracy:** Determined by accuracy of power line frequency. No accumulative error. **THERMOMETER:** 2½-digit with + and − signs, and indoor-outdoor indicators. **Format:** Switch-selected °C (Celsius) or °F (Fahrenheit) read out. **Temperature Range:** −40° to +70° C. −40° to +158° F. **Accuracy:** (Outdoor) ±1° from −40° to +70° C. ±2° from −40° to +158° F. (Indoor) ±1° C from 0° to 50° C. ±2° F from −30° to 120° F. **Power Requirement:** 105-135 VAC, 60 Hz. **Dimensions:** 11¼″ W x 6¾″ D x 2¾″ H.

[2] "Budget" Digital Electronic Alarm Clock

Shows the hours, minutes and seconds in bright ½″ high digits that can be seen easily most anywhere in the room. It wakes you with a gentle electronic "beep" and lets you take catnaps of approximately seven minutes each for up to an hour. The special power interruption indicator shows all "eights" if there is a significant power interruption. The "eights" remain until the clock has been reset, assuring correct time all the time. The GC-1094 can be wired for 12 or 24-hour readout, and it has a 24-hour alarm, so even if you reset the alarm in the morning, you'll be awakened the next day. Handsome wood-grain cabinet measures only 2¼″ H x 7″ W x 4¾″ D. Kit assembly is really easy, too — making it a great project for first-time builders. Most parts mount on just two circuit boards, and a wiring harness simplifies assembly. For 120/240 VAC, 60/50 Hz.

Kit GC-1094, Shpg. wt. 4 lbs. **49.95**

[2]

[3] Deluxe Digital Electronic Alarm Clock

Has the same fine circuit features as below, but includes a full-feature 24-hour alarm instead of the calendar. Wakes you to a gentle electronic "beep", and you can even take 7-minute "catnaps" for up to an hour by simply touching the snooze alarm. A convenient switch lets you select 12 or 24-hour (military) time format; an AM indicator lets you set the alarm for AM or PM. Easy to build, too. Same case style and dimensions as below. Less batteries.

Kit GC-1092A, Shpg. wt. 5 lbs. **79.95**

[4] Deluxe Digital Electronic Calendar Clock

Keeps you right on schedule with an easy-to-read ½″ high digital display of the time in hours, minutes and seconds — and the date in four digits for month and day. Displays time continuously, or the date 2 seconds out of every ten, and you can call the date display any time by simply touching the case-top control. A standby battery supply takes over in case of power interruption and keeps the clock running without the display. When AC power is restored, the correct time is once again displayed, with no need to reset the clock. Also has automatic control of display brightness — brightly in brightly lit areas, dim in dimmer areas, with a switch for a continuous bright display. 12 or 24-hour clock format, too. Has a built-in charging circuit for rechargeable nickel-cadmium batteries, or you can wire it for standard batteries. Handsome low-profile case with rich brown tone finish, or you can place it in its pedestal base (included!) which swivels and tilts for easy viewing from any angle. The GC-1092D is an easy kit to assemble, and it's one of the easiest ways ever to stay on time and up to date! 8⅜″ W x 4⅞″ D x 2½″ H (4″ H with pedestal.) For 120 VAC, 60 Hz. Less batteries.

Kit GC-1092D, Shpg. wt. 5 lbs. **79.95**

[3]

[4]

Order early for best selection! Phone (616) 982-3411 day or night.

New Experimenter Kits from famous Logix

Great gifts for kids — ages 8 to 15 — a perfect introduction to kitbuilding!

Super Electronics Kit with over 100 fascinating experiments

$16.95 ***No-solder, easy snap-fit assembly***

Deluxe solid-state lab experimenter kit includes over 100 components — resistors, transistors, capacitors and diodes. The fully illustrated manual has instructions for over 100 experiments including AM and short-wave radio receivers, burglar alarms, telegraph transceiver, amplifier, pollution detector and more. Do projects fast and easy with no-solder snap-fit assembly. An ideal introduction to the exciting field of electronics. Less batteries.

JKP-1224, Shpg. wt. 4 lbs. **16.95**

Computer Kit with plans for over 50 different programs

$24.95 ***Build a basic electronic computer***

Learn about computers — one of the most exciting and fast growing fields around! Educational fun kit includes all the parts to build a basic computer and do 50 programs including weather predicting, math calculations, chess and music plus instructions for writing your own programs! No soldering — snap-in parts let you build it and change programs easily. Includes fully illustrated 112 page manual with complete assembly instructions and programs. Less batteries.

JKP-1222, Shpg. wt. 5 lbs. **24.95**

Basic Electric Lab Kit with over 140 exciting experiments

$14.95 ***Covers electricity, magnetism, lots more***

A fun way to learn the basic principles of electricity. Build and experiment with telephone systems, electromagnets, motors, burglar alarm, compass, microphone, amplifier and speaker, lots more. Includes 135 experimenter parts plus a detailed instruction manual for hours of fun-filled education. No soldering — easy snap-fit assembly lets you build and change circuits fast 'n easy. Safe battery power. Great gift idea for beginning kitbuilders. Less batteries.

JKP-1223, Shpg. wt. 4 lbs. **14.95**

Heathkit Metal Locators - "Rewarding Gifts"!

These Heathkit metal locators really get you in on the fun and excitement of treasure hunting — find coins, antiques, buried metal objects of any type, fast 'n easy.

FIND YOUR FORTUNE WITH A FUN-TO-USE METAL LOCATOR — *The ideal beachcombing companion!*

SAVE $10

$89.95

- ***Lightweight, easy and FUN to use***
- ***Easy PC board assembly***

Heathkit GD-348 Our best Metal Locator

Heathkit metal locators use a sophisticated "induction balance" system — you don't hear anything until a piece of metal enters the field. Then the tone grows louder as you get closer to the object. Listen through the built-in speaker, optional headphones or use the front-panel meter to pinpoint your find. The GD-348 has null and wide range sensitivity controls that let you adjust it to find smaller or larger objects, overcome ground effects, etc. The controls are conveniently located near the pistol grip handle for easy operation. The shaft telescopes and the search coil folds flat for easy storage in suitcase or optional carrying case.

Kit GD-348, Locator only, Shpg. wt. 5 lbs. **89.95**
GDA-48-1, 9-volt battery, Shpg. wt. 1 lb. **3.25**
GD-396, 600-ohm Superex headphones, Shpg. wt. 1 lb. **5.95**
GDA-348-1, carrying case, Shpg. wt. 2 lbs. **11.95**

$59.95

- ***Telescoping handle for easy storage***
- ***Low-drain circuit for long battery life***

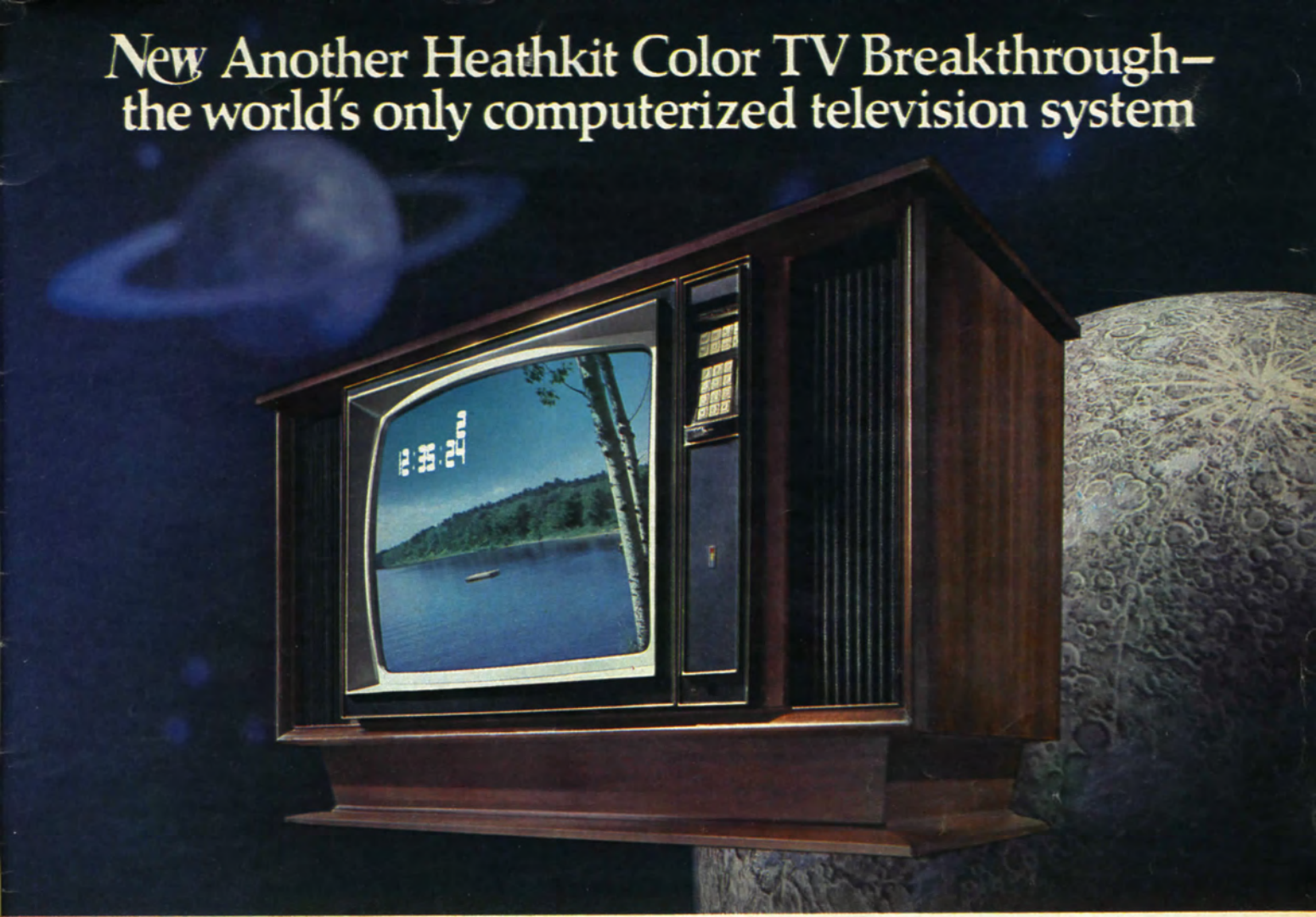
GD-48 Standard Metal Locator

Uses an "induction balance" system similar to the GD-348 — no tone variations to guess at, because there is no tone until a metal object enters the field. All solid-state circuitry, telescoping shaft, built-in speaker, headphone jack, meter. A single 9-volt battery (not included) supplies power. Shpg. wt. 6 lbs.

Kit GD-48, Locator only . . . . . **Was 69.95 — Now Only 59.95**
GDA-48-1, 9-volt battery, Shpg. wt. 1 lb. **3.25**
GD-396, 600-ohm Superex headphones, Shpg. wt. 1 lb. **5.95**

Order early for best selection! Phone (616) 982-3411 day or night.

New Another Heathkit Color TV Breakthrough— the world's only computerized television system



A sophisticated color TV that's also a computer you can program for an entire evening of TV viewing!

The new GR-2001 is the most sophisticated, best performing color TV we've ever designed, but it is also much more. It is the heart of a total home viewing system — a Computer TV!

Complete Programming Capability

This Computer TV system allows you to program your set for an entire evening's viewing. The top bank of 8 keys accesses the memory and turns the on-screen clock display into a computer CRT readout which allows you to see your "program" as you enter it through the bank of 12 keys below the programmer panel. The selected time appears in the first four digits of the clock display, the channel number appears in the last two. First, enter the time at which you want the set to change channels. Then, enter the channel number you want. You can program up to 32 channel changes within two 12/24-hour periods!

The two programming periods add extra versatility. Program the first for your daytime viewing schedule, the second for evening shows. Or, program the first for weeknights, the second for weekends. You can even preselect the programs young children can watch—once the Programmer is engaged the manual keyboard is disconnected and can only be reactivated by the remote control or by pressing the correct button on the programming panel. There are an almost infinite number of uses for the Programmer.

Our Best Color Picture and Sound Ever!

The TV set itself contains dozens of circuit refinements and improvements designed to give you the best picture and performance you've ever seen. New phase-locked loop horizontal and vertical oscillators provide a rock-steady picture — it's so adjustment-free that we've eliminated conventional horizontal and vertical hold controls! The Automatic Gain Control circuit has been significantly improved to provide better resistance to airplane flutter. The audio circuitry is probably the finest on any commercial set in the world. The sound signal has its own separate IF stage to dramatically reduce the "buzz" caused by the picture carrier modulating the sound. You can hear the difference — especially if you use the output jack to connect the GR-2001 to your stereo system. It's one of the first sets ever to give you real hi-fi sound from a TV!

Fully Automatic Antenna Rotor

The Automatic Antenna Rotor Control is another Heathkit innovation. Instead of manually rotating the antenna each time you change stations, the Automatic Roter control turns the antenna to the correct heading each time you change channels — no special knobs to turn, no buttons to push. You can select up to eight separate antenna headings with up to three stations per heading! It is the world's most convenient rotor system.

Remote Control Convenience

The wireless remote control is the best we've ever offered with improved circuitry for greater range and reliability. It provides continuous volume control, up/down channel scan, tint adjustment, power on/off — all at the touch of a button.

New Totally "Programmable" Heathkit

There's never been a color television system like this before — just look at these performance and convenience features:

HEATH charg-a-kit REVOLVING CHARGE

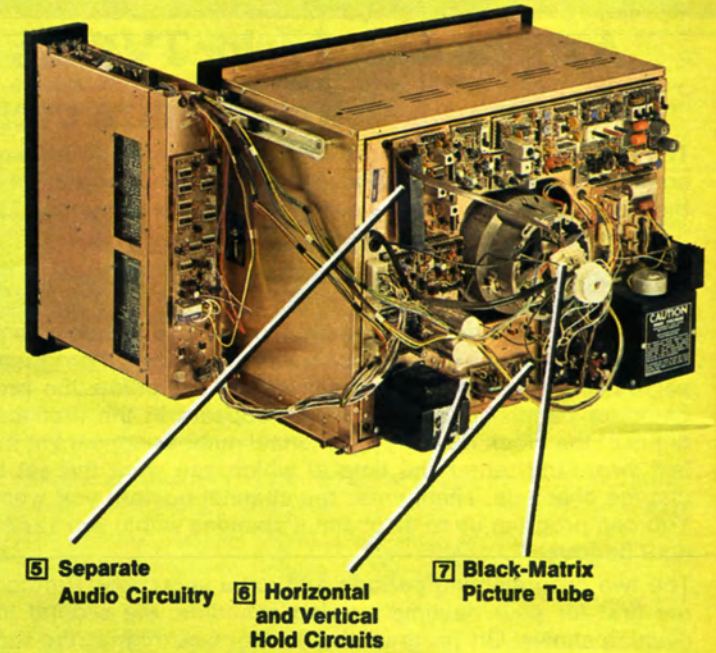
- ***Changes channels automatically at any preselected time***
- ***Automatically rotates your TV antenna to the correct heading each time you change channels***
- ***1"-tall on-screen digits show you the channel number and time whenever you change channels***

1 Programmer Keyboard. These eight buttons allow you the instant access to the optional Programmer's static NMOS random access memory (RAM). Just enter the time and channel number you want — up to 16 changes in either of two switch-selected positions. Then the optional Programmer's memory takes over. While you sit back and relax, the GD-1185 Programmer automatically changes to the right channel at the right time. You can even program the set to return to manual operation at a preselected time, then resume automatic operation at another time. When the last program you want to see is over, the set can be programmed to switch to an empty channel. This will cause the screen to go blank and the on-screen readout to flash on and off, indicating that it is time to turn the system off with the front-panel pushbutton or optional remote control.

2 Convenient Remote Control. The optional remote control lets you adjust volume, turn the set on or off, adjust tint, scan up or down through the pre-programmed channels — even turn the optional Programmer on or off. The advanced remote control receiver builds right in to the chassis on the GR-2001.

3 Random-Access Tuning. The 3 x 4 keyboard lets you instantly choose any of 16 preselected stations. Switch from VHF to UHF, up or down. In any sequence, and be tuned in instantly, without switching through in-between channels. Up and down buttons on the keyboard also let you scan all the preselected stations. And the option GRA-2001-9 lets you add up to 8 additional channels — up to 24 in all!

4 Automatic Antenna Rotor Control: A Heathkit exclusive! With the optional GD-1184 antenna rotator control, you can program the GR-2001 to automatically rotate your outdoor antenna system as it changes from one channel to another, for optimum reception on every channel. It's perfect for areas where stations are in widely separated locations.



5 Separate Audio Circuitry on the IF board. The GR-2001 gives you audio reception to go along with its outstanding picture thanks to a separate audio circuit that's the equivalent of a fine-quality FM receiver. The wide-range speaker (included) offers excellent fidelity too. And an audio output jack lets you listen to the TV sound through your stereo system.

6 Phase-Locked-Loop Horizontal and Vertical Hold Circuits. The GR-2001 "locks in" on any channel with a picture that's rock-steady and stable. There are no ordinary vertical and horizontal hold controls because you never need them — so you get consistently excellent pictures year after year.

7 Black-Matrix Picture Tube. The GR-2001's 25" (diagonal), ultra-rectangular picture tube provides one of the brightest, sharpest pictures in the world. The tube is fully shielded to maintain outstanding color purity by eliminating stray magnetic fields.

Priority No-Charge Warranty Service Plan for Solid-State TV Modules!

If a component proves defective during the 90-day warranty period, the modules will be serviced with no charge for parts or labor. If the problem is due to a construction error or if the 90-day warranty has expired, modules will be serviced at a fixed charge of $5.00 per module. All picture tubes warranted for two full years.

GR-2001 SPECIFICATIONS: Deflection: Magnetic, 90°. Focus: Electrostatic. Convergence: Magnetic. Antenna Input Impedance: VHF: 300Ω balanced or 75Ω unbalanced. UHF: 300Ω balanced. Picture IF Carrier: 45.74 MHz. Sound IF Carrier: 41.25 MHz. Color IF Subcarrier: 42.17 MHz. Sound IF Frequency: 4.5 MHz. Video IF Bandwidth: 4.08 MHz, at 6 dB down. HI-FI Output: Frequency response: ±1 dB, 50 Hz to 15 kHz. Output voltage: Greater than 1.0 V RMS. Audio Output: 4Ω or 8Ω. 2 watts. Power Requirement: 110 to 130 volts AC, 60 Hz, 200 watts. Net Weight: 112 lbs.

Order early for best selection! Phone (616) 982-3411 day or night.

Computer Color TV

Heathkit GR-2001 25" (diagonal) Color TV Kit

Even if you order it without the options below, it's still one of the finest sets you can buy anywhere! Less cabinet, order your choice of fine-furniture cabinets at right. Includes chassis, picture tube, one speaker.

Kit GR-2001, Shpg. wt. 146 lbs., Motor Freight 699.95

8-Channel Accessory for your GR-2001

Adds 8 more channels to the GR-2001's random-access tuning system (a total of 24 channels) for even greater versatility.

Kit GRA-2001-9, Shpg. wt. 1 lb. 9.95

GD-1185 TV Programmer

Automatically changes channels at any time you select — up to 16 changes in either of two switch-selected 12/24-hour periods. Front-panel keyboard and on-screen readout make it easy to enter any time or channel you want. It's the ultimate in convenience — and a Heathkit exclusive! Requires GR-601 Clock below for operation.

Kit GD-1185, Shpg. wt. 8 lbs. 169.95

Automatic Antenna Rotor Control

Automatically rotates your antenna to preselected directions for the best reception on each channel. Accepts up to 3 channels for each of 8 directions. Operates with or without GD-1185 above. For use only with existing Cornell Dubilier AR-40 rotor system (Heath GDP-1176 or GDP-258) or optional motor below.

Kit GD-1184, Shpg. wt. 6 lbs. 59.95

GDA-1184-1, Rotor Motor. Requires 5-wire cable (not supplied). 11 lbs. 34.95

Easy-to-build On-Screen Digital Clock

Displays the time in hours, minutes and, if desired, seconds in 12/24 hour format below the channel number. Easy-to-read white digits can be adjusted with the channel numbers to remain on the screen for up to 1½ minutes each time the channel is changed, remain on permanently or automatically reappear at approximately 2-minute intervals.

Kit GRA-601, Shpg. wt. 1 lb. 29.95

Complete Computer TV System with Programmer, Clock and Rotor Control

- GR-2001 Deluxe 25" Color TV
- GD-1185 Programmer
- GRA-601 On-Screen TV Clock
- GD-1184 Automatic Antenna Rotor Control (less motor)

GRS-2002, Shpg. wt. 161 lbs. Motor Freight 899.95

SAVE $59.85

If purchased separately, 959.80

System Price **$899.95**

Order optional cabinet at right

GR-2001 with Programmer and Clock

- GR-2001 Deluxe 25" Color TV
- GD-1185 Programmer
- GRA-601 On-Screen TV Clock

GRS-2001, Shpg. wt. 155 lbs. Motor Freight 849.95

SAVE $49.90

If purchased separately, 899.85

System Price **$849.95**

Order optional cabinet at right

Convenient Wireless Remote Control

Controls on-off, volume, up/down channel scan and tint. Also turns programmer on or off. Operates up to 20 ft. away from set.

Kit GRA-2001-6, Shpg. wt. 4 lbs. 89.95

Fine-Furniture Cabinets for your GR-2001 or GR-2000 Color TV

Fully assembled and finished — the perfect "home" for your set

Contemporary cabinet. Dual speaker capability. Comes completely assembled and finished. Constructed of solids and veneers; oiled walnut finish. 28⅜" H x 46⅜" W x 20¾" D. (23⅝" D including cup).

GRA-602-25, Shpg. wt. 89 lbs. Motor Freight 159.95

Mediterranean cabinet with doors. Accepts 2 speakers. Constructed of solids & veneers; simulated wood-grain base & trim. Dark oak finish. Hardware finished in Windsor Antique Gold tone. Fully assembled, finished. 29¾" H x 48⅜" W x 23" D. (26¼" D including cup). Shpg. wt. 126 lbs.

GRA-605-25, Motor Freight 229.95

Early American cabinet. Twin speaker capability. Distressed maple finished wood solids & veneers; simulated wood-grain trim. Hardware has Windsor Antique Gold finish. Fully assembled & finished. 31⅜" H x 47⅜" W x 20½" D. (23¾" D including cup). Shpg. wt. 94 lbs.

GRA-603-25, Motor Freight 169.95

Mediterranean cabinet. Accepts 2 speakers. Crafted of solids & veneers; simulated wood-grain trim. Dark oak finish. Hardware features Antique Gold finish. Fully assembled and finished. 30⅝" H x 49⅜" W x 20⅞" D. (23⅝" D including cup.) Shpg. wt. 92 lbs.

GRA-604-25, Motor Freight 169.95

Compact contemporary cabinet. Solidly constructed of wood solids and veneers, beautifully finished in luxurious oiled walnut finish. Comes fully assembled with cutout for one speaker. Measures 34⅜" H x 33⅞" W x 20⅝" D (24⅛" D including cup.) Shpg. wt. 76 lbs.

GRA-608-25, Motor Freight 129.95

Charge-A-Kit — no money down on any kit — see page 54 for details.

Get Big CHRISTMAS SAVINGS on our

SAVE $90

This is the set that brought color TV into the digital age — the Heathkit GR-2000. It offers one of the most vivid, realistic pictures in the industry today and you can get it at a whopping $90 price cut in time for the holidays!

Total electronic tuning convenience

Simply touch a button on the front panel (or the optional remote control) and the sophisticated programmable digital counter sweeps up or down through any 16 pre-selected stations. And because the tuning is electronic, you eliminate noisy, unreliable turret tuners. Even the channel numbers are displayed electronically, right on the screen. The large, white digits can be positioned anywhere on the screen. They can be adjusted to remain on the screen for up to 1½ minutes, or permanently if you choose. And you can recall them by changing the channel or by tapping the Volume on the remote control.

A 25" (diagonal) color picture second to none!

Critics and owners have praised the GR-2000 for a bright, accurate color picture that seems to make programs "come alive". The picture tube provides outstanding brightness and sharpness thanks to its negative matrix and fully-illuminated phosphor dots.

Revolutionary electronics!

The GR-2000's circuitry is some of the most sophisticated in the industry. It was the first TV to utilize a fixed IF filter which virtually eliminates adjacent-channel interference — especially important in urban areas crowded with stations. This advanced filter provides ideally-shaped bandpass and — unlike the "traps" used in most sets — it never requires alignment.

And the GR-2000 uses other advanced circuitry to assure superior performance — improved signal circuits for greater clarity and definition, DC-controlled contrast for reduced interference, an integrated circuit color amplifier for more precise, realistic tints, and an IC automatic gain control for excellent sensitivity, selectivity and noise rejection. You get a consistently excellent picture year after year.

Easy and fun to build!

The completely illustrated assembly manual makes it easy to feel the pride of "building it yourself." Almost all the circuitry mounts on plug-in printed circuit boards and factory-fabricated wiring harnesses minimize point-to-point wiring. You'll find that building a GR-2000 is enjoyable — and you'll be even prouder of its exceptional performance.

Save money on service!

Because you build the set, you can service it. All the circuitry you need is built in — a digital-design dot generator, circuits for purity and convergence adjustments, vertical and horizontal centering circuits and a test meter. Much of the circuitry is accessible by pulling out the service drawer. You can keep your set in peak-performing condition with less inconvenience and expense. That alone makes the GR-2000 a bargain!

Optional accessories make your set even more enjoyable!

The optional Clock Module adds the time to the on-screen channel readout. The time appears in 1" digits beneath the channel and the clock can be set for 4 or 6-digit readout in 12 or 24-hour formats.

The optional remote control provides wireless selection of channel, volume, tint, color intensity — it even turns the set on and off!

And, if you want the incomparable performance of the GR-2000 in a more compact cabinet, look at the GR-2050 on the next page. It uses exactly the same chassis but with a smaller 21" (diagonal) screen. Either way, you'll own one of the world's finest color televisions.

No-Charge Warranty Service Plan for Solid-State TV Modules!

If a component proves defective during the 90-day warranty period, the modules will be serviced with no charge for parts or labor. If the problem is due to a construction error or if the 90-day warranty has expired, modules will be serviced at a fixed charge of $5.00 per module. All picture tubes warranted for two full years.

Charge-A-Kit — no money down on any kit — see page 54 for details.

world-famous GR-2000 and GR-2050 color TV's!

GR-2000 25″ (Diagonal) Digital Color TV Kit

Now at a sensational new low price — save $90 just in time for Christmas. Build it in time for Christmas too and you'll be able to watch all the exciting holiday specials on one of the brightest, best-performing sets available anywhere! Less cabinet, order your choice of fine-furniture cabinets from page 9. Includes chassis, one speaker, and picture tube. Shpg. wt. 147 lbs.

Kit GR-2000, Motor Freight . . . . . **Was 689.95 Now Only 599.95**

Optional Digital Clock for GR-2000.

Kit GRA-2000-1, Shpg. wt. 1 lb. **29.95**

Optional Remote Control for GR-2000.

Kit GRA-2000-6, Shpg. wt. 4 lbs. **89.95**

Second Speaker for GR-2000. Fits in space on GR-2000 cabinets (where indicated). Includes all cables.

GRA-2000-7, Shpg. wt. 2 lbs. **6.50**

GR-2000 SPECIFICATIONS: **Picture Tube:** 25″ (diagonal). **Viewing Area:** 315 sq. in. **Deflection:** Magnetic, 90 degrees. **Focus:** Electrostatic. **Convergence:** Magnetic. **Antenna Input Impedance: VHF:** 300 Ω balanced or 75 Ω unbalanced; **UHF:** 300 Ω balanced. **Tuning Range:** TV channels 2 through 83. (Preset any 16). **Picture IF Carrier:** 45.75 MHz. **Sound IF Carrier:** 41.25 MHz. **Color IF Subcarrier:** 42.17 MHz. **Sound IF Frequency:** 4.5 MHz. **Video IF Bandwidth:** 4.08 MHz, at 6 dB down. **Hi-Fi Output: Output Impedance:** 2200 Ω. **Frequency Response:** ±1 dB, 50 Hz to 15 kHz. **Harmonic Distortion:** Less than 1% at 1 kHz. **Output Voltage:** greater than 1.0V rms. **Audio Output: Output Impedance:** 4 Ω or 8 Ω. **Output Power:** 2 watts. **Power Requirements:** 110 to 130 volts AC, 60 Hz, 200 watts. **Net Weight:** 112 lbs.

Deluxe Ultrasonic Remote Control for GR-2000 and GR-2050

Provides armchair control of on and off, volume, channel selection, color intensity and tint, activation of digital readout. Includes receiver for in-chassis mounting, hand-held transmitter. Operates up to 20 ft. away from set.

Kit GRA-2000-6, Shpg. wt. 4 lbs. **89.95**

Digital Clock for GR-2000 and GR-2050

Shows time in hours, minutes and seconds with big, easy-to-read white numerals. Real convenience!

Kit GRA-2000-1,
Shpg. wt. 1 lb. **29.95**

SAVE $50

GR-2050 21″ (Diagonal) Color TV Kit

Now the popular 21″ diagonal Heathkit GR-2050 is also SALE-PRICED in time for Christmas savings! SAVE $50 and give yourself and your family a lifetime of entertainment! Has the same outstanding features and specifications as the GR-2000 (see complete description on previous page), but in the popular-size 21″ diagonal measure screen. Uses the same optional on-screen digital clock and remote control as the GR-2000. And it has the same bright and accurate color picture. You can order your choice of space-saving contemporary cabinet (shown in major illustration), or a luxurious Mediterranean style cabinet (below).

Building the GR-2050 is a rewarding experience too. There are many modular circuits and coded wiring harnesses keep point to point wiring to a minimum. Has built-in service and adjustment circuits too — dot generator, service circuit board, centering and pincushion circuits — so you can keep it in peak operating condition.

Kit GR-2050, With chassis, picture tube, one speaker.
Shpg. wt. 122 lbs., Motor Freight . . . . . **Was 599.95 Now Only 549.95**

Optional Remote Control for GR-2050. Described at left.

Kit GRA-2000-6, Shpg. wt. 4 lbs. **89.95**

Optional on-Screen Digital Clock for GR-2050. Described at left.

Kit GRA-2000-1, Shpg. wt. 1 lb. **29.95**

GR-2050 SPECIFICATIONS: Same as GR-2000 at left, except, **Picture Tube:** 21″ (diagonal measure). **Viewing Area:** 226 sq. in.

Space-saver Contemporary Cabinet for GR-2050. (Shown in illustration above). Fully assembled and finished with wood solids and veneers, walnut-stain finish, black foam grille. 28⅝″ H x 30½″ W x 18½″ D (22 1/16″ W with cup).

GRA-2050-1, Shpg. wt. 74 lbs., Motor Freight **124.95**

Deluxe Mediterranean Cabinet for GR-2050

This romantic and stylish "home" for your GR-2050 is fully assembled and constructed of wood solids and veneers, with handsome dark-oak stain highlights and simulated wood-grain trim. Has space in cabinet for second speaker. Brown grille cloth. 28⅞″ H x 38⅝″ W x 19¾″ D (23 5/16″ D with cup). Shpg. wt. 89 lbs.

GRA-2050-2, Motor Freight **154.95**

Order early for best selection! Phone (616) 982-3411 day or night.

Quality Heathkit Color and B/W TV!

19" Diagonal Measure GR-500

Build yourself years of viewing pleasure with one of these Heathkit popular-size Color TV's

"...a very simple kit to assemble...a picture quality second to none... In summation, this is a first-class color TV receiver, well worth the effort of assembling it from a kit."

Popular Electronics, September, 1975

These table/cart-size color TV's offer the same advanced design and precision engineering of our full-size console models, plus the features that have made Heathkit TV an industry leader. Choose the size that fits you're viewing needs for superb quality color TV you'll enjoy for years to come. The precision in-line gun color tube has a negative matrix screen for far more contrast and brightness than conventional color tubes. As you turn the tuning knob, the channel numbers appear on the screen in big, white, easy-to-read numerals. You can even add an on-screen digital clock and the time in hours, minutes and seconds will appear right with the channel numbers. An automatic fine-tune circuit locks in on the best picture each time the channel is changed. And once you set the contrast, brightness, color and tint with secondary rear panel controls — a touch of the PPC button returns the picture to perfection instantly — no matter how much the front panel controls have been disturbed — great if you have young children. The VHF tuner has a mixer circuit with a dual-gate FET, and an RF amplifier for low noise, high gain, and low cross modulation. The four tuner circuits (most sets have only three) offer far greater selectivity so you can get a better picture, with less interference. Has front panel controls for on-off volume, tint/AFC and color; thumbwheel controls for contrast and brightness. Other features include detent VHF and UHF tuning, instant-on operation with front panel defeat, hi-fi output jack and TV speaker defeat switch; 75-ohm VHF antenna input (ideal for cable TV installations).

Kit GR-500, less cabinet, Shpg. wt. 88 lbs., Motor Freight **499.95**

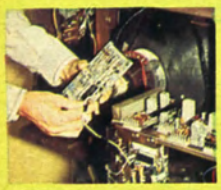
GRA-500-1, walnut veneer table model cabinet (main illustration), 17¼" H x 25½" W x 14" D (17" D including cup), Shpg. wt. 28 lbs., Motor Freight **39.95**

Kit GR-400, (less cabinet), Shpg. wt. 104 lbs. **449.95**

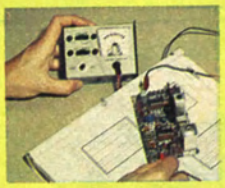
GRA-400-1, walnut-veneer cabinet (16⅜" H x 24⅛" W x 12¾" D, (15¾" D including cup). Shpg. wt. 27 lbs. **34.95**

GRA-403-18, roll-around cart. 22" H x 27" W x 15⅝" D, Shpg. wt. 17 lbs., Motor Freight **21.95**

Kit GRA-2000-1, Digital Clock Accessory, Shpg. wt. 1 lb. **29.95**

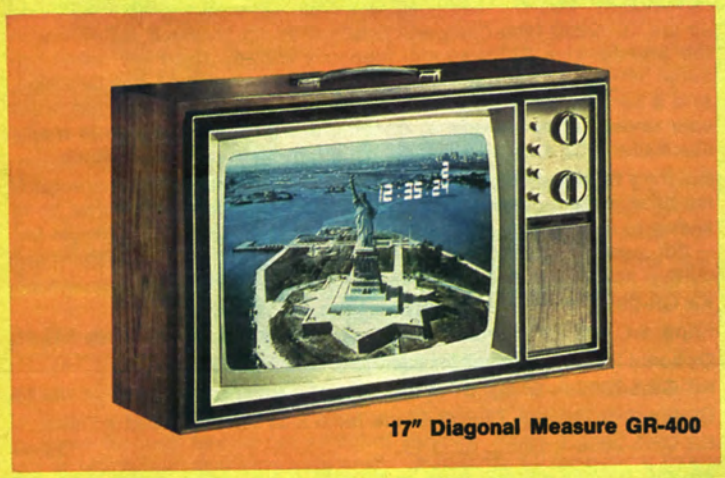


Modular circuit boards plug onto the slide out chassis. All components are easily accessible.



Separate test meter and troubleshooting manual let you solve most problems yourself.

Factory-adjusted static toroid yoke ends convergence or purity adjustment — forever.



17" Diagonal Measure GR-400

GR-500, -400, SPECIFICATIONS: **Deflection:** Magnetic, 90 degrees. **Focus:** Electrostatic. **Convergence:** Magnetic. **Antenna input impedance:** VHF: 300 Ω balanced or 75 Ω unbalanced. UHF: 300 Ω balanced. **Tuning range:** TV channels 2 through 83. **Picture IF carrier:** 45.75 MHz. **Sound IF subcarrier:** 42.17 MHz. **Sound IF frequency:** 4.5 MHz. **Video IF bandwidth:** 4.08 MHz at 6 dB down. **Hi-Fi output impedance:** 2200 Ω. **Frequency response:** ±1 dB, 50 Hz to 15 kHz. **Harmonic distortion:** less than 1% at 1 kHz. **Output voltage:** greater than 1.0V rms. **Audio output impedance:** 8 Ω. **Output power:** 1 watt: **Power requirements:** 110-130 VAC, 60 Hz, 230W.

Carry-Anywhere 12" Diagonal Black and White Portable TV

At home, the GR-104C plugs into a wall outlet. In your car, camper or boat, it works right from your 12-volt battery system. Outdoors, you can use it with its optional self-contained battery pack as a go-anywhere portable. Any way you use it, you'll get a crisp, clean, clear black-and-white picture of unsurpassed quality. Three IF video amplifiers provide superior gain and a 4-circuit VHF "memory" tuner brings in each VHF station with real precision. Has regulated power supply for drift-free operation, detent tuning, lighted channel indicators, telescoping antenna for VHF and a loop antenna for UHF. Rugged high-impact case with carrying handle for easy portability. Easy kit assembly with two circuit boards and a wiring harness. The VHF and UHF tuners are factory assembled and aligned.

Kit GR-104C, Shpg. wt. 35 lbs. **154.95**

Kit GRA-104-3, Optional Battery Pack, 9 lbs. **54.95**

GR-104C SPECIFICATIONS: **Picture Size:** 74 sq. in. viewing area, 12" picture diagonal. **Deflection:** Magnetic, 110 degrees, 20 mm neck. **Focus:** electrostatic. **Antenna Input Impedance:** 300 ohm balanced. **Audio Power Output:** 500 mW into 24 ohm load. **Power Requirements:** 110-130 volts AC, 40 watts; 12 volts DC at 24 watts. **Overall Size:** 11½" H x 15¾" W x 9⅜" D.

Simulated TV Pictures

Charge-A-Kit — no money down on any kit — see page 54 for details.

New Our sensational low-priced TV Game!

Heathkit GD-1380 Sportscreen™ Four-in-one Electronic TV Game

$49.95

Turn your solid-state Heathkit TV into a family game center with ping-pong, hockey, squash and practice games

If you own a Heathkit solid-state TV, or if you're planning to buy one now, your decision just became even smarter! Because now you can add our sensational new electronic TV game for about HALF the cost of other models.

The GD-1380 hooks up to your set easily, with five clip-on connections to your set's chassis. It lets you play ping-pong, hockey, squash, and an individual practice game that helps hand-eye coordination. It has automatic on-screen scoring; speed, paddle-size and angle adjustments, and a realistic ball sound that comes right through your set's speaker. The two remote player-controls come with 10-ft. of cable, so you can play all games right from your easy chair.

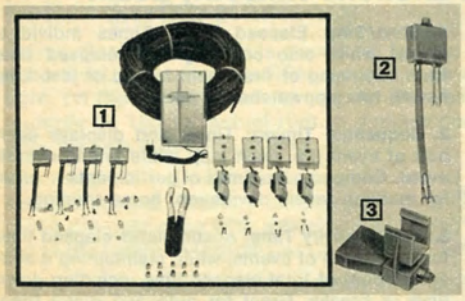
Order the GD-1380 today for years of family fun, challenge and excitement. It's the easy, low-cost way to get even more family entertainment and enjoyment from your Heathkit TV. For complete details, see page 3 of this catalog.

Kit GD-1380, Shpg. wt. 4 lbs. **For models below only.** **49.95**

GD-1380 SPECIFICATIONS

Control Unit Dimensions: 11¼″ W x 6¾″ D x 2¾″ H. Power Input: Draws power from Heath TV set. Maximum Power Dissipation: For any Heath solid-state TV, 3½ watts. For use with Heathkit Solid-State Color and B/W TV's only: Model Nos. GR-104, GR-104A, B, C; GR-169; GR-269; GR-270; GR-271; GR-300; GR-370; GR-371; GR-400; GR-500; GR-900; GR-1900; GR-2000; GR-2001; GR-2050.

TV Antennas and Accessories for BETTER Reception!



1 Coaxial distributor for 4-room TV/FM network — Takes single coax input from all-channel antenna, amplifies it to feed 4 wall outlets. Includes 200′ coax cable, connectors, crimping tool, 4 matching transformers/splitters.

GD-248, Shpg. wt. 14 lbs. **89.95**

GD-328, 100′ coax, w/connectors and antenna boot installed, Shpg. wt. 4 lbs. **13.95**

2 75/300 Ohm Transformer-Splitter matches one 75 ohm coax to separate VHF, UHF 300 ohm leads.

GD-298, Shpg. wt. 1 lb. **4.95**

3 All-Channel Matching Transformer converts 300 ohms to 75 ohms for coax.

GD-1054, Shpg. wt. 1 lb. **3.95**

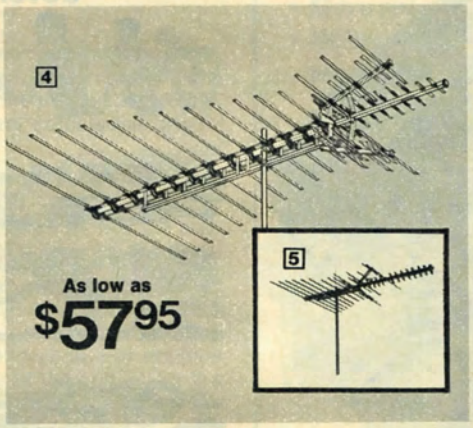
Easi-Guide to Color TV — buying a set, installing the antenna, adjustments. **EDP-128** **3.50**

Questions and Answers About Color TV — covers operation, installation, servicing. **EDP-129** **3.95**

99 Ways to Improve Your TV Reception. Emphasis on antenna & lead-in problems. **EDP-130** **3.50**

Home TV-FM Antennas — design, installation. **EDP-186** **5.95**

See page 52 for book ordering info.



4 "Super Antenna". 71 elements. F/B signal rejection: VHF, 23 dB. UHF, 24 dB. 196″ boom. 116″ turning radius; 166″ width. All aluminum with gold color, weather-protected finish.

GD-1460, 300 ohms, less mast and cable. Shpg. wt. 24 lbs. Motor Freight **89.95**

75-ohm **94.95***

5 "Deep Fringe" Antenna. Similar to above, 52 elements. 149″ boom, 82″ turning radius, 102″ W. F/B signal rejection: 20 dB VHF, 22 dB UHF.

GD-1450, 300 ohms, less mast and cable. Shpg. wt. 19 lbs. Motor Freight **57.95**

75 ohm **62.95***

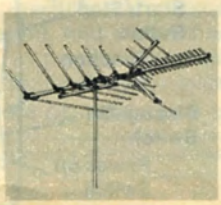
*Order GD-298 and GD-1054 to convert to 75 ohms. Reg. $8.90 — ONLY $5 with antenna. Antennas include removable FM blocking elements.

Deluxe Cornell-Dubilier Antenna-Rotor System

Deluxe antenna rotor system consists of control box and rugged outdoor rotor. Pin-points your outdoor antenna to the exact direction of the broadcast station for dramatically improved TV and FM reception. Heavy-duty 1 rpm rotor has positive automatic stop, instant reverse. ½″ dia. ball thrust bearing supports antennas to 150 lbs. Lower mast clamp accepts ⅞″ to 2″ dia. masts and is removable for direct mounting on rotor plate of tower. Lifetime lubricated bearings. Solid-state control box has 360° rotor control, plugs into AC outlet. Requires 5-wire cable (not supplied).

GDP-1176, Shpg. wt. 14 lbs. **54.95**

These low-cost mailable TV antennas really help



"Fringe" Antenna. Shown at left. 22-element antenna provides VHF reception up to 75 miles and UHF up to 45 miles. 119″ boom, 68″ turning radius.

GD-1431, 300 ohm, less mast and cable. Shpg. wt. 25 lbs. **29.95**

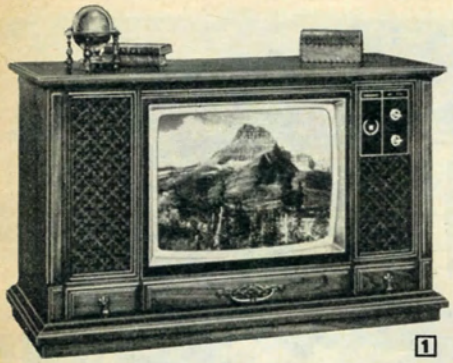
75 ohm **34.95***

Deluxe "Fringe" Antenna. Not shown. Has 28 elements, pulls in signals even in problem reception areas. Provides VHF reception up to 100 miles, UHF up to 60 miles. 131″ boom, 80″ turning radius.

GD-1441, 300 ohm, less mast and cable. Shpg. wt. 25 lbs. **39.95**

75 ohm **44.95***

Assembled Cabinets for the famous Heathkit GR-900 Color TV



1

2

These fine-furniture cabinets show off your GR-900 to its best advantage, and add a luxury touch to your decor. All are constructed with quality hardwoods and veneers, with beautiful natural wood-grain finish.

1 **Mediterranean cabinet.** Fully assembled and finished, a luxurious addition to your home. Constructed of pecan-stained wood solids and veneers, with simulated wood-grain base and trim. Hardware features handsome Antique Gold finish. Accepts 2 speakers. 30⅞" H x 48¾" W x 20⅝" D (23½" D with cup). Shpg. wt. 91 lbs.

GRA-404-25, Motor Freight **169.95**

2 **Contemporary cabinet.** Distinctive, modern style, fully assembled and finished. Constructed of walnut-stained wood solids and veneers with a rich, deep oil-rubbed finish. 30⅜" H x 37⅛" W x 19⅞" D (22¾" D with cup). Shpg. wt. 60 lbs.

GRA-401-25, Motor Freight **119.95**

3

3 **Early American cabinet.** Fully assembled and finished with maple-stained wood solids and veneers, simulated wood-grain trim. Hardware has Windsor Antique Gold finish. 32½" H x 38½" W x 19¾" D (22⅝" D with cup). Shpg. wt. 73 lbs.

GRA-403-25, Motor Freight **159.95**

Please allow up to 10 weeks for delivery

Digital Programmable Stopwatch—a TIMELY GIFT Indeed!

Used by coaches and timers of the United States International Skating Association.

$84.95

The world's most versatile stopwatch

For features, versatility and accuracy, we don't think you can find a better stopwatch than our GB-1201! Two exclusive Heath PMOS IC counters and quartz crystal accuracy make it ideal for almost any timing job. Reads hours, minutes, tens and hundredths of seconds in a bright red digital readout that's easy to see in most any light. We even include a sunscreen so you can read it in direct daylight!

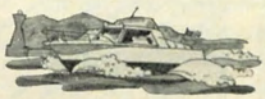
Includes pre-wired AC adapter/charger, rechargeable batteries, sunscreen, lanyard for wearing the GB-1201 around wrist or neck. Special modification instruction lets you convert the GB-1201 to read hundredths of minutes — perfect for car rallies and time studies.

Kit GB-1201, Shpg. wt. 2 lbs. **84.95**

ICA-2009-1, Felt-lined Naugahyde® carrying case, Wt. 1 lb. **3.95**

GB-1201 SPECIFICATIONS: **Accuracy:** ±0.006%, typically better than 0.003%. Instrument alignment provides higher accuracy. **Battery Life:** approx. 40 hrs. betweerr charges with displays mostly off; approx. 4 hrs. with displays continuously on. **Recharging:** approx. 14 hours with power off. **Temperature Range:** −10° to +120°F. **Dimensions:** 5½" H x 2¼" W x 2" D. **Net Weight:** approx. 8 oz.

Seven Functions Time Any Event



1. Start/Stop Elapsed Time: Times individual events while also counting total elapsed time from beginning of first event to end of last. Like having two stopwatches in one.

2. Sequential Timing: Times and displays each part of event (i.e. each lap), while timing overall event. Compares lap times of participants — great for multilap races, navigation, horse training.

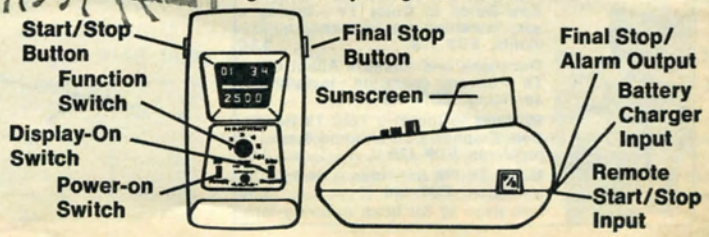
3. Total Activity Time: Accumulates elapsed time for any series of events, while maintaining a separate count of total elapsed time including down time or breaks. Great for auto and plane trips, efficiency studies, ball games.

4. Split Time: Displays cumulative time to each "split" point, while continuing to time overall event. For ski races, swim meets, sail boat committees.

5. Start/Stop Activity Time: Shows separate times for each event or "leg", then totals all individual times. For trips, races, rallies.

6. Upcount to Preset Time: For use with external alarms — counts up to pre-programmed times, then sends trigger pulse to alarm jack. Count can be interrupted and resumed at any point. Times can be transferred from other functions, or programmed by a digit-set method.

7. Downcount from Time: Counts down from pre-programmed time to zero, then sends trigger pulse to alarm jack. For yacht racing, testing, officiating, pacing oneself in training. Time can be transferred from other functions, or programmed by a digit-set method.



Find out how easy it is to build a kit — order the manual. See page 53.

Do-it-yourself accessories for your car

Digital Car Clock with 20-hour Trip Timer

- *Quartz crystal timebase insures high accuracy*
- *Readout dims automatically for safer night driving*
- *Easy to use built-in elapsed timer*

A totally electronic, totally reliable timepiece, typically accurate within one minute per month. Bright, easy-to-read ½"-high numerals display the time in hours and minutes.

To start the GC-1093's built-in elapsed timer, simply press the reset button. The elapsed time is displayed in minutes and seconds, for the first 20 minutes. After that the elapsed time is displayed in hours and minutes up to 19 hours — 59 minutes. Great for timing trips. Pressing the "Clock/ET" button lets you display either clock time or elapsed time, while the other function continues in the memory. A built-in AM or PM indicator lights up to show that you're looking at clock time, rather than elapsed time.

To reduce the drain on your battery, the clock or timer display fades out when the ignition is turned off, but the clock and the timer continue counting. However, the display can be recalled to full brightness at any time, even when the ignition is off, simply by pressing a button.

The splashproof, die-cast case features a handsome burl-grained vinyl insert to attractively accent the black-out clock display. Chrome function and ET reset buttons complete the well styled faceplate. The GC-1093 includes all hardware required to mount the unit on or under the dash of your car, boat, camper or motorcycle.

Kit GC-1093, Shpg. wt. 2 lbs. **64.95**

GC-1093 SPECIFICATIONS: **Power Requirement:** 10-17 VDC, neg. ground only. 300 mA max., display on. 30 mA max., display off. 4.5 volts minimum for clock memory. **Accuracy:** one min. per month, typical. **Temp. Range:** −30 to +60°C. **Format:** 12 hrs. with AM, PM and 20-hour rally timer. **Dimensions:** 1⅞" H x 4⅝" W x 4¾" D. **Net Weight:** 1 lb. 4 oz.

$64.95

Digital Readout Tachometer for better driving efficiency

- *More responsive and accurate than meter-type tachs*
- *Helps you find the best operating efficiency for your car or boat engine.*

2-digit electronic readouts sweep up to your engine's peak performance level. Your engine's RPM can easily be read, even in direct sunlight, on the ½"-tall numeric display. The readout shows 1st 2 digits, multiply by 100 for actual rpm. A dimmer control adjusts the brightness for safe nighttime driving.

Ten integrated circuits make construction of the CI-1079 simple and straightforward. Average construction time is just two evenings. The black die-cast case with a burl-grained vinyl insert matches the styling of the Heathkit Digital Car Clock and mounts on or under the dash.

The CI-1079 operates with conventional ignition systems, capacitive discharge systems (like the Heathkit Model CP-1060), and factory electronic ignitions. Installation is simple too — simply connect the CI-1079 directly to the primary side of the ignition coil. For engines with magnetos or without access to the primary of the coil, order the optional inductive pickup below.

Use on all 4-, 6-, or 8-cylinder, 4-cycle engines and 2-, 3-, or 4-cylinder, 2-cycle spark-ignition engines. Ease of assembly and ease of installation make the CI-1079 an ideal kit for the experienced kit builder or the beginner.

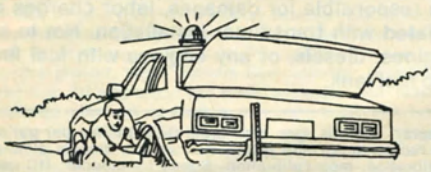
Kit CI-1079, Shpg. wt. 3 lbs. **49.95**

Kit CIA-1079-1, inductive pickup, Shpg. wt. 1 lb. **5.95**

CI-1079 SPECIFICATIONS: **Power Requirement:** 12 V, neg. gnd. only. **Readout Accuracy:** ±4% of reading, ±1 count. **Update Time:** 0.3, 0.2 or 0.15 seconds, depending on calibration point. **Applications:** 4, 6, 8-cyl. 4-cycle engines; 2, 3, 4-cyl. 2-cycle engines; 2, 3, 4-rotor Wankel engines. **Size:** 1⅞" H x 4⅝" W x 4¾" D.

$49.95

Emergency Strobe Light for highway safety



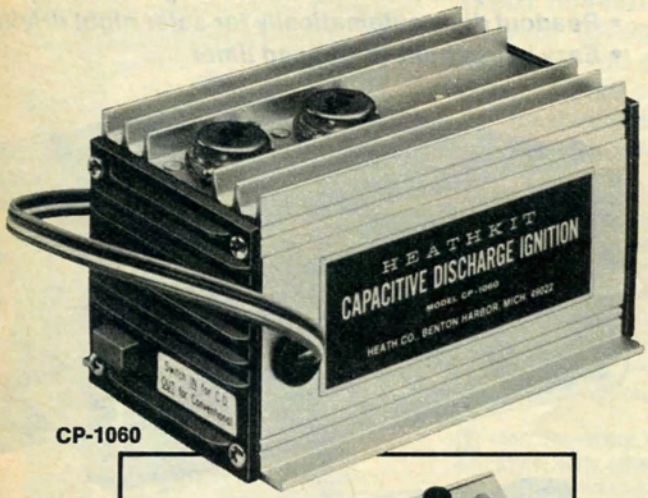
The GD-1026 BELONGS in every car! If you're stalled on the highway you make yourself visible so emergency help can find you fast. Just insert the adaptor plug provided into your car's cigarette lighter. A 12 ft. cord lets you place the flashing light in any spot on the car. Has non-marring magnetic base plate, highly visible flashing strobe with amber dome lens. High impact plastic case, moisture and corrosion resistant. And the cord coils neatly into the base so that the unit can be stored away in the trunk, ready for instant use. Easy assembly.

Kit GD-1026, Shpg. wt. 3 lbs. **29.95**

GD-1026 SPECIFICATIONS: **Supply voltage range:** 13.8 VDC ±20%. **Power consumption:** 5 watts nominal. **Flash voltage range:** 450 VDC ±20%. **Flash repetition rate:** greater than 1 per sec. **Operational temperature range:** −30°C to +60°.

$29.95

Build your way to better driving with these kits



CP-1060

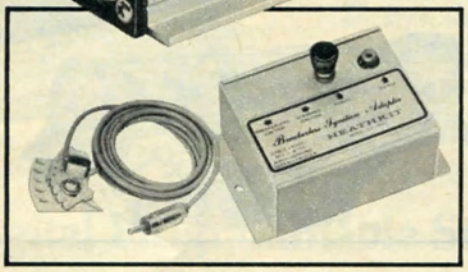
- Saves plugs and points
- Assures fast, sure starts
- Improved gas mileage

$34.95

Heathkit CD Ignition System

Delivers up to 50,000 miles between tune-ups on cars, truck, inboards, I/O & outboard marine engines with 12V battery/distributor/coil negative ground systems. External override button switches to conventional system. Build it in a couple of hours, install in less than that. 3⅛" H x 3¾" W x 6" D.

Kit CP-1060, Shpg. wt. 3 lbs. **34.95**



CP-1051

$44.95

Breakerless Ignition Adaptor

Develops a timing signal that isn't subject to mechanical problems of point wear and bounce. Replaces the points of all pre-1975 GM V-8 engines, and all AMC V-8s with external dwell adjustment (not for others). Easy-to-build unit mounts inside engine compartment; sensor mounts inside distributor, without removing points.

Kit CP-1051, Shpg. wt. 2 lbs. **44.95**

CPS-1060, Both Ignition System and Adaptor, Shpg. wt. 10 lbs. **64.90**

SAVE $15
Order the CD Ignition and Breakerless Adaptor together

Read about Solid-State Ignition Systems
Covers Capacitive Discharge and breakerless systems; servicing and troubleshooting techniques. **EDP-185** **4.50**
See page 52 for book-ordering information.

Heathkit Digital Electronic MPG Monitor/Speedometer

An important driving accessory for every car! The CI-1078 reads 0-99.9 miles-per-gallon and 0-99 miles-per-hour on bright amber-orange ½"-high digits. As a miles-per-gallon monitor it helps you save gas and money every time you drive, as an electronic speedometer it gives you a much more precise reading than conventional speedometers. Has a dimmer control to adjust the display for comfortable night driving, handsome die cast case with burl-grain vinyl insert. Includes all hardware for mounting in or under the dash, or on car's floor hump. When ordering, please specify make, model and year of your car. Be sure your car is covered in the speed transducer listing below. We cannot provide information on other models.

Note: The kits below differ only in the speedometer transducer supplied. Order the one that fits your car.

CI-1078-1. For speedometer cable mounting on: '55-'68 Chrysler Corp. Cars. '55-'71 Chrysler Corp. trucks; '55-'68 GM cars (except Opel); '55-'71 GM trucks (except LUV); '55-'68 Ford cars; '55-'72 Ford Trucks (except Courier); '55-'71 American Motors Cars; '72-'76 Gremlin, Sportabout and Hornet; '55-'66-Studebaker; '55-'76 Jeep; '55-'76 English Ford. For Cruise Control mounting on '69-'76 Chrysler Corp. cars; '69-'76 GM cars (except Opel); '55-'76 Ford cars.

Kit CI-1078-1, Shpg. wt. 5 lbs. **99.95**

CI-1078-2. For transmission mounting on: '69-'76 GM cars (except Opel); '72-'76 GM trucks (except LUV); '69-'76 Chrysler Cars except Colt and Cricket; '72-'76 Chrysler trucks.

Kit CI-1078-2, Shpg. wt. 5 lbs. **99.95**

CI-1078-3. For transmission mounting on: All Opel cars; '72-'76 Audi; '55-'76 BMW; '55-'76 Mercedes; '55-'76 Fiat; '55-'72 Saab; '55-'76 Volvo. For speedometer mounting on '55-'76 Porsche and VW.

Kit CI-1078-3, Shpg. wt. 5 lbs. **99.95**

CI-1078-4. For speedometer mounting on: '69-'76 Ford cars; '73-'76 Ford trucks (except Courier).

Kit CI-1078-4, Shpg. wt. 5 lbs. **99.95**

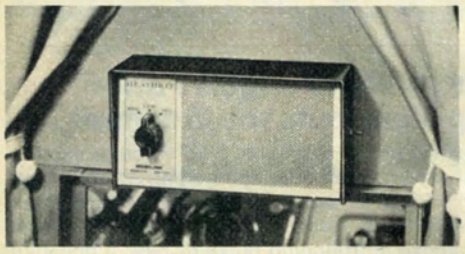
$99.95

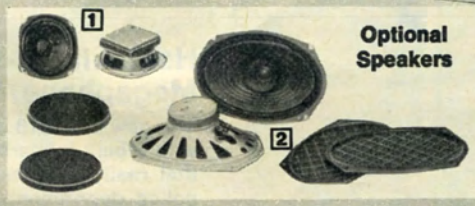
IMPORTANT NOTICE: Transducer installation requires good mechanical skill and in some instances a certain amount of ingenuity — since every make and model car is different. We cannot supply exact installation information for every car. In some cases you may choose to have a qualified mechanic install the speed and fuel flow transducers for you. Heath cannot be responsible for damages, labor charges or replacement parts associated with transducer installation. Not to be used on fuel-injected engines, diesels, or any engines with fuel line return from engine back to fuel tank.

CI-1078 SPECIFICATIONS: Display: 3 digits, gas discharge. 0-99.9 miles per gallon. 0-99 miles per hour. Controls: Front — mpg/mph pushbutton switch, display dimmer. Rear — update control, mph calibration, mpg calibration. Speed transducer: DC generator, 0-1.5 volt output with accuracy of 3% of 1 volt. Flow transducer: Photo resistor sensor measures fuel flow, 1.5 to 12 gallons per hour with accuracy ±3% of maximum flow rate. Electronics: Accuracy, ±2% of maximum reading. Temperature Range: 0-60° C operating, −40° to +70° C storage. Power requirements: 10 to 17 VDC at 500 mA; 13.5 to 17 volts required to meet specifications. Display unit dimensions: 1⅞" H x ⅝" W x 4¾" D. Display unit weight: 2 lbs.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Make your travel safer and more convenient





Optional Speakers

$69.95

- ***Hear real hi-fi sound in your car***
- ***Muting eliminates between-station noise***

Cab-to-Camper Intercom

$29.95

- ***Provides reliable communication between cab and camper***
- ***Easy assembly and installation***

Master selects "Standby", "Monitor" or "Talk" modes. Remote can initiate calls and has "Radio" position to bring music into camper from cab radio. Requires 12-volt, 250 mA power source.

Kit GD-160, Master, Remote and Cable, Shpg. wt. 5 lbs. **29.95**

GDA-160-1, Accessory Plug. For quick disconnect when camper and cab are separated. Shpg. wt. 1 lb. **4.50**

This FM Stereo Tuner puts REAL hi-fi Performance in your car!

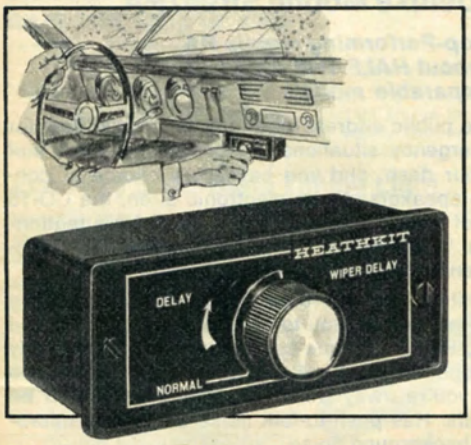
Enjoy stereo FM as you drive, with excellent fidelity. The Heathkit CR-1000A FM Stereo Tuner features a new Phase Locked Loop demodulator to bring you greater stability and separation, better noise rejection, and easier kitbuilding. And it offers the kind of specs you'd expect from a home system—less than 1% THD; frequency response ±1 dB, 30 to 15,000 Hz; 3 μV sensitivity; 60 dB selectivity; 40 dB nominal separation. Other features are: muting circuit to eliminate noise between stations; AFC; Tuning, Volume, Tone & Balance controls; on-off switch; stereo indicator light. Requires power amp. (right) for operation.

Kit CR-1000A, Shpg. wt. 7 lbs. **69.95**

Kit CRA-1000-1, Power amp., fits back of tuner, for 12V battery. Shpg. wt. 3 lbs. **29.95**

[1] **CRA-1000-2,** 4½", 4-ohm door-mount hi-fi speakers (including grilles, adapter plates for most speaker size openings and 24' speaker lead).
Shpg. wt. 6 lbs. . . . . (pair) **14.95**

[2] **CRA-1000-5,** 6"x9" 4-ohm rear deck mount hi-fi speakers (including grilles and 24' speaker lead).
Shpg. wt. 7 lbs. . . . . (pair) **21.95**



Windshield Wiper Delay

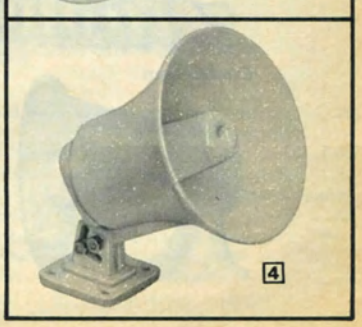
Eliminates constant wiper arm movement when an occasional sweep is sufficient. Lets you vary the time between sweeps.

Kit CH-1068, Shpg. wt. 2 lbs. **15.95**

CH-1068 SPECIFICATIONS—Delay Interval: 5 to 30 seconds minimum. **Sweeps interval:** .5 to 10 seconds minimum. **Input voltage:** 13.8 volts DC, ±20%. Positive or negative ground. **Wiper System Compatibility:** (Electric Only) GM: All single and two speed systems. Ford: Most small and intermediate models. Not compatible with full size models or '72-'76 Torino, or Montego, '74-'76 Cougar Chrysler: Single and two speed systems on small and intermediate models which do not use a motor reversing parking system. Ask dealer about your car's system. AMC: Single and two speed systems. Other models: Electric wipers which do not use a motor reversing parking system. NOTE: Heath does not supply automotive wiring diagrams for this unit.

Heathkit Mobile Security System—Keeps your car safe!

ONLY $24.95



Protects your entire car — engine, trunk and passenger compartment!

Here's effective auto protection at an affordable price! Ideal for cars with CB or amateur radio rigs, tape players, etc. Under-dash alarm set switch allows 5-15 second adjustable delay so you can enter or leave your car without sounding the alarm. If the passenger compartment is tampered with, the entry delay is defeated and further attempts to enter car will trigger the alarm instantly. An optional horn relay adapts the GD-1157 to cars whose horns do not use a relay or use a plug-in relay. Optional siren accessory provides attention-getting "yelp" sound instead of sounding the car horn. With all switches and hardware. Alarm unit, 2⅛" H x 4¾" W x 5" D. For 12 VDC negative ground only.

[3] **Kit GD-1157,** Shpg. wt. 3 lbs. **24.95**

[4] **Kit GDA-1157-1,** Optional Siren Accessory, 2 lbs. **19.95**

Kit GDA-1157-2, Optional Horn Relay (not shown), Shpg. wt. 1 lb. **2.95**

Order early for best selection! Phone (616) 982-3411 day or night.

Make yourself heard with Heathkit PA/Siren Systems

New

$79.95

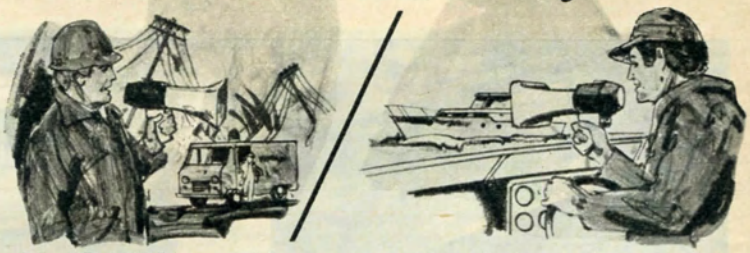
Offers more power and features, big savings over comparable assembled units!

Comfortable hand-contoured grip with trigger to operate voice or yelp

Rectangular horn speaker for outstanding efficiency and voice or yelp sound projection

GD-1818 SPECIFICATIONS

Power Output: 20 watts peak voice power. **Yelp Alarm:** single downward wail with automatic shutoff. Optional continuous tone selected during construction. **Pilot Lamp:** indicates Yelp or continuous tone. **Power Source:** 12 volts (eight "C" cells). **Weight:** 4 lbs. 12 oz. with batteries. **Dimensions:** Horn end, 8¾" W x 6¼" H, 14½" long overall.



The GD-1818 is a portable power megaphone/yelper that can be used wherever crowd control, hailing, or long range voice communications is needed.

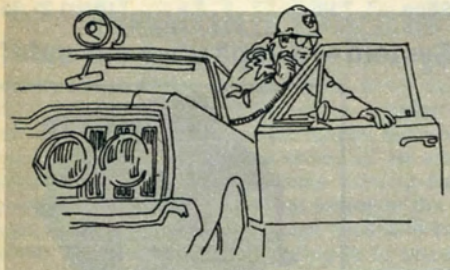
Heathkit GD-1818 20-Watt Portable Power Megaphone/Yelp Alarm puts you in control

The new GD-1818 is a quality power megaphone for voice projection, with a built-in alarm that produces an attention-getting "yelp" sound that really penetrates. It's ideal for outdoorsmen, volunteer fire and police departments, boat owners, track and field coaches; anyone who needs to be heard above surrounding noise or over a distance.

To amplify your voice through the GD-1818, simply pull the Trigger switch on the handle. The noise-cancelling microphone is highly selective to amplify your voice only with minimum background noise. Turning on the "Yelp" switch activates the alarm circuit, producing a single downward wail each time you pull the trigger. A bright pilot light lets you know the GD-1818's alarm is on. A volume control sets the sound level for both voice and alarm, with the circuit designed so that even at normal voice settings, the alarm is available at full power. The GD-1818 can be wired for a continuous-tone, instead of the yelp sound, making it useful as a portable horn for boats, dune buggies, etc.

Operates on eight "C" cells (not supplied) which fit easily into the battery compartment. High-impact plastic case is highly spray resistant for use on water, and rugged enough for outdoor uses.

Kit GD-1818, Shpg. wt. 6 lbs. **79.95**

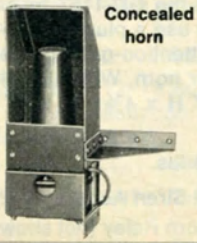


SAVE on the complete Siren/PA System!

Kit or Assembled

Exterior horn

Concealed horn



Heathkit GD-18 Deluxe Mobile Siren/PA

$64.95 Kit ***A Top-Performing mobile PA at about HALF THE COST of comparable models***

The GD-18 is a versatile public address/siren system that's ideal for anyone working in emergency situations. Its compact control unit mounts on or under your dash, and you have your choice of concealed or exterior horn speakers. As an electronic siren, the GD-18 boasts a full 55 watts of power with adjustable pitch for attention-getting sound. A manual "wail" button lets you override the PA function if you need the siren without resetting the function switch.

When used as a PA system, the GD-18 amplifies your voice with a full 20 watts of power — enough for you to be heard over crowds and background noises. And Heath's unique circuitry makes it practically immune to acoustic feedback. The GD-18 can also be used as a radio call alert — so even if you're away from your vehicle, you can be alerted to important calls. Has push-to-talk noise cancelling microphone which minimizes background noise.

You complete your GD-18 system with your choice of speakers — either concealed or exposed horn. Each speaker is easy to mount and provides extremely high output. Concealed speaker requires 4½" x 4½" x 13" behind grille. NOTE: please check the required standards for mobile sirens in your area.

Kit GD-18, Shpg. wt. 6 lbs. **64.95**
Assembled WD-5130, siren/PA amp, Shpg. wt. 6 lbs. **89.95**
Assembled GDA-18-1, exterior horn, Shpg. wt. 10 lbs. **64.95**
Kit GDA-18-2, concealed horn, Shpg. wt. 10 lbs. **64.95**
Assembled WDA-5130-2, concealed horn, Shpg. wt. 10 lbs. . . . **79.95**

Buy a complete system and SAVE!

If purchased separately, 129.90.
GD-18A (Kit GD-18 and Exterior Horn) Shpg. wt. 21 lbs. . . **121.95**
GD-18B (Kit GD-18 and Concealed Horn) Shpg. wt. 21 lbs. **121.95**

Charge-A-Kit — no money down on any kit — see page 54 for details.

Heathkit do-it-yourself auto tuneup

Tune up for better performance and economy. Heathkit tune-up gear and the books below make it easy and inexpensive.

Deluxe Timing Light flashes brighter than daylight

ONLY $29.95

Helps you keep your car properly timed for better driving efficiency, cleaner running, smoother performance and increased gas economy. Features a handy inductive pickup that snaps directly around the #1 spark plug wire without removing wire, using adapters, etc. (Recommended for GM-HEI and other systems, where high voltage may be present.) Has a super-bright xenon flash bulb that can be seen easily even outdoors. Can be hooked up while the engine is running, and won't interfere with other auto test equipment either. Comfortable pistol-grip handle, insulated blue-plastic housing. Polarity protected. Powered by your car's battery or a separate 15-volt supply. With all cables, pickup and clips.

Kit CI-1040, Shpg. wt. 3 lbs. **29.95**

CI-1040 SPECIFICATIONS

Useful Light Range: Up to 2 ft. in daylight. **Engine Speed Range:** Full flash brightness up to 2000 rpm. **Triggering:** Current pickup coil. **Power Requirement:** 12 VDC battery or separate 15 VDC power supply. **Dimensions:** 6½" H x 2" W x 10"L.

Economy Solid-State Timing Light

Has the same fine features as above, but no inductive pickup. Flash can be seen in direct sunlight. Easy to use: connect one cable to battery, the other to spark plug. Insulated housing, polarity protected. With all cables.

Kit CI-1020,
Shpg. wt. 3 lbs. **19.95**

CI-1020 SPECIFICATIONS

Useful Light Range: Up to 2 ft. in daylight. **Engine Speed:** Up to 2000 rpm. **Power Required:** 12 VDC battery or 15 VDC supply. **Size:** 6½" x 2" x 10".

Three-In-One Tune-Up Meter Ideal for "Weekend Mechanics" or Pro's

- ***Pays for itself with just a couple of tuneups***
- ***Helps you keep your car in top shape for best operating performance and efficiency***
- ***Measures dwell, engine rpm and voltage on an easy-to-read color coded 4½" meter***
- ***Easy to use — just connect two leads to your engine***

ONLY $24.95

Here's a compact and versatile tuneup meter that will help you save money every time you use it! Keeps your car engine operating at peak performance all the time, helps you do thorough tuneups fast and easy.

Combines a distributor cam dwell meter, an electronic tachometer and a direct-current voltmeter in a single, compact unit that's easy and convenient to use. Measure dwell angle on most 4-cycle, 3, 4, 6 and 8-cylinder engines having conventional (Kettering) ignition systems. Shows engine RPM on two scales — 0-1500 RPM idle speed and 0-4500 RPM high speed. Checks voltage from 0-15 volts.

Can be used with both 6 and 12-volt electrical systems with positive or negative ground. (Not for solid-state ignition systems.) It has just two leads to connect to the engine and no batteries to run down — draws its power directly from car battery. Complete with leads, instructions and high-impact case. Easy kit assembly too.

Kit CM-1073, Shpg. wt. 4 lbs. **24.95**

CM-1073 SPECIFICATIONS

Dwellmeter: Three dwell scales: 8 cyl., 10-45 degrees; 4 cyl., 20-90 degrees; 6 cyl. & 3 cyl. x 2, 25-60 degrees. **Tachometer:** Two RPM ranges; Low range — 0-1500 RPM; High range — 0-2500 RPM. **Voltmeter:** Direct reading scale, 0-20 VDC. **Power Requirement:** 10 mA approximate average current. **Meter:** 4½", 1 mA (100 degree movement). **Accuracy:** ±3% of full scale. **Dimensions:** 4¼" H x 8½" W x 7¼" D.

Informative Automotive Manuals and Tune-Up Guides

Using Electronic Testers for Automotive Tune-Up — ideal companion to Heathkit tune-up equipment. **EDP-165** **4.95**

Modern Guide to Auto Tune-Up and Emission Control Servicing — tells in plain language how to tune your care for best gas mileage and lower emissions. **EDP-166** **5.95**

Auto Repair Manual — Chilton's famous classic, covering U.S. cars from 1967 to 1976. **EDP-168** **11.95**

Small Engines Service Manual — has all the information needed to service small engines. All popular makes are covered. **EDP-170** **7.95**

"Can-Do-Tune-Up" Guides — step-by-step instruction book & cassette tape. A completely new way to handle tune-ups — an illustrated booklet gives you all the information you need and a tape cassette actually "talks you through" the important steps. Each book also includes information on periodic maintenance and a complete troubleshooting chart. For 1964-74 6 and 8-cylinder engines. **EDP-204,** for GM vehicles **7.95**

EDP-205, Ford, Lincoln, Mercury vehicles **7.95**
EDP-206, Chrysler, Plymouth, Dodge vehicles ... **7.95**
EDP-207, Volkswagen vehicles **7.95**

Automotive Electronics — a look at the state-of-the-art, plus a complete explanation of your car's electrical and ignition system. **EDP-162** **7.95**

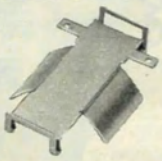
Auto Engine Tune-Up — a complete how-to-do-it guide to tune-up, including carburetion & ignition. **EDP-163** **6.75**

See page 52 for book ordering information.

Do your own auto tune-ups, save money

Diagnose ignition problems FAST on this 5″ scope

$159.95



Includes adapter that allows you to use the CO-1015 with GM High Energy Ignition Systems.

- ***Built-in rpm indicator***
- ***Clamp-on inductive pickup for easy hookup***
- ***Solves more problems, more quickly than meter type analyzers***

Locate ignition troubles the scientific way, not by "hit-or-miss" methods. The Heathkit CO-1015 Ignition Analyzer detects shorted spark plugs, bad ignition points, defective wiring, worn distributor parts, incorrect dwell angle, plus coil or condenser defects and transistor or capacitive discharge circuitry problems. Can be used with any standard, transistorized or capacitive discharge ignition system on six or eight-cylinder engines with distributors. It features a built-in tachometer, constant pattern width circuitry.

You select one of four different patterns — primary or secondary, in either parade or superimposed display. For detailed analysis, the horizontal sweep can be expanded 10 to 1, vertical sweep 2 to 1. The optional 12-volt inverter mounts permanently to the unit's rear panel, for portable or "on the road" tests. Includes adapter for use with General Motors High Energy Ignition systems. Operation handbook (supplied) illustrates typical auto engine waveforms to aid in your troubleshooting.

Kit CO-1015, Shpg. wt. 22 lbs. **159.95**

Kit COA-1015-1, 12-Volt Inverter, Shpg. wt. 3 lbs. **32.95**

WOA-5104-1, Assembled 12V Inverter, Shpg. wt. 3 lbs. **39.95**

CO-1015 SPECIFICATIONS

Power Requirement: 120/240 VAC, 60/50 Hz, 16 W. **RPM Range:** 400-5000. **Cylinders:** 3, 4, 6 or 8. **Vertical Expand:** Approx. 2 to 1. **Horizontal Expand:** Approx. 10 to 1. **Sweep Length:** ±5% over entire RPM range. **Intensity:** Fixed. **Presets:** Focus, Astigmatism, Trigger Adjust, Tach Cal. **Connection Cables:** 12′ pick-up clamp; ground and secondary clip leads extend 2′ beyond pick-up clamp. **Tachometer:** 0-1000 RPM, 0-5000 RPM ±5% of full scale. **Dimensions:** 7″ H x 10½″ W x 17½″ D.

15-Amp Automatic Battery Charger/Booster

Charges 12-volt car battery at 15-amp rate, boosts at 50-amp rate for quick start when battery is dead. Use on negative or positive ground. Circuit breaker protection.

Kit GP-1044, Shpg. wt. 22 lbs. **59.95**

GP-1044 SPECIFICATIONS

Charge Rate at 120 VAC (primary): Boost, 50 amperes (max. 1 minute). Normal, 15 amps. Shuts off automatically after battery is fully charged. **Output Voltage:** Shuts off when voltage at terminal reaches 14.5 V. **Power Requirement:** 110-130 VAC, 60 Hz. **Size:** 6⅛″ H x 11½″ W x 7¾″ D.

10-Amp Automatic Battery Charger

Keeps your car battery at full charge for easier starts. better performance! Won't operate unless correctly connected, can't overcharge the battery. Easy to use — just connect the cables to 12-volt battery terminals and plug into AC outlet.

Kit GP-21, Shpg. wt. 13 lbs. **39.95**

GP-21 SPECIFICATIONS

Charge Rate: 10 amperes maximum at 120 VAC line. **Output Voltage:** Between 13.2 VDC and 13.6 VDC. **Power Requirement:** 105-130 VAC, 60 Hz. **Dimensions:** 5½″ H x 9″ W x 6⅜″ D.

Small Engine Tune-up Meter

Ideal for garden tractor, lawn mower, motorcycle, snowmobile, outboard motors, etc. Tests volts, ohms, dwell & continuity on 1 to 4 cylinder, 2 & 4 cycle engines. Built-in tach, snap-on pickup. Less batteries. (Not for Briggs & Stratton engines.)

Kit CM-1045, Shpg. wt. 5 lbs. **42.95**

CM-1045 SPECIFICATIONS

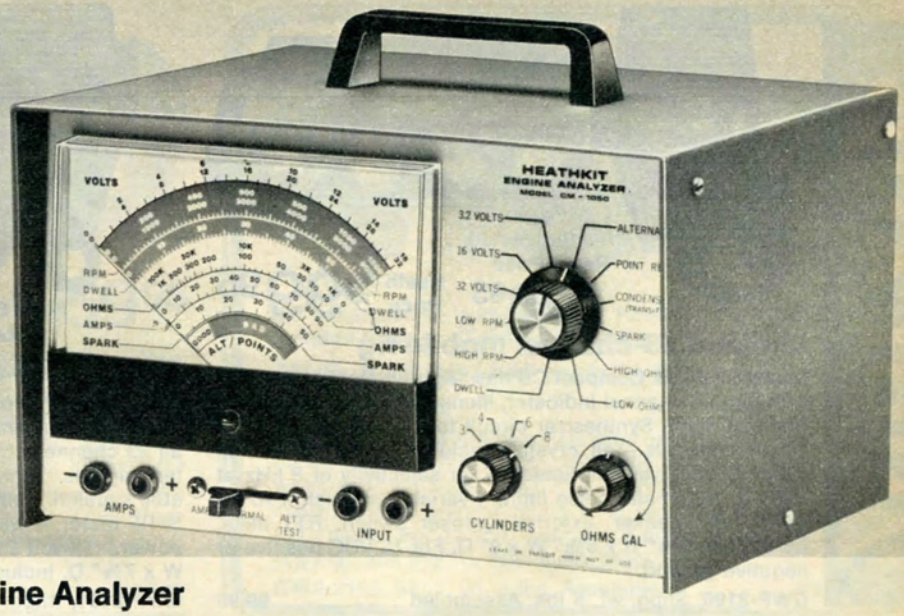
Voltmeter: 0-20 V DC. **Ohmmeter:** 0 to 100 kΩ (10 kΩ center scale.) **Tachometer:** Two ranges: 0-3000 rpm, 0-15000 rpm. **Dwell Meter:** Four scales: 1 cylinder, 90°-360°; 2 cylinder, 40°-180°; 3 cylinder, 30°-120°; 4 cylinder, 20°-90°. **Power Source:** Three 1.5 V "C" batteries. **Dimensions:** 9⅛″ H x 9⅜″ W x 5¼″ D.

With Heathkit products, American craftmanship starts at home — your home.

and time with Heathkit Auto Test Gear

Shows dwell, rpm, amps, volts, ohms, spark output, alternator and point condition

$69.95



HEATH charg-a-kit REVOLVING CHARGE

Low-cost professional-grade Engine Analyzer

- ***Keeps your car running like "new" for big savings***
- ***Color-coded meter for easy "no-mistake" readings***
- ***3% accuracy on all ranges for precise measurements***
- ***Complete with all leads and accessories for complete tuneups***

This professional-grade instrument performs the tests you need to tune up your car for improved performance and best fuel economy. Tests conventional, magneto, transistorized, and most capacitive discharge ignition systems — both positive and negative ground, any voltage, on any 3, 4, 6 or 8-cylinder engine. The CM-1050 Analyzer permits rapid testing and servicing of the storage battery, generator or alternator, voltage regulator, starter, distributor, ignition circuit (points, condenser and coil), accessories and all the electrical wiring.

Easy to connect and use — makes home tune-ups a snap. The large 6″ meter is color-coded for easy reading. Unlike most other engine analyzers, there is no need to recalibrate the unit between functions — all you do is turn the rotary switch to the desired range and you're ready to test. Accuracy is ±3% on all settings, over a wide range of operating temperatures. Operates on 3 standard "C" batteries (not supplied). Has convenient carrying handle. Comes complete with all leads and accessories, ready to build quickly and use.

Kit CM-1050, Shpg. wt. 8 lbs. **69.95**

CM-1050 SPECIFICATIONS

Voltmeter Ranges: 0-3.2 V DC. 0-32 V DC, ±3% of full scale. **Ohm-meter:** Two ranges: R x 1 (100 Ω center scale). R x 100 (10 kΩ center scale), ±3° arc. **Tachometer:** Two ranges: 0-1200 rpm, 0-6000 rpm, ±3% of full scale. **Dwell Meter:** Two ranges: 0-45° (on 0-60° scale). 0-60°, ±3% of full scale. **Amperes:** −5 to +90 amperes DC, ±3% of full scale. **Spark Output:** 0-50. **Point Resistance:** Good/Bad. **Alternator:** Good/Bad. **Condenser:** 0.22 μF, 10%. **Accuracy:** ±3% of full scale. **Cables Supplied:** Two 8″ two-conductor test cables. One 2′ alligator to alligator lead. One 2′ alligator to push-on connector lead. One calibration cable. **Accessories Supplied:** 90-ampere shunt. 0.25 Ω resistor assembly. One insulation-piercing alligator clip. Two #10 solder lugs. (#14). **Dimensions:** 7½″ H x 10½″ W x 8¾″ D.

Exhaust Gas Analyzer checks fuel efficiency

- ***Shows air-fuel ratio and percent of carbon monoxide***
- ***Helps you tune-up your car for peak performance***
- ***Includes all you need for fast and easy hookup***

Monitors your car's exhaust for minimum air pollution and maximum efficiency by measuring thermal conductivity of the exhaust gases. Shows the air-fuel ratio, combustion efficiency and the percentage of carbon monoxide in the exhaust. The CI-1080 is essential when you're tuning up a car which must meet specific requirements for exhaust emissions, or when you simply want peak operating efficiency. Comes with all cables and tubing for easy connection.

Kit CI-1080, Shpg. wt. 6 lbs. **64.95**

CI-1080 SPECIFICATIONS

Meter Scales (3): 11.5-15.0 Air-Fuel Ratio. 70%-90% Combustion Efficiency. 0-8% Carbon Monoxide. **Exhaust Type:** From 4-cycle gasoline engines. Not for use with catalytic converters. **Accuracy:** Within 1 Air-Fuel Ratio depending on fuel used. **Meter:** 4½″, 100-0-100 μA. **Connectors:** Battery cord, 7 feet. Sensor cord, 21 feet. Exhaust flexible tube, 30 inches. **Power Requirement:** 6-volt or 12-volt car battery, less than 150 mA. **Weight:** 4 lbs., 12 oz.

$64.95

Hanson Basic Tester Set

Helps you keep your car in top shape! Includes Model 714 Remote Starter Switch, Model 715 Deluxe Compression Tester, Model 709 Vacuum/Fuel Pump Tester.

CGP-1036, Assembled. Shpg. wt. 3 lbs. . . . **11.95**

GM Voltage Regulator Tester

Easy to use, fast and accurate! Shows condition of all 4 circuits in GM Delco Integral Charging System regulators. Optional leads for under-hood testing.

CTW-1170, Assembled, Shpg. wt. 15 lbs. **99.95**

CTW-1170-2, optional external leads, Shpg. wt. 1 lb. . . . **6.00**

CTW-1170 SPECIFICATIONS

Test Voltage: 16.5 VDC. **Sense Voltage:** Adjustable 0-17 VDC. **Voltmeter:** 0-20 VDC ±3%. **Short Circuit Current:** 0.1A. **Power Requirement:** 120 VAC, 60 Hz, 150W. **Case:** Aluminum. **Dimensions:** 7″ H x 11″ W x 7″ D.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Super-Low Prices on Heath-Recommended

MIDLAND INTERNATIONAL®

Mfr's Suggested Retail Price $129.95 Heath Price **$99.95**

Midland 23-channel mobile rig

Model 13-862B. Compact CB has "right-in-sight" top panel with lighted channel indicator, illuminated S/RF meter and Transmit light. Synthesizer circuit for instant operation on all 23 channels — all crystals included. Dual conversion superhet receiver has tuned RF for selectivity of 8 kHz at −6 dB. Automatic noise limiter, variable squelch, PA/CB switch, 3″ speaker, external speaker switch. PTT mike, cord. Size: 2¼″ H x 5⅛″ W x 9″ D. For 12 VDC positive or negative ground.

GWP-2190, Shpg. wt. 5 lbs. Assembled **99.95**

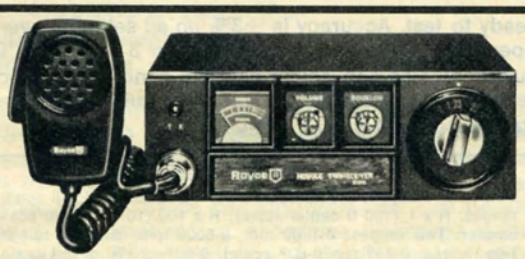
Mfr's Suggested Retail Price $169.95 Heath Price **$119.95**

Midland 23-channel mobile with delta tuning

Model 13-857. For the cost-conscious CB'er who wants outstanding operating convenience. Precise synthesized crystal system covers all 23 channels. Delta fine tuning adjusts ±1 kHz to pull in "off-center" signals. Tuned RF stage; AGC; switchable ANL; full-range variable squelch. Built-in 3″ speaker, external speaker provision. Lighted S/RF meter. 4-watt output with high level modulation for peak "talk power." 12-volt DC positive or negative ground. Size: 2¼″ H x 6⅜″ W x 7⅞″ D. Includes PTT mike with coil cord, mounting bracket.

GWP-2191, Shpg. wt. 6 lbs. Assembled **119.95**

Royce

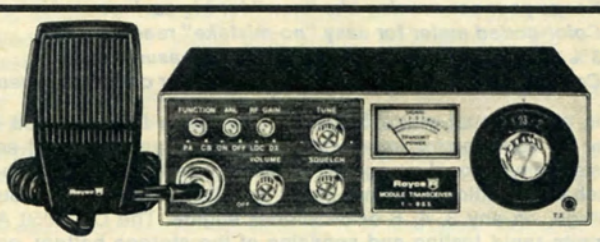


Mfr's Suggested Retail Price $144.95 Heath Price **$99.95**

Royce mobile 23-channel Transceiver

Model 650. Dependable communications at a modest price. Wireless modular design with synthesized 23-channel circuitry — all crystals are included. Dual conversion receiver has tuned RF stage, IC audio stage rated 6 watts RMS, 3 ceramic filters, amplified AGC, fully variable squelch. Lighted 1″ S/RF meter, external speaker jack, 3″ speaker, custom plug-in mike. Powered by 12 VDC, positive or negative ground. Vinyl-clad metal cabinet.

GWP-2180, Shpg. wt. 7 lbs. Assembled **99.95**



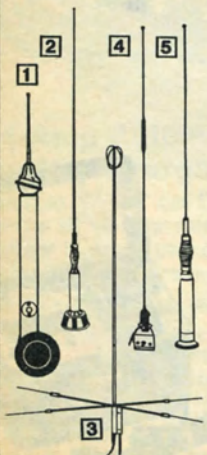
Mfr's Suggested Retail Price $179.95 Heath Price **$139.95**

Royce mobile CB Radio with Gyro-Lock

Model 655. Features Gyro-Lock (Phase Lock Loop) circuitry for 23-channel transmit/receive on Royce's famous "wireless" chassis. Has a big illuminated S/RF meter, continuous fine tuning control, pushbutton automatic noise limiter, pushbutton PA/CB switch, pushbutton RF gain control. AMC for maximum "talk power;" LED transmit light. Full-size plug-in microphone. Modular-design chassis for reliability, with jacks for external/PA speaker. Uses metal-case RF output transistor — more rugged than plastic. 12 VDC positive or negative ground operation; power cord included.

GWP-2181, Shpg. wt. 8 lbs. Assembled **139.95**

SAVE on Antennas too!



1 Tenna CBE-10 Retractable Mobile Antenna. Retracts out of sight when not in use for theft protection. Adjustable SWR. With 18′ coax, RG-58/U, all hardware.

GDP-110, Shpg. wt. 8 lbs. **59.95**

2 A-S M-176 "Quick-Grip" Mobile Antenna. Trunk lid mount (no holes to drill). 46″ high. Weatherproof loading coil; 17′ coax. Shpg. wt. 3 lbs.

GDP-2121 ..... **Was $26.95 Now 19.95**

3 A-S M-117 "Super Magnum" Base Antenna. ½ wave end-fed; gives 3.75 dB gain, improves S/N 6 dB! Static-reduction ball. Shpg. wt. 9 lbs.

GDP-2120 ..... **Was $39.95 Now 29.95**

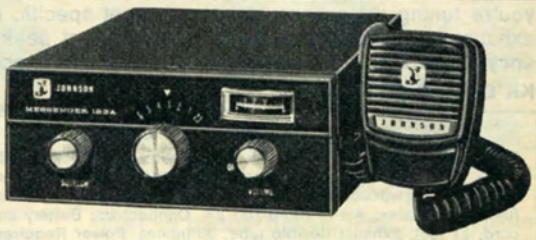
4 A-S MR-180 "Flipper" Mobile Antenna. Raingutter mount (no holes to drill). With 10′ coax. Shpg. wt. 3 lbs.

GDP-2122 ..... **Was $22.95 Now 16.95**

5 A-S M-125 Rooftop Mobile Antenna. Snap mounts in ⅜″ hole. Loading coil. 46″ h; 17′ coax.

GDP-2123, Shpg. wt. 3 lbs. **17.95**

JOHNSON®



Mfr's Suggested Retail Price $159.95 Heath Price **$129.95**

Low-priced Johnson mobile

Messenger 123A. Proven 100% solid-state chassis with speech compression, built-in automatic noise limiter, high-selectivity mechanical filter and acoustically isolated speaker. Lighted RF output/S meter. 23 channels with maximum legal power. Just 2½″ H x 6¾″ W x 9⅝″ D; operates on 12 VDC negative ground. With crystals, mike, bracket. Order antenna at left.

GWP-100, Shpg. wt. 6 lbs. Assembled **129.95**

GWP-100-1, AC supply. Shpg. wt. 4 lbs. **37.50**

See page 92 for informative CB books

CB Two-Way Radios! Get on-the-air for less!

Mfr's Suggested Retail Price ~~$204.95~~ Heath Price **$159.95**

Midland 23-channel mobile with volume on mike

Model 13-888. Super quality and convenience, with auxiliary volume control right on the microphone. Phase Lock Loop synthesizer circuit permits 23-channel operation — no crystals to buy! Big lighted S/RFO/SWR meter. Built-in SWR bridge and calibrator for tuning your antenna. PA function, audio tone control, noise blanker, ANL, delta tuning. Antenna Warning Light shows excessive VSWR. "Omni-Power" operation on any 12 V system, positive or negative ground. Dynamic mike, coiled cord, mounting bracket.

GWP-2192, Shpg. wt. 7 lbs. Assembled **159.95**

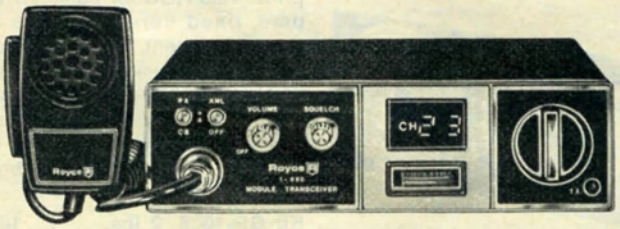
SUPER-BUY ON SSB!

Mfr's Suggested Retail Price ~~$299.95~~ Heath Price **$229.95**

Midland SSB/AM mobile CB Transceiver

Model 13-892. 23 AM channels plus upper and lower sidebands for more range than AM! Delivers 4-watt output (12 watts PEP on SSB). Has SSB clarifier control, RF gain control, noise blanker, hi/lo tone switch, PA switch, S/RFO meter. For 12 VDC positive or negative ground. 2½" H x 7½" W x 9½" D. With mike, bracket.

GWP-2193, Shpg. wt. 8 lbs. Assembled **229.95**



Mfr's Suggested Retail Price ~~$219.95~~ Heath Price **$169.95**

Royce digital 23-channel mobile CB

Model 660. Feature-packed all-channel CB 2-way radio has a digital readout dial system that shows channel selection in bright LED numerals. Gyro-Lock (Phase Lock Loop) 23-channel crystal system. Big S/RF meter, pushbutton ANL and PA/CB switches, fully variable squelch control. IC audio stage with 6-watt RMS output. Amplified AGC; 3 ceramic filters; tuned RF stage in the dual conversion receiver. AMC circuit for peak "talk power." Jacks for external/PA speakers. Rugged vinyl-clad metal cabinet. For 12-volt DC positive or negative ground. Includes mike, DC cord.

GWP-2182, Shpg. wt. 6 lbs. Assembled **169.95**

Mfr's Suggested Retail Price ~~$219.95~~ Heath Price **$179.95**

Royce 23-channel Base Station

Model 620. Has all the convenience features you could want in your CB base station. Sophisticated styling, too, with walnut end panels, charcoal gray top, black control panel and satin aluminum grille. Dual power supply operates from 117 VAC or 12 VDC. Fully variable tone control, automatic noise limiter pushbutton, delta tuning, tape recorder jack, fully variable squelch. Dual conversion receiver has ceramic filter for razor-sharp selectivity. Big channel readout dial; illuminated S/RF meter; bar-type Transmit and Modulation lights.

GWP-2183, Shpg. wt. 13 lbs. Assembled **179.95**

Mfr's Suggested Retail Price ~~$249.95~~ Heath Price **$199.95**

Johnson 23-channel mobile

Messenger 323A. For the serious mobile CB'er, a rig that's really loaded. Breakthrough in design... single conversion with dual cascade crystal filtering for spectacular freedom from interference. S/RF meter, lighted channel indicator, built-in PA function. Full 23 channel coverage. Hand-held microphone included. Size: 2½" H x 8" W x 9½" D. Requires 12 VDC power, positive or negative ground.

GWP-101, Shpg. wt. 9 lbs. Assembled **199.95**

GWP-101-1, Optional AC supply, Shpg. wt. 5 lbs. **46.50**

Mfr's Suggested Retail Price ~~$244.90~~ Heath Price **$219.95**

Johnson 23-channel Base Station

Messenger 250. One of the finest CB radios around... 100% solid-state design, large professional controls with full lighted metering. Has electronic speech compression for extra transmit range, special voice tailored audio for crisp, clean reception. 5⅝" H x 11" W x 9¹³⁄₁₆" D. For 117 VAC. Brown/beige. With all crystals, microphone.

GWP-102, Shpg. wt. 16 lbs. Assembled **219.95**

CB Radios on these two pages provide maximum legal 4-watt output, all are FCC Type Accepted

These easy to build radios make great gifts!

Heathkit AM/FM Portable Radio

$46.95

- ***Use it with batteries or optional AC adapter***
- ***Automatic Frequency Control prevents FM drift***
- ***Large, front-facing speaker for great sound***

Taking your own entertainment with you has never been easier than with the GR-17 Portable Radio. It's a great kit to build...just right for someone starting out because of its clean, open circuit design. And because we've packed so many quality features into the GR-17, it delivers the kind of listening enjoyment you just won't find in some other portables. The Automatic Gain Control keeps the AM volume level where you set it. And the Automatic Frequency Control locks onto the FM station you select, so you get stable, "no-drift" reception all the time. The GR-17 is powered by six "D" cell batteries (not included) to give you hours of on-the-go entertainment. An optional AC converter lets you plug the GR-17 into any standard AC outlet. Has good looking stitched leatherette carrying case with handle, smartly styled front panel. 6¾" H x 8¾" W x 4" D.

Kit GR-17, Shpg. wt. 6 lbs. **46.95**

GRA-43-1, AC Adapter, 1 lb. **4.95**

Solid-State AM/FM Table Radio

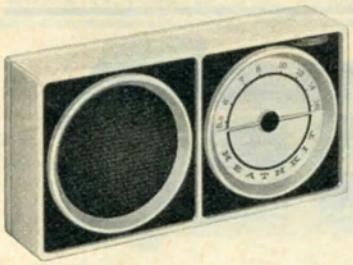
A fun-to-build kit with outstanding 5 μV (IHF) FM sensitivity — brings weak stations in loud and clear. With Automatic Frequency Control, built-in AM and FM antennas, easy-to-read, backlighted tuning dial, and rich-sounding 3" x 5" oval speaker. Attractive, high-impact plastic case 5¼" H x 10" W x 4⅞" D. For 120 VAC.

Kit GR-48,
Shpg. wt. 5 lbs. **43.95**

$43.95

AM Pocket Portable Radio anyone can build

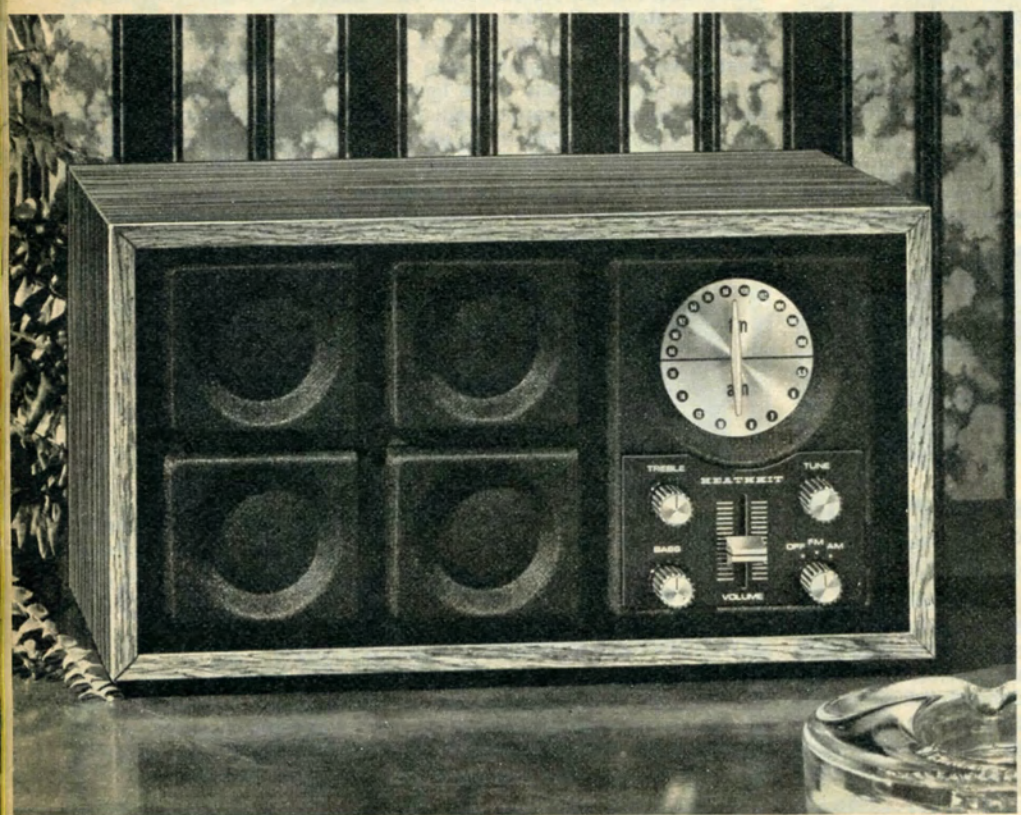
$16.95



A great kit for beginners. Goes together in a couple of evenings, and sings up a storm with big 3½" speaker & RF amplifier stage — unusual at this low kit price. Has AGC for constant volume, fixed ceramic filters for easy alignment. White & black plastic case measures a compact 4" H x 7⅞" W x 2" D. Operates on 9-V battery (not supplied). Get a youngster started in kit-building with this fun-to-build personal portable.

Kit GR-1008, 2 lbs. **16.95**

Save $10 on this Heathkit AM/FM Table Radio with real Hi-Fi Sound



Brighten up the holidays and enjoy great sound for years to come with the exciting GR-1085! Offers the same kind of sound that made Heathkit hi-fi famous — and style that makes it perfect for use anywhere in your home or office!

Features quality solid-state circuitry, a sensitive AM/FM tuner, and a full-range acoustic suspension speaker. Has the kind of station-pulling FM performance you'd expect from a far more expensive stereo receiver, and a quality AM section too.

Its low-distortion amplifier (Power Output: 5 watts, minimum RMS, into 8 ohms with less than 1.0% total harmonic distortion from 60 Hz to 15 kHz.) gives you a roomful of full-bodied sound, and separate bass and treble controls let you "tailor" the sound the way you like best.

You can build the GR-1085 in just a few evenings. It's a great gift for anyone who wants fine hi-fi sound in a table radio. Luxurious teak-grained vinyl covered cabinet with molded front grille. Shpg. wt. 19 lbs.

Kit GR-1085 .....**Was 99.95—NOW 89.95**

GR-1085 SPECIFICATIONS: FM: Sensitivity: 5 μV. Selectivity: 60 dB. GENERAL: Power Requirement: 120/240 VAC, 50/60 Hz, 25 watts. Speaker: 4½", 8 Ohm. Dimensions: 7" H x 13" W x 17½" D.

Find out how easy it is to build a kit — order the manual. See page 53.

Convenient and versatile AM/FM Digital Electronic Alarm Clock-Radio

$129.95

- ***"Catnap" with the 7-minute snooze button***
- ***Stay "on time", even if AC power fails thanks to the built-in "fail safe" circuit***

Here's everything you need in a quality clock-radio — 24 hour set'n forget alarm, fine sound and style that fits anywhere — kitchen, bedroom, den, office. Setting the pace for convenience in the GR-1075 is the all-electronic digital clock. It reads out the time in conventional 12-hour format with bright orange 7-segment Beckman digits. Displays AM or PM, too. A lighted decimal pulsates to indicate seconds and also shows that the alarm is properly set. Readout features automatic brightness control. The 24-hour alarm cycle offers convenience you just won't find on conventional alarm clocks. Go to bed at 9 PM and set the alarm for 10 AM without being awakened in an hour. The alarm can be set to wake you with a gentle pulsating, electronic "beep" (which can be changed in volume by the radio volume control)...or by the soft music from the FM or AM radio station of your choice. The 7-minute snooze cycle feature is repeatable for up to an hour. Two 9-volt batteries (not supplied) take over during power interruptions and keep the clock counting, without the display — when power is restored the clock is "on time" and the alarm will go off at the set time. On the front panel are finger-flip switches for on/off; AM/FM selection; radio or electronic alarm; "wake-up" alarm set; "Snooze" cycle; plus volume and AM/FM tuning controls. Black plastic cabinet with brushed aluminum trim strip, and simulated walnut-grain vinyl end panels.

Kit GR-1075, Shpg. wt. 10 lbs. **129.95**

GR-1075 SPECIFICATIONS: FM Sensitivity: 5 μV @ 30 dB quieting. AM Sensitivity: 300 μV/M @ 20 dB quieting. Speaker: 3″ x 5″ oval. Power requirement: 120/240 VAC, 50/60 Hz; 17 watts max.; clock, 7 watts. Dimensions: 4¼″ H x 13⅝″ W x 8⅛″ D.

Make your holiday parties brighter and more festive with this exciting Color Organ

$84.95

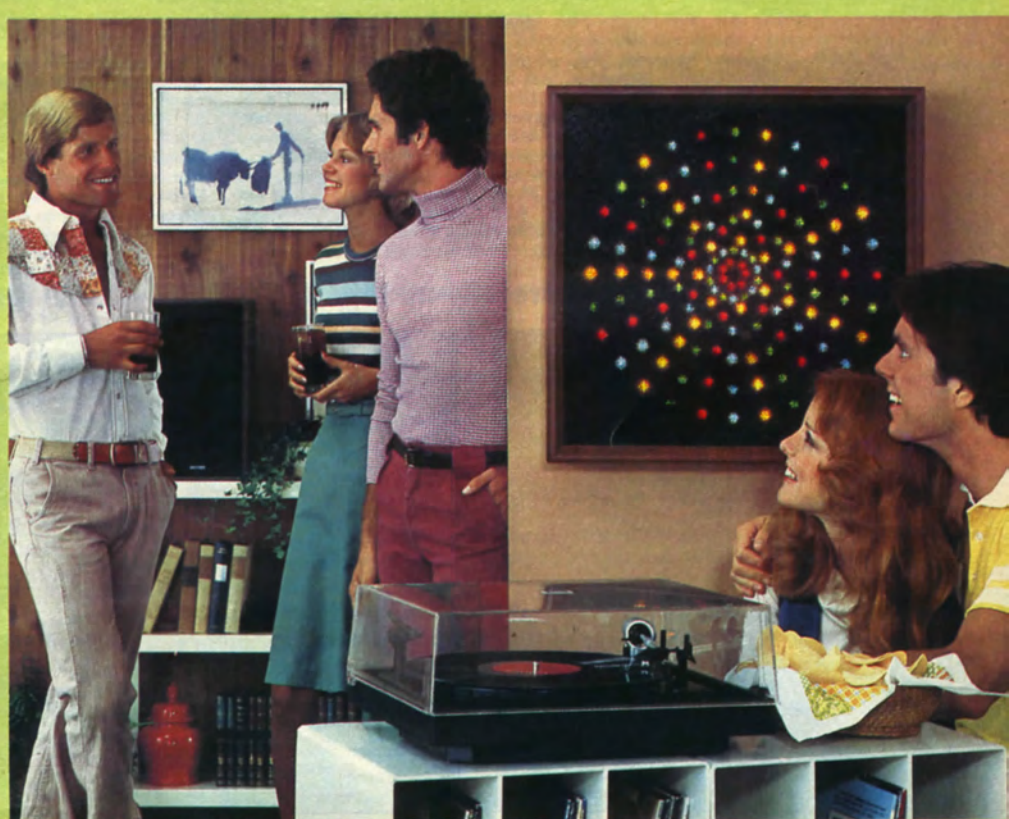
Make music "come alive" with vibrant, pulsating color

The TD-1006 Color Organ adds exciting sights to your sound system. With its extra wide dynamic range, it translates any kind of music into pulsing, whirling starbursts of color. Just connect the TD-1006 to the speaker leads of any sound source (except AM radio). Without effecting the sound, active filters separate the audio signal into four frequency bands, each with 35 brilliantly colored lights — red for bass, blue for low-midrange, green for upper-midrange and amber for treble (140 lights total). The lights pulsate in time to the music creating spokes of color that seem to swirl.

Just wire the two circuit boards and install the pre-strung lights in the factory-assembled cabinet. A single knob on the side controls sensitivity and turns power on or off. Just 4½″ deep — even hang it on the wall. Walnut-grained vinyl-clad case, black-out front panel. We think you'll agree music has never looked better.

Kit TD-1006, Shpg. wt. 32 lbs. **84.95**

TD-1006 SPECIFICATIONS: Dynamic Range, 25 dB, minimum. Input Signal: 1 volt RMS min. to 22 volts RMS max. Source Protection: line isolation. Power Requirement: 120/240 VAC, 50-60 Hz, 80 watts max. Dimension: 22¾″ W x 22¾″ H x 4½″ D. Net Weight: 20 lbs.



Our best stereo receiver ever–

70 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.08% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ

And look at these other impressive specifications!

AMPLIFIER — Frequency Response: +0, −1 dB, 8 Hz to 45 kHz; +0, −3 dB, 4 Hz to 80 kHz. **Intermodulation Distortion:** less than 0.08% from 0.25 to 70 watts (full output). **Damping Factor:** Greater than 60. **Input Sensitivity:** Phono 1 & 2, 2 mV. Aux., Tape & Dub., 200 mV. **Input Overload:** Phono, greater than 100 mV, Aux., Tape & Dub., greater than 10 V. **Hum and Noise:** Phono (2 mV reference), −65 dB. Aux., Tape & Dub., (200 mV reference) −80 dB. **FM (Monophonic): Frequency Response:** ±1 dB, 20-15,000 Hz. **Antenna:** 75 or 300 ohm. **Sensitivity:** 1.8 μV*. **Selectivity:** 100 dB*. **Image Rejection:** 90 dB*. **Capture Ratio:** 1.3 dB*. **AM Suppression:** 65 dB*. **Harmonic Distortion:** 0.3%. **Intermodulation Distortion:** 0.1%. **Signal to Noise Ratio:** 65 dB*. **Spurious Rejection:** 90 dB*. **Mute Threshold:** 0-5 μV variable. **FM (Stereophonic). Channel Separation:** 40 dB or greater at mid-frequencies; 35 dB at 100 Hz; 20 dB at 10 kHz. 20 dB (nominal) at 15 kHz. **Harmonic Distortion:** 0.35% with 100% modulation. **19 and 38 kHz Suppression:** 60 dB. **SCA Suppression:** 60 dB. **AM: Sensitivity:** 10 μV per meter with 50 -ohm direct input. **Selectivity:** 20 dB at 10 kHz. **AM Antenna:** external static-shielded loop. **Image Rejection:** 70 dB at 600 kHz. 50 dB at 1400 kHz. **GENERAL: Accessory AC Outlets:** One switched and one unswitched. **Power Requirement:** 120/240 VAC, 50/60 Hz. **Dimensions:** 21½″ W x 6¾″ H x 15″ D. **Net Weight:** 35.8 lbs.
*Rated IHF (Institute of High Fidelity Standards).
Dolby is a trademark of Dolby Laboratories.

Choose one of these carefully-matched AR-1515 systems for a lifetime of superb listening!

Save up to $132.39 — **System Price $864.31**

- ***Heathkit AR-1515 Stereo Receiver***
- ***Two AS-1352 Speakers (See pg. 39)***
- ***B·I·C 960 Turntable with Base and Choice of Shure M91ED or Empire 2000E/III Cartridge (See page 40)***

ARS-125, Shpg. wt. 130 lbs.
Mailable 864.31
If purchased separately, up to $996.70

Save up to $137.39 — **System Price $959.31**

- ***Heathkit AR-1515 Stereo Receiver***
- ***Two AS-1344 Speakers (See pg. 38)***
- ***B·I·C 980 Turntable with Base and Choice of Shure M91ED or Empire 2000E/III Cartridge (See page 40)***

ARS-126, Shpg. wt. 159 lbs.
Motor Freight 959.31
If purchased separately, up to $1096.70

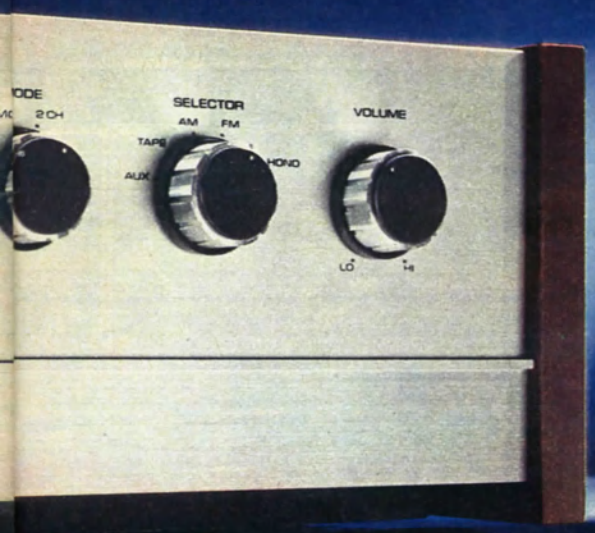
Save $140.00 — **System Price $1259.80**

- ***Heathkit AR-1515 Stereo Receiver***
- ***Two AS-48 Speakers (See pg. 39)***
- ***Dual CS-721 Turntable with Base, Dustcover and Shure V 15 III Cartridge (See pg. 41)***

ARS-127, Shpg. wt. 194 lbs.
Mailable 1259.80
If purchased separately, $1399.80

Please specify cartridge when ordering systems above.

Heathkit AR-1515



New **The AR-1515 has everything you've ever wanted in a stereo receiver: precision digital readout, incredibly low distortion, functionally elegant styling and much more!**

Over three years ago we gave our engineers a challenge: to design a totally new stereo receiver. A component which would set new standards for the industry.

They succeeded. To the dedicated music-lover, the AR-1515 offers exceptional specifications — massive power combined with vanishingly low distortion, a superlative FM section and an AM section which deserves to be called "hi-fi".

A flip-down panel reveals the AR-1515's secondary controls.

Only $549.95

AR-1515 Digital AM/FM Stereo Receiver — a new standard in convenience and performance

From its half-inch tall LED frequency readouts to its extraordinarily low distortion, the Heathkit AR-1515 is the finest receiver Heath has ever designed. Unquestionably, it is one of the world's finest audio components.

The AR-1515's digital readout is far more accurate and easy to use than conventional dial-type tuning. Simply tune to the exact frequency you want. Signal-strength and center-channel meters then help you "zero in" on the strongest signal and lowest FM distortion. There's even an oscilloscope output to monitor multipath distortion.

But digital readout is only the beginning. With 1.8 μV sensitivity, the FM section is one of the world's finest. The optional AD-1504 Dolby Module allows you to enjoy the reduced noise and increased dynamic range of Dolbyized FM broadcasts. The AM section is probably the finest in *any* receiver — dual-gate MOSFET's in the front end and a computer-designed 9-pole filter for outstanding selectivity without periodic realignment.

The amplifier section meets the same high standards. Harmonic distortion is an infinitesimal 0.08% — a figure unsurpassed by any other receiver in the world! Frequency response is +0, −1 dB from 8 Hz to 45,000 Hz and +0, −3 dB from 4 Hz to 80,000 Hz! That extra margin of performance assures clean, wide-range sound without audible strain or struggle on even the most complex musical passages. And you'll hear the music over a background of silence — hum and noise are 65 dB below full output in phono and 80 dB below full output on high-level sources.

The amplifier section is also unmatched in convenience. All the frequently-used controls — volume, input selector, stereo/mono switch, tuning — are on the front panel. The secondary controls (which clutter the front panels of many receivers) are concealed behind a hinged door — main and remote speaker switches, headphone jack, balance, bass and treble, FM muting and stereo blend, subsonic and high-frequency filters, tone-flat, dubbing inputs and outputs and more. All are convenient when you need them and out of the way when you don't. Convenient indicator lights in the black-out section of the front panel instantly show the input you've selected and which switches are engaged. In the same functional way, the digits light only when listening to AM or FM and only the necessary tuning meters are illuminated — signal-strength only for AM, signal-strength and center-tune for FM.

The bass and treble controls have been specially designed to act primarily at the frequency extremes, allowing you to compensate for room acoustics and program deficiencies while maintaining smooth midrange response. For even greater versatility, the AR-1515's pre-amp out/amp in jacks allow it to be used with any high-quality audio equalizer, such as the Heathkit AD-1305.

The AR-1515's styling is both elegant and functional. The massive brushed aluminum front panel is accented by an attractive, diecast Heathkit logo and by luxurious solid walnut end-panels.

The AR-1515 is even easy to build! Obviously the AR-1515 is a complex and sophisticated receiver, but its well thought out, modular design and color-coded wiring harnesses simplify assembly. There's even a separate test meter to double-check your work each step of the way. Finally, the illustrated, step-by-step assembly manual makes it easy for even a novice to assemble the AR-1515.

The receiver of the future... today! There's never been a receiver quite like the Heathkit AR-1515. It combines beauty, convenience, superb performance and value. And, in doing so, it redefines the state of the art. If you want the best for your audio system, it's the receiver you should own.

Kit AR-1515, Shpg. wt. 46 lbs. **549.95**

Dolby FM Module. Enjoy the reduced noise and increased dynamic range of Dolbyized FM broadcasts. Assembles and installs in one evening.

Kit AD-1504, Shpg. wt. 2 lbs. **39.95**

Heathkit Modulus—the total hi-fi system

> *...Heath's Modulus hi-fi system is good to look at, provides excellent sound and exemplifies the kind of thought-out human engineering that we admire most.*
>
> *Radio-Electronics, March, 1976*

> *...probably the most innovative idea to come along in years...The listening panel gave the...sound quality the highest of ratings, ranking this unit with the best in FM tuners and preamplifiers.*
>
> *Hi-Fi Stereo Buyer's Guide, March/April, 1976*

Destined to be the standard by which other hi-fi systems are judged

AA-1506 Stereo Amplifier

The AN-2016 Digital Tuner/Preamplifier is the "heart" of the Modulus system. Its sophisticated circuitry and exceptional versatility put you in complete command of your musical environment. And the AN-2016's matching amplifiers and optional plug-in modules let you "custom design" a system that's right for you. You can easily change or update your system to meet your changing needs. Add Dolby FM, a more powerful amplifier, convert to 4-channel, add SQ or CD-4 "build-in" modules — all at minimum cost and *without* obsoleting the AN-2016! Truly, Modulus is the world's most obsolescence-proof audio system! And its superb sound quality allows it to be the heart of even the world's finest stereo and quadraphonic music systems.

The tuner section of the AN-2016 is one of the most technologically advanced on the market. Four ½" tall LED digits display the broadcast frequency more accurately than a conventional tuning dial. TWO meters — signal-strength for fine tuning on both AM and FM, and center channel to indicate the point of lowest distortion on FM — give you outstanding tuning precision. And there are scope outputs so you can align your antenna for the lowest multipath distortion. Fully adjustable FM muting can be switched on or off from the front panel, and a phase-locked-loop stereo multiplex circuit assures wide stereo separation of 40 dB at 1000 Hz. Even the AM section is one of the world's best — with dual-gate MOSFET's, a 9-pole LC filter and a static-shielded loop antenna (a Heath exclusive which provides exceptional freedom from noise and improved dynamic range) for AM reception that's real "hi-fi" quality.

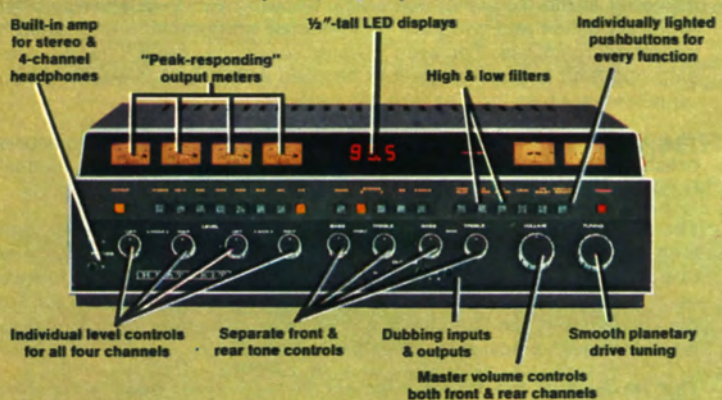
The preamplifier inputs nave overload characteristics and freedom from distortion that allow superb sound reproduction from any program source. On high-level inputs, the AN-2016 reaches full output with a signal of 170 mV, yet it doesn't overload until 3 volts. The phono amplifier can be driven to full output with as little as 2 mV, but does not overload until the input reaches 60 mV! This gives you the "headroom" you need to use virtually ANY tape deck or phono cartridge to its fullest capabilities. And total harmonic distortion is a mere 0.05% throughout the entire frequency range, so low you'll NEVER hear it!

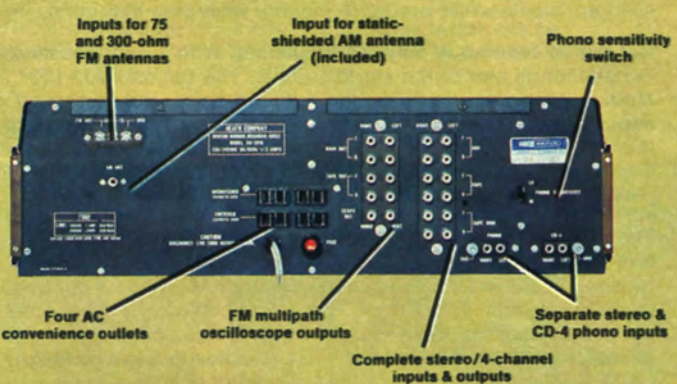
Each channel's peak-responding meter has a full 40 dB dynamic range to follow the softest and loudest musical passages faithfully — quickly detects distortion-causing clipping or overload. Handsome styling features diecast front panel and walnut-grained metal side panels.

We think Modulus represents an advance in high-fidelity concept and design that provides genuine progress in benefits, features, and styling. Its expansion capabilities make it the only hi-fi system you'll probably ever need to own; and its superb specifications and music-playing abilities make it the only hi-fi system you'll probably ever want to own. Order the AN-2016 Tuner/Preamp below, optional modules and amplifiers from next page.

It is one of the most highly acclaimed audio components in the world. Order yours today — you'll be enjoying good listening for many years to come.

Kit AN-2016, Shpg. wt. 38 lbs. **599.95**





AN-2016 SPECIFICATIONS: PREAMPLIFIER — Frequency Response: −0.5 dB at 10 Hz and 30 kHz. **Total Harmonic Distortion:** less than 0.05% at 1.5 V into 20K ohms. **IM Distortion:** less than 0.05%. **Hum & Noise (unweighted):** phono, −75 dB ref. to 10 mV; high-level, −80 dB ref. to 0.25V. **Bass Control:** ±15 dB at 20 Hz nominal. **Treble Control:** ±12 dB at 20 kHz nominal. **Hi Filter:** −3 dB at 7 kHz ±1 kHz, 12 dB/octave slope. **Lo Filter:** −3 dB at 30 Hz ±2 Hz, 12 dB/octave slope. **Input Sensitivity (for 1.5 V output):** phono, 2/6 mV ±1 dB (switch selected). **Phono Equalization:** ±0.5 dB of RIAA standard from 20-20,000 Hz. 100 K ohms shunted by 300 picofarads. **Output Voltage:** 1.5 V RMS. **FM TUNER — (Monophonic) — Sensitivity:** 1.7 μV (IHF); 3.5 μV for 50 dB S/N. **Signal-to-Noise Ratio:** 68 dB at 1000 μV. **Selectivity:** greater than 100 dB. **Capture Ratio:** 1.3 dB. **Spurious Rejection:** greater than 90 dB. **IF Rejection:** greater than 100 dB. **Image Rejection:** greater than 90 dB. **Total Harmonic Distortion:** 0.3% at 1 kHz. **IM Distortion:** less than 0.1%. **AM Suppression:** 68 dB at 1000 μV. **Antenna Inputs:** 300Ω balanced; 75Ω unbalanced. **— FM (Stereophonic) — Stereo Sensitivity:** 35 μV for 50 dB S/N, 1% THD. **Total Harmonic Distortion:** 1 kHz, 0.35%. **Stereo Separation:** 40 dB at 1 kHz; 20 dB at 15 kHz. **SCA Rejection:** 65 dB. **AM TUNER — Sensitivity:** 6 μV for 20 dB S+N/N. **Selectivity:** more than 60 dB. **Signal-to-Noise Ratio:** more than 48 dB. **Harmonic Distortion at 1000 μV, 30% mod.:** less than 1.0% at 400 Hz. **Antenna:** external static-shielded loop. **GENERAL — Power Requirement:** 120/240 VAC, 60/50 Hz. **AC Convenience Outlets:** 2 switched, 2 unswitched (500 watts max.). **Dimensions:** approx. 6½" H x 19" W x 14½" D.

†SQ is a trademark of CBS, Inc.; "Dolby" is a trademark of Dolby Labs and "CD-4" is a trademark of the Japan Victor Company.

Charge-A-Kit — no money down on any kit — see page 54 for details.

that changes to meet your changing needs

AN-2016 Tuner/Preamp

CD-4 Demodulator Module. Lets you play CD-4 discrete 4-channel records through the AN-2016. Includes calibration record. For use with CD-4 phono cartridge.
Kit AD-1507, Shpg. wt. 2 lbs. **79.95**

Dolby FM Module. Provides the reduced noise and increased dynamic range of Dolbyized FM. Assembles, installs in one evening.
Kit AD-1504, Shpg. wt. 2 lbs. **39.95**

SQ Decoder Module. For 4-channel SQ material. Includes full-logic with variable blend enhancement for outstanding separation from tapes, records and FM.
Kit AM-1503, Shpg. wt. 1 lb. **49.95**

Modulus Stereo System

- ***Heathkit AN-2016 Modulus AM/FM Control Center***
- ***Heathkit AA-1506 Stereo Power Amplifier***
- ***Two Heath AS-1373 Speakers (See page 38)***
- ***Dual 1249 Turntable with base and your choice of Empire 2000E/III or Shure M91ED Stereo Cartridge (See page 41)***

Please specify cartridge when ordering.

Save up to $154.89

System Price

$1291.76

Specially selected to provide superb sound now, and grow with your needs later. Shpg. wt. 207 lbs.
ARS-110, Motor Freight **1291.76**

If purchased separately, $1446.65

Feature-packed power amplifiers... exceptional performance at a budget price

35 WATTS (AA-1505) OR 60 WATTS (AA-1506) MINIMUM RMS, PER CHANNEL INTO 8 OHMS AT LESS THAN 0.1% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ.

A perfect match for the AN-2016 in styling and performance — and you should also consider using them with other quality preamps. Just compare the specs — intermodulation distortion is less than 0.1% at full power and drops to a mere 0.05% at 0.1 watt. Frequency response is exceptionally wide and flat — down just 0.5 dB at 8 Hz and 45,000 Hz. And, with a damping factor of over 60, you can count on the AA-1505 and 1506 to provide high definition bass response. Feature pushbutton main and remote speaker switching, lighted power button. Heath's unique plug-in speaker connectors help eliminate phasing problems. Massive side-mounted black heat sinks and walnut-grained metal side panels give the AA-1505 and AA-1506 a truly impressive appearance. Remarkably easy to build — even for first-time kitbuilders. The two printed circuit boards mount directly on the heat sinks, minimizing point-to-point wiring. A built-in test meter lets you check your work as you build.

Kit AA-1505, (Not shown.) Shpg. wt. 24 lbs. **129.95**
Kit AA-1506, (Shown above.) Shpg. wt. 25 lbs. **179.95**

OTHER AA-1506/1505 SPECIFICATIONS: **Hum and Noise:** 95 dB (referred to rated power, inputs shorted). **Separation:** 60 dB. **Input Sensitivity:** 1.5 volts for rated output. **Input Impedance:** more than 15K ohms. **Power Requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 8" W x 5⅝" H x 14³⁄₃₂" D. **Net Weight:** approx. 21 lbs.

Find out how easy it is to build a kit — order the manual. See page 53.

The famous Heathkit AR-1500A—

These carefully selected AR-1500A stereo systems will provide you with years of fine music listening

Budget-pleaser

- *Heathkit AR-1500A AM/FM Stereo Receiver and walnut veneer case*
- *Two AS-1342 Speakers (See pg. 39)*
- *B·I·C 940 Automatic Turntable with base and your choice of Shure M91ED or Empire 2000E/III Cartridge (See page 40)*

ARS-122, Shpg. wt. 141 lbs. . . **669.51**

If purchased separately, up to $791.65

SAVE UP TO $122.14

System Price $669.51

Please Specify Cartridge When Ordering

Performance Plus

- *Heathkit AR-1500A AM/FM Stereo Receiver and walnut veneer case*
- *Two AS-1352 Speakers (See pg. 39)*
- *Dual 510 Belt-Drive Turntable with Base and your choice of Shure M91ED or Empire 2000E/III Cartridge (See page 41)*

ARS-123, Shpg. wt. 173 lbs. . . . **774.01**

If purchased separately, up to $901.65

SAVE UP TO $127.64

System Price $774.01

Please Specify Cartridge When Ordering

Reference standard

- *Heathkit AR-1500A AM/FM Stereo Receiver and walnut veneer case*
- *Two AS-1373 Speakers (See pg. 38)*
- *Dual 1249 Automatic Turntable with Base and Choice of Shure M91ED or Empire 2000E/111 Cartridge (see page 31)*

ARS-124, Shpg. wt. 209 lbs., Motor Freight **926.01**

If purchased separately, up to $1010.65

SAVE UP TO $135.64

System Price $926.01

Please Specify Cartridge When Ordering

Stereo/4-Channel Audio-Scope

Shown with optional walnut veneer case

Measure phasing and channel separation on stereo and 4-channel systems; even indicates signal-strength, FM center tune, FM multipath distortion on tuners and receivers with multipath scope outputs. Has built-in audio oscillator for frequency response checks. A front panel input lets you use the AD-1013 as a conventional oscilloscope and there's also a front panel audio oscillator output. With black metal cabinet, optional case below.

Kit AD-1013, Shpg. wt. 20 lbs. **249.95**

Walnut veneer case. ARA-1500-1, Shpg wt. 7 lbs. **24.95**

AD-1013 SPECIFICATIONS FRONT PANEL — **Scope Input: Vertical Sensitivity:** 25 millivolts P-P/cm. **Input Impedance:** 100 kΩ. **Frequency Response:** 5 Hz to 200 kHz ±3 dB. **Oscillator Output:** 20 Hz to 20 kHz. **Voltage Level:** 2 mV to 3 volts (rms) (variable). **Output Impedance** (front panel jack): Approximately 600Ω. **Calibrator Voltage:** 1.0 volt P-P ±5%. **Total Harmonic Distortion:** 1% or less. **REAR PANEL — Oscillator Output Impedance:** 6000Ω. **Multipath Input (Scope Horizontal and Scope Vertical):** Sensitivity: 25 mV P-P/cm. Input Impedance: 100 kΩ. **Left Front, Right Front, Left Back and Right Back Inputs:** Sensitivity: 25 mV P-P/cm. Input Impedance: 100 kΩ. Frequency Response: 5 Hz to 200 kHz, ±3 dB. **4-Channel Input:** Sensitivity: 1 volt P-P/cm. Input Impedance: 5000 Ω. **GENERAL — Triggered Sweep Generator:** Range: 10 Hz to 100 kHz. **Power Requirement:** 120 or 240 volts AC, 60/50 Hz, 15 watts. **Dimensions (overall):** 5⅛" H x 18½" W x 13½" D.

Luxurious Mediterranean equipment cabinet

Fully Assembled

$279.95

- *Hickory Veneers*
- *Solid Oak Trim*
- *Pecan Finish*

Ducted port speaker enclosures with precut 12" openings. Overall cabinet: 26⅞" H x 66" W x 19¼" D. Shelf compartment: 35⅞" W x 17½" D overall, shelf 15" D. Adjustable shelf height: 5½", 6½", 7½", 8½". Lower compartment: 35⅞" W x 17½" D x 12¼" H min. (shelf at 8½"). Speaker cabinet volume: 2.3 cu. ft. Changer Base: 5½" H x 18" W x 14" D. Shpg. wt. 166 lbs.

AE-101, Motor Freight **279.95**

AEA-101-3, slide-shelf accessory, 8 lbs. **24.95**

Audio Cyclopedia—the most comprehensive & authoritative work on audio available—3650 entries in all. **EDP-113 . . . 34.00**

99 Ways to Improve Your Hi-Fi—Projects that enhance your hi-fi enjoyment. **EDP-105 . . . . . 3.50**

Guide to High Fidelity—non-technical presentation of stereo and 4-channel components. Prepared by the Institute of High Fidelity. **EDP-194 . . . . . 4.50**

See page 52 for book ordering information.

Save 5% with Heath's hi-fi system discount — see page 43.

one of the world's finest stereo receivers

60 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.25% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ.

$399.95

Shown in optional Case.

Heathkit AR-1500A Stereo FM-AM Receiver gives you top performance for your audio dollar

The AR-1500A delivers the kind of clean, low-distortion power and excellent AM and FM performance others only talk about. It's an all-in-one receiver that compares in versatility to many separate preamplifier — amplifier-tuner systems — and at a low build-it-yourself price too!

To see for yourself, compare our specifications with any other receiver — kit or assembled. The specifications speak for themselves. 60 watts, minimum RMS, per channel into 8 ohms with less than 0.25% total harmonic distortion from 20-20,000 Hz. Intermodulation distortion is an infinitesimal 0.1% at full power or at one watt. Frequency response extends from 9 Hz to 80,000 Hz, +0, −1dB. And if those numbers sound pretty impressive, remember that they're guaranteed *minimum* specifications! The AR-1500A you build will probably perform even better!

A factory-assembled FET front-end provides high sensitivity and excellent resistance to overload so you get clean reception all the time, without fading and blasting from weak or strong signals. IHF sensitivity is just 1.8 μV, so you hear more stations and less noise. And fixed LC IF filters help keep stations separate. A phase-locked multiplex demodulator provides over 40 dB of midband FM stereo separation for excellent stereo realism. Signal-strength and center-tune meters make tuning easy and accurate. There's even a front-panel control so you can set the FM muting threshold to suit reception conditions in your area.

Pushbuttons instantly select tape, tape monitor, auxiliary, phono, AM, FM stereo stations only, or FM with automatic stereo/mono switching. Pushbuttons also control main and remote speakers and, for private listening, there are two front-panel stereo headphone jacks. Has multipath scope outputs for use with an audio scope like the AD-1013, switchable loudness compensation for realistic response at low-volume listening levels, a tone flat button to bypass the tone controls for "flat" response, a blend button to reduce noise on weak stereo stations. Preamp outputs and power amp inputs for use with other audio accessories. There are individually adjustable level controls for each channel of every input, so there are no annoying volume changes when you switch from phono to tuner to tape.

everything you need to know — even how to solder and, after assembly, troubleshoot. You start by building a simple test meter which then allows you to test each completed circuit board. Most of the circuitry fits on 10 circuit board modules, nine of which plug into the chassis. Two factory-fabricated wiring harnesses eliminate most point-to-point wiring. The plug-in boards can be flipped up or extended from the chassis while the receiver is operating. From start to finish, the large fully-illustrated assembly manual guides you step by step, even if you're a first-time kitbuilder.

Because you build the AR-1500A yourself, you can make the repairs to keep your receiver "tuned up" and in top operating condition for years to come. That could be a big money saver.

A blackout dial accents the massive, diecast front panel. And you can custom mount the receiver or order the optional walnut veneer case. Either way, it's one beautiful receiver at a beautiful, build-it-yourself price. Less case.

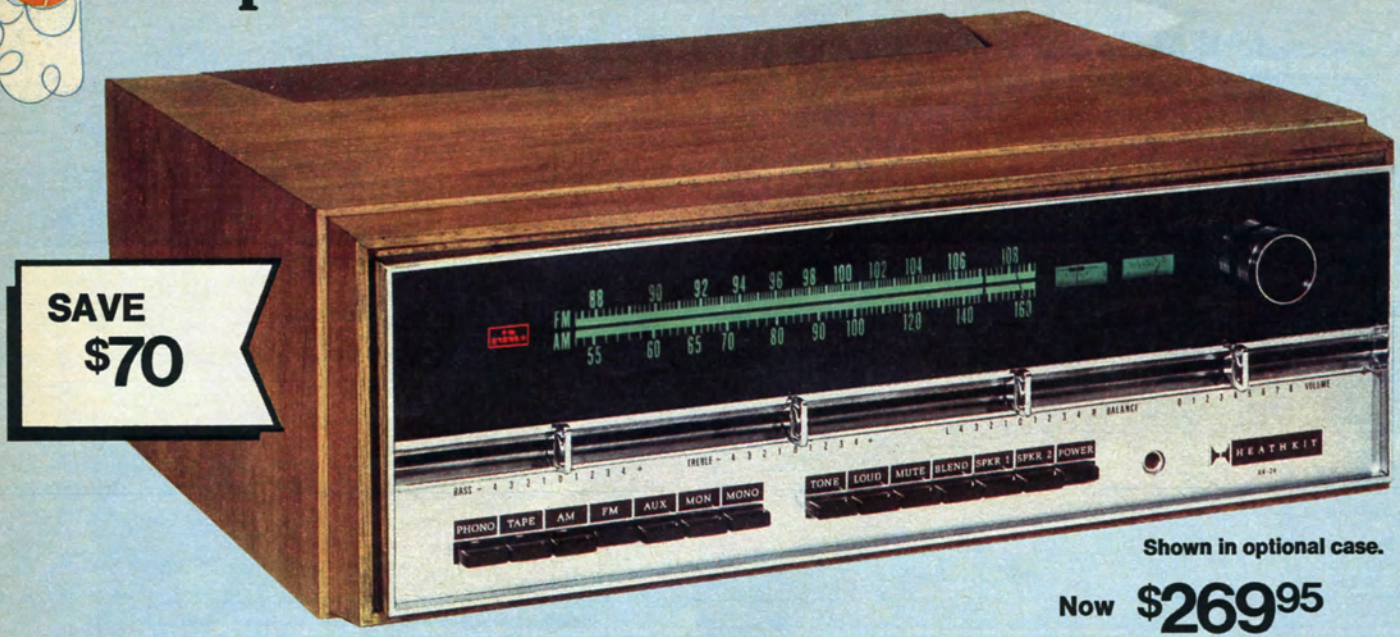
Kit AR-1500A, Shpg. wt. 49 lbs. **399.95**

Walnut veneer case.
ARA-1500-1, Shpg. wt. 7 lbs. **24.95**

AR-1500A SPECIFICATIONS

AMPLIFIER — Frequency Response (1 watt level): −1 dB, 9 Hz to 80 kHz; −3 dB, from less than 5 Hz to 120 kHz. **Intermodulation Distortion:** Less than 0.1% at full power; less than 0.1% at 1 watt. **Damping Factor:** Greater than 60. **Input Sensitivity:** Phono, 1.8 millivolts; Tape, Aux., Monitors: 140 millivolts. **Hum & Noise:** Phono (10 millivolt reference), −63 dB. Tape and Aux (0.25 volt reference), 75 dB. **— FM (Monophonic) — Frequency Response:** ±1 dB, 20 to 15,000 Hz. **Antenna:** 75 or 300-ohm. **Sensitivity:** 1.8 μV.* **Selectivity:** 90 dB.* **Image Rejection:** 100 dB.* **IF Rejection:** 100 dB.* **Capture Ratio:** 1.5 dB.* **AM Suppression:** 50 dB.* **Harmonic Distortion:** 0.5% or less.* **Intermodulation Distortion:** 0.1% or less.* **Hum & Noise:** 60 dB.* **Spurious Rejection:** 100 dB.* **— FM (Stereophonic) — Channel Separation:** 40 dB or greater at midfrequencies; 35 dB at 50 Hz; 25 dB at 10 kHz; 20 dB at 15 kHz. **Harmonic Distortion:** 0.5% at 1000 Hz with 100% modulation. **19 kHz and 38 kHz Suppression:** 55 dB or greater. **SCA Suppression:** 55 dB. **— AM — Sensitivity:** 50 μV with external input; 300 μV per meter with radiated input. **AM Antenna:** Built-in rod type; connections for external antenna and ground. **Image Rejection:** 70 dB at 600 kHz; 50 dB at 1400 kHz. **IF Rejection:** 70 dB at 1000 kHz. **GENERAL — Accessory AC Outlets:** Two. One switched and one unswitched (240 watts). **Power Requirement:** 120 or 240 volts 60/50 Hz AC. 40 watts idling (zero output) and 356 watts at full output. **Dimensions:** Overall — 18½" W x 5⅛" H x 13⅞" D.
*Rated IHF (Institute of High Fidelity) Standards.

Spectacular Heathkit Receiver SALE!



Shown in optional case.

Now $269.95

Heathkit AR-29 AM/FM Stereo Receiver for cost-conscious connoisseurs Was ~~$339.95~~

35 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS AT LESS THAN 0.25% TOTAL HARMONIC DISTORTION FROM 20-20,000 Hz.

The AR-29 AM/FM stereo receiver is a best-seller that offers you no-compromise performance — and now it's priced even lower in time for the holidays. Its overall quality design, along with conservative specifications, assures a level of performance normally associated with far more expensive units. Has pushbutton function selectors, slide controls, FM muting and stereo blend, tape monitor and main/remote speaker switching. Tuning is as easy and accurate as you could want, with a wide, clearly marked slide-rule tuning dial and two meters; signal strength for both AM and FM, center channel for FM. Special level controls for each channel of all inputs let you switch from phono to tuner to tape without changing volume. The AR-29 provides as much power as you're likely to need for most listening areas with about half the distortion of many competitive models. Intermodulation distortion is extremely low too; less than 0.2% at full power and less than 0.1% at 1 watt. As the audio experts have noted, the AR-29's sound is solid, clean and well-defined, which is what hi-fi is all about. Kit assembly is easy and fun — most parts mount on printed circuit boards that simply plug into the unit, and a pre-assembled harness with individual wires stripped and cut to length further simplifies construction. A built-in meter, with test probes and function switch, lets you check yourself every step of the way during assembly, and aids in servicing. With black metal cabinet, order wood case (illustrated) below.

Kit AR-29, Shpg. wt. 34 lbs. . . . . **Was 339.95 . . . NOW ONLY 269.95**

Pecan-Stained Veneer Case.
AE-19, Shpg. wt. 10 lbs. **21.95**

AR-29 SPECIFICATIONS: AMPLIFIER — Frequency Response: —1 dB, 7 Hz to 60 kHz. IM Distortion: 0.2% at 35 W, 0.1% at 1 W. Input Sensitivity: Phono: 2.2 mV. Tape, Aux. and Tape Mon., 180 mV. Hum and Noise: Phono (10 mV ref.), —65 dB. Tape & Aux. (0.25 V ref.), — FM Sensitivity: 1.8 μV*. Selectivity: 70 dB*. Image Rejection: 90 dB*. Capture Ratio: 1.5 dB*. AM Suppression: 50 dB*. Harmonic Distortion: 0.5%*. Spurious Rejection: —90 dB*. Antenna: 75 or 300-ohm. Channel Separation: Typically 45 dB at mid-frequencies. SCA Suppression: 55 dB. — AM SECTION — AM Antenna: Adjustable rod. Connections for external ant., gnd. Sensitivity: External antenna, 20 μV at 1000 kHz for 20 dB S+N/N. Selectivity: 40 dB at 20 kHz. Image Rejection: 60 dB at 600 kHz*. 45 dB at 1400 kHz*. Power Requirement: 120/240 VAC 60/50 Hz. Dimensions: 5⅛" H x 16¾" W x 14½" D.
*Rated IHF (Institute of High Fidelity) Standards.

Get Superb Sound and big Savings with this complete AR-29 System

If purchased separately, $539.60
SAVE UP TO $62.94

System Price
$476.66

- *Heathkit AR-29 AM/FM Stereo Receiver with Wood Case*
- *Two Heathkit AS-1332 Speakers (See page 39)*
- *B·I·C 920 Automatic Turntable with Base and choice of Shure M91ED or Empire 2000E/III Stereo Cartridge*

ARS-120, Shpg. wt. 114 lbs. **476.66**
Please Specify Cartridge when ordering.

Top-Performing AR-29 System gives you BETTER SOUND for your money

If purchased separately, $798.65
SAVE UP TO $122.49

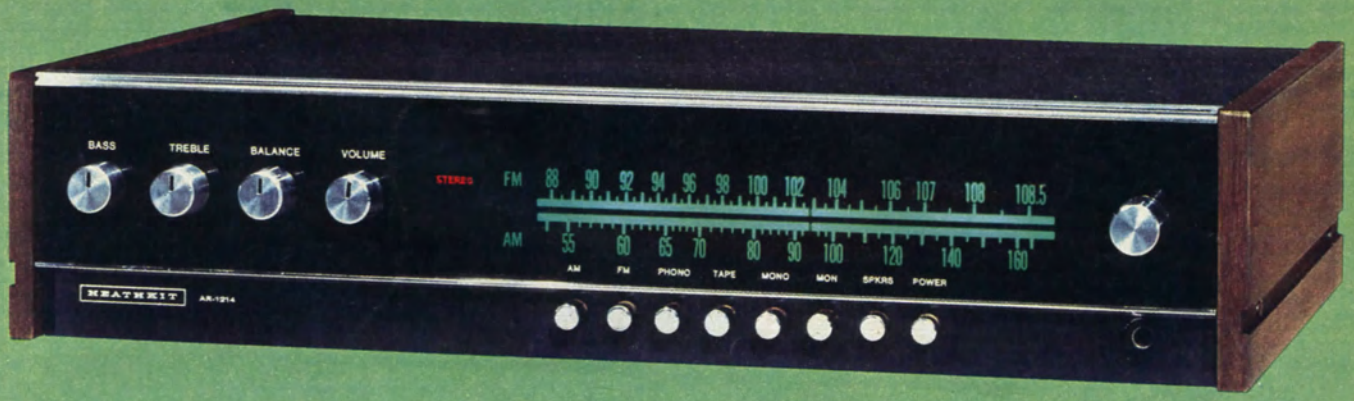
System Price
$676.16

- *Heathkit AR-29 AM/FM Stereo Receiver with Wood Case*
- *Two Heathkit AS-1344 Column Speakers (See page 38)*
- *B·I·C 960 Automatic Turntable with Base and choice of Shure M91ED or Empire 2000E/III Stereo Cartridge*

ARS-121, Shpg. wt. 177 lbs. **676.16**
Please specify cartridge when ordering.

Charge-A-Kit — no money down on any kit — see page 54 for details.

BIG-VALUE Stereo and 4-Channel Receivers



Save up to $58.34

- *Heathkit AR-1214 AM/FM Stereo Receiver*
- *Two Heathkit AS-1332 Speakers*
- *B•I•C 920 Automatic Turntable with Base and choice of Shure M91ED or Empire 2000E/III Stereo Cartridge*

ARS-118, Shpg. wt. 84 lbs. **389.31**

If purchased separately, $447.65

Please specify cartridge when ordering.

Save up to $114.89

- *Heathkit AR-1214 AM/FM Stereo Receiver*
- *Two Heathkit AS-1352 Speakers*
- *B•I•C 960 Automatic Turntable with Base and choice of Shure M91ED or Empire 2000E/III Stereo Cartridge*

ARS-119, Shpg. wt. 127 lbs. **531.81**

If purchased separately, $646.70

Please specify cartridge when ordering.

Heathkit AR-1214 AM/FM Stereo Receiver

$199.95

Compare performance and price and you'll be convinced! The AR-1214 gives you more for your money.

15 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.5% TOTAL HARMONIC DISTORTION FROM 20-20,000 Hz.

Here's a receiver that will have you really enjoying your favorite music, at a price you can easily afford — and in time for the holidays. The AR-1214 brings you full fidelity AM, FM and stereo FM reception; also has inputs for magnetic phono, aux. and tape so you can have a complete and versatile home entertainment setup. Has power enough for solid bass even from inefficient speakers; advanced phase-lock-loop FM stereo circuit for wide stereo separation and minimum distortion: a factory assembled and aligned FM front end which assures 2 μV sensitivity to really pull in FM stations. Features include: tape monitor, pushbutton input selection, speaker on-off button, stereo headphone jack, easy and accurate flywheel tuning with stereo indicator light. Inputs for 75 or 300 ohm FM antenna and a built-in swivel-mounted AM antenna help you get the best reception even from weak stations. It's an easy kit to build too, just three PC boards, a wiring harness, and an open chassis layout for easy installation of components. The famous Heathkit manual makes it ideal even for first-time kit builders. Stylish front panel and case with walnut-veneer end panels.

Kit AR-1214, Shpg. wt. 18 lbs. **199.95**

AR-1214 SPECIFICATIONS: AMPLIFIER — Frequency Response: ±1 dB, 7 Hz to 100 kHz. Im Distortion: less than 0.5%, full power; less than 0.2% at 1 watt. Hum and Noise: −65 dB. FM SECTION — Sensitivity: 2 μV*. Selectivity: 60 dB*. Image Rejection: 50 dB*. Stereo Separation: 40 dB typ., 35 dB minimum. — AM SECTION — Sensitivity: 100 μV per meter*. Selectivity: 40 dB. Power Requirement: 120/240 VAC, 60/50 Hz. Dimensions: 3⅞″ H x 17″ W x 13″ D.

*Rated IHF (Institute of High Fidelity) Standards.

Get quadraphonic excitement with the Heathkit AR-2020 4-Channel AM/FM Receiver

15 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.5% TOTAL HARMONIC DISTORTION FROM 20-20,000 Hz.

- *Matrix decoder is optimized for SQ† 4-channel sound*
- *Costs little more than many stereo receivers!*

Get in on the spacious and dramatic sound of 4-channel at a sensational low build-it-yourself price. The AR-2020's low-distortion amplifier puts out plenty of power; the AM and FM tuner sections pull in stations far and near. The preassembled and aligned FM front end offers excellent 2 μV sensitivity and 2 dB capture ratio. Ceramic filters in the FM IF minimize alignment problems. Has a built-in matrix decoder for all 4-channel encoded sources; inputs for both stereo and discrete 4-channel auxiliary sources, full inputs and outputs for a 4-channel tape recorder.

Individual volume controls for each channel let you adjust for best balance, a master volume control adjusts sound levels. There are 2/4-channel headphone jacks; bass and treble controls for front and rear channels; easy-action flywheel tuning with stereo indicator. Good looking case with vinyl clad steel top and walnut-veneer end panels.

Kit AR-2020, Shpg. wt. 32 lbs. **229.95**

$229.95

AR-2020 SPECIFICATIONS: AMPLIFIER — Frequency Response: ±1 dB, 7 Hz to 50 kHz. IM Distortion: less than 0.5% at full output, less than 0.25% at 1 watt. Input Sensitivity: Phono, 2.2 mV. Tape, 200 mV. Hum and Noise: Phono, −60 dB. Tape, −70 dB. FM SECTION: Sensitivity: 2 μV*. Selectivity: 60 dB*. Image Rejection: 50 dB*. Capture Ratio: 2 dB. Power Requirement: 120/240 VAC, 60/50 Hz. Dimensions: 5″ H x 20″ W x 14″ D.

*Rated IHF (Institute of High Fidelity) Standards.

†SQ is a registered trademark of CBS, Inc.

Find out how easy it is to build a kit — order the manual. See page 53.

Heathkit "Superamp" for superior sound

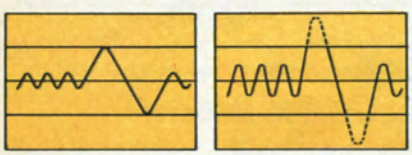
200 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.1% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ

Who needs all that power?

Many hi-fi systems need a "super-amp" like the AA-1640 for good scientific and musical reasons. As sounds become louder, the ear becomes less sensitive. For one sound to seem twice as loud as another (10 dB louder), requires *10 times* as much power. A 3 dB change is barely audible, yet it requires twice as much power.

In an average-sized room, acoustic suspension speakers may require 20 watts per channel to produce a reasonable listening level — about 90 dB. But when a momentary musical peak of 10 dB comes along, your amplifier must try to produce 200 watts per channel. Tone controls, loudness circuits, and equalizers make the same demands.

And if your amp can't deliver that much power, it clips off the peaks as shown.



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Clipping causes distortion and reduces the dynamic range — the contrast between loud and soft passages. Music sounds constricted, dull and unreal. Clipping also produces harmonics which can actually damage your tweeters.

A high power amplifier can make a big difference. Its wider dynamic range lets more of the live-performance realism come through loud and clear. Perhaps the most striking difference you'll hear is the improved definition of music...solid bass free of "boom" and distinct note for note...accurate treble clearly defined and open.

If your music system uses low-efficiency acoustic suspension speakers, only a superamp like the Heathkit AA-1640 can help them deliver their finest sound.

Heathkit AA-1640 Stereo Power Amplifier

$439.95 less meters

SAVE $19.95
When you order amplifier and meters together

"Virtually a new standard of excellence. Will probably be the amplifier to which all others are compared."
Hi-Fi Stereo Buyer's Guide, Sept./Oct., 1975

- ***Automatic circuitry assures complete speaker protection***
- ***Use with any quality preamp like the AP-1615 or AN-2016***
- ***Massive heat sinking for adequate dissipation without noisy fans***

In sheer power and exceptionally low distortion, the Heathkit AA-1640 is an extraordinary amplifier. As Julian Hirsch said in the May (1975) issue of *Stereo Review:* "The electrical performance of the Heath AA-1640 makes comment superfluous. In every respect it ranks with the finest high-power amplifiers on the market. We were constantly impressed with the conservatism of its construction and ratings."

Despite its enormous power, the AA-1640 is also an exceptionally quiet amplifier. Hum and noise are an inaudible 100 dB below full output, so you can hear music over a velvety background of silence. And you can enjoy all that quiet because there's no noisy fan. Even if it is used as a PA amplifier, the AA-1640 requires only normal ventilation and that kind of rugged, conservative design pays off in increased reliability.

A 10-second delay protects your speakers from turn-on thumps and instantly disconnects them when you turn the power off. This delay circuit also disconnects the speakers if it detects DC or extremely low-frequency AC at the outputs. Automatic thermal shutdown helps prevent damage from overheating. Finally, speaker fuses are located in the primary feedback loop — an exclusive design which maintains a high damping factor for excellent bass definition.

The optional peak-responding meters continuously monitor the output, accurately showing how much power is reaching your speakers. The backlighted scales are calibrated from −30 to +3 dB and from 0.2 to 200 watts into 8 ohms. They respond to peaks as short as a record click, making them useful as overload indicators. The meters can be installed when the amplifier is built, or later. However, if you buy the meters at the same time you buy the amplifier, you'll save $19.95.

Front-panel controls include pushbutton power on/off, left and right channel gain controls, and LED power and high temperature indicators. Plug-in speaker connectors simplify hookup.

To appreciate its real quality, the AA-1640 should be used with only the finest preamplifiers such as the Heathkit AP-1615 (facing page) or AN-2016 (see page 28).

Kit AA-1640, less meters,
Shpg. wt. 72 lbs. **439.95**

Kit AAA-1640-1, Output meters only,
Shpg. wt. 3 lbs. **69.95**

Kit AAS-1640, Amp and meters together.
Shpg. wt. 82 lbs. **489.95**

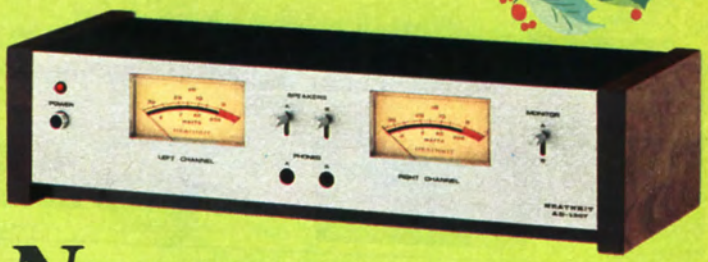
OTHER AA-1640 SPECIFICATIONS

Frequency Response: −1 dB, 7 Hz to 50 kHz; −3 dB, 5 Hz to 100 kHz. **Intermodulation Distortion:** less than 0.1% from .25 to 200 watts. **Damping Factor:** greater than 50. **Hum and Noise:** Less than 400 μV or 100 dB below full output. **Channel Separation:** 50 dB, min. **Input Impedance:** 50k ohms. **Input Sensitivity:** 1.5 V. **Net Weight:** 58 lbs. **Dimensions:** 19″W x 7¼″H x 18″D. **Power Requirement:** 120 VAC, 60 Hz only.

Audio Control Center, Preamp and Equalizer

AD-1307 deluxe Audio Control Center

- ***Ideal for use in high-power audio systems***
- ***Dual meters accurately monitor power output***
- ***Provides complete AC power and speaker switching***



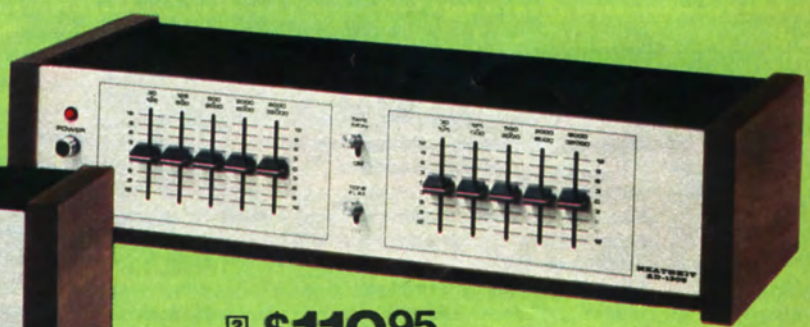
New $119.95

The Heathkit AD-1307 is an outstanding audio control center that is useful for any component stereo system and especially recommended for systems using high-power amplifiers. It provides accurate power output monitoring for exact system balance, and complete AC switching facilities for the most sophisticated component setups. Lets you hook up one stereo amplifier to two sets of speakers, two stereo amplifiers (or a 4-channel amplifier) to four speakers. Uses the same output meters as the AA-1640. Julian Hirsch of "Stereo Review" described those meters as "by far the most useful we have ever seen on an audio amplifier...they are the ONLY ones that have any practical utility for the listener..." The meters are peak-responding with a log scale calibrated in both decibels and watts. Because they can respond to output peaks as short as a record click, they are extremely accurate and useful as overload indicators. A front panel monitor switch allows you to monitor the outputs of up to two amplifiers, you can even use a four-channel amplifier to "A-B" speaker systems. Has four switched and four unswitched outlets, a main power switch and a line cord capable of carrying up to 13 amps provide power switching for all the components in your system. There's a front panel headphone jack for conventional phones, and a barrier-type terminal strip on the rear panel for convenient connection of electrostatic headphones. The AD-1307 is an easy kit to build too, you can assemble it in just a couple of evenings. Add it to your component system for real convenience and versatility.

Kit AD-1307, Shpg. wt. 11 lbs. **119.95**

AD-1307 SPECIFICATIONS: **Meter Scale Calibration:** −30 dB to +3 dB, 0.2 to 200 watts. (0 dB = 200 watts into 8 ohms.) **Meter Circuit Type:** Peak Responding. **Meter Circuit Response Time:** Less than 50 μsec. **Meter Circuit Fall Time:** Greater than 0.5 sec. **Power Requirement:** 120 VAC, 50/60 Hz, 10 watts. 240 VAC, 50/60 Hz, 10 watts. **Dimensions:** 17½″ W x 8½″ D x 4½″ H. **Weight:** 8 lbs.

[1] **$129.95**



[2] **$119.95**

[1] AP-1615 Stereo Preamp/Control Center

Perfect for use with AA-1640 or any high-quality power amplifier

The Heathkit AP-1615 offers the kind of specifications and features normally found on preamps costing much more. Harmonic and IM distortion are insignificant, less than 0.05%. And extremely wide dynamic range, 100 dB for all inputs, means that even the loudest and most complex musical passages come through with minimum distortion.

If you need tone controls, the optional AD-1305 (right) offers far more versatility and precise tone adjustment than ordinary bass and treble controls. A relay instantly mutes the output when power is turned on or off to prevent "thumps." A sub-sonic filter eliminates the noise from turntable rumble or record warp which causes distortion at the speaker (important with high power amplifiers). Has high-frequency filter, two phono inputs, aux. and tuner inputs, tape monitor, mono switch, headphone jack and front panel dubbing inputs and outputs. Case with solid walnut end panels.

Kit AP-1615, Shpg. wt. 12 lbs. **129.95**

AP-1615 SPECIFICATIONS: **Input Sensitivity:** Phono, 2 mV. **Hi-Level** (Tuner, Tape, Aux., Tape Mon and Tape Dub): 180 mV. **Input Overload:** Phono, over 100 mV. Hi-Level, over 10 V. **Hum and Noise:** Phono, −65 dB (2 mV input); Hi-Level, −85 dB (180 mV input). **Frequency Response:** Phono, ±0.5 dB, 30 Hz to 15 kHz. Hi-Level, ±.2 dB, 20 to 20 kHz. **Rated Output:** 1.5 V at rated sensitivity. **Tape Output:** 180 mV. **Harmonic and IM Distortion:** Less than 0.05% from 20 Hz to 20 kHz at 1.5 V output. **Channel Separation:** 50 dB at 1 kHz. **Filters:** Low, −3 dB at 15 Hz, −12 dB octave/slope. High, −3 dB at 7 kHz, −12 dB octave/slope. **Power Requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 4½″ H x 17½″ W x 8⅛″ D.

[2] AD-1305 5-band, 2-channel Audio Equalizer

Offers more complete control than conventional bass and treble controls

The AD-1305 is an audio equalizer offering complete tone control versatility with five slide controls for each stereo channel. It is designed for use with the AP-1615 at left, or any receiver or amplifier having a preamp output and power amp input, or tape monitor. Each control provides a 12 dB per octave slope, for precise corrections in each portion of the frequency spectrum, without overlapping. A center detent allows exact "0" dB setting bypassing each band; a tone flat switch bypasses the equalizer entirely. Allows precise corrections for room acoustics, differences in cartridges and speakers, even deficiencies in program sources. Can also be used with tape recorders to filter old or scratchy records or broadcasts before recording.

The active bandpass filters in the AD-1305 use large, fully-shielded coils, ensuring extremely low distortion. The AD-1305's own tape monitor lets it be used in a receiver's tape monitor circuit without losing monitor capability. Case with solid walnut end panels.

Kit AD-1305, Shpg. wt. 11 lbs. **119.95**

AD-1305 SPECIFICATIONS: **Input Impedance:** 100k ohms. **Output Impedance:** 100 ohms. **Rated Output:** 1.5 V rms. **Overload:** 5 V rms. **Signal-to-Noise Ratio:** 90 dB below 1.5 V. **Total Harmonic Distortion:** .05% from 20 Hz to 20 kHz at 1.5 V output. **IM Distortion:** .05% at 1.5 volts. **Frequency Control Range:** (separate controls for each channel), 30-125 Hz, 125-500 Hz, 500-2000 Hz, 2000 Hz to 8 kHz, 8 kHz − 32 kHz. **Overall Gain (flat):** Zero dB (unity gain). **Slope of Filters:** 12 dB per octave. **AC outlets:** One switched, one unswitched. **Power Requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 4⅞″ H x 17½″ W x 8″ D.

1515 "Separates"—Incredible Performers

New AA-1515 Stereo Amplifier

$299.95

70 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.08% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ

For style, features and performance, we don't think you can buy a better stereo amplifier at anywhere near this low price! Has the low-distortion power you need to drive most any speakers to "live performance" volume levels; inputs and outputs for a totally versatile system setup. Harmonic distortion is an amazing 0.08% over the entire frequency range for exceptionally accurate music reproduction. Background noise is totally inaudible, a full 65 dB down on phono inputs, 80 dB down on all other inputs, so your music comes through clean, crisp and clear. And the AA-1515's excellent dynamic range provides ultra-realistic definition on even the most complex musical passages. Has dual output meters calibrated in both watts and decibels over a 40 dB range for an accurate visual indication of amplifier output. The meters respond to peaks as short as a record click, making them useful as overload indicators. High and low filters help you get the best sound from old or worn records. There are complete tape outputs for monitoring and dubbing, preamp out and main-amp in jacks for audio accessories. The primary controls — on-off, stereo-mono switch, volume and mode selector — are located right up front; large, easy-to-use and positive. The secondary controls are located behind a hinged front panel. Has bass and treble tone controls, balance, tone flat and loudness switches. There are outputs for two sets of speakers, and a front panel stereo headphone jack. Lighted output meters and program legends show through the smoke-tint front "window". Handsome cabinet with brushed aluminum front panel, solid walnut side panels. Easy kit assembly.

Kit AA-1515, Shpg. wt. 40 lbs. **299.95**

AA-1515 SPECIFICATIONS: **Frequency Response:** −1 dB, 8 Hz to 45 kHz; −3 dB, 4 Hz to 80 kHz. **IM Distortion:** less than 0.08% from 0.25 to 70 watts. **Damping Factor:** greater than 60. **Input Sensitivity:** Phono, 2 mV. Aux., Tuner, Tape, Tape Mon., Tape Dub., 150 mV. **Input Overload:** Phono, greater than 100 mV. All other inputs: greater than 10 volts. **Hum and Noise:** Phono, 65 dB. Tape, Tuner and Aux., 80 dB. **Power Requirement:** 120 or 240 volts; 60/50 Hz. **Dimensions:** 17½" W x 6⅛" H x 14¼" D. **Net Weight:** 27 lbs.

New AJ-1515 AM/FM Stereo Tuner

$379.95

The tuner section from our AR-1515 Stereo Receiver — one of the finest tuners you can buy

The AJ-1515 is a top performing stereo tuner designed for use in the finest component systems. Its digital frequency readout displays AM and FM broadcast frequencies far more accurately than tuners with conventional dials; its signal-strength and center-channel tuning meters help you "zero in" on stations for the finest reception. Has 1.8 μV sensitivity with a steep quieting slope to bring in even weak signals; outstanding selectivity and capture ratio characteristics that make it ideal for crowded FM signal areas. You can build in the optional Dolby FM module for Dolbyized FM broadcasts now in many areas, too. Even the AM section features a shielded loop antenna and a 9-pole L-C filter for "hi-fi" quality AM without alignment problems. Has stereo-mono switch, a blend switch for clean reception of weak stations, switchable muting for quiet tuning, output level controls. Handsome functional styling with main controls right up front, secondary controls hidden behind a convenient fold-down front panel. The stereo light, tuning meters and program indicators show through the smoke-tint front "window". Stylish brushed aluminum case with walnut-finish side panels. Easy kit assembly too.

Kit AJ-1515, Shpg. wt. 26 lbs. **379.95**

Kit AD-1504, Optional Dolby FM Module. 2 lbs. **39.95**

AJ-1515 SPECIFICATIONS: **Frequency Response:** ±1 dB, 20-15,000 Hz. **Antenna:** 300 ohm balanced, 75 ohm unbalanced. **Sensitivity:** 1.8 μV. **Selectivity:** Alternate Channel: 100 dB*. **Adjacent Channel:** 15 dB*. **Image Rejection:** 90 dB*. **IF Rejection:** 90 dB*. **Capture Ratio:** 1.3 dB*. **AM Suppression:** 65 dB*. **Harmonic Distortion:** 0.3%. **Intermodulation Distortion:** 0.1%. **Spurious Rejection:** 90 dB*. **Signal-to-Noise Ratio:** 65 dB*. **Stereo Channel Separation:** 40 dB at mid-frequencies (1000 Hz). 35 dB at 100 Hz. 20 dB at 10 kHz. 20 dB (nominal) at 15 kHz. **Stereo Harmonic Distortion:** (100% modulation): 0.35%. **19 kHz and 38 kHz Suppression:** 60 dB. **SCA Suppression:** 60 dB. **Mute Threshold:** 0-5 μV (variable). **AM Sensitivity:** 5 μV with 50 ohm direct input. **Selectivity:** 20 dB at 10 kHz. **Image Rejection:** 70 dB at 600 kHz, 50 dB at 1400 kHz. **IF Rejection:** 45 dB at 600 kHz, 50 dB at 1400 kHz. **Harmonic Distortion:** 3%. **Power Requirement:** 120 or 240 volts, 60/50 Hz. **Dimensions:** 17½" W x 6⅛" H x 14¼" D. **Net Weight:** 27 lbs.

*Rated IHF (Institute of High Fidelity) Standards Dolby is a trademark of Dolby Labs.

New AA-2015 deluxe 4-Channel Amplifier

35 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.25% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ

The same distinctive styling and features of the AA-1515 above, offered in a discrete 4-channel amplifier version for spacious quadraphonic sound. Has four lighted output meters; complete 4-channel volume and balance controls; heavy-duty heat sinks and power supply for continuous high power operation. 2 and 4-channel headphone jacks, front and rear channel speaker on-off switches. Plays all discrete 4-channel program material, accepts optional AD-1507 CD-4 discrete disc decoder and AM-1503 SQ decoder.

Kit AA-2015, Shpg. wt. 40 lbs. **399.95**

Kit AD-1507, Optional CD-4 Module. Shpg. wt. 2 lbs. **79.95**

Kit AM-1503, Optional SQ Module. Shpg. wt. 1 lbs. **49.95**

AA-2015 SPECIFICATIONS: **Frequency Response:** (at 1 watt): 0 dB to −1 dB, 7 Hz to 40 kHz. **Intermodulation Distortion:** Less than 0.2% from 250 mW to 35 watts. **Damping Factor:** greater than 50. **Input Sensitivity:** Phono, 2 mV. High level, 200 mV. **Input Overload:** phono, 95 mV. High level, 5 volts. **Hum and Noise (input shorted):** Phono, −65 dB. High level, −75 dB. **Power Requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 18" W x 6¼" H x 14¾" D. **Net Weight:** 31 lbs.

New $399.95

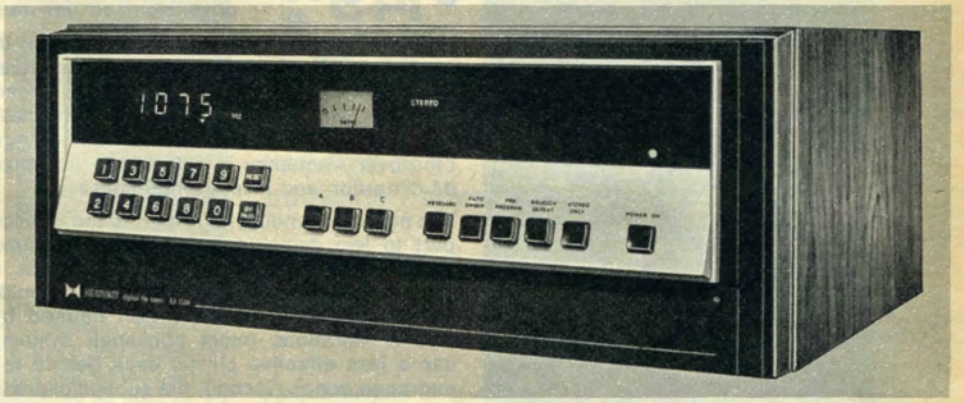
Find out how easy it is to build a kit — order the manual. See page 53.

Build yourself great sound at low cost!

Our best FM stereo tuner has advanced computer technology for finest performance

- *Less than 1.8 μV sensitivity*
- *Over 95 dB selectivity*

$499.95



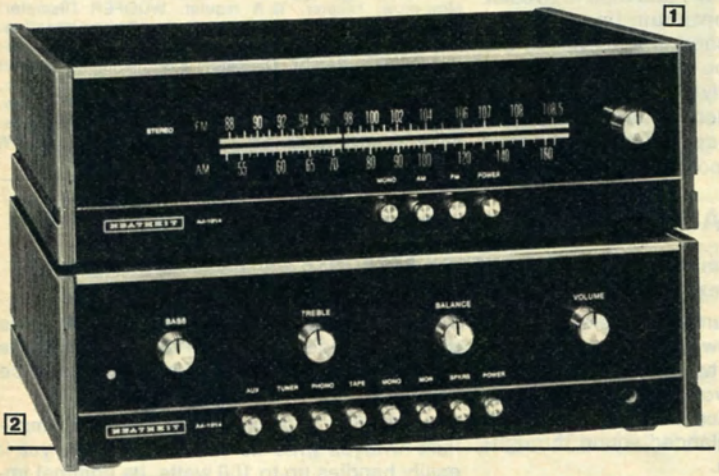
Incorporates the most precise and accurate tuning system available today — digital readout and digital frequency synthesis — for an incredible 0.005% tuning accuracy that virtually eliminates interference as well as many other problems of conventional tuners.

Features convenient three-way tuning — enter a station's frequency through the front panel keyboard; use the Auto-Sweep to count down from the top of the FM band and stop automatically at each listenable station, or program it to stop only at stereo stations; or use the A, B and C buttons to select any of three stations programmed with computer-type punch cards. We even supply extra cards so you'll have one for each of your favorite stations.

Has multipath outputs for DC coupled scopes (like the AD-1013), adjustable AGC and squelch, much more. The front panel meter indicates the relative signal strength of each station received, and is used as a convenient test meter during kit assembly and checkout. Build and operate the AJ-1510A tuner, we think you'll agree that it's truly one of the world's finest tuners. With metal cabinet, order case below. 6" H x 16⅜" W x 14¾" D.

Kit AJ-1510A, Shpg. wt. 25 lbs. **499.95**
Pecan Veneer Case.
AJA-1510-1, Shpg. wt. 8 lbs. **26.95**

AJ-1510 SPECIFICATIONS: MONOPHONIC: Tuning: Digitally synthesized. Antenna: 75 or 300 ohm. Sensitivity: Less than 1.8 μV. Selectivity (alternate channel): Greater than 95 dB. Capture ratio: Less than 1.5 dB. Harmonic distortion: Less than 0.3%. IF rejection: Greater than 95 dB. Spurious rejection: Greater than 90 dB. STEREOPHONIC — Channel separation: 1,000 Hz, 40 dB; 80 Hz, 25 dB; 10 kHz, 25 dB; 15 kHz, 20 dB. Harmonic distortion: 0.35%. AUDIO OUTPUT — Audio output level: (fixed): 1.2 V rms nominal (with 100% mod.). GENERAL — Power Requirement: 120/240 VAC, 60/50 Hz, 50 W.



1 AJ-1214 Deluxe AM/FM Stereo Tuner

$114.95

The perfect "system mate" for the AA-1214 amplifier. Pre-assembled and aligned FM front end provides 2 μV sensitivity with extremely low cross modulation and virtually no overload, even on strong signals. The FM IF uses two IC's and ceramic filters for over 60 dB selectivity. A phase-lock-loop multiplex circuit provides excellent stereo separation with minimum distortion. Pushbutton band selection, flywheel tuning, wide slide-rule dial, stereo indicator light. Inputs for 75 or 300-ohm antenna. Walnut-stained veneer end panels.

Kit AJ-1214, Shpg. wt. 11 lbs. **114.95**

2 AA-1214 Fine-Sounding Stereo Amplifier

$114.95

Offers the same excellent performance as the amplifier section of our famous AR-1214 receiver. And the AA-1214 has a host of "top of the line features" for operating convenience and versatility. Input level controls match the amplifier to your phono cartridge's output; tape monitor lets you listen as you record (with 3-head decks), positive pushbutton input selection, front panel stereo headphone jack, bass and treble controls, and much more. The kit building is fun and easy too, with most parts mounted on two printed circuit boards and a wiring harness. Case with walnut-stained veneer end panels.

Kit AA-1214, Shpg. wt. 13 lbs. **114.95**
Kit AA-2005A, 4-channel version of above with built-in matrix decoder optimized for SQ. Shpg. wt. 28 lbs. **139.95**

15 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS WITH LESS THAN 0.5% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ.

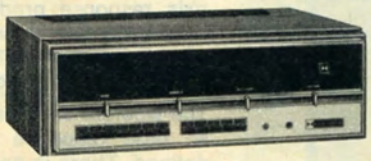
AA-1214 SPECIFICATIONS: Frequency Response: ±1 dB, 7 Hz to 100 kHz. IM Distortion: less than 0.5% at full power; less than 0.2% at 1 watt. Hum and Noise: −65 dB. Power: 120/240 VAC, 60/50 Hz. Dimensions: 3⅞" H x 12¾" W x 12" D.
AJ-1214 SPECIFICATIONS: FM Sensitivity: 2μV. Selectivity: 60 dB. Capture Ratio: 2 dB. AM Suppression: 50 dB. Stereo Channel Separation: 40 dB typ., 35 dB min. Power Requirement: 120/240 VAC, 60/50 Hz. Dimensions: 3⅝" H x 13" W x 11" D.

AA-18 Solid-State Mono Amplifier

3.25 WATTS, MINIMUM RMS, INTO 8 OHMS WITH LESS THAN 1.5% TOTAL HARMONIC DISTORTION FROM 40-20,000 HZ.

Has inputs for phono with ceramic cartridge, mono AM or FM tuner, or tape recorder. Drives efficient 8-ohm speakers to surprising sound levels... also can be used as a good headphone amplifier. Ideal beginner kit, goes together in just a couple of evenings. With metal case. 2⅝" H x 7 1/16" W x 5⅝" D. 120/240 VAC, 60/50 Hz.

Kit AA-18, Shpg. wt. 4 lbs. **24.95**



Stereo Amplifier

35 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS, WITH LESS THAN 0.25% TOTAL HARMONIC DISTORTION FROM 20-20,000 HZ.

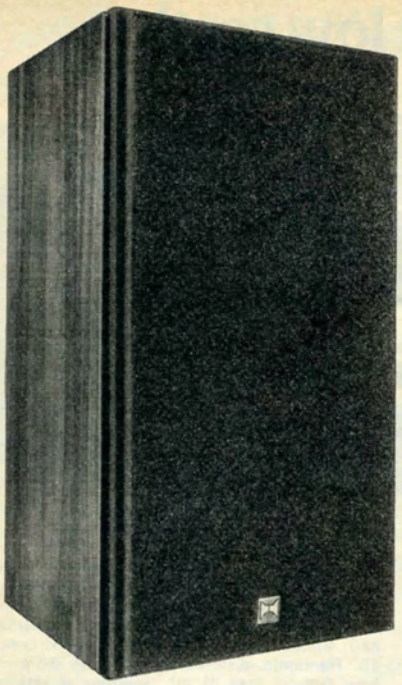
Has slide controls, tuner, two aux. and tape monitor inputs with level controls; loudness circuit, main/remote speaker switches and headphone jack. With metal cabinet, optional wood case below.

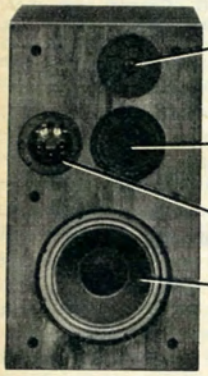
Kit AA-29, Shpg. wt. 28 lbs. **189.95**
AE-19, Pecan-Veneer Case, 10 lbs. **21.95**

AA-29 SPECIFICATIONS: Frequency Response: ±1 dB, 7 Hz to 60 kHz. Hum and Noise: Phono, −65 dB. Tape & Aux.: −70 dB. Power Requirement: 120/240 VAC, 60/50 Hz. Dimensions: 5⅛" H x 16¾" W x 14½" D.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Heathkit Speaker Systems make





1" wide-dispersion dome tweeter for superb definition

4½" midrange in special subenclosure

Easy-access controls and fuses

Gutsy 10" woofer for solid, well-defined bass

Heathkit AS-1373 deluxe 3-way Speaker System

$149.95 ***A superb sounding speaker that rivals the performance of speakers costing much more***

Here's a superb, build-it-yourself addition to our speaker line...with guaranteed specifications you won't find on comparably priced speakers. The 10" woofer provides solid, well-defined bass. And the woofer-to-midrange crossover frequency is 500 kHz to minimize IM distortion and insure smoothness.

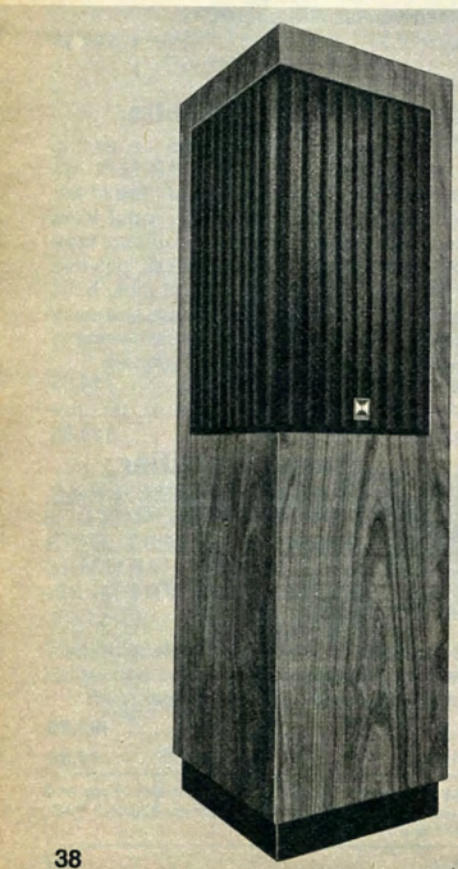
The natural-sounding midrange is due in large part to two design features normally found only in speakers costing over $300. First, a special subenclosure isolates the 4½" midrange speaker from distortion caused by woofer vibrations (most bookshelf systems use a less effective plastic back behind the midrange cone). Second, the subenclosure is filled with a polyester damping material which prevents reflections—a primary cause of midrange coloration. The 1" dome tweeter is one of the finest made — excellent power handling and superb definition. Even at 12,000 Hz its horizontal dispersion is 120°!

Poor imaging (a constantly-shifting blur of sound) is a common problem in bookshelf speakers. To create a sharply focused sound "image", all three of the AS-1373's drivers are flush-mounted. And there are no "rails" around the edges of the cabinet to limit treble dispersion or cause peaks and dips in tweeter response. Also, for optimum imaging, the tweeter can be positioned directly above the midrange. Whether you position the system horizontally or vertically—simply interchange the tweeter and switch plate. Finally, the handsome foam grille contributes to superior imaging because it is more acoustically transparent than ordinary grille cloth — especially at high frequencies.

The AS-1373 is a great combination of efficiency and high power handling. Although it can be driven by as little as 10 watts, it's rated at 200 watts max. (the woofer can withstand up to 400 watts of pulse power). So, while the AS-1373 can be used with almost any amplifier, a high-power amplifier like the AA-1340 reveals its awesome dynamic range and clarity. And the AS-1373 provides maximum protection by individually fusing each driver, virtually eliminating expensive burn outs. The sophisticated crossover circuit (a weak link in many systems) is every bit as rugged as the drivers. Two subtle but effective controls match the mid- and high-frequency response to your room's acoustics. Shpg. wt. 62 lbs.

Kit AS-1373, Motor Freight . . . . . **each 149.95**

AS-1373 SPECIFICATIONS: **Frequency Response:** ±3 dB from 40 Hz to 20,000 Hz, in a typical listening room; −10 dB at 30 Hz and 22k Hz. **Impedance:** 8 ohms, nominal; 6 ohms, minimum. **Recommended Amplifier Power:** 10 watts, minimum; 200 watts, maximum (fused for larger amps). **Crossover Frequencies:** 500 Hz and 3000 Hz, 12 dB/octave. **Controls:** 3 kHz shelf/flat; 10 kHz rolloff/flat. **Fuses:** Woofer, 1¼ A slow-blow; midrange, ¾ A slow-blow; tweeter, ½ A regular. **WOOFER Diameter:** 10", nominal. **Magnet Weight:** 2 lbs. **Power Handling:** 400 watts, pulse (if not excursion limited); 40 watts continuous. **MID-RANGE Diameter:** 4½", nominal. **Magnet Weight:** 10 ounces. **Power Handling:** 250 watts, pulse; 25 watts continuous. **TWEETER Diameter:** 1" dome. **Magnet Weight:** 8 ounces. **Power Handling:** 140 watts, pulse; 14 watts continuous. **Dimensions:** 26" H x 14½" W x 11⅞" D, without 1¼" grille. **Net Weight:** 47 lbs.



Heathkit AS-1344 two-way column Speaker System

$129.95 ***Smooth sound, FLAT ENERGY RESPONSE and placement flexibility make the AS-1344 an outstanding speaker value***

One of the finest column speakers you can buy, at a surprising low price! Has two 6½" full-range drivers and two 1" dome tweeters, mounted in separate woofer-tweeter arrangements on adjacent sides of the cabinet. This helps maintain well-balanced sound throughout your listening room.

The AS-1344 is designed for flat energy response—a widely overlooked factor in speaker design. The reason is simple: once you're six feet away from a speaker, over 80% of the sound you hear is reflected off the walls, ceiling and floor of your listening room. So even if the "on-axis" response is excellent, poor response off-axis can make a speaker's treble sound dull. Combining excellent on- and off-axis response produces flat energy and a bright, completely realistic sound. The AS-1344 has one of the flattest energy responses we've ever measured.

The woofers are located well above the floor, so bass response is very solid and well-defined. There is no mid-bass boom or resonance either, so middle frequencies come through remarkably clean and clear. The tweeters deliver a full 10 to 20 dB more off-axis output than conventional tweeters for bright, realistic highs — and their amazing 270° dispersion pattern maintains a well-balanced stereo image no matter what your listening position.

The overall bass-to-treble balance and wide dynamic range of the AS-1344 make it one of the best speakers you'll hear in this price category.

The AS-1344 is designed for use with amplifiers with as little as 10 watts power, yet it easily handles up to 100 watts. Its nominal impedance is 4 ohms, so most amplifiers will deliver up to TWICE their rated 8 ohm power when used with AS-1344's. Woofers and tweeters are separately fused for protection. A flat/-3 dB level control tailors high-frequency response for normal or "live" listening rooms. Has light walnut-vinyl finish on all four sides, recessed top with simulated black slate and dark brown acoustically transparent foam grille. Easy kit assembly too!

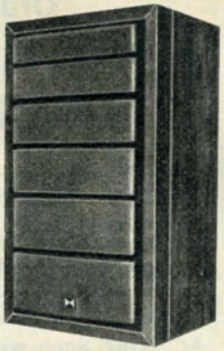
Kit AS-1344, Shpg. wt. 53 lbs.,
Motor Freight . . . . . **each 129.95**

AS-1344 SPECIFICATIONS: **Frequency Response:** 35-22,000 Hz, within ±3 dB from 55-20,000 Hz in a typical listening room. **Impedance:** 4 ohms minimum. **Recommended Amplifier Power:** 10 watts minimum, 100 watts maximum. **Crossover Frequency:** 4000 Hz mechanical (woofer) and 12 dB/octave electrical on tweeter. **Control:** two position tweeter level, flat and −3 dB. **Fuses:** 1½ amp Slow-Blow for woofers; 1 amp regular for tweeter. **WOOFERS: Diameter:** 6½". **Magnet Weight:** 10 oz. **Power Handling:** 300 watts total pulse power; 30 watts continuous. **Tweeters: Diameter:** 1". **Magnet Weight:** 8 oz. **Power Handling:** 200 watts pulse power; 20 watts continuous. **Dimensions:** 40" H x 11" W x 11" D. **Net Weight:** 45 lbs.

Charge-A-Kit — no money down on any kit — see page 54 for details.

your favorite music sound its BEST!

Heathkit deluxe 2-way bookshelf speaker



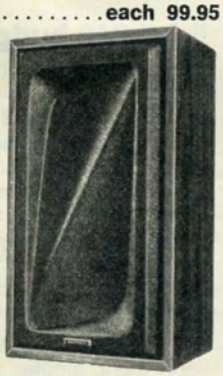
Handsome walnut-veneer cabinet with deluxe foam grille

$99.95 each

One of the best sounding "mid-priced" speakers around! The special-design 10" woofer has enhanced midrange response so the AS-1352 has the kind of smooth, effortless sound you'd expect from an expensive three-way system. The 1¾" tweeter has phenolic ring suspension for superior dispersion. Frequency response extends from 30-20,000 Hz and is a flat 3 dB from 45-18,000 Hz for excellent overall performance. Has a flat/–3 dB high frequency switch, separately fused woofer and tweeter. Can be driven by as little as 10 watts, but handles up to 50 watts. Factory assembled walnut-veneer watts, but handles up to 50 watts. Handsome factory assembled walnut-veneer cabinet with acoustical foam grille. 24" H x 13½" W x 11" D. 8 ohms impedance.

Kit AS-1352, Shpg. wt. 49 lbs. ..... **each 99.95**

Heathkit 2-way bookshelf speaker



Offers BIG Audio Performance from a compact enclosure

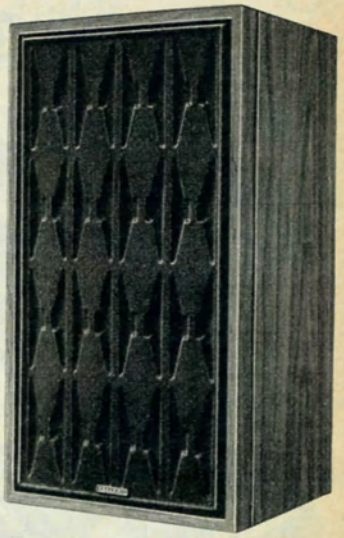
$59.95 each

An excellent choice for low to medium priced music systems. Has an 8" woofer with a hefty 1-lb. ceramic magnet, 1¾" phenolic ring tweeter. The flat response characteristics of the AS-1332 provide clean, natural and well-balanced sound. Frequency response extends from 40-20,000 Hz and is a flat 3 dB from 50-18,000 Hz—the kind of performance you'd expect only in a far more expensive speaker. Can be driven by as little as 10 watts, but handles to 50 watts. 3400 Hz crossover for smooth, even frequency distribution. Has individual fuses for woofer and tweeter; tweeter level control; factory-assembled walnut grain vinyl covered enclosure, three dimensional formed grille cloth. 19½" H x 10½" W x 8" D. 8 ohms impedance.

Kit AS-1332, Shpg. wt. 22 lbs. ..... **each 59.95**

New

Heathkit 2-way "mid-priced" bookshelf speaker



$79.95 each

Fine-Sounding 8" speaker system with high efficiency and wide-response for good sound even from lower power amplifiers and receivers.

Now even low and medium power systems can pack a real "punch" with this new high-efficiency speaker! Uses an 8" woofer with a ceramic magnet and a 2x6" horn-type tweeter for smooth wide-range sound with excellent high-frequency dispersion.

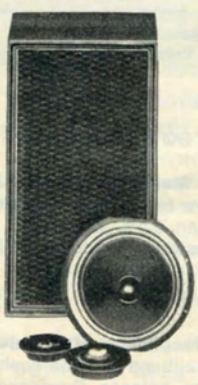
Frequency response extends from 40-16,000 Hz and is a flat ±3 dB from 60-14,000 Hz a performance level that's not usually found on speakers priced this low. The crossover is at 2500 Hz (12 dB per octave) to minimize distortion and insure smooth overall response. The woofer and horn tweeter are front-mounted and the cabinet rails are kept low to minimize diffraction and dispersion problems. And the horn tweeter can be mounted so you get the best high-frequency dispersion no matter whether you place the system horizontally or vertically — a Heath exclusive!

A continuous tweeter level control lets you adjust the high frequency response to suit your listening area. And each driver is individually fused for protection. The AS-1342 can be driven by as little as 5 watts, yet it handles up to 25 watts. Impedance is 8 ohms. With factory assembled walnut-finish vinyl-covered enclosure, handsome 3-dimensional formed grille cloth. 12" W x 22¼" H x 10½" D. Easy 2-4 hour kit assembly. Build a pair for great stereo sound!

Kit AS-1342, Shpg. wt. 30 lbs. ..... **each 79.95**

High-performance Heathkit/"Brand-Name" Speaker Systems

Heathkit/AR combine for super sound



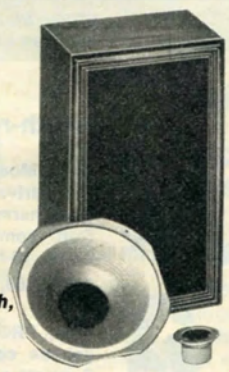
$219.95 each

Outstanding bass response all the way down to 30 Hz—smooth, natural sound

Has three Acoustic Research AR-3A drivers mounted in an oiled walnut veneer enclosure. 12-in. acoustic suspension woofer, hemispherical dome midrange and tweeter. Midrange and tweeter level controls, too. 30-20,000 Hz response. 4 ohms. Requires minimum 25 W rms. 25" H x 14" W x 11¾" D. Shpg. wt. 64 lbs.

Kit AS-103A, Motor Freight ..... **each 219.95**

Ultra-efficient Heathkit/JBL system



$239.95 each

Massive 14" woofer with 11½-lb. magnet for superb bass response, 2" tweeter

So efficient it can be driven by almost any amplifier, yet it handles up to 50 watts! Frequency response is smooth from 40 to 20 kHz. 3-position tweeter level control "tailors" response to your listening area. Factory assembled oak veneer cabinet. 8 ohms. Measures 14" H x 23½" W x 12" D. Shpg. wt. 57 lbs.

Kit AS-48, Shpg. wt. 57 lbs. ..... **each 239.95**

Heath/Altec-Lansing—Our Finest Speaker System

$349.95 each

High-efficiency design delivers "live performance" volume with almost any amplifier

Bass reflex design. With 15-in. woofer, mid- and high-frequency exponential horn. Requires 10 watts min., handles to 50 watts. 8 ohms. High frequency level control. The factory assembled cabinet features pecan veneers, hardwood trim, gold and black grille cloth. 29⅝" H x 27¾" W x 18⅞" D. Shpg. wt. 128 lbs.

Kit AS-101, Motor Freight ..... **each 349.95**

Order early for best selection! Phone (616) 982-3411 day or night.

Order one of these Heath-recommended

Order one with a complete hi-fi system

B·I·C™

With Base and Cartridge

$199.95

If purchased separately, up to $286.85

Save up to $86.90

B·I·C 980 with electronic speed control

Precision belt drive and electronic speed control give you the performance and reliability of studio-quality turntables. The unique "programming panel" gives you the convenience of a changer. Permits automatic play of a single disc once or up to six times, or plays a six-record stack. Has 24-pole synchronous motor, pitch control, strobe, 33⅓ and 45 rpm operation. Includes base and your choice of cartridge: Shure M91ED or Empire 2000E/111 (specify). For premium performance, add $45 for Shure V-15 Type III or $35 for Audio-Technica AT-14Sa cartridge; see cartridge specs in chart below. 15⅞" W x 12 11/16" D x 4 13/16" above mounting board, 1⅝" below.

ACP-1167, Shpg. wt. 13 lbs. Assembled **199.95**

With Base and Cartridge

$159.95

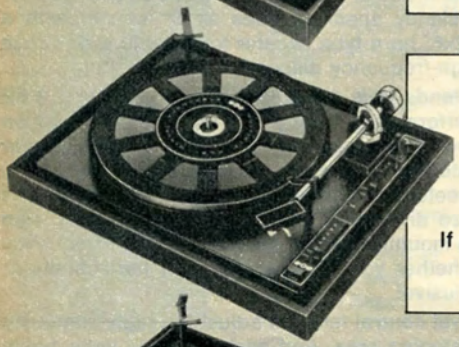
If purchased separately, up to $246.85

Save up to $86.90

B·I·C 960 belt-drive automatic turntable

The same ultra-reliable design as the B•I•C 980 minus the electronic speed control, adjustable pitch and strobe. 33⅓ and 45 rpm. Includes base and your choice of Shure M91ED or Empire 2000E/111 cartridge (specify). 15⅞" W x 12 11/16" D x 4 13/16" above board, 1⅝" below.

ACP-1166, Shpg. wt. 11 lbs. Assembled **159.95**



With Base and Cartridge

$119.95

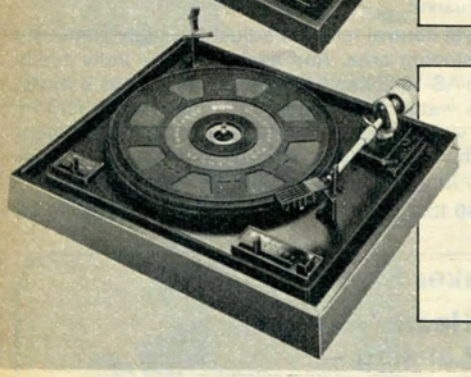
If purchased separately, up to $206.85

Save up to $86.90

B·I·C 940 budget-priced belt-drive turntable

A true B•I•C automatic turntable—with belt drive, low speed 24-pole synchronous motor, up to six-record continuous play. Extremely low-friction bearings and an isolated counterweight allow tonearm to track even the highest quality cartridges. Has viscous-damped cueing, 12" platter, 33⅓ and 45 rpm speeds, and CD-4 capability. Includes base and your choice of Shure M91ED or Empire 2000E/111 cartridge (specify). 15⅞" W x 12 11/16" D x 4 13/16" above board, 1⅝" below.

ACP-1161, Shpg. wt. 11 lbs. Assembled **119.95**



With Base Dust Cover and Cartridge

$89.95

Value up to **$127.80**

B·I·C 920 low-cost belt drive turntable

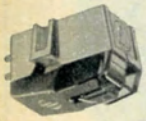
THE choice for a low-priced stereo system! Belt-drive, 24-pole motor, lightweight tubular tonearm, anti-skate and tracking force adjustments, lots more: Plays a single record up to six times, or six records in a stack. 33⅓ or 45-rpm operation. CD-4 capability. 10½" precision formed platter. Includes base, dust cover and Shure M91ED stereo cartridge. 15¼" W x 13⅜" D x 6⅜" H with dust cover.

ACP-1211, Shpg. wt. 16 lbs. Assembled **89.95**

ACCESSORIES FOR B·I·C TURNTABLES, EXCEPT 920

ADP-1163, Solid oiled walnut base, Shpg. wt. 3 lbs. **16.95**
ADP-1164, Hinged dustcover, Shpg. wt. 4 lbs. **9.95**
ADP-1165, 45-rpm spindle, Shpg. wt. 1 lb. **3.95**

NOTE: When ordering turntable, please specify cartridge and base model numbers on order blank.



Stereo Cartridges

Shure V-15 Type III. Famous for its excellent tracking and smooth, uncolored sound. For tonearms capable of tracking at ¾ to 1¼ grams. See specifications below.

AD-1059, Shpg. wt. 1 lb. **85.00**
With turntable purchase **45.00**

Audio-Technica AT-14Sa. Specially shaped and polished Shibata stylus for unparalleled quadraphonic CD-4 and stereo response. Lasts twice as long as ellipticals! Specs below.

ADP-1139, Shpg. wt. 1 lb. **69.95**
With turntable purchase **35.00**

Model	Response (Hz)	Output	Separation	Elliptical Stylus	Tracking	Price Alone	With Turntable
ADP-1062, Wt. 1 lb. Shure M91ED	20-20,000	5.0 mV	25 dB	0.2 x 0.7	¾ to 1½ gr.	59.95	FREE
ADP-1147, Wt. 1 lb. Empire 2000E/111	20-20,000	4.5 mV	28 dB	0.2 x 0.7	½ to 1½ gr.	69.95	FREE
AD-1059, Wt. 1 lb. Shure V-15 Type III	10-25,000	3.5 mV	28 dB	0.2 x 0.7	¾ to 1¼ gr.	85.00	45.00
ADP-1139, Wt. 1 lb. Audio-Tech. AT-14Sa	5-45,000	2.7 mV	25 dB	Shibata	1 to 2 gr.	69.95	35.00

Heath-recommended stereo headphones

Koss Model HV/1 High-Velocity Stereophones with Decilite™ drivers. Wide-range 10-octave response, 15-30,000 Hz; total harmonic distortion less than 0.5% at 109 dB SPL. Soft, comfortable cushions, adjustable headband. 3.2-600 ohms. 10-ft. cord, ¼" phone plug.

AHP-1168, Shpg. wt. 2 lbs. Assembled **44.95**

Koss PRO/5LC Professional Stereophones with individual volume controls. Comfortable headband and earcushions. Controls on each earcup for volume, balance. Response: 10-20,000 Hz. 3.2-600 ohms. 10-ft. cord, ¼" phone plug.

AHP-1169, Shpg. wt. 2 lbs. Assembled **54.95**

Sennheiser HD-424 Headphones with patented Open-Air design. Listen in private, but stay aware of what's going on around you. Super lightweight—a mere 6.5 ounces. 15-20,000 Hz response, less than 1.0% total harmonic distortion. 2000 ohms. 10-ft. coil cord, ¼" phone plug.

AHP-1193, Shpg. wt. 2 lbs. Assembled **64.95**

Charge-A-Kit — no money down on any kit — see page 54 for details.

turntable packages and save up to $86.90

and save another 5%

Dual®

The belt-drive changer from Dual

The incredible Dual 1249 featuring precision belt-drive, 4-point gimbal-mounted tonearm with selectable tracking angles for automatic and manual play. Has illuminated strobe, variable pitch control, CD-4 compatibility. 33⅓ and 45 rpm speeds. Dynamically balanced full-size 12″ turntable platter. Includes base and choice of Shure M91ED or Empire 2000E/III cartridge (specify). Or, add $45 for Shure V-15 Type III or $35 for Audio-Technica AT-14Sa cartridge. 4½″ H x 14¾″ W x 12⅛″ D, less base.

ACP-1148, Shpg. wt. 16 lbs. Assembled **249.95**

With Base and Cartridge

$249.95

If purchased separately, up to $336.85

Save up to $86.90

Dual 510 belt-drive semi-automatic

Single-play turntable features four-point gimbal mounted tonearm and 8-pole synchronous motor driving a 12″ dynamically-balanced cast platter by means of a precision-ground belt. A special sensor indicates when the tonearm is properly positioned manually over the lead-in grooves of 12″ or 7″ records. After record has played, tonearm lifts and motor shuts off automatically. Has two-way damped cueing, anti-skate calibrated for conical, elliptical and CD-4 styli, pitch control with lighted strobe. 33⅓ and 45-rpm operation. Includes base and choice of Shure M91ED or Empire 2000E/III cartridge. 4½″ H x 14¾″ W x 12⅛″ D.

ACP-1213, Shpg. wt. 16 lbs. Assembled **189.95**

With Base and Cartridge

$189.95

If purchased separately, $276.85

Save $86.90

Dual CS-721 direct-drive automatic

One of the finest turntables available. Fully automatic single-play, electronic direct-drive motor, advanced design four-point twin gimbal tonearm mounting. Adjustable tonearm height lets you use almost any cartridge without spacers — provides the correct tracking angle without adding to effective tonearm mass and lets you interchange cartridges easily. Has two anti-resonance filters in the counterbalance housing to prevent acoustical feedback, lighted strobe, adjustable speed; cueing, electronic pitch control, continuous repeat play, anti-skate calibrated for conical, elliptical and CD-4 styli. 33⅓ and 45-rpm operation. CD-4 capability. With Shure V-15 Type III cartridge, base and dust cover.

ACP-1217, Shpg. wt. 16 lbs. Assembled **369.95**

With Base Dust Cover and Shure V15 Type III Cartridge

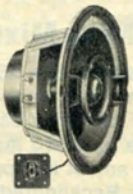
$369.95

Accessories for Dual 1249 and 510 Turntables

ADP-1220, Low-Profile wood base, Shpg. wt. 5 lbs. **16.95**
ADA-49-4, Dustcover, Shpg. wt. 5 lbs. **15.95**
ADA-39-2, 45-rpm spindle for 1249 only. Shpg. wt. 1 lb. **9.95**

NOTE: When ordering turntable, please specify cartridge and base model numbers on order blank.

12″ High Compliance Two-Way Speaker



12″ woofer with re-entrant horn tweeter; high frequency level control. 1-year guarantee.

SPECIFICATIONS — Impedance: 8 ohms. Power Rating: 30 watts. Frequency Response: 20-15,000 Hz. Cone Resonance: 25 Hz. Magnet Weights: 1¾ lbs. and 4.65 oz. Voice Call Sizes: 1½″ and 1″.

Model AS-183, Shpg. wt. 15 lbs. **69.95**
Pair (AS-183-2), Shpg. wt. 39 lbs. **133.00**

Hints for the audiophile

How to Wire Hi-Fi Extension Speakers. EDP-103 .....**3.95**
Acoustic Techniques for Home & Studio. EDP-111 .....**5.95**
Hi-Fi Loudspeakers & Enclosures. EDP-192 .....**6.85**

See page 52 for book-ordering information.

Build yourself great sound for the holidays!

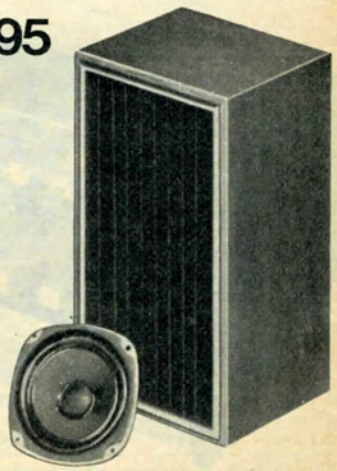
Our lowest-priced acoustic suspension speaker system

$26.95 EACH

- ***BIG sound from an ultra-compact enclosure***
- ***Ideal for stereo where space is limited***

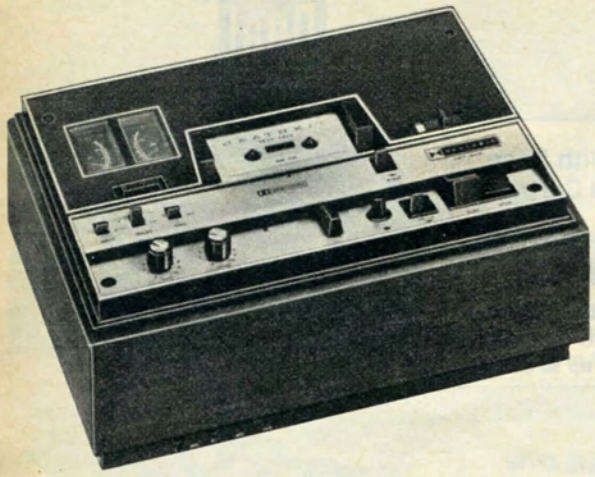
A Big-Sound system at a surprisingly low price! Delivers clean, well-balanced sound — the kind you would expect from larger, much more expensive speaker systems. A high-compliance 4½″ speaker provides usable frequency response from 70 Hz to 16 kHz. The factory-assembled walnut veneer enclosure measures just 12″ H x 7″ W x6″ D. An excellent choice for small apartments or any limited-space area. For use with amplifiers delivering 4 to 20 watts. 8-ohm impedance. You can build a pair in just an evening, for stereo sound you will appreciate and enjoy for years to come.

Kit AS-106, Shpg. wt. 9 lbs. .....**each 26.95**



Charge-A-Kit — no money down on any kit — see page 54 for details.

Build Your Way to Better Recording



Deluxe Stereo Cassette Deck with Dolby®

$279.95

- ***Make full-fidelity stereo cassettes that are BETTER than pre-recorded!***
- ***Hooks up easily to your stereo system***

The Heathkit AD-1530, in easy-to-assemble kit form, combines a performance-proven domestic tape transport with the famous Dolby noise reduction system and Heath electronics. The famous tape transport comes preassembled, ready to wire into the kit. Has play, stop, fast-forward, rewind, and eject controls; safety interlock; automatic shutoff at end of tape in both "play" and "record" modes; piano-key control of play-record-stop; lever control of fast-forward, rewind, eject, stereo/mono input, Dolby on-off, selector for both iron oxide and chromium dioxide tapes.

Other features include individual bias adjust controls for regular and CrO_2 tape; large three-digit resettable counter; lighted VU meters; pause control; input selector switch for either microphone or high-level source input (any low impedance microphone with standard ¼" phone jack can be used); walnut-stained veneer base. PC board amplifier and Dolby circuits simplify kit construction and servicing. Built-in test circuitry and free test cassette aid in checkout and adjustment. Blank 60 minute cassette included.

Kit AD-1530, Shpg. wt. 20 lbs. **279.95**

ADA-1530-1, Dust cover, Shpg. wt. 1 lb. **6.95**

AD-1530 SPECIFICATIONS: **Response:** Regular (iron oxide) tape; ±3 dB from 40 Hz to 12 kHz typical. CrO_2 (chromium dioxide) tape; ±3 dB from 40 Hz to 14 kHz typical. **Distortion:** Tape dependent; electronics less than 0.2%. **Hum and Noise:** Dolby Switch OFF, −48 dB. Dolby Switch ON provides up to 10 dB additional noise reduction. **Wow and Flutter:** Less than 0.25% rms. **Inputs: Microphone:** Lo-Z, 0.2 mV to 10 mV. **Auxiliary:** Hi-Z, 50 mV to 10V. **Fast Forward/Rewind Time:** Approximately 45 sec. for C-60 cassette. **Dimensions:** 5½" H x 9½" D x 14" W. **Power Requirement:** 120 volts, 60 Hz, 15 W. Dolby is a Trademark of Dolby Labs.

Stereo cassette tape recorder/player offers excellent performance at a budget price

Record and play stereo or mono cassettes through your present hi-fi system. It's easy with the AD-110. Features include an internally adjustable bias for chromium dioxide or standard tapes; two-transistor regulated DC motor for stable tape speed with minimum wow and flutter; six pushbuttons for control of all tape transport functions; separate level controls and meters; preassembled and aligned transport mechanism for simplified assembly. Blank 60-minute cassette included.

Kit AD-110, Shpg. wt. 11 lbs. **129.95**

AD-110 SPECIFICATIONS: **Frequency Response:** ±3 dB from 30 Hz to 12 kHz typical. **Hum and Noise:** −45 dB. **Wow and Flutter:** Less than 0.25% WRMS record and playback. **Finish:** Walnut-stained veneer end panels. **Dimensions (over-all):** 3⅛" H x 13⅝" W x 11" D. **Power:** 120/240 VAC, 60/50 Hz, 7 watts.

Questions and Answers About Tape Recording — everything from "accessories" to "weak sound."
EDP-107 ..... **5.95**

How to Select/Use/Troubleshoot Cassette and Cartridge Recorders. EDP-195 ..... **4.55**

See page 52 for book-ordering information.

$129.95

Heathkit Stereo Mike Mixer Console

Wide response (40-20,000 Hz, ±1 dB) and low distortion (0.5%) give you clean, life-like mixing. Each of the two outputs has its own master level control and meter and they can be switched for use in stereo or mono. Has four mike plus two aux. inputs. The fourth mike input has a "pan" control to adjust its apparent location from left to right or anywhere in between. Backlighted meters with two switch-selected ranges plus a pair of LED's with adjustable threshold (80 mV to 6.5 mV) show instantaneous peaks to help reduce distortion. Handsome cabinet in black with walnut stained veneer end panels.

Kit TM-1626, Shpg. wt. 12 lbs. **129.95**

$129.95

TM-1626 SPECIFICATIONS: **Frequency Response:** 40-20,000 Hz, ±1 dB. **Distortion:** 0.5% maximum. **Hum:** −80 dB at minimum volume. **Hum & Noise:** −50 dB from 20-20,000 Hz, all controls set at maximum. **Input Sensitivity for 1.0 Volt Ouptut:** Mike (low-Z), 1 mV; Mike (high-Z), 14 mV; Aux., 150 mV. **Input Overload:** Mike −60 mV (low-Z), 900 mV (high-Z). Auxiliary, 3.0 V. Mixer Bus, 200 mV. **Input Impedance:** Mike −1100 ohms (low-Z), 170k ohms (high-Z). Auxiliary: 100k ohms. **Mixer Bus:** 3000 ohms. **Output Impedance:** 150 ohms. **Power Requirement:** 120/240 VAC, 60/50 Hz, 15 watts maximum. **Dimensions:** 5¾6" H x 16" W x 9⅞" D.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Get BIG SAVINGS on Heathkit Music Systems

While the term "best buy" is somewhat shopworn...the Heathkit...system would certainly qualify as a best buy in low-cost stereo...

Elementary Electronics, July/August, 1975

AM/FM Stereo Receiver with 2 Speakers

$139.96

If bought separately, $197.90

A great low-cost system and now it's an even better buy! Inputs for ceramic phono and tape, slide controls, slide-rule dial with stereo light. Easy kit construction too. AS-1140 speakers described below.

ACS-1118, AC-1118 with speakers, 30 lbs. . . **139.96**

Kit AC-1118, Shpg. wt. 15 lbs. **139.95**

AM/FM/8-Track Receiver with 2 Speakers

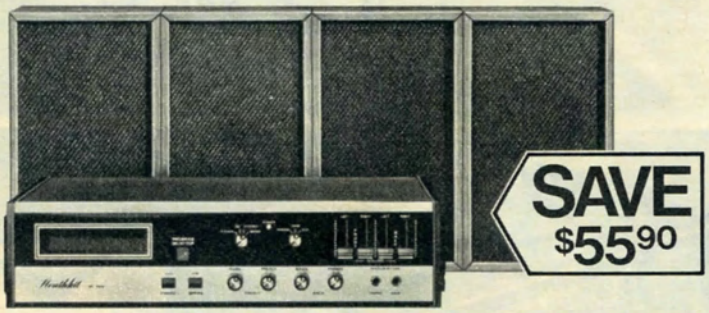
$179.96

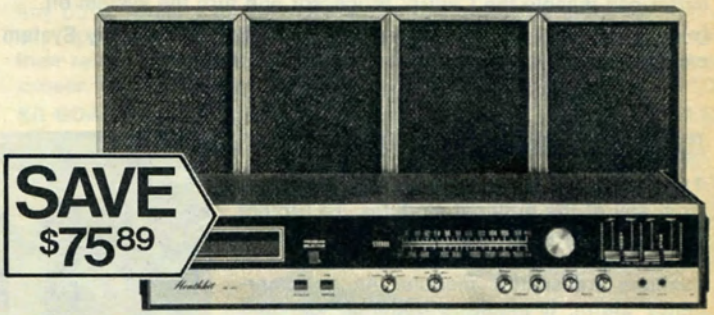
If bought separately, $217.90

Has the same fine features as the AC-1118, but with a preassembled and aligned 8-track tape player that simply drops into the chassis. With automatic or manual program change, lighted indicators. AS-1140 speakers described below.

ACS-1120, AC-1120 with speakers, 37 lbs. . . **179.96**

Kit AC-1120, Shpg. wt. 22 lbs. **179.95**





8-Track/4-Channel Player with 4 Speakers

$119.95

If bought separately, $175.85

Plays discrete 4-channel and stereo 8-track tapes, has SQ* decoder for matrix 4-channel or enhanced stereo. Inputs for ceramic cartridge changer, high-level stereo or 4-channel source, assembled 8-track section. AS-1140 speakers described below.

ATS-1124, AT-1124 with speakers, 51 lbs. . . **119.95**

Kit AT-1124, Player/Amp Alone, Shpg. wt. 21 lbs. **99.95**

AM/FM/8-Track 4-Channel with 4 Speakers

$199.96

If bought separately, $275.85

Has discrete 4-channel amplifier with built-in SQ* decoder, assembled 8-track player section compatible with all stereo and 4-channel cartridges. Full controls, stereo and 4-channel headphone jacks. AS-1140 speakers described below.

ACS-1122, AC-1122 with speakers, 55 lbs. . . **199.96**

Kit AC-1122, Shpg. wt. 25 lbs. **199.95**

*SQ is a trademark of CBS, Inc.

These specifications apply to all components on this page.

4.5 WATTS, MINIMUM RMS, PER CHANNEL INTO 8 OHMS AT LESS THAN 1.0% TOTAL HARMONIC DISTORTION FROM 50-15,000 HZ.

AMPLIFIER — Response: 30-15,000 Hz, ±3 dB. Hum & Noise: −60 dB. FM Sensitivity: 5 μV. Stereo Separation: 35 dB. AM — Sensitivity: 300 μV/m. TAPE PLAYER — Response: 50-10,000 Hz, +3, −5 dB. Separation: 30 dB at 1 kHz. GENERAL — Power Requirement: 120/240 VAC, 60/50 Hz. Dimensions: All units are 4″ high and 15″ deep; units with 8-track players are 22″ wide, others are 17″ wide. Cases: walnut-grained, vinyl clad metal and plastic.

HIGH-EFFICIENCY SPEAKERS. 4½″ foam suspension speakers for use with units on this page, other compact stereo systems. 70-16,000 Hz response. Good-looking walnut-grain vinyl-clad enclosures. 12″ H x 7″ W x 6″ D. 8 ohms impedance. **Kit AS-1140,** Shpg. wt. 15 lbs. . . . . **Pair 37.95**

CERAMIC CARTRIDGE CHANGER. 3-speed changer with molded vinyl base, dust cover, 45-rpm adaptor. Ceramic cartridge with diamond stylus. 7¼″ H x 15¼″ W x 14⅛″ D. **ACP-1138,** Shpg. wt. 15 lbs. **44.95**

SAVE AN EXTRA 5% when you order a complete hi-fi system from Heath

Here's another way Heath helps you get more good sound for your money. Simply select a component system from this catalog and list it at right. Here's how — 1) order a receiver and a pair of speakers or 2) order an amplifier, a pair of speakers and program source (tuner, turntable or tape deck). Add the costs of the individual components, then deduct 5%. That's your low Heathkit system price. On our featured systems, pages 26-33, we've already done the arithmetic for you! The same 5% discount applies to any audio accessories you order with your system — remote or rear-channel speakers, cabinet, tape deck, turntable — audio scope, headphone or headphone control box. NO LIMIT — order as many accessories as you like and still get the 5% discount! (NOTE: Discount does not apply to sale-priced systems above.)

Components	Separate Prices
Receiver	
Amplifier	
Tuner or Tape Deck	
Speakers	
Changer & Cartridge	
Other Accessories	
Total Price	
Less 5% Discount	
You pay the Heath System Price	

Charge-A-Kit — no money down on any kit — see page 54 for details.

This Heathkit Wireless Security System gives

Heathkit FM Wireless Security System — priceless peace of mind at a price you can afford

Protect your family and home — even your business — from thieves, fire, vandals — almost any kind of emergency. Our GD-1158 Security System provides the kind of protection and peace of mind you expect from expensive commercial systems — but at a fraction of their cost.

The GD-1158 System is wireless — just plug the modules into any AC outlet, no other connecting wires necessary. All signals are frequency modulated (FM) to prevent false triggering caused by power line noise. And "wireless" design means your system can easily be moved to a new home or expanded to meet your changing needs.

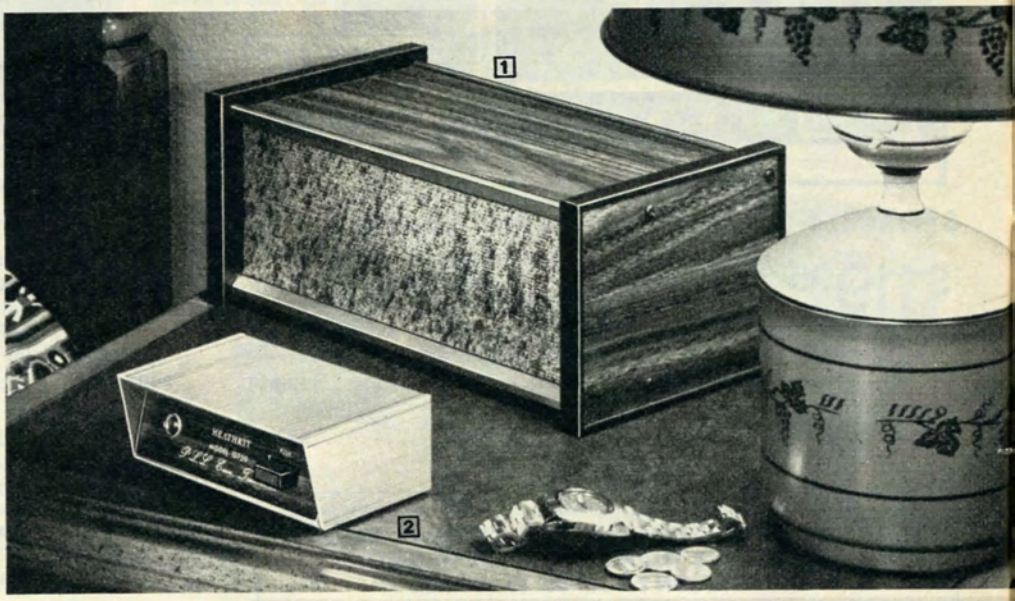
The "heart" of the GD-1158 System is the Central Processor which sounds the alarm whenever it receives a signal from one of the remote modules. This "modular" design provides exactly the protection you need, when you need it—an Ultrasonic Detector protects large areas from intrusion; an Auxiliary Transmitter handles optional heat and smoke detectors as well as contact and pressure switches, and the Emergency Transmitter is a "panic button" so you can sound the alarm. For added convenience and security, only the On/Off Transmitter can disable the Central Processor and turn the system off.

Don't leave your family unprotected. The GD-1158 Security System can prevent an emergency from becoming a tragedy.

1 Central Processor Module

The Central Processor responds to signals from any of the optional modules. To protect against intruders, it sounds the alarm if it receives a signal from an ultrasonic detector or auxiliary transmitter module. As an emergency alarm, it monitors optional heat and fire detectors and can also be triggered by the optional "panic button." And the Central Processor is protected from tampering by a circuit that sounds the alarm if AC power is lost. The Central Processor is designed for your convenience as well as security. A time delay lets you enter or leave the protected area without triggering the alarm. The Central Processor also automatically resets itself within two minutes after the cause of the alarm has been removed. Includes built-in siren and outputs for an external speaker (such as GDA-1158-7) and our new GD-1156 telephone dialer. Batteries included.

Kit GDA-1158-1, Shpg. wt. 8 lbs. **159.95**



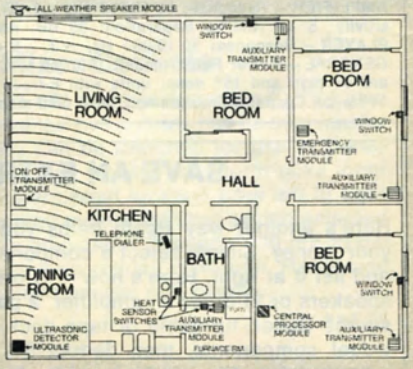
GDA-1158-1 SPECIFICATIONS

Power requirement: 115 VAC, 60 Hz. **Carrier frequencies:** emergency, 40 kHz. intrusion, 56 kHz. **Range:** any point on same power distribution transformer secondary. **Exit time:** 2 minutes. **Entry time:** 20 seconds. **Emergency activation time:** 2 seconds. **Disable time:** 1.5 sec. **Outputs:** external speaker; relay contacts; telephone dialer. **Sound source:** switchable internal speaker; or optional external speaker (12 watts into 8 ohms). **Sound level at 10 ft.:** internal speaker, +88 dB. **Dimensions:** 4½″ H x 10⅞″ W x 6″ D.

2 Emergency Transmitter Module

No security system is complete without a dependable "panic button." So to provide that extra peace-of-mind and security, we've included this Emergency Transmitter Module in the design of the Heathkit Home Security System. The GDA-1158-4 sounds the alarm instantly, at the touch of a button. In any emergency situation, all you have to do is push the button and the unit transmits a signal to the Central Processor for an alarm. Put one in the bedroom, kitchen, den — anyplace where needed. Then just plug it into the nearest AC outlet. It's one of the extras that we feel makes the big difference between an "adequate" security system and one that gives you the added margin of protection your family deserves. 1¾″ H x 5″ W x 3¾″ D.

Kit GDA-1158-4, Shpg. wt. 2 lbs. **29.95**



Typical installation for complete home security

Our Heathkit Security System is designed for maximum versatility in your home. You can locate modules wherever you need them... even move them from room to room, to create a total home protection system. Use it to protect your business, too.

The unique modular design of the Heathkit Security System means you can start with a modest investment, then add components to fit your requirements... and your budget.

Charge-A-Kit — no money down on any kit — see page 54 for details.

your home and family the protection they deserve

NOTE: Since the GDA-1158-2 Ultrasonic Alarm operates in the same frequency range as Ultrasonic TV Remote Controls, interference between the two is possible.

[3] On/Off Transmitter Module

The **only** way in which the intrusion part of your security system can be deactivated. Just plug the unit into an AC outlet in any convenient location, then push the button in to disable the intrusion circuits of the Central Processor. To turn the Central Processor back on again, just release the button, or unplug the transmitter. 1¾" H x 5" W x 3¾" D.

Kit GDA-1158-3, Shpg. wt. 2 lbs. **29.95**

[4] Ultrasonic Detector Module

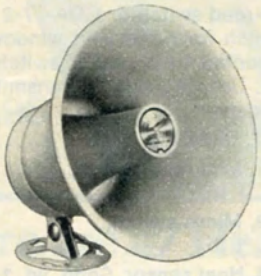
You can place any number of these ultrasonic detectors within your customized security system. Each unit plugs directly into an AC outlet and monitors an area of up to 300 sq. ft. The range of each unit is up to 20 feet. The detectors use harmless, inaudible high frequency sound waves to detect movement within the protected area. If an intruder enters the area, the detector will transmit a signal to the Central Processor which sounds the alarm. 10⅝" H x 3¼" W x 3¼" D.

Kit GDA-1158-2, Shpg. wt. 3 lbs. **74.95**

[5] Auxiliary Transmitter Module

Lets you add door and window switches, mat pressure switches and any other sensors to the system. Switches must be either all normally open (N.O.) or all normal closed (N.C.) types. The transmitter then relays signals from the connected devices to the Central Processor. Plugs into any convenient AC outlet. 3¼"H x 7¼"W x 3¼"D.

Kit GDA-1158-6, Shpg. wt. 2 lbs. **39.95**



Outdoor Speaker

Provides more than enough volume to be heard throughout your neighborhood...loud enough to frighten any would-be intruders and summon help. The speaker's all-weather design lets you mount it indoors or out. All necessary mounting hardware is included. Connects to the Central Processor.

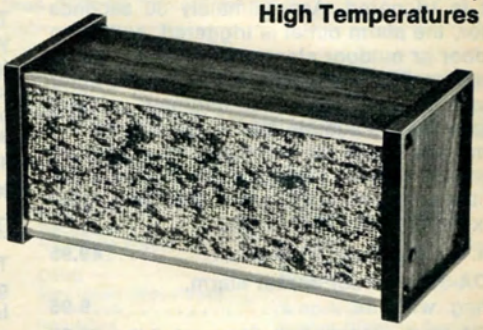
GDA-1158-7, Shpg. wt. 3 lbs. . . . **19.95**

Early Warning Smoke/ Fire Detector

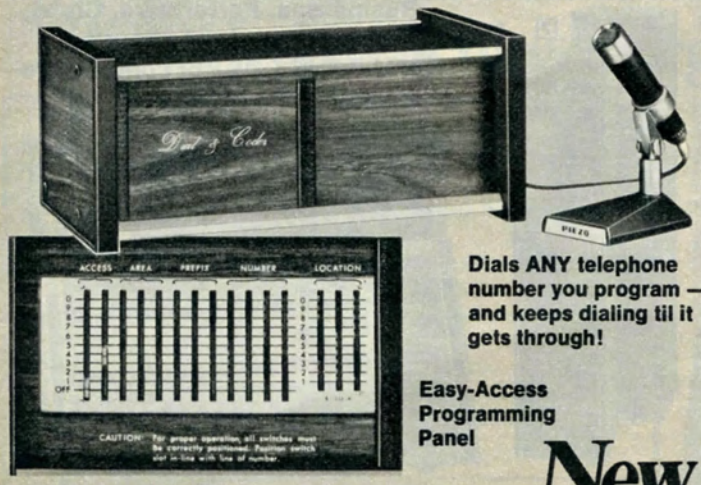
An important security device you can use as a vital link in your complete Heathkit FM Security System, or by itself with its built-in speaker. Has a sensitive solid-state sensor that detects gases generated in the early stages of combustion and sounds the alarm *before* the point of flames or intense heat has been reached. A built-in thermal switch also activates the alarm when the temperature exceeds 133°F (56°C). Simply install the unit in the area to be protected and plug into any AC outlet. When used with the complete security system, the alarm is transmitted to the central processor; when used alone, the alarm sounds through the built-in speaker. Has sensitivity control to prevent false triggering, pilot light, automatic reset in case of power failure. 3¼"H x 7¼"W x 3¼"D.

Kit GDA-1158-5, Shpg. wt. 3 lbs. **74.95**

Detects Smoke, Combustible Gases, High Temperatures



Use alone, or as part of the complete Heathkit wireless security system.



Dials ANY telephone number you program — and keeps dialing til it gets through!

Easy-Access Programming Panel

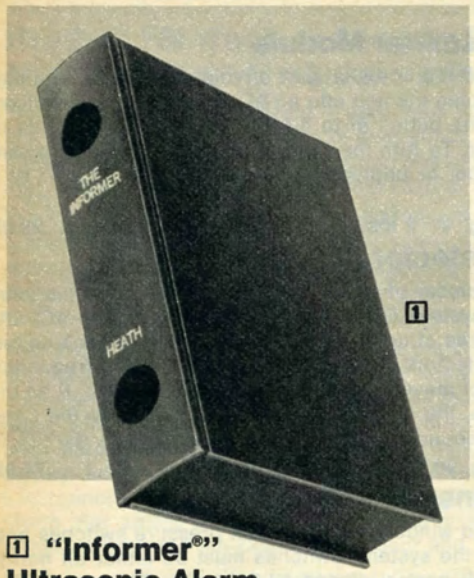
New

NEW Automatic Telephone Dialer and Coder "Calls out" in case of emergencies

The GD-1156 gives you that extra measure of security that means total protection! Whenever an alarm sounds, the Heath GD-1156 automatically dials the number you have programmed — police, fire, relatives, etc. A simple switch closure triggers the GD-1156, so it can be used with intrusion alarms, pressure switches, panic buttons, the Heath Complete Security System or others. Also can be triggered manually. It's the security device you NEED for cottages, small businesses, isolated plant areas, any place that needs protection but may be unoccupied. The GD-1156 can dial up to 12 digits: enough for access, area code and number, anywhere in the world! Features include: automatic re-dial if number is busy, a 3-digit location code that sends help rushing to the right location, a microphone to let you hear what's going on at the dialer. Solid-state for complete reliability; battery-powered so it operates even when AC power fails. Easy installation, includes telephone plug for external coupler; adapter for plug-in phones, and microphone. The GD-1156 can also be used as a convenient automatic dialer in non-emergency situations. 4¾" H x 11" W x 6" D. Batteries included. Check local phone company for installation requirements, if any.

Kit GD-1156, Shpg. wt. 6 lbs. **189.95**

Heath Security-protection that works full time



1

Use all three together for a truly effective, economy home protection system

3 Smoke Detector

2 Alarm

4 Utility Transmitter

1 "Informer®" Ultrasonic Alarm

The Heathkit Informer sits quietly on bookshelf or table until something or someone invades its field of surveillance. Then "The Informer" can activate indoor buzzer alarms, outdoor bells, table or floor lamps. Any movement that interferes with transmitted signal in the room (up to 25 feet away) is perceived by the receiver, and the lamp outlet is triggered. Approximately 30 seconds later, the alarm outlet is triggered, activating indoor or outdoor alarms. Built-in time delay between light and alarm allows you to enter room and deactivate the "Informer" without triggering the audible alarm. You can set the lamp and alarm for automatic reset after 25 seconds or have audible alarm continue until the unit is manually reset. 2⅜" W x 10⅛" H x 7½" D. For 120/240 VAC.

Kit GD-39, Shpg. wt. 5 lbs. **49.95**

GDA-39-1, indoor buzzer alarm, Shpg. wt. 1 lb. **9.95**

GDA-39-2, outdoor bell, Shpg. wt. 6 lbs. **26.95**

NOTE: As the GD-39 Ultrasonic Alarm operates in the same frequency range as Ultrasonic TV Remote Controls, interference between the two is possible.

Heathkit Wireless Security Devices — Simply plug each unit into existing AC outlets — minimum installation!

This complete home protection system is in "modular" form, so you can buy just what you need now, and expand whenever you wish. Simply wire reed or heat switches to transmitters, plug transmitters into wall outlets. Your house wiring carries the signal to the alarm, which can be placed anywhere.

2 Receiver Alarm

For use with the Heathkit Fire Detector/Transmitter and Utility Transmitter to alert your family to intrusion, fire, freezing, power failure, etc. Emits piercing tone to raise the soundest sleeper. Has continuously charged nickel-cadmium battery to trigger Receiver Alarm in case of power failure. Just plug into 110 VAC outlet to receive signals.

Kit GD-77, Shpg. wt. 3 lbs. **56.95**

3 Smoke/Fire Detector

The Heathkit fire detector/transmitter triggers the Receiver Alarm upon detecting very low density smoke or 133°F. heat. Photocell smoke detector. Adjustable sensitivity. Remote heat sensors can be added. Uses AC line to transmit signal to GD-77 receiver.

Kit GD-87A, Shpg. wt. 4 lbs. **56.95**

4 Utility Transmitter

The Heathkit Utility transmitter accepts any switch or sensor that produces a closed circuit, such as Heathkit GDA-97-1 miniature magnetic-reed switch or GDA-97-2 miniature micro switch for doors and windows, or the easily-mounted heat sensor switch GDA-97-4 (135°F). Uses AC line to transmit signal to GD-77 receiver.

Kit GD-97, Shpg. wt. 3 lbs. **42.95**

GDA-97-1, Mini reed switch, Shpg. wt. 1 lb. **2.75**

GDA-97-2, Micro switch, Shpg. wt. 1 lb. **3.00**

GDA-97-4, Heat sensor, Shpg. wt. 1 lb. . .**3.50**

Helpful Security Information

Building & Installing Electronic Intrusion Alarms — covers construction, installation & maintenance of all types of alarms & sensors for home & auto. **EDP-135** **4.50**

Installing & Servicing Electronic Protective Systems. Covers virtually every electronic fire & theft security system. **EDP-136** . . .**5.95**

See page 52 for book ordering information.

Professional-quality PA Equipment

$699.95 If purchased separately, $739.85 **SAVE $39.90**

Control Amplifier and Two Column Speakers.
TAS-1620, Shpg. wt. 277 lbs. Motor Freight **699.95**

5 PA Control Amplifier. Delivers 100 watts continuous power to two column speakers, has six fully mixable low-impedance inputs; each with bass, treble, reverb-on-off and attenuation controls; complete filtering system for good sound. Add as many booster amps and speakers as you need for any audience coverage — even add more control amps for additional inputs. Rugged case, 21½" W x 11¼" H x 7" D. For 120/240 VAC, 60/50 Hz.

Kit TA-1620, Shpg. wt. 53 lbs. **399.95**

6 Low-Distortion Booster Amplifier. Use with the TA-1620 for even more power. Delivers 100 watts continuous to two column speakers. Matched in style and stackable with the TA-1620.

Kit TA-1625, Shpg. wt. 22 lbs. **159.95**

7 PA Speaker Column. Has six 8" full-range speakers response tailored for clean voice reproduction; an output jack for TA-1625 booster amp, or to connect two columns in parallel. With 50' cable, storage compartment. 14" W x 62" H x 10¼" D.

Kit TS-1630, Shpg. wt. 112 lbs. Motor Freight .....each **169.95**

Ideal for Schools, Churches, Businesses, Performers, Clubs, Outdoors — priced about HALF THE COST of comparable assembled models!

7

6

5

Charge-A-Kit — no money down on any kit — see page 54 for details.

Here's easier circuit design from Heath

This Laboratory Breadboard makes circuit development simpler and faster...for experimenters, students & design engineers

Here's everything you could want for basic solid-state circuit design and development...in one neat package. The Heathkit ET-3300 is a laboratory breadboard with solderless sockets and built-in power supplies...and that means convenient, easy circuit hook-up and fast teardown.

The ET-3300 can be as versatile as you like. It's an excellent aid for hobbyists and technicians in laboratory experiments; or the "3300" can be used by designers for building up a prototype of a new circuit design. And many of your troubleshooting efforts will be made easier because the ET-3300 is great for testing electronic components and circuits, even can be used as a power supply!

Unique features include three dual ground and power buss trips and four breadboarding sockets, each with forty-eight dual rows of common connection points. Holds up to twenty-four 14-pin IC's! The "3300" accommodates both discrete components and integrated circuits...and its solderless connectors accept up to #20 solid wire. For maximum versatility and ease in circuit design and development, get your ET-3300 today.

Kit ET-3300, Shpg. wt. 6 lbs. **79.95**

ET-3300 SPECIFICATIONS

OUTPUTS: +5 VDC @ 1.5 amps; +12 VDC @ 100 mA; −12 VDC @ 100 mA. **REGULATION: Load:** Less than 2% variation from no load to full load on all supplies. **CURRENT LIMITING:** Fixed current imiting of each supply at rated current provides short-circuit protection. **POWER REQUIREMENT:** 120/240 VAC 60/50 Hz 30 watts at full load. **SIZE:** 3½″ H x 12″ W x 12″ D.

$79.95

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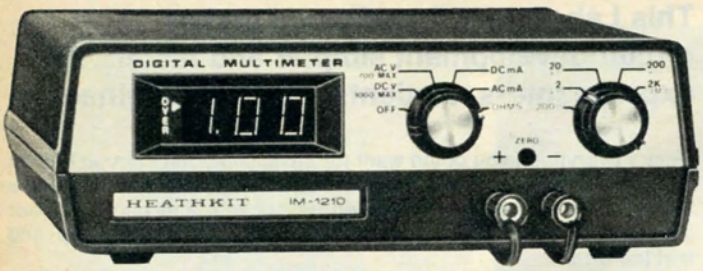
New Heathkit DMM's—Easy to read and Accurate!



Our lowest cost bench Digital Multimeter

Here's a low-cost, high performance DMM that hams, hobbyists and service techs have been waiting for. Its full-function capability even includes AC voltage measurements up to 700 volts. Has four overlapping AC & DC voltage & current ranges and five resistance ranges. And it's hard to find better accuracy at a price this low: 1% on DC volts, 1½% on AC volts and AC/DC current, and 1½% on resistance. Lighted front-panel indicators show overrange, + and — DC voltages and current at a glance.

A solid-state design uses IC circuitry for a clear non-blanking 2½-digit display with automatic decimal positioning. It's ease of operation makes it a pleasure to use for both beginners and advanced technicians. The easy assembly makes it a great project for student electronics labs. And the exclusive Heath built-in calibration standards are all that's needed for initial and periodic adjustments.

Features overload protection on all ranges, 120 or 240 VAC operation, isolated floating ground, attractive heavy-duty case to withstand rugged use, universal banana jack inputs for easy testing of all types of electronic equipment.

Kit IM-1210, Shpg. wt. 6 lbs. **67.95**

IM-1212 SPECIFICATIONS: Functions: DC volts, DC current, AC volts, AC current, Ohms. **Ranges (Full-Scale):** DC volts: 0-2, 20, 200, 1,000 V; DC current: 0-2, 20, 200, 2,000 mA; AC volts: 0-2, 20, 200, 700 V rms (50 Hz to 10 kHz). AC current: 0-2, 20, 200, 2,000 mA rms (50 Hz to 10 kHz). Ohms: 0-200, 2K, 20K, 200K, 2M ohms. **Overrange:** 25% on all functions, within maximum input limits. **Maximum Input:** 3 amperes into AC or DC mA, and Ohms (fuse protected). 700 VAC rms into Volts (except 2V range: 250 VAC rms). 1000 VDC into Volts (except 2V range; 350 VDC). "—" input may be floated 1000 VDC (700 VAC) above earth ground. **Resolution (Low Range):** Volts: 10 mV. Current: 10 μA. Ohms: 1 ohm. **Display:** 2½-digit, 7-segment, planar, LED (light emitting diode) with overrange and negative-input indicators. **Accuracy (Full Scale, ±1 Digit):** DC volts: ±1%. DC current: ±1.5%. AC volts: ±1.5%. AC current. ±2%. Ohms: ±1.5%. **Input Impedance:** 1 megohm on all voltage ranges. 2.1-volt drop maximum on current ranges (except 2.5-volt drop on 2,000 mA range). **Sample Rate:** Line frequency. **Display Settling Time:** Less than 1.0 seconds on DC volts and DC current, and less than 3.0 seconds on AC volts, AC current, and ohms; to within 5 counts. **Power Requirements:** 100-135 VAC, 200-270 VAC 50/60 Hz, 8 watts. **Fuse Requirements:** Input: 3AG, 3-ampere. Line: 3AG, ¼-ampere slow-blow. (⅛-ampere slow-blow for 240 VAC.) **Dimensions (overall):** 3.00″ H x 8.69″ W x 10.54″ D. (7.62 cm high, 22.07 cm wide, 26.77 cm deep.) **Weight:** 3.3 pounds (1.5 kg).

NOTE: The Multimeter requires a warmup time of 30 minutes to meet specifications.

Portable lab-grade Digital Multimeter

26 ranges — measures AC and DC volts, DC current and resistance. True professional performance at a low-kit form price!

Kit IM-2202, Shpg. wt. 7 lbs. **179.95**

IM-2202 SPECIFICATIONS: DC VOLTAGE — Range/Input Impedance: 100.0 mV/50 MΩ, 1,000 V/500 MΩ, 10.00 V/10 MΩ, 100.0 V/10 MΩ, 1000 V/10 MΩ. Overload Capability: 300 V on 100 mV & 1 V ranges; 1000 V on 10 V & 1000 V ranges. **Accuracy:** Built-in references, ±0.5%, ±1 digit. Laboratory standards, ±0.2%, ±1 digit. **AC VOLTAGE — Range/Input Impedance:** 100.0 mV/10 MΩ-120 pF, 1.000 V/10 MΩ-120 pF, 10.00 V/10 MΩ-60 pF, 100.0 V/10 MΩ-60 pF, 750 V/10 MΩ-60 pF. **Overload Capability:** 250 V on 100 mV & 1 V ranges; 750 V on 10 V, 100 V & 750 V ranges. **Accuracy:** Built-in references...±1.0%, ±3 digits; 40 Hz to 1 kHz (except 40 Hz to 10 kHz on 100 m and ranges). Laboratory standards...±0.5%, ±3 digits; 40 Hz to 2 kHz on 750 range). **DC CURRENT — Range/Voltage Drop:** 100.0 μA/100 mV, 1.000 mA/100 mV, 10.00 mA/100 mA/150 mV, 1000 mA/300 mV. **Accuracy:** Built-in references...±.5%, ±1 digit (except ±1%, ±1 digit on 1000 mA range). Laboratory standards...±.2% ±1 digit (except ±.5%, ±1 digit on 1000 mA range). **Overload Protection:** Input coupled through 3.0 Ampere fuse to shunt diodes for overloads above approximate 1.2 Volts. **AC CURRENT — Range/Voltage Drop:** 100 μA/100 mV, 1.000 mA/100 mV, 10.00 mA/100 mV, 100.0 mA/150 mV, 1000 mA/300 mV. **Accuracy:** Built-in references...±1.0%, ±3 digits (except ±1.5%, ±3 digits on 1000 mA range); 40 Hz to 10 kHz. Laboratory references...±.5%, ±3 digits (except ±1.0%, ±3 digits on 1000 mA range); 40 Hz to 10 kHz. **Overload Protection:** Input coupled through 3.0 Ampere fuse to shunt diodes for overloads above approximate 1.2 Volts. **RESISTANCE — Range/Test Current:** 100.0 Ω/1.0 mA, 1.000 kΩ/1.0 mA, 10.00 kΩ/0.1 mA, 100.0 kΩ/1.0 μA, 1000 kΩ/10. μA. **Accuracy:** Built-in references... ±2%. ±1 digit. **Open-circuit Voltage:** 12 VDC. **Overload Protection:** Positive input over-voltage protection by blocking diode to 400 volts; negative input over-voltage through 0.03 A fuse and shunt diode. **GENERAL — Overrange Capability:** 100% on all ranges except 1000 VDC & 750 VAC. **Display:** 1999 maximum; seven segment planar; 0.55″ high digits. **Display Rate:** Approximately 5 per second, non-blinking. **Normal Mode Rejection:** 35 dB (line operation); extended on battery operation. **Common Mode Rejection:** 80 dB (line operation); extended on battery operation. **Power Line Isolation:** May be operated 1500 V above power line ground (during line operation). **Operating Temperature Range:** 10°C to 40°C. **Power Requirement:** 110 to 130 VAC, or 220 to 260 VAC (internal selectable); 60/50 Hz; 5 watts typical during charge. **Size (overall including handle folded to rear):** 3″ H x 8¼″ W x 8″ D).

NOTE: Accuracy specifications of the IM-2202 depend on use of built-in references or laboratory standard references for calibration.

3½-Digit Multimeter

26 ranges — AC, DC volts, DC current, and resistance. Has automatic polarity indication and decimal positioning and overrange indication, lots more! One of the finest DMM's you can buy!

Kit IM-102, Shpg. wt. 9 lbs. **249.95**

Our finest 3½-digit Multimeter has the features you NEED for fast, easy and profitable service

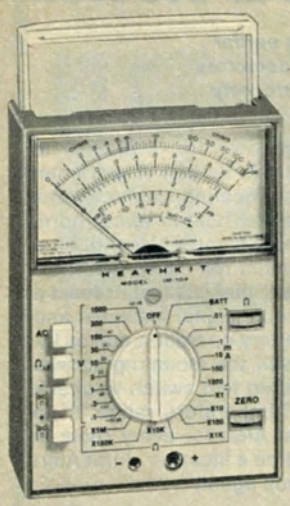
IM-102 SPECIFICATIONS: DC VOLTMETER — 5 Ranges: 200 mV, 2V, 20V, 200V, 1000V. **Input Impedance:** Approx. 100 megohm on 200 mV, approx. 1000 megohm on 2 V, 10 megohm on all other ranges. **Accuracy:** ±.2% ±1 digit with furnished DC calibrator, ±0.1% ±1 digit with lab calibration. **Normal Mode Rejection:** 35 dB minimum @ 60 Hz. **Common Mode Rejection:** 80 dB minimum with 1k unbalance @ 60 Hz. **OHMMETER — 6 Ranges:** 200 ohms with 1 mA test current, 2k with 100μA, 20k with 10μA, 200k with 10μA, 2M with 1μ, 20M with 100 nA. **Accuracy:** With DC calibrator, ±0.5% ±1 digit on 200, 2k, 20k, 200k ranges; ±1.5% ±1 digit on 2M and 20M ranges. With lab calibration, ±0.5% ±1 digit on 200 ohm range; ±0.25% ±1 digit on 2k, 20k, 200k; ±1% ±1 digit on 2M and 20M. **AC VOLTMETER** (Average responding, rms calibrated) — **5 Ranges:** 20 mV, 2V, 20V, 200V, 1000V. **Input Impedance:** 1 megohm @ 150 pF. **Accuracy:** With DC calibrator, ±0.75% ±1 digit for 40Hz-10kHz, ±1% ±1 digit for 10kHz-20kHz on 200 mV and 2V ranges: ±0.75% ±1 digit for 40Hz-5kHz, ±1.5% ±1 digit for 5kHz-10kHz on 20V and 200V ranges: ±1.5% ±1 digit for 40Hz-7.5kHz on 1000V range. **DC AMMETER — 5 Ranges:** 200μA, 2mA, 20mA, 200mA, 2A. **Voltage Drop:** 0.2V (nominal). **Accuracy:** With DC calibrator, ±0.5% ±1 digit for 2A, ±3% ±1 digit on all other ranges. With lab calibration, ±0.25% ±1 digit for 2mA and 20mA; ±0.3% ±1 digit for 200mA; ±0.5% ±1 digit for 2A. **AC AMMETER** (40Hz-10kHz) — **5 Ranges:** 200μA, 2mA, 20mA, 200mA, 2A. **Voltage Drop:** 0.2 V (nominal). **Accuracy:** With DC calibrator, ±1.5% ±1 digit on 2A, ±1% on all other ranges. With lab calibration, ±0.75% ±1 digit on 200μA, ±0.7% ±1 digit on 2mA and 20mA; ±0.8% %1 digit on 200mA; ±1 digit on 2A. **GENERAL — Display:** Maximum count, 1999. **Overrange Indication:** Automatic beyond 1999. **Polarity Indication:** Automatic "+" or "—". **Display Rate:** Approx. 5 per second, non-blinking. **Power Requirement:** 120 or 240 VAC, 60/50 Hz, 8 W nominal. **Power Line Isolation:** May be operated 500 volts above power line ground (during line operation). **Operating Temperature:** 10°C-40°C. **Size:** 3″ H x 7″ W x 7.9″ D.

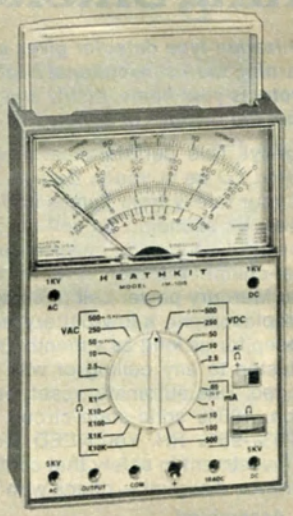
NOTE: Accuracy specifications of the IM-102 depend on use of built-in references or laboratory standard references for calibration.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Build a Better Value Heathkit VOM

Heath Test Instruments have won the confidence of thousands the world over. No matter what your electronic testing need, there's a Heath Instrument that will do it for you, and do it better.





The IM-17 voltmeter is perfect for fast, easy electrical measurements around the house and in your car. You'll find hundreds of everyday uses for it!

[1] **$84.95 KIT**

[2] **$69.95 KIT**

[3] **$32.95**

[1] Our best portable meter with FET, taut band, ten megohm input

A portable lab-grade FET VOM combining accuracy, versatility, convenience and ruggedness — in an easy-to-build dollar-saving kit! Our IM-104 has low-drift 1% precision metal film and wirewound resistors for exceptional stability. Nine DCV & ACV ranges measure from .01V to 1000V. Six current ranges cover 0.001 mA to 1000mA, DC & AC. Seven resistance ranges from 1 ohm to 100 megohms, conventional or low voltage modes. Decibel ranges from −40 dB to +62 dB. DC null scale with better than 1 mV resolution. The 4½" ruggedized, taut-band meter is diode protected, built to take plenty of abuse. Built-in circuitry shows battery condition at the flip of the range selector. Three evenings put this great portable VOM on your bench.

Kit IM-104, Shpg. wt. 4 lbs. **84.95**

Assembled SM-666, has additional 1μA current range, less 100 & 1000 mA ranges, Shpg. wt. 4 lbs. **149.00**

IM-104 SPECIFICATIONS

DC VOLTMETER — 9 ranges: 0.1, 0.3, 1, 3, 10, 30, 100, 300, 1000V. **Input resistance:** 10 megohm. **Accuracy:** ±2% of full scale (meter in horizontal position). **AC rejection:** Accuracy not affected by impressed 60 Hz sine wave with rms value 2x greater than full-scale value. **Null indicator:** On 0.1, 1, 10, 100, 1000V, meter zero level may be adjusted to center of null referenced scale. Null variations of approx. 1% of full-scale can be resolved. **AC VOLTMETER — 9 ranges:** 0-0.1, 0.3, 1, 3, 10, 30, 100, 300, 1000V. **Range factor:** 1 to 3.162 (10 dB) per step. **Input resistance:** 10 megohm. **Input capacity:** 100 pF typical. **Accuracy:** ±3% of full scale (meter in horizontal position; 60 Hz sine wave). **Response:** Average value of ½ sine wave. Scale calibrated to indicate rms. **Frequency response:** 20 Hz to 20 kHz ±3%, 20 Hz to 50 kHz ±5% on 0.1 to 30 V, 20 Hz to 10 kHz ±3%, 20 Hz to 20 kHz ±5% on 100 and 300 V. 20 Hz to 1.0 kHz ±3%, 20 Hz to 2.5 kHz ±5% on 1000 V. **DC MILLIAMMETER — 6 ranges:** 0-0.01, .1, 1, 10, 100, 1000V mA. **Voltage drop (approx. full scale):** 0.100 V on 0.01 to 10, 0.150V on 100, 0.350 V on 1000. **Insertion resistance:** Voltage drop divided by full-scale current. **Accuracy:** ±2% on 0.01 to 100, ±3% on 1000. (Meter in horizontal position.) **AC MILLIAMMETER — 6 ranges:** 0-0.01, 0.1, 1, 10, 100, 1000 mA. **Voltage drop (approx. of full scale):** 0.100 V on 0.01 to 1, 0.150 V on 100, 0.350 on 1000 V. **Insertion resistance:** Voltage drop divided by full scale. **Accuracy:** ±3° on 0.01 to 100, ±4% on 1000. (Meter in horizontal position; 60 Hz sine waves.) **Response:** Average value of ½ of sine wave (DC current must be negligible). Scale calibrated to include rms. **Frequency response:** 20 Hz to 5 kHz ±3% on 0.01, 20 Hz to 20 kHz ±3% on 0.1, 20 Hz to 50 kHz ±3% on 1 to 1000. **OHMMETER — 7 ranges:** Rx1 (10 ohm center scale), Rx10, Rx100, Rx1k, Rx10k, Rx100k, Rx1M. **Accuracy:** ±3% on x10 to 1M. **Test voltage (nominal):** 1.55V on +DC/ohm and −DC/ohm, 0.085 V on ohm. **DB RANGE — 9 ranges (0 dB = mV into 600 ohm):** −40 to −18, −30 to −8, −20 to +2, −10 to +12, 0 +22, +10 to +32, +20 to +42, +30 to +52, +40 to +62. **Accuracy:** ±3 dB @ −20 dB to ±0.3 dB @ +28. **Meter protection:** will sustain momentary overload of 220 VAC or DC on any range, diode and 2A fuse protected on ohms x1 and 0.01 to 100 mA, FET protected on 0.1 to 100 V and ohms x10k to ohms x1M. Internal circuitry protected against improper battery installation. Diode protected meter. **Amplified circuit:** Dual FET source followers driving operational amp. **Operating temperature:** 0 to 50°C. **Storage temperature (less batteries):** −40 to +80°C. **Batteries (not supplied):** 1 1.5 V D-cell (NEDA #13). 4 1.5 V AA-cell (NEDA #15). **Dimensions:** 6.95" H x 4.95" W x 2.25" D.

[2] Heathkit taut-band general-purpose VOM

It's an easy, enjoyable one-evening kit — build-up two modular circuit boards and you have it. This highly versatile IM-105 gives you a low-friction, taut-band meter with diode & fuse protected movement. Fuse in-line with the input connector is removable from front for extra convenience. Other professional features include calibrating controls, DC polarity switch, self-storing handle.

Kit IM-105, Shpg. wt. 3 lbs. **69.95**

Assembled SM-660, (less 5 KV ranges), Shpg. wt. 4 lbs. **85.00**

IM-105 SPECIFICATIONS

DC VOLTAGE RANGES: −0.25, 2.5, 10, 50, 250, 500, 1000 & 5000 V full scale. **Accuracy:** ±3% of full scale. **Input resistance:** 20,000 ohms/V full scale. **AC VOLTAGE RANGES:** −2.5, 10, 50, 250, 500 V, 1 kV & 5 kV full scale. **Accuracy:** ±4% of full scale. **Input resistance:** 5000 ohms/V. **Input capacity:** Less than 20 pF. **Frequency response:** 2.5, 10, and 50 V ranges: ±5%, 10 Hz to 100 kHz; 250, 500 V ranges: ±5%, 10 Hz. **DC CURRENT RANGES:** −0.05, 1.0, 10, 100, 500 mA & 10 A full scale. **Accuracy:** ±3% of full scale. **Voltage drop:** Approximately 0.25 V at full scale. **RESISTANCE RANGES:** −x1 (20 center scale), x10, x100, x1k, x10k. **Accuracy:** ±3 degrees of arc. **Source voltage:** x1 through x1k ranges: 1.5 V x 10k range: 15 V. **DECIBEL RANGES:** (0 dB = 1 mW in 600 ohms): −10 to +56 dB. **GENERAL — Operating temperature range:** 0-55° C. **Batteries (not supplied):** One 1.5V "D" cell (NEDA #13). One 15V (NEDA #208). **Dimensions:** 7" H x 5" W x 2¼" D.

[3] Heathkit IM-17 — everybody's VOM

The perfect buy for homeowners, hams, servicemen, hobbyists, modelers, everyone. This battery-powered voltmeter has hundreds of uses around the house — use to check appliance operation, house wiring, even automobile electrical circuits. It's rugged, portable case with storage compartment for prober makes it ideal for fast, in-the-field checks too. All solid-state circuit with FET input for less circuit loading, provides better accuracy than ordinary VOM's. Has zero and ohms-adjust controls, DC polarity switch, three test leads, jack for accessory probe. Easy 3-5 hour assembly makes it an ideal beginner's kit. Less batteries. NOTE: The IM-17 is recommended for use with the Heathkit Continuing Education Series — See pages 93-95.

Kit IM-17, Shpg. wt. 4 lbs. **32.95**

IM-17 SPECIFICATIONS

DC VOLTMETER — Four ranges: 0-1, 10, 100, 1000 V full scales. **Input resistance:** 11 meg. on all ranges. **Accuracy:** ±3% of full scale. **AC VOLTMETER — Four ranges:** 0-1, 10, 100, 1000V full scale. **Input resistance:** 1 meg. on all ranges. **Accuracy:** ±5% of full scale. **Frequency response:** ±1 dB, 10 Hz to 1 MHz. **OHMMETER — Four ranges:** RX1, RX100, RX10k, RX1M. **Input resistance:** 1 meg. on all ranges. **Meter:** 4½", 200-μA, 100-degree movement. **Transistor-Diode Complement:** 1 FET, 4 silicon transistors, 1 silicon diode. **Batteries (not supplied):** One 1.5 V "C" cell (NEDA #14); one 8.4 V mercury cell (NEDA #1611). **Dimensions:** 5⅜" H x 9⅜" W x 9" D.

Heathkit performance specifications are guaranteed.

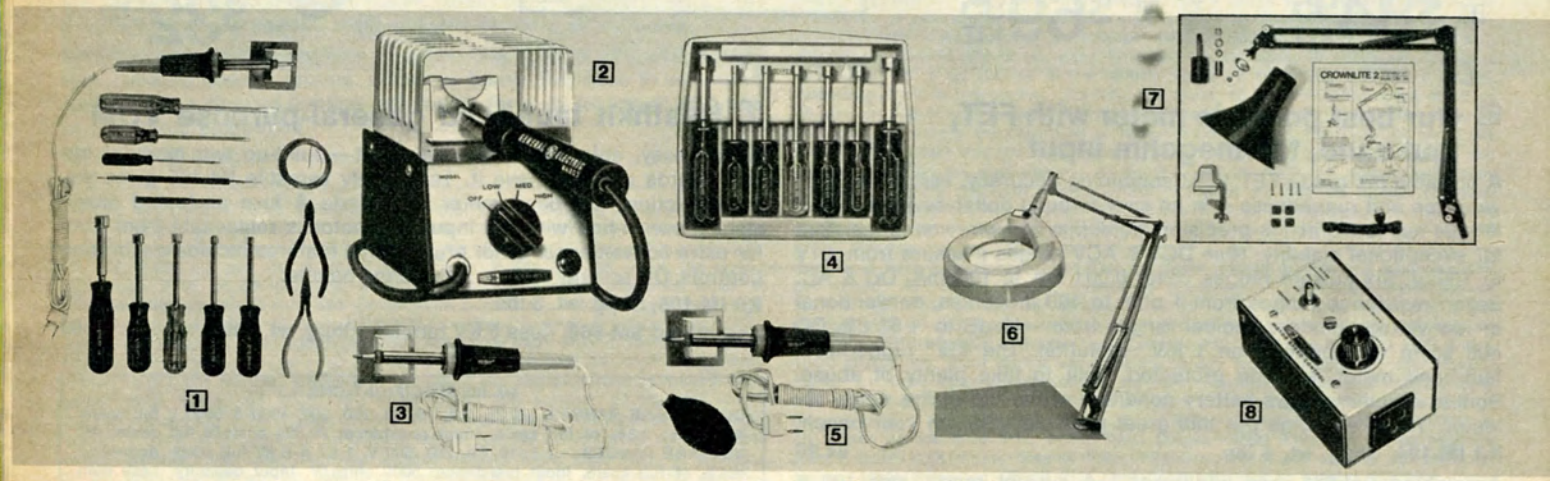
First Alert™ Battery-Operated Early Warning Smoke Detector

$39.95

- ***Ionization-type detector gives an earlier warning than conventional heat detectors***
- ***Protects your home, family and property from the ravages of deadly fire***

Protect yourself from tragedy! This performance-proven detector is already in millions of homes and it *SHOULD* be in yours. Detects fire in its first stage, when there's still time to protect your family from flames and suffocating smoke. Warns you before smoke or flames, by sounding its self-contained built-in alarm horn. This 85 decibel horn is powerful enough to awaken people sleeping soundly behind closed doors. Has dual-chamber detection for maximum reliability. Operates on a 112-volt 1000 mA/hour Mercury power cell (included!) that will last at least a year. If the battery needs replacement, a low-battery trouble signal activates and will sound an intermittent beep for as long as a month. Battery operation makes installation easy too — just fasten to any ceiling or wall with the mounting screws and anchors that are included. Has automatic reset, built-in test switch to check operation before installation. 100% solid-state circuit. Temperature range: 0° to 112° F. Humidity Range: 20%-95% RH. You NEED First Alert for every room in your house, it's a low-cost investment in safety that could be a lifesaver. First Alert may qualify you for an insurance discount — check with you agent.

GD-1414, Shpg. wt. 2 lbs. Assembled **39.95**



Work Savers! Heath-approved tools make kit-building more fun!

Start Right, Stay Right with Heathkit Tools!

1 Kitbuilders' Tool Set

A great way to start you first kit! Includes wire stripper/diagonal side cutter; small long-nose pliers; three screwdrivers (3/32", 1/8", 3/16"); Weller WP-25 soldering iron; five nut drivers (3/16", 1/4", 5/16", 3/8", 1/2"); nut starter; soldering aid; and solder.

Model GH-25, Shpg. wt. 3 lbs. **29.95**

2 3-Heat Soldering Iron Kit

Handy stand with metal cage keeps iron safe and secure. 3 heat ranges for all types of circuit work from delicate IC soldering to heavy chassis connections. Goes together in about an hour, and it's a real treat for first-time kit builders. With six foot power cord. 120 VAC.

Kit GH-17A, Shpg. wt. 4 lbs. **22.95**

3 Heath-approved Weller 25-Watt Pencil Soldering Iron

Lightweight and convenient. 1/8" chisel tip develops 860° heat fast, ready to work in seconds. U.L. and C.S.A. Approved.

Model GDP-207, Shpg. wt. 1 lb. **7.95**

4 Heathkit Nut Driver Set

Seven drivers for most commonly used nut sizes: 3/16", 1/4", 5/16", 3/8", 13/32", 7/16" and 1/2". Plastic handles are color-coded for quick identification.

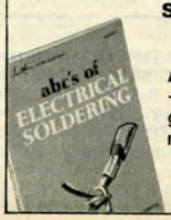
Model GDP-204, Shpg. wt. 2 lbs. **11.95**

5 Heath Solder/de-Solder Set

Weller 25-watt pencil soldering iron that develops 860°. Includes de-solder squeeze bulb with heat and solder-resistant nozzle. A must for serious kitbuilders!

GDP-1009, Shpg. wt. 1 lb. **9.95**

The basic kitbuilding tool is the soldering iron — learn to use it like a pro.



ABCs of Electrical Soldering — a how-to- book for the beginner, a review for the technician. **EDP-178** **3.95**

See page 52 for book-ordering information.

6 Illuminated Magnifier

Fluorescent lighting and 5" diameter 3 diopter lens take the strain out of close work at your bench. Clamps to horizontal surface; 360° movement; 45" reach. Requires 22-watt T-9 Circline Fluorescent tube (not included). Durable gray enamel finish.

Kit GDP-200, Shpg. wt. 7 lbs. **39.95**

7 Make building easier with this Extension Lamp Kit

The extension arm comes already assembled. All you do is attach the socket, shade and cord. Lamp features a 34" reach and 360° sweep; vented shade, and movable base clamp. Incandescent bulb not included.

Kit GDP-202, Shpg. wt. 4 lbs. **16.95**

8 Motor Speed Control

Saves power, blades, bits, saws, etc. You can use a large drill to cut through steel at slow speed without overheating the motor. Ideal for use with any universal motor with nameplate rating of 15 amps or less. (Not for use with Dremel tools).

Kit GD-973A, Shpg. wt. 2 lbs. **19.95**

Charge-A-Kit — no money down on any kit — see page 54 for details.

YOUR PERSONAL ENGRAVED NAME PLATE...A Special Offer For Customers Who Order From This Catalog!

Shown Actual Size

Your personal name plate in jewel-like, silver-satin finish – etched, hand-engraved and adhesive backed. Easily worth $2.95 – yours, with an order from this catalog, for only

$1.50 for one

($1.30 each for 2 or more)

What better way to show your pride in your finished kit? These handsome hand-engraved name-plates feature a virtually indestructible silver-satin, brushed jeweler's finish on durable Metal Graphics™ Aluminum. The self-adhesive backing lets you position the name-plate easily and permanently on any flat surface of your kit. And, at this special low price, you'll want one for every Heathkit product you own. So fill in the order form and send it today. Give your kits that personal touch, and you'll be even prouder you built them! Remember, your name plate order **must** accompany a regular kit order from this catalog.

FILL IN THIS SPECIAL NAME PLATE ORDER FORM COMPLETELY. PRINT YOUR NAME PLAINLY IN CAPITAL LETTERS USING THE MAXIMUM 14 CHARACTERS (INCLUDING SPACES) – BOXES PROVIDED BELOW.

Please ship ___ GDP-1225 Name Plates as shown below at $1.50 each, $1.30 each for two or more (including postage and handling). Name Plates are shipped 1st class mail under separate cover. My total remittance of $ _____ is included with the regular Heathkit order form (p. 53) attached.

FILL IN SHIPPING LABEL BELOW – Please Print

I have entered my name plate order on the regular catalog order form.

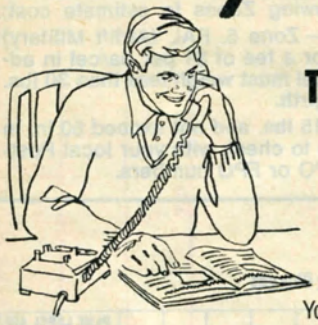
Name

Address

City

State Zip Code

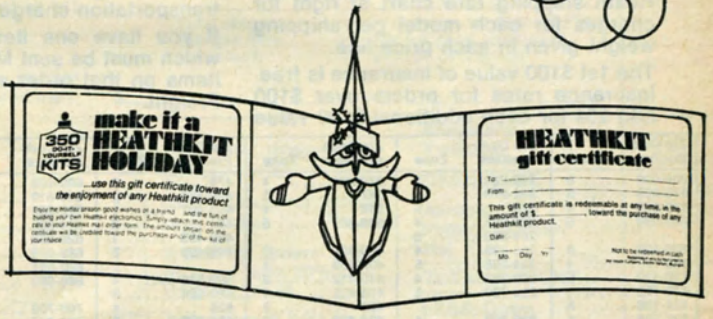
CUT OUT ENTIRE FORM ON DOTTED LINE AND ATTACH TO YOUR KIT ORDER



Take Advantage of Heath's 24 Hour Phone Order HOTLINE: call (616) 982-3411

You can order our kits any time – day or night – with the 24-hour Heathkit hotline. And when we get your order by phone, you can be sure it will be expedited in the fastest manner possible!

THE PERFECT GIFT CHOICE for the Kitbuilder or anyone else! Let them CHOOSE their own gift with a convenient Heathkit gift certificate!



Be the early bird for the holiday rush!

Place your order by Dec. 15th and you'll be sure to get it in time for Christmas. It's the best way to assure yourself of fast, prompt delivery!

If you've any doubts about any of the fabulous gift selections in this catalog – let THEM choose. A Heathkit gift certificate lets them pick the kit they want to own. It's an easy, convenient and thoughtful way to give your friends and relatives exactly what they want!

Here's how to order your Heathkit Equipment

BY PHONE:

Use the Heath "Hotline", Call

(616) 982-3411

SAVE ENERGY

SHOP BY MAIL OR PHONE

BY MAIL:

- **Fill out the order blank completely.** Print your name exactly the same each time you order. When you print an address, please give full details including your Zip Code and phone number.

Heath has a phone order desk open 24 hours a day, 7 days a week. You can call in your order at minimum cost from most areas in the country, and after-hour rates are a bargain.

Replacement Parts Orders: 616-982-3571. Use this number for parts orders, weekdays only, from 8 A.M. to 4:30 P.M., EDT.

Other Important Heath Company Phone Numbers:
International Sales: 616-982-3512
General Office: 616-982-3200

USE THESE NUMBERS FOR TECHNICAL HELP

8 A.M. to 4:30 P.M., EDT, weekdays only

- R/C, Audio and Electronic Organs .....(616) 982-3310
- Amateur Radio .....(616) 982-3296
- Test Equipment, Strobe Lights, Calculators, Clocks, Weather Instruments .....(616) 982-3315
- Television .....(616) 982-3307
- Automotive, Marine, Metal Locators, Appliances, Security, Shortwave and General Products .....(616) 982-3496

Book Ordering Information

There is a $10 minimum order for a BOOK ONLY purchase. No minimum on books purchased with kits. Do not calculate postage on book orders, just add 50¢ for each book to the postage column on the order blank. Do not use the zone chart for book orders.

Discounts on Heathkit Continuing Education Programs

Enjoy a 15% discount on the purchase price of 10 or more of any one item from our Continuing Education product line. For information on quantities greater than 100 of an individual item, contact our Contract Sales Dept., Mr. Richard Shadler, Mgr. (616) 982-3519.

- **Please give full ordering information.** Be sure to give model number, description and price, exactly as shown in the catalog.
- **Total up your order.** Please refer to the chart and calculate shipping charges of each item separately, and total up amount. All items are mailable unless indicated Motor Freight. These items sent transportation charges, collect.
- **Insurance for mailable items:** The 1st $100 value of insurance is free. Insurance rates for orders over $100: add 25¢ for each additional $100 value or fraction thereof.
- **Cash Orders:** Do not send currency or stamps. Send personal check, money order, etc. NOTE: If the charge for merchandise and transportation is less than the amount you send us, we will refund the difference.
- **Heath Revolving Charge Plan:** No money down. Up to two years to pay. Two convenient payment plans. Follow instructions on the reverse side of order blank. Be sure to sign charge agreement.
- **C.O.D.** — For orders of $10 or more only. 20% deposit is required on C.O.D. orders placed by mail. Balance will be collected at time of delivery, and payment must be made in cash, since carriers usually will not accept personal checks. (C.O.D. fees will be added to your order and collected on delivery.)
- **ROUTING YOUR ORDER:** Heath will find the fastest service to your area by surface transportation. If you have a routing preference, please indicate on the order blank. West Coast customers should mention their choice of UPS Blue Label Service over regular UPS.
- **NON-MAILABLE ITEMS:** The Heathkit products shown as Motor Freight are shipped by truck because these exceed weight and/or size limitations for mailing. Examples: Most TV antennas, large TV's, organs, cabinets, speaker systems and garage door mechanisms. Items are shipped with freight charges collect. Motor Freight charges vary, so check with your local carrier before ordering.
- **APO/FPO SHIPMENTS:** We can send Heathkit models that are able to be mailed to servicemen anyplace in the world. For APO and FPO addresses, use the following Zones to estimate cost: West Coast — Zone 8; East Coast — Zone 5. PAL (Airlift Military) carries packages by air transport for a fee of $1 per parcel in addition to regular postage rates. Parcel must weigh less than 30 lbs. and not exceed 60 in. in length and girth.

  SAM: Parcel must weigh less than 15 lbs. and not exceed 60 in. in length and girth combined. Be sure to check with your local Postmaster for exceptions to certain APO or FPO numbers.

HOW TO FIGURE SHIPPING & HANDLING CHARGES

Use the zone chart below and the **first** three numbers of your zip code to determine your zone. Then refer to the Heath shipping rate chart at right for charges for each model per shipping weight given in each price line.

The 1st $100 value of insurance is free. Insurance rates for orders over $100 add 25¢ for each additional $100 value or fraction thereof.

Rate chart is for "mailable" items only. Motor Freight items will be shipped transportation charges collect.

If you have one item on your order which must be sent Motor Freight, ALL items on that order will be sent Motor Freight.

Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone
006-009	8	260-261	3	370-386	4	478	3	600-609	2	823-826	6
010-069	5	262-278	4	387	5	479-489	2	610-619	3	827	5
070-089	4	279	5	388	4	490-491	1	620-623	4	828-832	6
090-099	5	280-283	4	389-397	5	492	2	624-628	3	833	7
		284-285	5			493-495	1	629-668	4	834	6
100-108	5	286-293	4	400-406	3	496-499	3	669-679	5	835-838	7
109	4	294-295	5	407-409	4			680-687	4	840-847	6
110-119	5	296-297	4	410-412	3	500-516	4	688-693	5	850-864	7
120-123	4	298-299	5	413-422	4	520-524	3			865-884	6
124-126	5			423	3	525	4	700-722	5	890-898	7
127-128	4	300-303	4	424-426	4	526-528	3	723-727	4		
129	5	304	5	427-432	3	530-534	2	728-768	5	900-921	8
130-152	4	305-307	4	433-436	2	535-539	3	769	6	922-928	7
153	3	308-329	5	437-457	3	540	4	770-778	5	930-934	8
154-160	4	330-334	6	458	2	541-546	3	779-789	6	935	7
161	3	335-338	5	460-462	3	547-548	4	790-792	5	936-960	8
162-163	4	339	6	463-464	2	549	3	793-799	6	961	7
164-165	3	350-352	4	465-466	1	550-566	4			962-976	8
166-199	4	354	5	467-469	2	567	5	800-803	5	977-979	7
		355-359	4	470-472	3	570-572	4	804-805	6	980-987	8
200-232	4	360-361	5	473	2	573-588	5	806-807	5	988-994	7
233-237	5	362	4	474-475	3	590-597	6	808-816	6	995-999	8
238-259	4	363-369	5	476-477	4	598-599	7	820-822	5		

Heath Shipping and Handling Charges
(Mailable items only)

Shipping Weight	Local	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	BLUE LABEL AIR SERVICE CHARGE to Calif., Ore., Wash. only.
1 lb.	$ .77	$ .90	$ .93	$1.04	$1.15	$1.28	$1.40	$1.48	$1.02
2	.77	.90	.93	1.04	1.15	1.28	1.40	1.48	1.41
3	.82	.97	1.02	1.15	1.29	1.46	1.62	1.74	1.80
4	.86	1.04	1.10	1.25	1.42	1.63	1.84	2.00	2.19
5	.91	1.11	1.19	1.36	1.56	1.81	2.06	2.26	2.58
6	.95	1.18	1.27	1.46	1.69	1.98	2.28	2.52	2.97
7	1.00	1.25	1.36	1.57	1.83	2.16	2.50	2.78	3.36
8	1.04	1.32	1.44	1.67	1.96	2.33	2.72	3.04	3.75
9	1.09	1.39	1.53	1.78	2.10	2.51	2.94	3.30	4.14
10	1.13	1.46	1.61	1.88	2.23	2.68	3.16	3.56	4.53
11	1.18	1.53	1.70	1.99	2.37	2.86	3.38	3.82	4.92
12	1.22	1.60	1.78	2.09	2.50	3.03	3.60	4.08	5.31
13	1.27	1.67	1.87	2.20	2.64	3.21	3.82	4.34	5.70
14	1.31	1.74	1.95	2.30	2.77	3.38	4.04	4.60	6.09
15	1.36	1.81	2.04	2.41	2.91	3.56	4.26	4.86	6.48
16	1.40	1.88	2.12	2.51	3.04	3.73	4.48	5.12	6.87
17	1.45	1.95	2.21	2.62	3.18	3.91	4.70	5.38	7.26
18	1.49	2.02	2.29	2.72	3.31	4.08	4.92	5.64	7.65
19	1.54	2.09	2.38	2.83	3.45	4.26	5.14	5.90	8.04
20	1.58	2.16	2.46	2.93	3.58	4.43	5.36	6.16	8.43
21	1.63	2.23	2.55	3.04	3.72	4.61	5.58	6.42	8.82
22	1.67	2.30	2.63	3.14	3.85	4.78	5.80	6.68	9.21
23	1.72	2.37	2.72	3.25	3.99	4.96	6.02	6.94	9.60
24	1.76	2.44	2.80	3.35	4.12	5.13	6.24	7.20	9.99
25	1.81	2.51	2.89	3.46	4.26	5.31	6.46	7.46	10.38
Add'l lbs.	.07 lb.	.07 lb.	.08 lb.	.11 lb.	.14 lb.	.17 lb.	.22 lb.	.26 lb.	.39

IMPORTANT: 1. Shipping weights listed for model numbers shipped in more than one carton have been adjusted to provide correct postage.

YOUR MONEY-BACK MANUAL ORDER FORM

See how easy kitbuilding really is! "Shop" a Heathkit manual before you buy ...only $2 (except Color TV, Organs, SB-104, HW-104, AN-2016, EK & EF series which are $5) plus 50¢ each postage and handling. And we'll deduct the price of the manual when you buy the kit (just include the manual invoice with your kit order). Use this mini order blank for all manual orders. NOTE: This offer does not apply to EE-series Individual Learning Programs.

Use This Form For Manual Orders Only—Use Regular Order Blank For Book Orders

Enclosed is $_____ MODEL NO.(S):_____

Please send me the following Heathkit manual(s): (I understand that the price of the manual will be refunded when I order the kit.)

NAME:_____

ADDRESS:_____

CITY:_____ STATE:_____ ZIP:_____

Note: When ordering Revolving Charge, please write current account number here to speed processing. Be sure to date and sign the agreement on back.

AA

HEATH COMPANY
a Schlumberger company
Benton Harbor, Michigan 49022

ORDER FORM

PLEASE DO NOT WRITE IN THIS SPACE

1 Please Print or Write Plainly — Always Use the Same Name.

Name

Street Address

City

State Zip

TELEPHONE NUMBER ▶

2 Ship To Another Address?

Name

Street Address

City

State Zip

3 We ship all items UPS for fastest delivery *except those designated Motor Freight.* Indicate other preference:

4 Include Zone from Zone Chart on page 48.

5 What new kits would you like us to make?

6 If you have moved since your last order, please give FORMER ADDRESS here

Name

Street Address

City

State Zip

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	1	2	3	4	5	6	7	8	9
	P/L		COD		I		A/F		M/F		PAL		U		P		2	3	4	5	6	7	8	9	10	11	12	13	14	15					

QUAN.	MODEL NUMBER	KIT DESCRIPTION	WT.	PRICE EA.	TOTAL

IMPORTANT:

1. Please use separate sheet to order parts or for any correspondence.
2. All prices quoted are net FOB Benton Harbor, Mich., and apply to the U.S., FPO and APO areas.
3. Prices and specifications subject to change without notice.
4. MAILABLE ITEMS: Figure charges for each model separately using indicated shipping weight, then remit total of all charges.
5. Motor Freight items are sent "Freight Collect."
6. If one item in an order is Motor Freight, *all* items in that order will be sent Motor Freight. Do not send postage money.

When ordering, be sure to remove entire page

Heath Co. Catalog

7 813 20

If merchandise ordered from another catalog, please list Catalog No._____

10 TOTAL FOR MERCHANDISE. $

Add **4% Sales Tax** for deliveries in Michigan only.

For Mailable Items only

Total shipping charges here (see chart)

Insurance: 1st $100.00 FREE, 25¢ for each additional $100.00 or fraction

$_____ + $_____ =

8 TYPE OF ORDER (CHECK ONE)

☐ **CASH:** Check or money order only.

☐ **C.O.D.** for orders of $10 or more only. 20% deposit required.

☐ **REVOLVING CHARGE** See reverse side for details.

☐ **ADD ON**

9 Is this your first order?

☐ YES ☐ NO

If no, list year of last purchase date:_____

Allowance if offered	
CASH PRICE	
Amount Due Previous Order. Inv. #_____	
TOTAL AMOUNT.	
LESS: Down Payment_____	
20% C.O.D. Deposit	
UNPAID BALANCE (Total Amount less Down Payment or C.O.D. deposit)	

PLEASE DO NOT WRITE IN THIS SPACE

TO: HEATH COMPANY, BENTON HARBOR, MICHIGAN 49022

REVOLVING CHARGE SECURITY AGREEMENT

I hereby purchase the merchandise listed on the reverse side at a time sale price which is the cash price including 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 on 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 which ever is the lesser.

Account Balance Amount	Periodic Percentage Rate	ANNUAL PERCENTAGE RATE
ALL BALANCES	1½ %	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 $400. The amount of my monthly installment can be determined from the charts below:

REGULAR REVOLVING CHARGE									
Charge up to:	$150	200	250	300	350	400	450	500	550
Pay Monthly	$10	15	20	25	30	35	40	45	50

EXTENDED REVOLVING CHARGE									
Charge up to:	$400	500	600	700	800	900	1,000	1,100	1,200
Pay Monthly	$20	25	30	35	40	45	50	55	60

Add $5 for every $100, or a portion thereof over $1,200.

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: Upon default on the terms of this agreement, you may declare my existing outstanding balance due and payable and you may repossess the property. If legal proceedings are commenced, I will be required to pay reasonable attorney's fees in such an amount as may be allowed by the court. My installments shall be applied as follows: In case of items purchased on different dates, the first purchase shall be deemed first paid for. In case of items purchased on the same date, the lowest price shall be deemed first paid for. You are authorized to investigate my credit record and report to proper persons and bureaus my performance on this agreement.

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. The other side of this page is part of this contract. 3. Notice: See accompanying statement for important information regarding your rights to dispute billing errors. **4. 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.**

TYPE OF ACCOUNT
☐ INDIVIDUAL
☐ JOINT

Sign here_____ Date_____
(Customer's Signature)

Sign here_____ Date_____
(Spouse's Signature) If Joint Account

Check Revolving Charge Plan Desired
☐ Regular ☐ Extended

FILL IN IF YOU ARE A NEW ACCOUNT, OR IF YOUR PREVIOUS ACCOUNT HAS BEEN PAID UP FOR 12 MONTHS OR MORE.

CREDIT APPLICATION TO: HEATH COMPANY, BENTON HARBOR, MICHIGAN 49022 Former Account No._____

The Federal Equal Credit Opportunity Act prohibits creditors from discriminating against credit applications on the basis of sex or marital status. The Federal agency which administers compliance with this law concerning this company is Federal Trade Commission, Washington, D.C. 20580.

IMPORTANT: Please fill in completely. **Omissions and errors cause delays** **SIGN REVOLVING AGREEMENT**

ACCOUNT To Be In The Name Of

First Initial Last | AGE | No. of Dependent Children

Present Residence: Address—Street | Area Code + Phone Number

City State Zip | How Long ____YRS ____MO

☐ OWN ☐ RENT ☐ BOARD Monthly Rent or Mortgage Payments $____ ☐ MARRIED ☐ UNMARRIED ☐ SEPARATED | TYPE OF ACCOUNT ☐ INDIVIDUAL ☐ JOINT | Social Security Number

Former Address If Less Than 3 Yrs. At Present Address

Street City State Zip | How Long ____YRS ____MO

COMPLETE FOR PERSON REQUESTING ACCOUNT:

Employer's Name (Give Firm's Full Name)	How Long ____YRS ____MO	Position	Salary (Monthly) $	Business Phone
Employer's Address	(Child support, alimony and separate maintenance optional.) Other Income — Source(s)			Amount (Monthly) $
Former Employer — Name-Address		Position	How Long ____YRS ____MO	Salary (Monthly) $
Bank — Branch Address City State Zip				☐ Check ☐ Loan ☐ Savings

CREDIT REFERENCE: (Give Merchants, Firms, or Finance Companies with whom you do or have done business)

Firm Name	Address — Street, City, State	Account No.	Balance

Name Nearest Relative Not At Your Present Address | Relationship | Relative's Address

COMPLETE FOR SPOUSE IF JOINT ACCOUNT REQUESTED:

Spouse's Full Name (First, Initial, Last) | Age | Social Security Number

Employer's Name (Give Firm's Name) | Employer's Address | Business Phone

How Long ____YRS ____MO	Position	Salary (Monthly) $	Bank — Branch	☐ Check ☐ Loan ☐ Savings

WHEN ORDERING, BE SURE TO REMOVE ENTIRE PAGE.

THE PRESIDENT'S CORNER

Dear Friends:

We at Heath are pleased to be able to put some extra sparkle under your Christmas tree this holiday season. You will see that many of our new "you can build it better" products are designed for the whole family.

First, there is the introduction of the GR-2001 color television system. Long recognized for the superior performance and design of our television products, Heath now offers you the first totally programmable digital color television system. With this system you will be able to program an entire day's viewing into the set. Sit back and let the GR-2001 automatically sequence your favorite programs at the proper time. It will even rotate the antenna to the proper direction for the best reception. The GR-2001 is going to give you armchair enjoyment for many seasons to come. Look for it on pages 7, 8 and 9.

Speaking of television, if you are planning to purchase a Heath television this Christmas, or already own one, now is the time to look at the Heathkit TV game. Designed exclusively for our Heathkit solid-state TV customers, this game, shown on page 3, will bring hours of family fun into your home.

Our audiophile friends have a special treat in store for them. The AR-1515 AM/FM receiver with digital frequency readout is the receiver that is going to set the pace for many years to come. It is priced far below any competitive receiver in its category. Turn to pages 26, 27 and 36 for a complete description of the AR-1515 and its new companion units, the AJ-1515 digital tuner, the AA-1515 integrated amplifier or the new AA-2015 four channel amplifier.

As a family project the new Keyboard Kombo will add to the excitement of Christmas this year and for many more to come. Or for Dad, one of the scanners appearing on page 101 might be what he has always wanted, while the electronic Logix games shown on page 6 are just the thing for the youngsters. And we have not forgotten Mom, as she will appreciate the freezer alarm illustrated on page 98.

Our Heath family wishes you and yours a Merry Christmas. Season's Greetings and the best of everything in the coming new year.

D. W. Nurse

David W. Nurse, *President*

ELECTRONIC DESIGN ENGINEERS

We now have openings for RF and Test Equipment Engineers with BSEE or MSEE and min. of 3-5 years experience. If you seek a new challenge, send us your resume and salary requirements in confidence.

An Equal Opportunity Employer (M/F)

The following notice is required by the Fair Credit Billing Act:

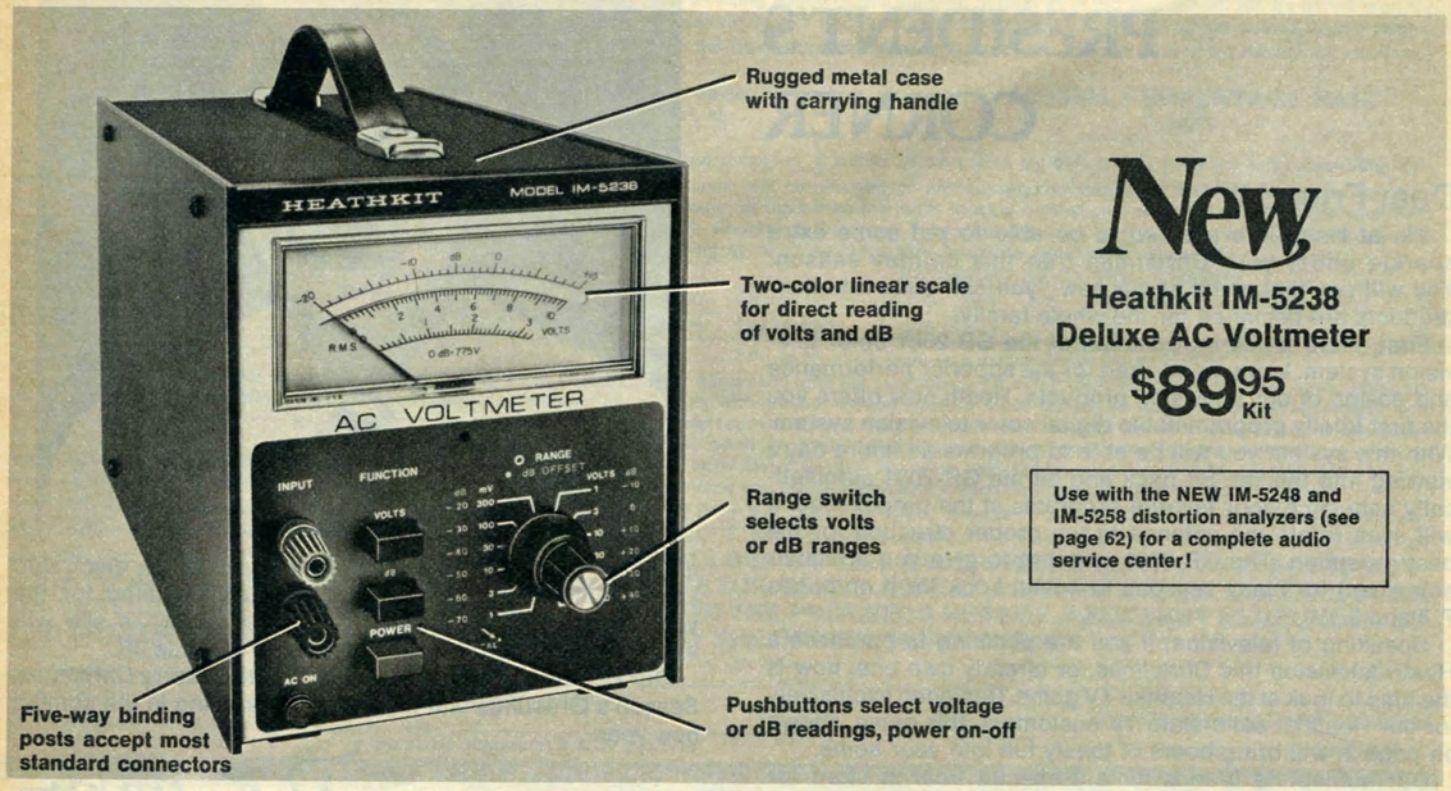
IN CASE OF ERRORS OR INQUIRIES ABOUT YOUR BILL

The Federal Truth in Lending Act requires prompt correction of billing mistakes.

1. If you want to preserve your rights under the Act, here's what to do if you think your bill is wrong or if you need more information about an item on your bill:
   a. Do not write on the bill. On a separate sheet of paper write (you may telephone your inquiry but *doing so will not preserve your rights under this law)* the following:
      i . Your name and account number (if any).
      ii. A description of the error and an explanation (to the extent you can explain) why you believe it is an error.
      If you only need more information, explain the item you are not sure about and, if you wish, ask for evidence of the charge such as a copy of the charge slip. Do not send in your copy of a sales slip or other document unless you have a duplicate copy for your records.
      iii. The dollar amount of the suspected error.
      iv. Any other information (such as your address) which you think will help the creditor to identify you or the reason for your complaint or inquiry.
   b. Send your billing error notice to the address on your bill which is listed after the words: "Send Inquiries to:,"
      Mail it as soon as you can, but in any case, early enough to reach the creditor within 60 days after the bill was mailed to you. If you have authorized your bank to automatically pay from your checking or savings account any credit card bills from that bank, you can stop or reverse payment on any amount you think is wrong by mailing your notice so the creditor receives it within 16 days after the bill was sent to you. However, you do not have to meet this 16-day deadline to get the creditor to investigate your billing error claim.
2. The creditor must acknowledge all letters pointing out possible errors within 30 days of receipt, unless the creditor is able to correct your bill during that 30 days. Within 90 days after receiving your letter, the creditor must either correct the error or explain why the creditor believes the bill was correct. Once the creditor has explained the bill, the creditor has no further obligation to you even though you still believe there is an error, except as provided in paragraph 5 below.
3. After the creditor has been notified, neither the creditor nor an attorney nor a collection agency may send you collection letters or take other collection action with respect to the amount in dispute; but periodic statements may be sent to you, and the disputed amount can be applied against your credit limit. You cannot be threatened with damage to your credit rating or sued for the amount in question, nor can the disputed amount be reported to a credit bureau or to other creditors as delinquent until the creditor has answered your inquiry. *However, you remain obligated to pay the parts of your bill not in dispute.*
4. If it is determined that the creditor has made a mistake on your bill, you will not have to pay any *FINANCE CHARGES* on any disputed amount. If it turns out that the creditor has not made an error, you may have to pay *FINANCE CHARGES* on the amount in dispute, and you will have to make up any missed minimum or required payments on the disputed amount. Unless you have agreed that your bill was correct, the creditor must send you a written notification of what you owe; and if it is determined that the creditor did make a mistake in billing the disputed amount, you must be given the time to pay which you normally are given to pay undisputed amounts before any more *FINANCE CHARGES* or late payment charges on the disputed amount can be charged to you.
5. If the creditor's explanation does not satisfy you and you notify the creditor *in writing* within *10 days* after you receive his explanation that you still refuse to pay the disputed amount, the creditor may report you to credit bureaus and other creditors and may pursue regular collection procedures, but the creditor must also report that you think you do not owe the money, and the creditor must let you know to whom such reports were made. Once the matter has been settled between you and the creditor, the creditor must notify those to whom the creditor reported you as delinquent of the subsequent resolution.
6. If the creditor does not follow these rules, the creditor is not allowed to collect the first $50 of the disputed amount and *FINANCE CHARGES,* even if the bill turns out to be correct.
7. If you have a problem with property or services purchased with a credit card, you may have the right not to pay the remaining amount due on them, if you first try in good faith to return them or give the merchant a chance to correct the problem. There are two limitations on this right:
   a. You must have bought them 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.

However, these limitations do not apply if the merchant is owned or operated by the creditor, or if the creditor mailed you the advertisement for the property or services.

Heathkit Instruments give you that



New

Heathkit IM-5238 Deluxe AC Voltmeter

$89.95 Kit

Use with the NEW IM-5248 and IM-5258 distortion analyzers (see page 62) for a complete audio service center!

An important addition to any audio service bench

- ***Linear scales for both volts and dB make readings easy and accurate***
- ***High sensitivity 0-1 mV full-scale range for low-voltage measurements***
- ***Excellent frequency response of 10 Hz to 1 MHz***
- ***Wide dynamic range for less range switching***

The new Heathkit IM-5238 AC voltmeter has the features you NEED to make your audio servicing easier, faster and more profitable. It performs as well as assembled units costing more than twice as much, and it's the ONLY AC voltmeter available that combines LINEAR voltage and dB scales in a single, compact unit!

AC volts are measured in 12 ranges from 0-1 mV to 0-300 VAC. High sensitivity and a full-scale 0-1 mV range make it ideal for extremely low AC voltage measurements; its wide frequency response is excellent for a variety of AC voltage measurements. Measures phono cartridge, amplifier and tuner outputs, power supply ripple and noise, audio generator outputs, power line voltage, gain, much more.

The linear dB scale provides less crowding of divisions, so there's no dropoff in resolution when reading at the low end. dB measurements can be made from −70 to +40 dB in 12 ranges. The meter is calibrated to read standard dBm (0 dBm=1 mW into 600 ohms=0.775 V rms). A dB offset control changes the reference voltage over a 10 dB range, so you can set any reference voltage you need.

Rear panel outputs proportional to both voltage and dB permit the IM-5238 to be used with a sweep generator and X-Y recorder to automatically plot frequency response of audio and other equipment.

Has pushbutton function switches, range selector and dB offset control, power-on switch and pilot light, rear panel amplified AC output. Front panel five-way binding posts accept almost all types of input cables for easy and convenient hookup. Easy kit assembly and alignment make the IM-5238 an enjoyable kitbuilding experience too.

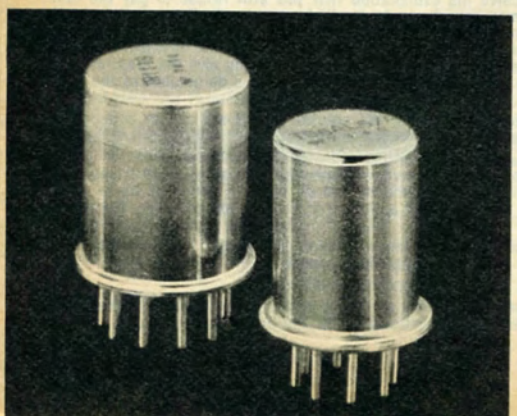
Kit IM-5238, Shpg. wt. 8 lbs. **89.95**

Factory assembled and calibrated version of above.

SM-5238, Shpg. wt. 8 lbs. **130.00**

IM-5238 SPECIFICATIONS

Voltage Range (full scale): 1 millivolt to 300 volts AC, 12 ranges. **Decibel Range:** −70 dB to +40 dB, 12 ranges in 10 dB steps with variable offset. **Input:** 10 megohms, 30 pF, negative input grounded to chassis. **Frequency Response:** 10 Hz to 1 MHz ±1 dB. **Outputs:** DC (proportional to input volts), 1 volt full scale. DC (proportional to log of input volts), 3 volts full scale. AC (amplified output), 1 volt peak, full scale. **Scales:** 0-10 volts; 0-3.16 volts; −20 to +10 dB. **Accuracy:** Voltage Ranges, 4% of full scale at 1 kHz plus accuracy of calibration standard. dB ranges, ±1.0 dB at 1 kHz plus accuracy of calibration standard. **Operating Temperature Range:** 10° C to 40° C. **Power Requirement:** 100-135 VAC, 200-270 VAC, 50/60 Hz, 20 watts. **Overall Dimensions:** 5⅝" W x 6¾" H x 10⅞" D. **Net Weight:** 5.5 lbs.



Now — convert your tube-type Heathkit VTVM to instant-on solid-state design

Replaces the 6AL5 and 12AU7 tubes used in many Heathkit VTVMs, including IM-18 and IM-28. Two solid-state devices plug directly into the tube sockets — requires only minor rewiring! One is a high voltage amplifier containing 4 FETs; the other contains 2 special diodes with low forward drop. Provides instant-on service, eliminates pointer-drift corrections.

IMA-18-1, Shpg. wt. 1 lb. **17.95**

Get the most from your meter

Handbook of Practical Electronic Tests & Measurements. EDP-137 . . . . . **17.95**

101 Ways to Use Your VOM/VTVM, covers equipment checks ac & dc voltage, dc current, ohmmeter, signal tracing, alignment & color TV. **EDP-150** . . **4.50**

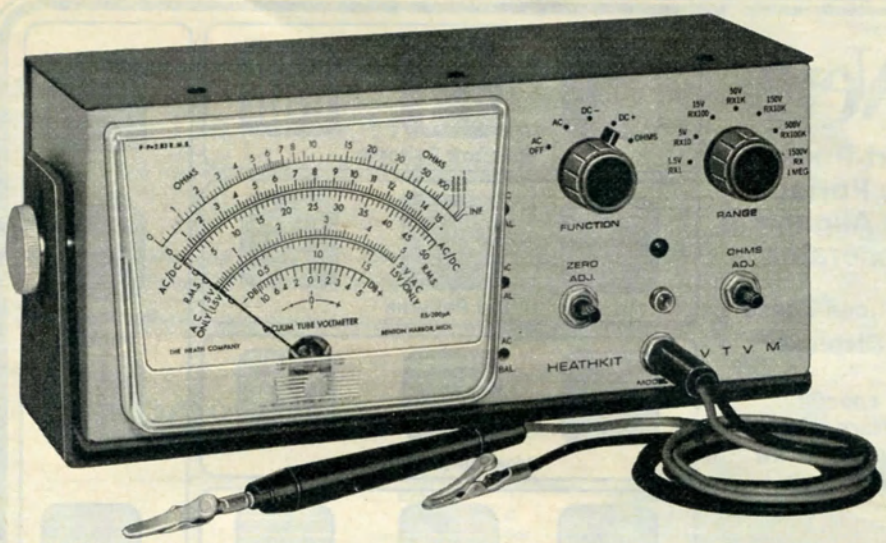
Understanding & Using the VOM & DVM. EDP-140 . . . . . **4.95**

Electronic Measurements Simplified, covers TV servicing, 2-way & ham radio, CB, etc. **EDP-141** . . . **4.95**

See page 52 for book-ordering information

Charge-A-Kit — no money down on any kit — see page 54 for details.

"extra measure" of precision and accuracy



Heathkit IM-28 Service Bench VTVM

$49.95 Kit ***A bench-type version of the IM-18 with PLUS features that make it ideal for service and repair***

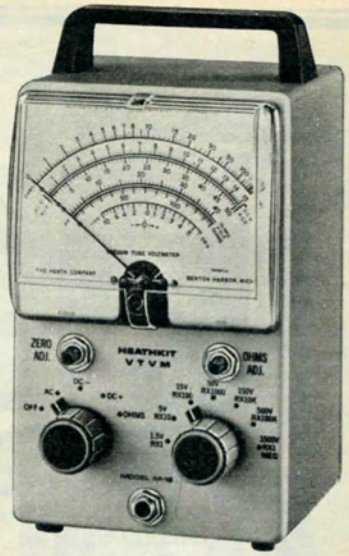
The one to have for day-in, day-out service and testing! The big 6" meter is really easy to read; separate 1.5 and 5 VAC scales make low voltage readings easy and accurate too. All calibration controls are conveniently adjustable from the front panel, so there's no need to remove the cabinet. Has the same outstanding features and performance specifications of the IM-18 — 7 AC, DC and ohms ranges, 1% precision divider resistors, extended frequency response. All measurements are made with a single probe, and the ground test lead has an alligator clip for added convenience. Can be wired to operate from 120 or 240 VAC. Easy printed circuit board kit assembly, or order the unit factory assembled and tested. Either way, you'll get more instrument for your dollar. Converts easily to solid-state with IMA-18-1, page 56.

Kit IM-28, Shpg. wt. 6 lbs. **49.95**

Assembled SM-21A, Shpg. wt. 7 lbs. **95.00**

IM-28 SPECIFICATIONS

DC VOLTMETER — Ranges: 0-1.5, 5, 15, 50, 150, 500, 1500 V full scale; up to 30,000 V with accessory probe. **Input Resistance:** 11 megohm (1 megohm in probe) on all ranges: 1100 megohms with accessory probe. **Circuit:** Balanced bridge (push-pull) using twin triode. **Accuracy:** ±3% of full scale. **AC VOLTMETER — Ranges:** 0-1.5, 5, 15, 50, 150, 500, 1500 rms scales. **Frequency Response (5 V range):** ±1 dB 25 Hz to 1 MHz (800 ohm source, referred to 60 Hz). **Accuracy:** 5% of full scale. **Input Resistance & Capacitance:** 1 megohm shunted by 40 pF measured at input terminals (200 pF at probe tip). **OHMMETER — Ranges:** Scale with 10 ohm center X1, X10, X100, X1000, X10k, X100k, X1 meg. Measures .1 ohm to 1000 megohms with internal battery. **Meter:** 6" 200 μA movement, polystyrene case. **Battery:** 1½ V, "C" cell (not supplied). **Power requirement:** 120/240 VAC, 60/50 Hz, 10 W. **Dimensions:** 5" H x 12 1/16" W x 4¾" D.



Heathkit IM-18 — our most popular VTVM

$39.95 Kit ***The basic tester EVERYONE can use — make voltage and resistance tests on audio, TV, appliances, instruments, etc.***

Features a single test probe that makes all measurements; seven practical AC, DC volts and ohms ranges; a precision 4½" color-coded 200 μA meter; and a convenient size for portability. 1% precision network resistors provide excellent accuracy; wide ±1 dB, 25 Hz to 1 MHz frequency response permit a variety of AC measurements. Measures both rms and p-p AC volts. Separate full-scale ranges for 1.5 and 5 volts makes low-voltage readings really easy, ideal for work with solid-state and latest digital equipment. Easy printed circuit board kit assembly or you can order the unit factory assembled and tested. Can be wired for 120 or 240 VAC operation. Converts easily to solid-state with IMA-18-1 on facing page.

Kit IM-18, Shpg. wt. 5 lbs. **39.95**

Assembled SM-20A, Shpg. wt. 5 lbs. **75.00**

IM-18 SPECIFICATIONS

Meter scales: DC & AC (rms): 0-1.5, 15, 50, 150, 500, 1500 V full scale. **AC peak-to-peak:** 0.4, 14, 40, 140, 400, 1400, 4000 V full scale. **Resistance:** 10 ohm center scale x1, x10, x100, x1000, x10k, x100k, x1 meg. Measures 1 ohm to 100 megohms. **Meter:** 4½" 200 μA movement: **Input resistance:** 11 megohms (1 megohm in probe) on all DC ranges; 1 megohm shunted by 35 pF on all AC ranges. **Circuit:** Balanced bridge (push-pull) using twin triode. **Accuracy:** DC ±3%, AC ±5% of full scale. **Frequency response:** ±1 dB, 25 Hz to 1 MHz (600 ohm source). **Battery requirements:** 1.5 V, size "C" cell (not supplied). **Power requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 7⅜" H x 4 11/16" W x 4¼" D.

Low-cost Heathkit Strip Chart Recorder

$189.95

Has 1 mV or 10 mV full-scale input (selected during assembly); twelve chart speeds from 5 sec./in. to 200 min./in. Power, servo and chart switches, coarse and fine zero controls, high impedance, floating input. Zener regulated reference voltage supply. Less than 1% error, full scale. For 120/240 VAC, 60/50 Hz. 6" H x 15" W x 9⅛" D.

Kit IR-18M, Shpg. wt. 15 lbs. **189.95**

3 rolls chart paper (140 ft./roll). **IRA-18-1,** Shpg. wt. 5 lbs. **10.95**

120 ft. roll chart paper. (For slow speeds.) **SU-445-17,** 2 lbs. **4.75**

Heathkit Laboratory AC VTVM

$52.50

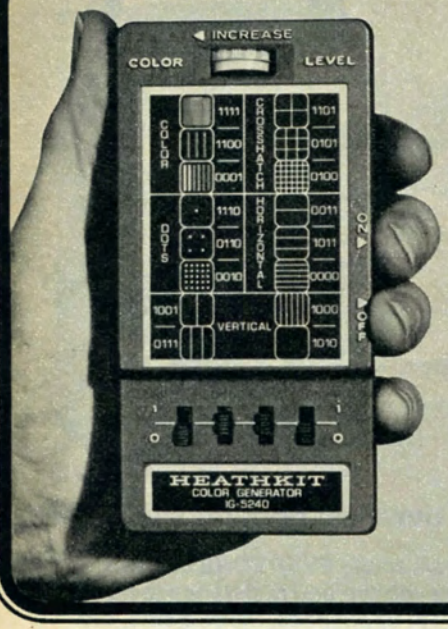
The IM-38 features extended accuracy in measuring low-level AC voltages. Any voltage from 10 Hz to 1 MHz can be measured quickly. It can also be used as a VU meter to indicate changing AC voltages, such as those that occur in speech or music equipment.

Kit IM-38, Shpg. wt. 5 lbs. **52.50**

IM-38 SPECIFICATIONS

Frequency response: ±1 dB 10 Hz to 500 kHz. ±2 dB 10 Hz to 1 MHz, all ranges. **Ranges:** Ten ranges from 0.01 to 300 V rms full scale. **Decibels:** Total-range −52 to +58, meter scale −12 to +2 dB (0 dB = 1 mW in 600 ohms), ten switch selected ranges from −40 dB to +50 dB in 10 dB steps. **Input impedance:** 10 megohms shunted by 12 pF on ranges 10 to 300 V, scale. 10 megohms shunted by 22 pF on ranges .01 to 3 V. **Accuracy:** Within 5% of full scale. **Power requirement:** 120/250 VAC, 60/50 Hz, 10 W. **Dimensions:** 7⅜" H x 4 11/16" W x 4⅛" D.

Let Heath help you make color TV servicing



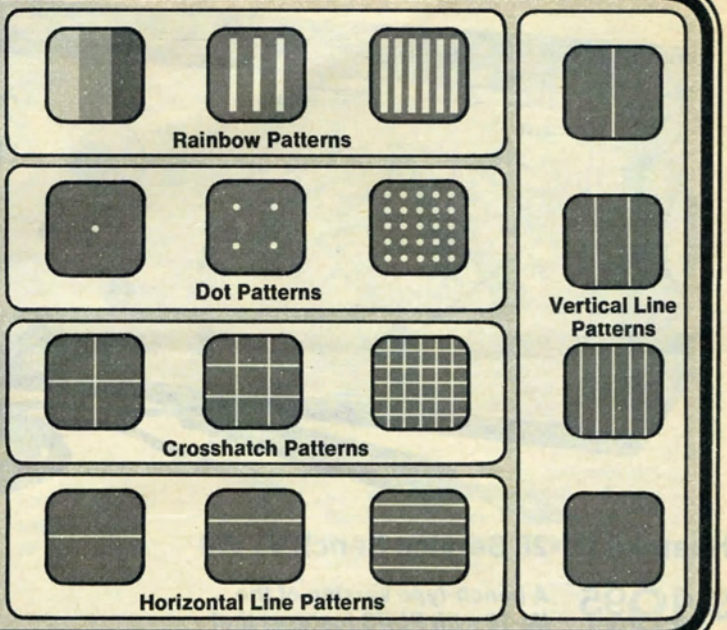
New

"Shirt-Pocket" Size Portable Color Alignment Generator

Produces These 16 Displays!

special "battery-saver" circuit for extra efficiency.

$64.95 KIT



New from Heath, a *truly portable* color alignment generator with the versatility you NEED for complete color TV alignment and convergence. The IG-5240 offers outstanding performance, with crystal-controlled carrier and color oscillator for real precision, accuracy and stability. Its convenient "shirt-pocket" size makes it the one to take along for in-the-field service calls every time, and you'll find yourself using it every day in the shop! It's a versatile, low-cost service tool for hobbyists, too.

The IG-5240 is really easy to operate. Simply connect its output cable to the VHF terminals of any color TV. The RF carrier frequency is calibrated for channel 4. An "on" pushbutton turns the IG-5240 on, four program slide switches select any of the 16 displays available. A color level control adjusts the color intensity of the three color patterns.

A special "battery saver" timing circuit turns the display "off" automatically after a minimum of five minutes "on". This conserves battery power and lets you get the most efficient operation from your batteries. The unit uses two inexpensive 9-volt transistor batteries (NEDA #1604 or equivalent), which provide a minimum of 8 hours continuous operation.

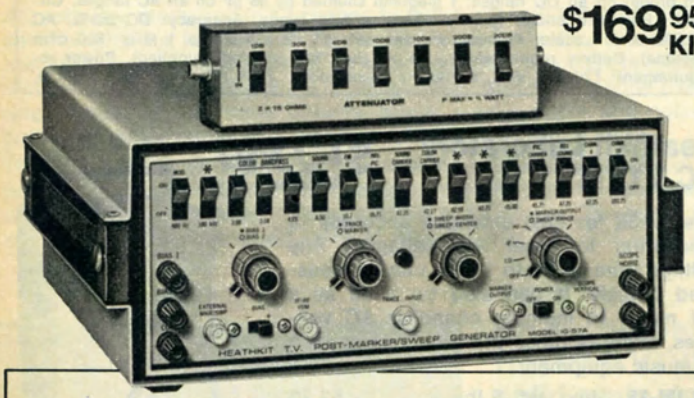
For features, convenience and versatility, we don't think you can find a better color alignment generator than the IG-5240. Put it in your service shop today!

Kit IG-5240, Shpg. wt. 2 lbs. **64.95**

Factory assembled version of above.
SG-5240, Shpg. wt. 2 lbs. **85.00**

IG/SG-5240 SPECIFICATIONS

Display Patterns: Raster for purity adjustments. **Horizontal Lines:** 1, 7, 15. **Vertical Lines:** 1, 11, 21. **Crosshatch:** 7x11 matrix; 1x1 matrix; 15x21 matrix. **Dots:** 1x11 matrix; 15x21 matrix. **Rainbow:** no luminance. **Gated Rainbow:** 3 bars with luminance; 10 bars with luminance. **Chroma Carrier:** 3563.795 kHz ±0.005% crystal-controlled. **Master Timer:** 377.616 kHz ±0.005% crystal-controlled. **RF Carrier:** Channel 4, 67.250 MHz ±0.005% crystal-controlled. **RF Output Level:** 5000 μV min. into 300 ohms. **Video Modulation:** 50% (approx.) **On-Time Interval:** 5 minutes min. OFF pushbutton can override time out. **Power Requirement:** Two 9-volt transistor batteries; with k80 mAH capacity (NEDA #1604). **Dimensions:** 5.4″ L x 2.75″ W x 1.15″ D.



$169.95 KIT

IG-57A SPECIFICATIONS: Marker frequency: 100 kHz. **Marker frequencies, crystal-controlled:** 3.08, 3.58, 4.08, and 4.50 MHz ±0.1%. 10.7, 39.75, 41.25, 42.17, 42.50, 42.75, 45.00, 45.75, 47.25, 67.25 and 193.25 MHz ±.005%. **Modulation frequency:** 400 Hz. **Input impedance:** External Marker/Sweep, and Attenuator — 75 ohms. Trace in — 220 k ohms. **Output impedance:** Marker Output, Sweep Output, and Attenuator — 75 ohms. Scope Vert. — 1 k ohms. **Bias voltage:** Two individually adjustable supplies: Positive or negative polarity. **Sweep frequency ranges:** LO Band — 2.5 to 5.5 MHz ±1 dB. IF Band — 38 to 49 MHz ±1 dB. RF band — 64 to 72 MHz ±1 dB. **Attenuator:** Total of 70 dB in seven steps. **Power requirement:** 120 V, 60 Hz AC at 4.5 watts.

Heathkit Post-Marker/Sweep Generator helps you do fast, easy, thorough alignment jobs

The Heathkit IG-57A checks overall receiver response from the antenna terminals throughout the tuner, IF strip video detector, to the color bandpass amplifier outputs. Sweep modulated picture carriers are available at 45.75 MHz for the tuner mixed input and at 67.25 MHz for the antenna terminal input. And the exclusive Heath external attenuator enables you to accurately set bandwidth in seconds...eliminates guessing at important 6 dB points. Fifteen crystal-controlled markers are provided...four for color bandpass...one for FM-IF... eight for TV IFs from 39.75 to 47.25 MHz...plus picture and sound carrier markers for channels 4 and 10. Accurate location of picture and sound carriers, 6 dB points and trap locations is a breeze with the IG-57A. Three sweep oscillators in stable Colpitts configurations produce five ranges using harmonics for color bandpass, FM IF, video IF bandpass, VHF channels 4 & 10. Uses quick-disconnect BNC connectors for easy setup. Includes 4 coax cables, 4 test leads and a demodulation probe.

Kit IG-57A, Shpg. wt. 15 lbs. **169.95**

Assembled SG-57A, factory-assembled & calibrated version of the IG-57A in handsome black & white styling (not shown), Shpg. wt. 15 lbs. **275.00**

Find out how easy it is to build a kit — order the manual. See page 53.

easier than ever!

The Heathkit IT-5230— A CRT Tester/Rejuvenator That Really Works!

Brings old and worn TV picture tubes back to LIFE! Even handles new IN-LINE GUN CRT's!

$89.95 Kit

At last, a deluxe CRT tester/rejuvenator priced within reach of most any service shop, and it performs as well as models costing up to three times as much! The IT-5230 will help you test, rejuvenate and clean almost all popular CRT's, *including the new IN-LINE GUN CRT's.* Features simplified pushbutton operation for all test, rejuvenation and cleaning operations, individual grid current meters for each color gun, a separate heater voltage meter to allow precise settings of heater voltage on the CRT. Has lamp to indicate shorts in the CRT, heater voltage and cutoff controls. A special GUN REL/LIFE pushbutton provides an indication of the life remaining in the tube. The restore indicator glows brighter as the rejuvenating current level is increased for an easy visual indication of rejuvenation. Transformer power supply assures safe, reliable operation even at low line voltages. The IT-5230 can also be used to clean and rejuvenate computer terminal and oscilloscope CRT's.

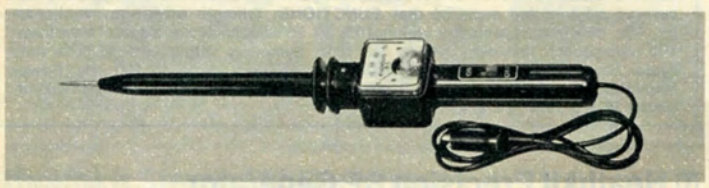
Kit IT-5230, Shpg. wt. 9 lbs. **89.95**

Factory Assembled version of above.

ST-5230, Shpg. wt. 9 lbs. **140.00**

IT-5230 SPECIFICATIONS

Sockets Supplied: 14-pin for 90° color tubes; 13-pin for in-line color tubes; 8-pin for black-and-white tubes; 7-pin for black-and-white tubes. **Heater Supply Voltage:** Variable from 2 volts to 12 volts at 1 ampere. **Test Cables Supplied:** 4′ heavy duty. **Power Requirement:** 105-135 VAC, 60/50 Hz (50 watts maximum at 60 Hz). **Dimensions:** 5.12″ high x 10″ deep x 13.5″ wide.



Heathkit 40 kV High-Voltage Probe Meter

TV tube voltage measurements are fast and convenient with the Heathkit IM-5210 Probe Meter. It is light weight, portable and will measure DC voltages up to 40 kV with ±3% accuracy. You just attach the ground clip to the TV chassis, place the probe against the tube's high voltage connector and switch on the meter. The on-off switch on the handle protects the meter during hookup and when the probe is not in use. Assembles easily. 1½″ H x 1⅞″ W x 15″ D.

Kit IM-5210, Shpg. wt. 1 lb. **17.95**

How to Use Color TV Test Instruments — get the most out of your investment in test gear. **EDP-138** **5.95**

How to Use Vectorscope-Oscilloscopes & Sweep-Marker Generators — trouble-shooting & alignment techniques; how to isolate defective ICs and transistors. **EDP-142** **5.95**

See page 52 for book ordering information.

$94.95 Kit

Color Bar Pattern Generator

Provides 12 patterns plus a clear raster for purity adjustments, and patterns are available in the exclusive Heath 3x3 display or the familiar 9x9. Has RF output for channels 2 through 6, variable up to 50,000 μV, variable plus and minus going video, front panel gun shorting switches and lead piercing grid jacks, front panel sync output, 4.5 MHz sound carrier oscillator, two 500W AC receptacles.

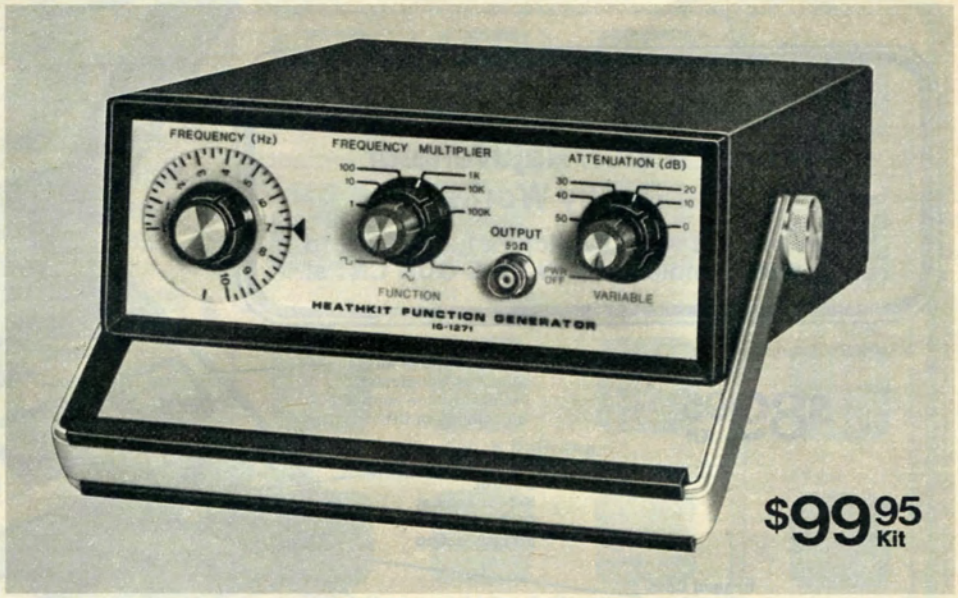
Kit IG-28, Shpg. wt. 9 lbs. **94.95**

Assembled SG-28A, Shpg. wt. 9 lbs. **155.00**

IG-28 SPECIFICATIONS

Output signals: Video — Greater than ±1 V peak-to-peak composite signal. RF — Variable to 50,000 μV output, channels 2 through 6. Sync. — Greater than 3.5 V peak-to-peak signal. Control Grids (3) — Individual red, blue, and green control grid signals for viewing chroma signal demodulator phase adjustments. **Power supply:** full wave zener diode regulated. Input — 120/240 VAC, 60/50 Hz. Output —3.6 VDC, 500 mA, zener diode regulated. **Dimensions:** 5½″H x13½″ Wx8″ D.

Get more value for your money with



Heathkit Vectorscope/Color Generator makes color TV service easier and faster

Two instruments in one — at a low kit form price! The vectorscope displays ten color bars to accurately represent the chroma signal being fed to the CRT guns. Indicates missing or weak colors, proper adjustment of the burst phase transformer, 3.58 MHz oscillator, reactance coil, bandpass transformer, color demodulation angle. A grid-cathode switch displays all vector patterns the same way, regardless of how CRT is driven. The color bar/pattern generator provides 12 patterns plus a raster for purity adjustments in either the familiar 9x9 display or the exclusive Heath 3x3 format. Features tuning for channels two through six, RF output variable to 50,000 μV, plus or minus going video signals, front panel sync output, 4.5 MHz crystal controlled sound carrier, lead-piercing grid jacks and front panel gun shorting switches.

Kit IO-101, Shpg. wt. 12 lbs. **149.95**

IO-101 SPECIFICATIONS: PATTERNS — **Purity:** Produces a snow-free raster. **Dots*:** 9x9 (110 small dots.) 3x3 (9 dots). **Crossshatch*:** 9x9 (11 vertical and 10 horizontal lines.) 3x3 (3 vertical and 3 horizontal lines.) **Horizontal lines*:** 9x9 (10 horizontal lines.) 3x3 (3 horizontal lines.) **Vertical lines*:** 9x9 (11 vertical lines.) 3x3 (3 vertical lines.) **Color bars*:** 9x9 (ten standard color bars.) A visual fingerprint (voltage pattern) of all ten color bars in the form of a petal pattern is displayed for color circuit servicing. **Gray scale:** Provides a wide bar crosshatch pattern with six shades of brightness. **OUTPUT SIGNALS — Video:** Greater than ±1 volt p-p composite signal for composite signal injection beyond the video detector. **Sync:** Greater than 3.5 volts p-p. **Power requirement:** 105-125 or 210-250 VAC, 60/50 Hz, 20 Watts. **Dimensions:** 9¼″ H x 6¾″ W x 14½″ D.
*The number of dots, lines, and bars indicated for a 9x9 display is the number displayed if the receiver under test has no overscan.

This low-cost function generator delivers sine, square & triangle waveforms from 0.1 to 1 MHz

Combines wide frequency range, compact size and reliable Heath engineering in a low-cost generator. All controls are located on the front panel for convenient operation. Generates sine, square or triangle waveforms from 0.1 Hz to 1 MHz. The large tuning control allows fast and precise control of frequency over a 100:1 range. The six-position Frequency Multiplier is the only other control needed to set any frequency. The short-circuit-proof output amplifier supplies a 10 volt peak-to-peak signal into a 50-ohm load. A calibrated step attenuator adjusts from 0 to 50 dB (10V p-p to 30 mV p-p) in 10 dB steps. The variable attenuator control provides up to 20 dB additional attenuation for each step for total attenuation of 70 dB. Attenuator accuracy is ±1 dB. Frequency accuracy is ±3%. Nonlinearity of the triangle waveform is 5% maximum, with waveform symmetry within 10%. Square wave rise and fall times are 100 nsec maximum. 105-130 or 210-260 VAC operation. A triggered oscilloscope such as the IO-4530 (see page 74) is necessary for calibration.

Kit IG-1271, Shpg. wt. 7 lbs. **99.95**

Assembled SG-1271, wired version of the IG-1271 in same attractive blue & white styling (not shown), Shpg. wt. 7 lbs. **150.00**

IG-1271 SPECIFICATIONS: **Frequency range:** 0.1 Hz to 1 MHz. **Frequency accuracy:** ±3% of full scale on dial. **FUNCTIONS: Triangle waveform:** Nonlinearity, 5% maximum. Symmetry within 10% of 50% duty cycle. **Square waveform:** 100 nanosecond maximum rise or fall time. Symmetry within 10% of 50% duty cycle. **Sine waveform:** Harmonic distortion; 3% max., 5 Hz to 100 kHz. **Power requirement:** 105-130 volts or 210-260 volts rms, 60/50 Hz. 15 watts max. **Dimensions:** 3″ H x 7¼″ W x 8⅞″ D.

1 Heathkit Precision RF Generator

The IG-42 provides 100 kHz to 30 MHz signals with ±3% adjustable frequency calibration for testing IF and RF sections of receivers, determining sensitivity, measuring gain and image rejection. RF output voltage adjusts from 5 to 100,000 μV in five attenuated steps, with 10:1 variable attenuation. Output can be modulated from 0-50% with 5% accuracy. 120/240 VAC, 60/50 Hz. 8½″ H x 13″ W x 7″ D.

Kit IG-42, Shpg. wt. 15 lbs. **99.95**

2 Heathkit Low Distortion Audio Generator

Get precision sine-wave signals for testing of audio equipment and instruments. Distortion is less than 0.1% from 20 to 20,000 Hz. A front panel switch selects frequencies from 10 Hz to 100 kHz, meter monitors output in volts and dB to within ±5% from 10 Hz to 100 kHz. 120/240 VAC, 60/50 Hz, 40 W. 6½″ H x 9½″ W x 5″ D.

Kit IG-72, Shpg. wt. 8 lbs. **64.95**

Assembled SG-72A, wired version of the IG-72 in black & white styling, Shpg. wt. 8 lbs. **100.00**

Order early for best selection! Phone (616) 982-3411 day or night.

these quality Generators from Heath

$49.95

$84.95 Kit

General Purpose RF Generator provides accurate signals for convenient radio and TV service

The Heathkit IG-102 is an accurate, stable source of modulated or unmodulated RF signals for use in AM, FM, TV, LW and SW broadcast bands. It covers 100 kHz to 100 MHz in 6 bands (100-200 MHz on harmonics) with 2% tuning accuracy. Has a large, easy-to-read calibrated dial, fine and coarse attenuation controls, external modulation input. Internal signal modulation is 400 Hz and a 400 Hz audio output is provided for audio tests. 120/240 VAC, 60/50 Hz. 9½″ H x 6½″ W x 5″ D.

Kit IG-102, Shpg. wt. 6 lbs. **49.95**

$99.95

Heathkit Stereo FM Generator

Provides audio or composite stereo signal for multiplex adapter adjustments... an RF carrier modulated by these signals for tuner & receiver adjustments... phase test function for subcarrier transformer adjustment... a variable level crystal-controlled 19 kHz pilot signal for checking receiver lock-in ranges... plus built-in sweep and marker signals for RF & IF alignment. With test leads.

Kit IG-37, Shpg. wt. 12 lbs. **99.95**

IG-37 SPECIFICATIONS

RF signal frequency: 100 MHz adjustable by approx. ±2 MHz. **Pilot modulating frequency:** 19 kHz ±2 Hz. **FM modulation:** Left channel (stereo), right channel (stereo), Phase Test (left plus right channel in phase). Monophonic FM. **Deviation:** Adjustable to 75 kHz. **Sweep rate:** (used for RF and IF alignment) 60 Hz. **Sweep width:** (used for RF and IF alignment). Adjustable to 750 kHz. **RF attenuator range:** 60 dB in 20 dB steps. **Crystal-controlled markers:** 10.7, 90.95, 96.30, 96.30, 101.65 & 107 MHz. **Composite signal output:** Left channel (stereo); Right channel (stereo). Phase test (left plus right channels in phase). **Audio output:** 400, 1000 & 5000 Hz; 10 kHz (±2 Hz); 38 kHz & SCA (65 or 67 kHz). **Distortion:** (At 400, 1000 & 5000 Hz), Less than 5%. **Power requirement:** 120/240 VAC, 50/60 Hz, 35 W. **Dimensions:** 5½″ H x 13½″ W x 9″ D.

Sine-square wave Audio Generator with frequency range to 100 kHz

- ***Sine wave output available from 1 Hz to 100 kHz with low distortion***
- ***5 Hz to 100 kHz square wave output with fast risetime ideal for audio response testing***
- ***Outputs available simultaneously or independently***

A highly versatile, low cost addition to any bench. The IG-18 is ideal for gain and frequency response measurements in audio amplifiers, as a signal source for harmonic distortion measurements or as an external modulator for RF signal generators.

Sine wave signals are available from 1 Hz to 100 kHz with distortion less than 0.1% from 10 Hz to 20 kHz. Eight switch-selected output ranges from 0.003 to 10 V are provided when operating into a high impedance (10 k ohm min.) external load. Six ranges from 0.003 to 1 V are available when operating into the internal 600 ohm load or external load. A meter monitors the sine wave output, and is conveniently calibrated in both volts and dB. Square wave output is available from 5 Hz to 100 kHz with peak-to-peak output levels of 0.1 and 10 V into a load of 2000 ohms or greater. Risetime is 50 nanoseconds, making the IG-18 ideal for checking audio amplifier response or use as a trigger for digital circuitry testing.

Frequency is quickly and accurately selected using front panel switches for 0-100, 0-10, and x1, 10, 100 and 1000 multipliers. A separate vernier control is provided for the 0-1 range.

Other features include output available simultaneously or independently at 5-way banana jacks... switchable internal or external load ... dual primary transformer for 120 or 240 VAC operation... built-in carrying handles for easy portability. Easy kit assembly, or you can order the unit factory tested and calibrated.

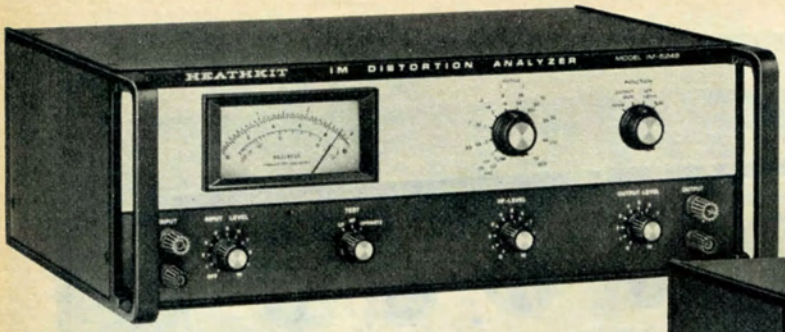
Kit IG-18, Shpg. wt. 11 lbs. **84.95**

Assembled SG-18A, wired version of the IG-18 in black & white styling, Shpg. wt. 10 lbs. **130.00**

IG-18 SPECIFICATIONS

SINE WAVE OUTPUT: Output voltage: 8 ranges, 0.003 to 10 V rms (full-scale) with 10 k ohm or higher external load. 6 ranges, 0.003 to 1 V (full scale) with 600 ohm internal or external load. **dB ranges:** −62 dB to +22 dB, −12 dB to +2 dB on meter and −50 to +20 dB on amplitude switch in 10 dB steps. +2 dB max. into 600 ohm load. (0 dB=1 mW in 600 ohm). **Output variation:** +1 dB 10 Hz to 100 Hz. **Output indications:** Two voltage and one dB scale on meter. **Output impedance:** 10 V range: 0-1000 ohm; 3 V range: 800-1000 ohm; 1 V range and lower; 600 ohm. **Meter accuracy:** ±10% of full scale with proper load termination. **SQUARE WAVE OUTPUT: Output voltage (peak-to-peak):** 0.1; 1, 10 V into 2000 ohm load or higher. **Output impedance:** 0.1 V and 1 V ranges: 52 ohm; 10 range: up to 220 ohm. **Power requirement:** 105-125 or 210-250 VAC, 60/50 Hz, 6 watts.

Here's Professional Performance Priced Right!



Two great new instruments for your audio service bench!

New Heathkit IM-5248
Intermodulation Distortion Analyzer

$169.95 Kit

Easily the lowest-priced professional IMD analyzer on the market — offers the same specifications and performance as analyzers costing far more!

This new intermodulation distortion analyzer is designed for professional-quality audio servicing and testing — measures distortion as low as 0.01% (plus residual)! It has convenience features for easy operation, specifications that make it the equal of instruments far more expensive, operating ranges and accuracy that make it capable of performing IM distortion measurements on sophisticated high-fidelity receivers and amplifiers. It also features a convenient built-in AC voltmeter with dB ranges.

IM distortion measurements are made according to the SMPTE* standard, but the IM-5248's extra flexibility and full controls let you use a variety of other test conditions. Features built-in 60 Hz and 7000 Hz oscillators, external oscillator inputs for measurements at different frequencies. The internal oscillators can be used as separate signal sources also.

The built-in AC voltmeter can be used separately and measures from 0-10 mV to 0-300 VAC in 12 switch-selected ranges. Its wide response, 5% full-scale accuracy and excellent sensitivity make it ideal for a variety of AC voltage measurements. The IM-5248 can also be used to make dB measurements.

Has an easy-to-read front panel meter, input and output level controls, range and function switches. Universal five-way binding post connectors let you use the IM-5248 with virtually all associated equipment — without special cables or adapters.

The IM-5248 is ideal for use in any audio service shop, even hobbyists, engineers and experimenters will find it a welcome addition to their test equipment. Open chassis layout and a wiring harness make kit construction fast and easy.

Kit IM-5248, Shpg. wt. 15 lbs. **169.95**
Factory assembled version of above.
SM-5248, Shpg. wt. 15 lbs. **250.00**

***Society of Motion Picture and Television Engineers**

IM/SM-5248 SPECIFICATIONS

IM METER: Ranges: 0.1 to 100% in a 1-3-10 sequence. Readable to 0.01% plus residual. **Residual:** Less than 0.01% with internal generators. **Accuracy:** 5% full scale. **Input Impedance:** 1 megohm. **HF sensitivity:** 100 mV minimum. **Oscillator Frequencies:** 60 Hz (line syncable), and 7000 Hz. **Generator Amplitude:** Adjustable, 100 mV to 3 volts rms (50 mV to 1.5 volts into 600 ohms), with 60 Hz and 7000 Hz at a 4:1 ratio. **Impedance and Bandwidths of External Oscillator Outputs:** LF — 51k ohms, 10 to 500 Hz. HF — 18k ohms to 25k ohms; 2 kHz to 100 kHz. **Impedance of Oscillator Outputs:** 1000 ohms. **Connectors:** 5-way binding posts. **AC VOLTMETER:** 10 mV to 300 volts in a 1-3-10 sequence. **Input Impedance:** 1 megohm. **Accuracy:** 5% full scale. **Frequency Response:** 5 Hz to 1 MHz, 3 dB. **Power Requirement:** 100-135 VAC or 200-270 VAC switch selected, 60/50 Hz. 15 watts. **Dimensions:** 5⅜" H x 15" W x 11½" D.

New Heathkit IM-5258
Total Harmonic Distortion Analyzer

$219.95 Kit

Lets you measure THD to check published amplifier specifications, adjust amplifiers and receivers for peak performance

The new Heathkit IM-5258 is a professional-grade harmonic distortion analyzer offering excellent features and performance — it accurately measures harmonic distortion as low as 0.03%! It's ideal for use in audio service shops, or by hi-fi enthusiasts interested in getting and maintaining peak performance from their amplifiers and receivers. It can also be used for quality control in amplifier and receiver manufacture.

The IM-5258's outstanding sensitivity and bandwidth permit it to measure total harmonic distortion levels to as low as 0.03%, over a frequency range of 5 Hz to 100 kHz, so it can be used to check amplifiers and receivers claiming the finest specifications. Also functions as an AC rms voltmeter measuring AC voltage from 0-1 mV to 0-300 VAC in 12 switch selected ranges. Makes dB measurements directly, too.

An automatic null circuit, usually found only on analyzers costing $1000 or more, makes the IM-5258 really easy to operate! Simply "rough-tune" the unit for approximate balance and flip the AUTO mode switch. The analyzer automatically balances, eliminating the need for delicate fine-tune adjustments.

Has fine and coarse frequency tuning and balance controls, input binding posts for wire leads or banana plug connectors. A level switch and level control provide proper signal attenuation for all functions. Output binding posts let you monitor the measured signal with an oscilloscope, an external voltmeter, or a spectrum analyzer.

The IM-5258 is really easy to build and use. Put it in your audio service shop for added convenience and profits, put it on your hobby or work bench to keep your high fidelity equipment in top operating condition.

Kit IM-5258, Shpg. wt. 17 lbs. **219.95**
Factory assembled version of above.
SM-5258, Shpg. wt. 16 lbs. **330.00**

IM/SM-5258 SPECIFICATIONS

Frequency Range: 5 Hz to 100 kHz in 5 ranges; 5-10 Hz, 10-100 Hz, 100-1000 Hz, 1-10 kHz and 10-100 kHz. **Distortion Range:** reads from 0.3% to 100% full scale in 6 ranges with a 1-3-10 sequence. **Residual Distortion:** 0.03% or less. **Input Impedance:** 1 megohm/70 pF maximum. **Required Input Level:** 316 mV for distortion measurements. **Voltmeter:** 1 mV to 300 V in 12 ranges with a 1-3-10 sequence. **Accuracy:** 5% of full scale. **Output:** 100 mV for full scale meter deflection. **Power Requirement:** 100-135 VAC or 200-270 VAC switch selected, 60/50 Hz. 12 watts. **Dimensions:** 5⅜" H x 15" W x 11½" D.

Complete your audio service bench with the NEW IM-5238 AC voltmeter, *see page 56.*

Our lowest-priced frequency counter—value PLUS!

Power/Time Base Switch Turns the IM-4100 on, selects between kHz and MHz for frequency measurements, and selects second or millisecond time bases for period measurements.

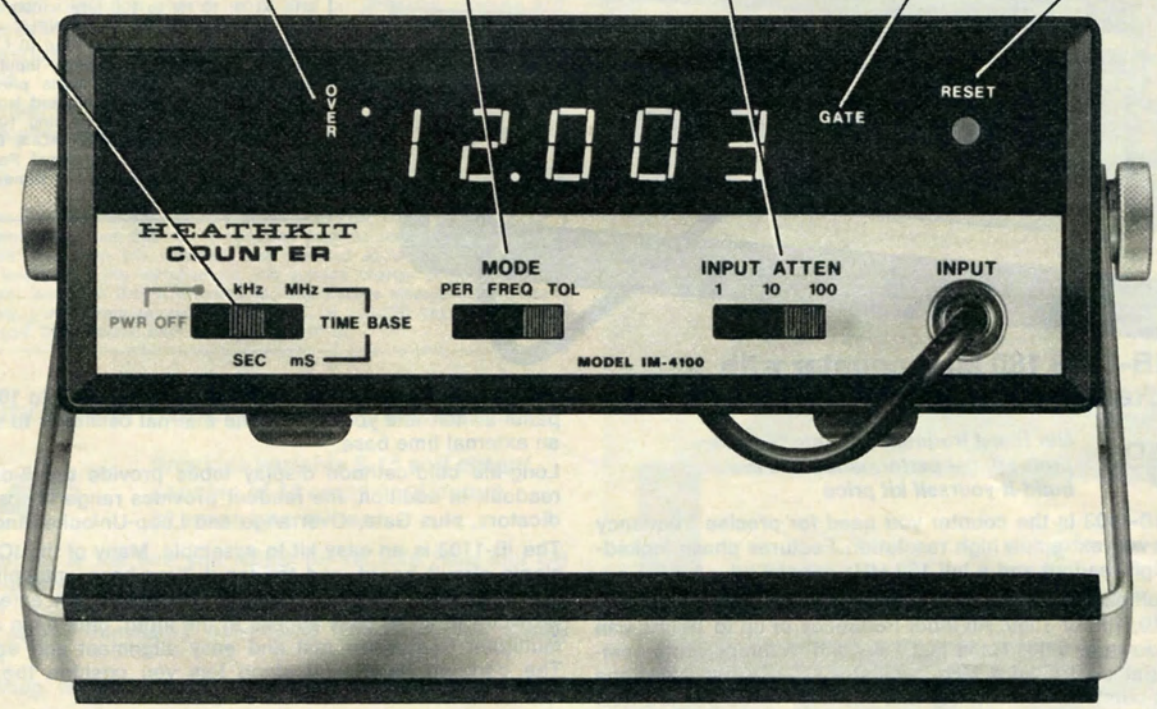
Overrange Indicator Indicates when the number to be displayed is larger than the display can handle.

Three Operating Modes Modes for frequency measurement to 30 MHz, period measurements to 99.-999 seconds, or totalize for events counting to 99,999 are easily switch-selected.

Input Attenuator Three-position switch provides ÷1, ÷10 or ÷100 attenuation of the Input signal.

Gate Lamp Flashes on when the display is updated. Also functions as a logic probe for troubleshooting during calibration or servicing.

Reset Switch Pushbutton switch resets the display to zero in any mode of operation.



Our most versatile counter — frequency to 30 MHz, period to 99.999 seconds, events to 99,999

$129.95 Kit

Gives you the performance you NEED for precision measurements — outstanding resolution and sensitivity!

The Heathkit IM-4100 is an almost unbelievable counter value. It's a full five-digit frequency counter. It will also function in period mode or totalize mode. It provides built-in input attenuation and 12-volt operation all in one compact package. The latest digital design and a stable 10 MHz crystal oscillator assure outstanding accuracy and precision on all measurements. Its excellent resolution makes it ideal for a variety of signal alignment applications.

As a frequency counter, the IM-4100 is guaranteed to 30 MHz with 1 Hz resolution. Sensitivity is a low 15 mV from 50 Hz to 30 MHz, 50 mV below 50 Hz.

In the period mode, it measures intervals up to 99.999 seconds. Using the millisecond time base, it resolves to 1 μsec! This mode can be used for low frequency measurements with high accuracy. Just position the TIME BASE switch to mS and the MODE switch to PER. Then solve the equation f = 1/period, using the displayed value.

The totalize mode will add up (totalize) event pulses up to a count of 99,999. Pushing the RESET button starts the count at zero. An inhibit signal can be applied through a rear panel terminal to stop the totalize mode at any time, without loss of the displayed count.

The front panel attenuator switch allows the amplitude of input signals to be divided by 1, 10 or 100. The pushbutton RESET switch quickly resets the display to zero in *any* mode. Front panel display includes overrange indicator and a gate lamp.

A rear panel switch easily selects internal or external time base. The rear panel connector can be used as an input for the external time base signal, or as an output to check the internal 10 MHz time base or provide a convenient frequency standard of 1 MHz for bench use. Switch selected 120 or 240 VAC, or operation from any 12-volt DC source is possible with the IM-4100 — no extra accessories are needed. Power is applied through a rear panel connector (mating connector supplied).

The IM-4100 is an easy kit to build, with an open chassis layout, circuit board construction and wiring harness to simplify assembly. Or you can order it factory assembled and tested. Add the IM-4100 to your service bench today — dollar for dollar, it's one of the best counter values you'll ever see!

Kit IM-4100, Shpg. wt. 7 lbs. **129.95**

Factory assembled and tested version of above.
SM-4100, Shpg. wt. 7 lbs. **190.00**

IM-4100 SPECIFICATIONS

FUNCTIONS — Frequency: 5 Hz to 30 MHz. Period: 1 μsec resolution to 99.999 sec. **Totalize:** 1-99,999 events. **INPUT — Frequency Range:** 5 Hz to 30 MHz minimum. **Sensitivity:** 15 mV rms (50 mV, 5 Hz to 50 Hz). **Period Pulse Width:** 25 nsec minimum. **Low Frequency Signal Risetime:** 1 msec for signals less than 10 Hz. **Input Impedance:** 1 megohm shunted by less than 35 pF. **Protection:** 240 volts rms at 60 Hz. **Attenuator:** X1, X10, X100 fixed compensation. **TIME BASE — Frequency:** 10 MHz. **Setability:** ±1 ppm. **Temperature stability:** ±10 ppm, maximum 0° to 40° C ambient. **OSCILLATOR CONNECTION — External Input Frequency:** DC to 20 MHz. **External Input Sensitivity:** TTL or 2.5 V rms from 50-ohm source. **Internal Output:** TTL signal at 1 MHz. **GENERAL — Gate Interval:** kHz-1 sec, MHz-1 msec. **Manual Gate:** DC control in events mode using external OSC input connector. **Display Time:** 200 msec plus gate interval. **Power Requirement:** 105-130 or 210-260 VAC (switch-selected). 60/50 Hz, (at 25 watts); or 9-14 VDC at 1.25 amperes. **Dimensions:** 2¾" H x 7¼" W x 10½" D (less handle).

Charge-A-Kit — no money down on any kit — see page 54 for details.

Get MORE for your counter dollar at Heath!

IB-1103 SPECIFICATIONS

FREQUENCY MEASUREMENTS — Range: 1 Hz to 180 MHz. **Accuracy:** ±1 count ±time base stability. **Readout:** MHz, kHz, or Hz with correctly positioned decimal. **Impedance:** 1 megohm in parallel with 35 pF. **Overload:** Diode-protected input circuit. **TIME BASE — Crystal frequency:** 4 MHz TCXO (Temperature Compensated Crystal Oscillator). **Stability:** Aging rate ±1 ppm/yr. **FREQUENCY MULTIPLIER** — Ranges versus input frequency: x1: No multiplier (direct counting). x10: 100 Hz to 300 kHz. x100: 10 Hz to 100 kHz. x1000: 10 Hz to 10 kHz. **EXTERNAL TIME BASE INPUT — Frequency:** 1 MHz with stability greater than 10^{-7}. **Input impedance:** 1000 ohms. **Maximum input:** 3 V rms. **GENERAL — Display:** 8½ digits plus overrange, gate, MHz, kHz, Hz and unlocked lamps. **Operating temperature range:** Operating 10° to 40° C. **Connectors:** 3 BNC's. Input (AC & DC) on front panel; external clock on rear panel. **Power requirement:** 120/240 VAC, 60/50 Hz. **Dimensions:** 3⅝" H x 8⅝" W x 9¼" D.

Heathkit IB-1103 180 MHz counter with phase-locked frequency counter

$349.95 ***Our finest frequency counter — true professional performance at a low build-it-yourself kit price***

The Heathkit IB-1103 is the counter you need for precise frequency measurements with extremely high resolution. Features phase locked-multiplier, 8-digit readout and a full 180 MHz capability!

Pushbutton multiplier selection permits input frequency multiplication by 1 (direct), 10, 100 or 1000. An input frequency of up to 10 kHz can be measured down to 0.001 Hz in just 1 second! A temperature compensated, crystal controlled 4 MHz oscillator (TCXO) generates the time base with outstanding accuracy and stability. Three pushbuttons provide 1 millisecond, 100 millisecond and 1 second gate times.

Input sensitivity is 50 mV to 120 MHz and 100 mV to 180 MHz. A rear panel switch lets you bypass the internal oscillator to allow use with an external time base.

Long-life cold-cathode display tubes provide the 8-digit frequency readout. In addition, the readout provides range lamps for status indicators, plus Gate, Overrange and Loop-Unlocked indicators.

The IB-1103 is an easy kit to assemble. Many of the IC's mount on a single circuit board, and the input, time base, multiplier and power supply boards plug into chassis connectors. An extender board is provided to allow easy access to the input, time base and frequency multiplier boards for fast and easy alignment and service checks. The carrying handle/tilt stand lets you position the unit on your bench for most convenient viewing.

Kit IB-1103, Shpg. wt. 14 lbs. **349.95**

Heathkit IB-1102 8-digit counter measures to over 120 MHz with excellent sensitivity

$279.95 ***FET input circuitry and TCXO time base for precision measurements — external time base input too***

An extremely versatile and easy-to-use counter! Eight cold-cathode display tubes, an overrange lamp, gate lamp and two range indicator lamps provide a clear, easy to read display. A temperature compensated TCXO time base provides excellent stability and overall accuracy. The high impedance (FET) inputs presents minimum loading to the circuit under test.

Sensitivity is 50 mV to 100 MHz and 125 mV above 100 MHz. Accepts inputs up to 120 V rms from 1 Hz to 150 Hz, 50 V at 40 MHz and 3 V at 120 MHz without damage.

ECL (Emitter Coupled Logic) circuitry and the 8-digit readout let you read frequencies with the best resolution without changing the time base. Resolution is 1 Hz for frequencies up to 99.999 Hz, 10 Hz above. MHz, kHz, overrange and gating conditions are indicated by lighted legends on the front panel.

The IB-1102 goes together easily. The IC's are mounted on sockets and three of the circuit boards plug into the chassis for easy construction and service. The IB-1102's handle has three detent positions so you can put it on your bench at the most desirable viewing angle. The detachable line cord and test cable make the unit easily portable.

Kit IB-1102, Shpg. wt. 11 lbs. **279.95**

IB-1102 SPECIFICATIONS

FREQUENCY MEASUREMENTS — Range: 1 Hz to 120 MHz. **Gate time:** 1 msec. or 1 sec. **Accuracy:** ±1 count ±time base stability. **Readout:** kHz or MHz with fixed decimal point. **SIGNAL INPUT — Sensitivity:** 50 mV rms. **Impedance:** 1 megohm in parallel with 35 pF. **Trigger level:** Automatic. **Overload:** Diode protected input circuit. **TIME BASE — Crystal Frequency:** 4 MHz, TCXO (Temperature Compensated Crystal Oscillator). **Stability: Aging rate:** ±1 ppm/yr. **Short term:** Better than 0.5 ppm in 1 sec. **Temperature:** ±1 ppm between 15°C to 50°C. **Line voltage:** 0.5 ppm with ±10% voltage change. **Frequency trimming: Accuracy:** ±1 ppm. **Range:** ±10 ppm. **Sample rate:** 500 msec. (Time between two openings of counting gate). **EXTERNAL TIME BASE INPUT: Frequency:** 1 MHz with stability >10^{-7}. **Input impedance:** 1000Ω. **Maximum input:** 3V rms. **GENERAL — Display:** 8 digits plus overrange, gate, kHz, and MHz lamps. **Operating temperature range:** Operating 10°C to 40°C. **Power requirement:** 120/220 VAC, 50/60 Hz, 30 W. **Connectors:** Two BNC's. Input on front panel; external clock on rear panel. **Cabinet dimensions:** 8⅝" W x 3⅝" H x 9¼" D.

Find out how easy it is to build a kit — order the manual. See page 53.

Pick the power you NEED for your bench!

Tri-Output Experimenter's Power Supply

$79.95 Kit

Three floating outputs can be connected in any combination for a wide variety of output voltage and current capability

Combines 5 VDC fixed output with two 0-20 VDC variable outputs in a single, compact supply ideal for experimenters. The 0-20 variable outputs can be tracked — one will "follow" the other at any specified voltage difference — ideal for analog circuits requiring a + and — voltage. The 5-volt output is useful for digital circuits. All outputs are short-circuit proof, with current limiting. They can be operated independently, in series, or in parallel. Switchable front panel meter monitors all outputs.

Kit IP-2718, Shpg. wt. 12 lbs. **79.95**

Assembled SP-2718, Shpg. wt. 12 lbs. **140.00**

IP-2718 SPECIFICATIONS

Outputs: 5 volts DC ±5% at 1.5 A. Two 0-20 VDC at 0.5A, continuously adjustable. **Regulation: Load:** less than 0.1% variation from no load to full load on 20-volt supplies; less than 2% variation from no load to full load on 5-volt supply. **Line:** less than 0.2% variation for line voltage change of 10 volts on 20 volt supplies: less than 0.15% variation for line voltage change of 10 volts on 5-volt supply. **Power Requirement:** 100-135 VAC or 200-270 VAC, 60/50 Hz, 100 watts full load. **Dimensions:** 4½" H x 10¾" W x 9" D.

Offers 3 Output Voltages for Virtually Any Circuit Design

Heavy-Duty Power Supply/Battery Eliminator

$134.95

Provides variable 9-15 volt output capable of 12 amps continuous, 20 amps intermittent

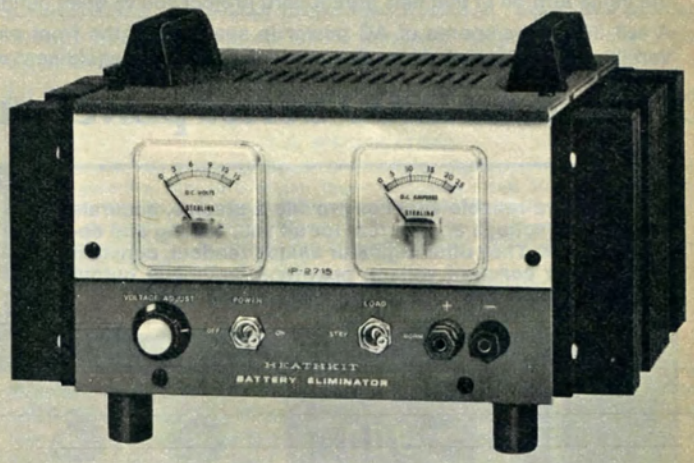
Heavy-duty supply is the one you NEED for reliable Ham and CB radio servicing, any high-current 12-volt use. Features negligible ripple; excellent regulation from no load to full load. Has double heat sinks with 4 output transistors, extra-large transformer for steady smooth power.

Kit IP-2715, Shpg. wt. 31 lbs. **134.95**

IP-2715 SPECIFICATIONS

Output Voltage: variable from 9-15 VDC. **Output Current:** 12 amps continuous, 20 amps intermittent (per derating curve in manual). **Ripple:** less than 1% at full load. **Regulation:** less than 2% variation from no load to full load. **Fuses:** 7A, 3 AG slow-blow primary; 20A, 3 AG output. **Power Requirements:** 110-130 VAC, 7A or 220-260 VAC, 3.5 A, 60/50 Hz. **Dimensions:** 5¼" H x 11" W x 11" D.

Ideal for 2-way Radio Servicing, High-Current 12-Volt Applications



1-15 VDC Regulated Power Supply

$24.95

Ideal for service, design and testing of low-voltage solid-state equipment — transistor radios, portable tape recorders, etc. Has continuously adjustable 1-15 VDC output with 50 mV line and load regulation...*and* fully adjustable current limiting from 10 mA to 500 mA. AC or DC programming capability lets you control output voltage from another source. Three-terminal "floating" output enables the IP-18 to furnish positive or negative voltages. Has front panel voltage and current controls, on-off switch and pilot light, binding post terminals. With three-wire line cord.

Kit IP-18, Shpg. wt. 5 lbs. **24.95**

IP-18 SPECIFICATIONS

Ripple and Noise: Less than 5 mV. **Current Output:** 500 mA maximum continuous load. **Current Limiting:** Adjustable from 10 mA to over 500 mA. **Transient Response:** 25 microseconds. **Output Impedance:** .5 ohm or less to 100 kHz. **Power Requirement:** 120/240 VAC, 60/50 Hz, 15 W at full load. **Dimensions:** 4⅜" H x 5½" W x 5¾" D. **Programming:** AC or DC, 5000 ohm input resistance.

0-400 VDC General-Purpose Power Supply

$99.95 Kit

A versatile supply for experimenters and service techs. Provides 0-400 VDC at 0-100 mA continuous, 125 mA intermittent. Features excellent line and load regulation for stable operation, even with varying line voltages. Has front panel voltage and current meters, built-in circuit protection, binding posts insulated from chassis to allow positive or negative high voltage and bias operation. Makes a great general purpose supply for the physics or chemistry lab.

Kit IP-17, Shpg. wt. 21 lbs. **99.95**

Assembled SP-17A, Shpg. wt. 21 lbs. **160.00**

IP-17 SPECIFICATIONS

Additional Outputs: 0 to —100 VDC at 1 mA variable bias voltage, 6.3 VAC at 4 amps., 12.6 VAC at 2 amps. (25 VA max. AC load), filament voltage. **Regulation:** Output variation less than 1% from no load to full load. **Ripple:** Less than 10 millivolts rms. **Output Impedance:** Less than 10 ohms, DC to 1 MHz. **Meters:** Voltmeter 0-400 V or 0-150 V; Milliammeter 0-150 mA. **Power Requirement:** 120/240 VAC, 60/50 Hz, 150 W max. **Dimensions:** 5⅛"H x 13¼" W x 11" D.

Power your bench with Heathkit Supplies

Heathkit IP-5220 Variable Isolated AC Supply

- ***Safe isolated source of AC power for service work***
- ***Variable 0-140 VAC output***
- ***1 A & 3 A ammeter ranges for easy low-current readings***
- ***Simultaneous metering of voltage and current output***

Every service tech and hobbyist needs a Heathkit IP-5220. With this new variable AC source, you can isolate transformerless equipment for safer operation when servicing. It provides complete isolation between the AC power line and any electrical equipment that is plugged into its front panel variable output socket. The variable 0-140 volt output is useful anywhere a slow run-up of line voltage is needed...like the initial turn-on of that new breadboard project you've been building.

A full 360 volt-amperes of AC power is available at the front panel variable output socket. More than enough to operate equipment with large power requirements, such as a color TV. And the IP-5220 is capable of supplying its full rated output continuously.

The IP-5220's ability to start from zero voltage is helpful when trying to locate circuit faults caused by high or low line voltage — or testing equipment with unknown power requirements. You simply monitor the output on the large voltmeter and ammeter as output voltage is increased. When excessive current is observed, power can be quickly and easily removed before components are damaged.

For easier low current measurements, the ammeter has two switch-selected full scale ranges of 1 A and 3 A. Fuses for both ranges are front panel mounted for easy replacement. The variable output socket is fused to protect the IP-5220 and the circuit under test in case of a short circuit. A socket for direct line connection is front panel mounted for convenience.

Kit IP-5220, Shpg. wt. 27 lbs. **109.95**

IP-5220 SPECIFICATIONS

Input Voltage: 120 V @ 60 Hz for specified output. Output Voltage: 0-140 V @ 60 Hz. Voltmeter Range: 0-150 VAC. Ammeter Ranges: 0-1 & 0-3 A, AC. Output Current: 3 A max. 10 A (direct line connection). Output Power: 360 Volt-Amperes maximum. Dimensions: 5.5″ H x 15″ W x 10.5″ D.

Learn more about power supplies

Regulated Power Supplies — covers static & dynamic characteristics, regulation techniques, use of integrated circuits and more.

EDP-152 .....**5.50**

See page 52 for book-ordering information.

Famous 2700 Series power supplies NEVER PRICED LOWER!

These ultra-reliable supplies provide a precise, accurate source of voltage and current for all your testing and design needs. They offer digital or analog readout, constant current or constant voltage operation, complete output protection. Choose one for your bench and SAVE!

Choose analog or digital readout!

Ideal for powering breadboard circuits, electrical component testing, or as a power source for bench use. All feature remote programming and voltage sensing; simplified front panel operation. Digital readout types have two decade auto-ranging for high resolution on low voltage and current settings. Choose from four DC models: 0-7.5 V @ 10 A; 0-15 V @ 5 A; 0-30 V @ 3 A; 0-60 V @ 1.5 A.

SAVE UP TO $170

Kit IP-2700, 60V @ 1.5A analog, Shpg. wt. 39 lbs. . .**Was 149.95 Now 99.95**

Assembled SP-2700, 60V analog, Shpg. wt. 35 lbs. .....
Was 220.00 Now 130.00

Kit IP-2701, 60V @ 1.5A digital, Shpg. wt. 40 lbs. . .**Was 199.95 Now 119.95**

Assembled SP-2701, 60V digital, Shpg. wt. 37 lbs. .....
Was 300.00 Now 150.00

Kit IP-2710, 30V @ 3A analog, Shpg. wt. 34 lbs. . .**Was 169.95 Now 149.95**

Assembled SP-2710, 30V analog, Shpg. wt. 34 lbs. .....
Was 255.00 Now 220.00

Kit IP-2711, 30V @ 3A digital, Shpg. wt. 36 lbs. . .**Was 219.95 Now 199.95**

Assembled SP-2711, 30V digital, Shpg. wt. 36 lbs. .....
Was 340.00 Now 300.00

Kit IP-2720, 15V @ 5A analog, Shpg. wt. 34 lbs. . . .**Was 149.95 Now 99.95**

Assembled SP-2720, 15V analog, Shpg. wt. 32 lbs. .....
Was 220.00 Now 130.00

Kit IP-2721, 15V @ 5A digital, Shpg. wt. 36 lbs. . .**Was 199.95 Now 119.95**

Assembled SP-2721, 15V digital, Shpg. wt. 35 lbs. .....
Was 300.00 Now 150.00

Kit IP-2730, 7.5V @ 10A analog, Shpg. wt. 36 lbs. . . .**Was 149.95 Now 79.95**

Assembled SP-2730, 7.5V analog, Shpg. wt. 34 lbs. .....
Was 220.00 Now 100.00

Kit IP-2731, 7.5V @ 10A digital, Shpg. wt. 38 lbs. . . .**Was 199.95 Now 99.95**

Assembled SP-2731, 7.5V digital, Shpg. wt. 35 lbs. .....
Was 300.00 Now 130.00

IP/SP-2700 SERIES SPECIFICATIONS

(NOTE: Specs measured in accordance with NEMA standards (PYI-1972) after 30-minute warmup period.)

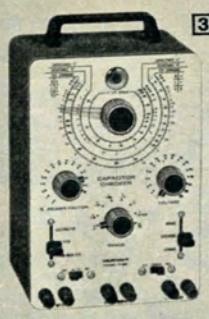
Max. Rated Output: Models IP/SP-2700 & 2701; 60V, 1.5A; models IP/SP-2710 & 2711: 30V, 3A; models IP/S-2720 & 2721: 15V, 5A; models IP-2730 & 2731: 7.5V, 10A. **Load Regulation:** Voltage: ±0.05% +1 mV, Current: ±0.10% +3.5 mA. **Line Regulation:** Voltage: ±0.05% +1 mV. Current: ±0.10% +1 mA. **Ripple & Noise:** Voltage: 1 mV RMS; 0.03% of rated output, peak-to-peak. **Voltage/Current Readout (Switchable):** Analog: 3½″, 100°, meter. Digital: 3½-digit (1999), two-decade, auto-ranging, digital meter. **Readout Accuracy:** Voltage: Analog ±3% of rated output; Digital ±0.5% of reading ±1 count using lab standards, ±1.0% of reading ±1 count using built-in calibrator. Current: Analog — ±3% of rated output; Digital — ±1.0% of reading ±4 count using lab standards, ±1.5% of reading ±4 count using built-in calibrator. **Readout Response Time: (Digital):** 2 seconds to within 5 counts. **Stability at Output Terminals:** Voltage: ±(0.01% + 1 mV)/hr. Current: ±(0.05% + 1 mA)/hr. **Stability as Displayed (Digital):** Voltage: ±(0.01% + 1 mV + ½ count)/hr. Current: ±(0.01% + 1 mA + ½ count)/hr. **Operating Modes:** Constant voltage, constant current, auto-series, auto parallel. **Programming Mode:** Voltage: A—zero to rated output with 0 to 5.0 VDC applied; B—zero to rated output with 0 to 5000Ω external resistor. Current: Zero to rated output with applied voltage of 1.0 volt/amp (0.1 volt/amp for IP-2731). Programming transient response: 0.1 ms for low current to high current changes: 1.0 ms for high to low. Load resistance less than 10 x (E Rated/IRated). **Power Requirements:** 120/240 ± 10/20 VAC; 60/50 Hz, 2.0/1.0 Amps max. **Overall Dimensions:** 5.5″ H x 15″ W x 13.5″ D.

Charge-A-Kit — no money down on any kit — see page 54 for details.

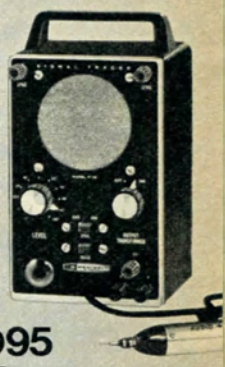
Round out your bench with these practical kits

1 $124.95

2 $99.95



3 $57.95



4 $32.95

1 High-accuracy Impedance Bridge

Has four separate bridge circuits for accurate measurement of resistance, capacitance, and low & high inductance, dissipation factor of capacitors and storage factor of inductors. Has direct reading 100-0-100 microammeter, front panel binding posts for easy test setups. Requires headphones or scope for alignment.

Kit IB-28, Shpg. wt. 11 lbs. **124.95**

IB-28 SPECIFICATIONS

DC Measurements: Built-in power supply. Binding posts for external supply. **Meter:** 100-0-100 microampere meter. **AC Measurements:** Built-in 1000 Hz generator. Terminals on panel for external generator. **Detector:** Vacuum tube detector and amplifier, using built-in meter. Terminals for external detector. **Resistance:** 0.1 ohm to 10 megohm. **Capacitance:** 100 pF to 100 μF. **Inductance:** 0.1 mH to 100 H. **Dissipation Factor:** (D) 0.002 to 1. **Storage Factor:** (Q) 0.1 to 1000. **Accuracy:** ½% decade resistors used. **Power Supply:** Transformer and silicon rectifier. **Power Requirements:** 105-125 V. or 210-250 V., 60/50 Hz, 10 watts. **Dimensions:** 8″ H x 17″ W x 6″ D.

2 Low-cost Tube Checker

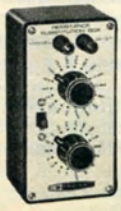
Essential for radio-TV servicing! Tests tubes on the basis of total emission, for shorts, leakage, open elements, and filament continuity. Has good-?-bad indicator to show relative quality, neon bulb indicator for filament continuity and leakage or shorts between elements.

Kit IT-17, Shpg. wt. 12 lbs. **99.95**

Updated Tube Chart Subscription Service for all Heathkit Tube Checkers includes new data book plus two supplements per year for only $6.85. Write: Heath Tube Data Service, P.O. Box 377, Hewlett, Long Island, New York 11557.

IT-17 SPECIFICATIONS

Sockets: 4-pin, 5-pin, 6-pin combination and pilot light. 7-pin miniature, octal, loctal, 10-pin miniature, 9-pin novar, 9-pin miniature, 12-pin compactron, 5-pin nuvistor, 7-pin nuvistor. **Meter:** 1 mA BAD-?-GOOD scale, illuminated. **Line Voltage Adjustment:** Step type. **Roll Chart Mechanism:** Constant tension, free-rolling, thumbwheel operation, illuminated. **Filament Voltage:** .63, 1.4, 2, 2.35, 2.5, 3.15, 4.2, 4.7, 5, 6.3, 7.5, 9.45, 12.6, 19.6, 25, 32, 50, 70, 110 VAC. **Element Test Voltages:** 30, 100, 250 VAC. **Power Requirement:** 120 VAC, 50/60 Hz. **Dimensions:** 8½″ H x 13″ W x 5½″ D.



Capacitor Substitution Box

Helps you determine proper capacitance values without time-consuming calculations. Provides switch selection of any of 18 EIA standard capacitors from 100 pF to 0.22 μF. All are rated at 600 V except 3 lowest and 2 highest values are 500 & 400 V respectively. 5⅜″ H x 3⅛″ W x 3″ D.

Kit IN-47, Shpg. wt. 2 lbs. **10.95**

Resistor Substitution Box

Gives you a rapid and flexible means of determining resistance values required in electronic circuits. Provides switch selection of any one of 36 EIA standard 10% 1-watt resistors from 15 ohms to 10 meg. Hi/lo switch. 5⅜″ H x 3⅛″ W x 3″ D.

Kit IN-37, Shpg. wt. 2 lbs. **10.95**

3 Direct-reading Capacitor Checker

Fast, accurate analysis of all capacitor types. No calculations — just read directly from front-panel scales. Measures capacitance from 10 pF to 1000 μF, resistance from 5 ohms to 50 megohms and 16 leakage testing voltages. Low bridge voltage makes it ideal for testing miniature electrolytics. Has terminals for external standard L, C or R measurements, calibrated power factor control, "eye" tube null and leakage indicator. External audio generator may also be used. Can be wired for 120/240 VAC operation.

Kit IT-28, Shpg. wt. 7 lbs. **57.95**

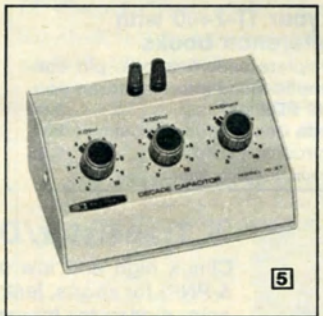
IT-28 SPECIFICATIONS

Test Circuit: AC bridge, powered by internal 60 Hz supply or partial external audio generator with 10 V output. **Upper Frequency Limit:** 10 Hz. **Capacitance Ranges:** 10 pF to .005 μF, .001 μF to .5 μF, .1 μF to 50 μF, 20 μF to 100 μF. External standard (comparison bridge; maximum ratio 25:1). **Inductance Check:** External standard only. **Power Requirement:** 120/240 VAC 60/50 Hz, 30 W. **Dimensions:** 9⅝″ H x 6⅝″ W x 5″ D.

4 Visual-aural Signal Tracer

The instrument you NEED for fast, effective stage by stage trouble-shooting and service in AM, FM and TV circuits, both tube type and solid-state. Trace RF, IF and audio signals; locate noisy or intermittent components. Has 3½-inch speaker, bright eye-tube indicator. Also doubles as test amp and speaker. Switchable audio/RF probe included. Can be wired for 120/240 VAC operation. 7½″ H x 4½″ W x 4″ D.

Kit IT-12, Shpg. wt. 6 lbs. **32.95**



5

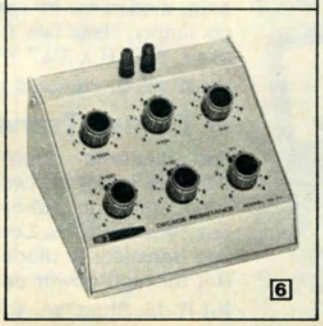
5 Capacitance Box

Selects 100 pF to 0.111 μF in 100 pF steps. Use with the IN-17 (below) in solving R and C network problems.

Kit IN-27, Shpg. wt. 3 lbs. **26.95**

IN-27 SPECIFICATIONS

Voltage Rating: 350 VDC continuous; 500 VDC intermittent; 100 VDC instantaneous test. **Accuracy of Incremental Capacity:** ±1%. **Stray Capacitance:** 10 to 15 pF at terminals. **Dimensions:** 4″ H x 7⅛″ W x 5″ D.



6

6 Resistance Box

1 ohm to 999,999 ohms in 1-ohm steps. Resistors are 1-watt, ½% accuracy.

Kit IN-17, Shpg. wt. 4 lbs. **39.95**

IN-17 SPECIFICATIONS

Minimum DC Resistance: .025 ohms or less at terminals with all switches at zero. **Dimensions:** 5″ H x 7½″ W x 6⅝″ D.

Order early for best selection! Phone (616) 982-3411 day or night.

Top Performance Heathkit Test Equipment

1 $74.95

2 $54.95

3 $99.95

1 Heathkit Digital IC Tester adds amazing versatility to any hobby or test bench

- ***"Zero Force" Insertion Socket prevents bent pins on IC's***
- ***No-bounce stepping switch***

A "must" for anyone working with digital IC's. Lets you determine functions of unknown IC's, check operation against your own data sheets. Features a special high-quality "zero-force" insertion socket — the same as used in expensive production-line testers — lets you make thousands of insertions and extractions without worrying about bent pins. Exclusive "bounce-free," computer-type mercury stepping switch allows safe and easy "exercising" of multi-function IC's such as flip-flops. Has input-output jacks for each pin; neon indicators. Exceptionally easy to operate — 14- or 16-pin IC's can be installed in any position, switches and banana jacks allow each IC pin to be used as input or output. Ideal for use with the Heathkit Digital Techniques Program (page 95).

Kit IT-7400, Shpg. wt. 7 lbs. **74.95**

IT-7400 SPECIFICATIONS

Pin Arrangement: accepts 14 or 16-pin dual-in-line IC's. **Indicator Lamps:** 17 neon lamps, one at each pin, plus ON indicator. **Stepping Circuit:** mercury switch with zero bounce stepping into any pin selected. **Pull-up Resistors:** externally connected, with patch terminals. **Patch Terminals:** one at each pin. **Selector Switches:** two at each terminal, one for +5V, step, or off; the other for gas discharge or ground. **Gas Discharge:** allows direct driving of neon indicator lamp for high voltage decoder driver. **Power Supply:** 5 VDC regulated, ±5%, 300 mA and 3.6 VDC, switch selected. **Power Requirement:** 100-135/200-270 VAC, 60/50 Hz, switch selected. **Dimensions:** 4⅝" H x 11⅜" W x 9¼" D.

Get MORE from your IT-7400 with these valuable reference books

The TTL Data Book. Complete specifications, pin connections, test data and applications information on popular 7400 TTL digital IC's. **EDP-220** **3.95**

Supplement to The TTL Data Book. Updates volume above with info on latest TTL circuits. **EDP-221** **1.95**

See page 52 for book-ordering information.

2 High-accuracy FET/Transistor Tester

Reduce your service time with quick, accurate tests of conventional (bipolar) transistors, diodes, FETs, SCRs, triacs and unijunction transistors. Tests components either in-circuit using color-coded test leads supplied or out-of-circuit using built-in sockets. Shows gain (DC Beta), trans-conductance (Gm) and leakage directly. Special circuitry balances out in-circuit impedances. Five current ranges measure leakage to 1 μA and collector currents to 1 A.

Kit IT-121, Shpg. wt. 5 lbs. ..... **was 62.95, NOW ONLY 54.95**

IT-121 SPECIFICATIONS: **DC Beta:** 1 to 5000 in ranges of 1 to 50, 5 to 250, 10 to 500, 50 to 2500, 100 to 5000. **Collector Currents Available:** 1 mA, 5 mA, 10 mA, 100 mA, 500 mA, and 1 A. **Gm:** 0 to 50,000 μmhos. **Leakage Measurements:** Five ranges, 0 to 100 μA, 0 to 1 mA, 0 to 10 mA, 0 to 100 mA, 0 to 1 A. **Out-of-Circuit Accuracy:** ±5% for DC beta and leakage. **In-Circuit Accuracy:** Indicates good or bad transistor, FET, diode, SCR or triac. **Diode Test:** Tests for forward conduction and blocking. **Unijunction Transistor Test:** Measures I_{eb_2}s, $I_{b_2b_1}$s and emitter current. **Power Requirement:** Two 1½ V cells, (alkaline for best performance, not supplied). **Dimensions:** 5" H x 9 7/16" W x 8⅛" D.

3 Heathkit Semiconductor Curve Tracer

For oscilloscopes with horizontal sensitivity of 0.5 V/div. and vertical sensitivity of 1 V/div. Displays parameters for virtually any discrete semiconductor — bipolar transistors, diodes, SCRs, triacs, FETs, etc. Plug-in cables are supplied for easy scope hookup. Switch permits fast and accurate scope calibration. Displays gain (beta), leakage, breakdown voltage saturation, forward conduction voltage, output admittance, linearity, capacitance and temperature effects, others.

Kit IT-1121, Shpg. wt. 11 lbs. **99.95**

IT-1121 SPECIFICATIONS: **Sweep Voltage Ranges:** 0-40 volts at 1 ampere max. 0-200 volts at 200 mA max. **Sweep Voltage Sampling:** .1, .2, .5, 1, 2, 5, 10, 20 and 50 V/div. ±3%. **Sweep Current Sampling:** .5, 1, 2, 5, 10, 50, 100 and 200 mA/div. ±3%. **Step Currents:** .002, .005, .01, .02, .1, .2, 2, 5, and 10 mA/step, ±3%, ±250 nA offset current max. **Step Voltages:** .05, .1, .2, .5, and 1 volt/step, +3%, ±5 mA maximum offset voltage. **Calibration Source:** 9 volts ±2% in 1 volt steps. **Oscilloscope Requirements:** Bandwidth to 20 kHz or greater. (DC-coupled oscilloscope is recommended). **Power Requirement:** 110 to 130 or 220 to 260 VAC. **Dimensions:** 4½" H x 11¼" W x 10" D.

4 5

4 Transistor/Diode Checker

Check high and low power transistors (NPN & PNP) for shorts, leakage, opens and current gain, diodes for forward and reverse current, continuity. Uses two 1.5 V "C" cells, not supplied. 3⅛" H x 3⅛" W x 3¾" D.

Kit IT-27, Shpg. wt. 2 lbs. **11.95**

5 Deluxe Transistor Tester

For reliable in- or out-of-circuit tests. Reads DC Beta (gain) on two ranges, 2-100 and 20-1000. Measures out-of-circuit leakage, identifies NPN or PNP's. Low power — will not damage transistor or diode incorrectly connected. Not for high power or switching transistors.

Kit IT-18, Shpg. wt. 4 lbs. **32.95**

IT-18 SPECIFICATIONS

Out-of-Circuit Accuracy: ±5%. **In-Circuit Accuracy:** Indicates good or bad. **Iceo** — 0-5000 μA; **Icho** — 0-5000 μA. **Diodes:** Forward or reverse current — 0-5000 μA. **Power:** One standard "D" cell (not supplied). **Dimensions:** 4½" H x 8½" W x 7⅛" D.

Tube Substitution Handbook — lists over 12,000 direct replacements for all types of domestic & foreign receiving & picture tubes. **EDP-174,** **2.25**

Transistor Substitution Handbook — contains substitutions for over 100,000 bi-polar transistors. **EDP-175,** **4.50**

See page 52 for book-ordering information.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Our finest oscilloscope does it ALL!

Dual-Trace, DC-15 MHz — the one you NEED for professional service, circuit-design and engineering — available fully assembled, or in money-saving kit form

charg-a-kit

Easy kit assembly and service — major circuitry is contained on 5 PC boards

TV Servicing — excellent for stage by stage troubleshooting

Lab Work — circuit design, testing components, checking assembly

Heathkit IO-4510 Dual-Trace Oscilloscope

$569.95 Kit

- ***DC-15 MHz bandwidth with post-deflection accelerated CRT for high brightness***
- ***45 MHz typical triggering bandwidth***
- ***1 mV/cm input sensitivity***
- ***Time base sweep to 100 nsec/cm; x5 sweep magnifier***
- ***Y_1 and Y_2 trigger selection***
- ***X-Y capability***
- ***Fully regulated power supplies***
- ***Operate on any common line voltage from 100 to 280 VAC***

The IO-4510 offers professional scope performance at a low price — plus DC-15 MHz bandwidth, 1 mV/cm vertical sensitivity, time base to 100 ns/cm and complete dual trace capability. It also offers many features others don't provide at anywhere near our low price.

Vertical input sensitivity of 1 mV/cm is provided over the entire bandwidth. With the 4510 and a X10 probe (the way you're most likely to use an oscilloscope), you can read waveforms to 10 mV, not the 50 or 100 mV found on other scopes. See page 72 for the PKW-101 high impedance isolating probe with 10:1 attenuation.

The IO-4510 will typically trigger on signals up to 45 MHz and is guaranteed to 30 MHz. And there's no stability control needed with the digitally-controlled triggering circuits. In the automatic mode, a reference baseline is generated even when the trigger signal is absent. Complete triggering controls are provided with choice of AC, ACF or DC coupling, triggering at any point on the vertical signal. The ACF fast coupling mode is provided to reject low-frequency components of the trigger waveform for accurate scope triggering. Choice of normal or automatic sweep uses any one of 20 time bases from 0.2 sec/cm to 0.1 μsec/cm. Any sweep speed can be magnified five times. An externally generated horizontal signal can also be selected.

Internal delay lines insure start of the horizontal sweep prior to the beginning of the vertical signal. The IO-4510 guarantees display of at least 20 nanoseconds of the pre-triggered waveform, insuring complete waveform display — mandatory for logic analysis.

The IO-4510 is remarkably easy to build and service. All major circuitry is located on five circuit boards for easy trouble-shooting. Push-on connectors permit fast removal of any board. Even the CRT can be removed and replaced in a matter of minutes.

The fully regulated power supplies provide stable voltages regardless of varying line voltage and load conditions. An adjustable AC line switch is easily accessible and is used to match the regulated power supplies to any common line voltage from 100 VAC to 280 VAC.

IO-4510 calibration requires precise source of square waves such as IOA-4510-1 or IG-4505 on page 72.

Kit IO-4510, Shpg. wt. 36 lbs. **569.95**

SO-4510, factory assembled & calibrated version of IO-4510, Shpg. wt. 28 lbs. **750.00**

IO/SO-4510 SPECIFICATIONS

VERTICAL: Deflection Factor: Sensitivity: 1 mv/cm to 5 V/cm. **Attenuator:** 12 steps in 1-2-5 sequence. **Variable:** Continuous between steps to approx. 15 V/cm. **Accuracy:** Within 3% (20°C to 30°C), 5% (10°C to 40°C) referenced to 0.2 V/cm @ 25°C. **Vertical Response: DC Coupling:** DC to 15 MHz (—3 dB). **AC Coupling:** 2 Hz to 15 MHz (—3 dB). **Rise Time:** 24 nanoseconds. **Overshoot:** Less than 3%. **Delay Line:** Allows display of at least 20 ns of pretriggered waveform. **Vertical Input: Impedance:** 1 megohm shunted by approx. 40 pF. **Maximum Input:** 400 volts peak combined AC & DC. **Connector:** BNC. **Vertical Modes: Single:** Y_1 or Y_2 selected by vertical position controls. **Dual:** Chopped (200 kHz) or alternate automatically selected by Time Base switch. **HORIZONTAL: Time Base: Ramp:** 0.2 s/cm to 0.1 μsec/cm. **Positions:** 20 steps in 1-2-5 sequence. **Variable:** Continuous between ranges to approx. 0.6 sec/cm. **Accuracy:** Within 3% (20°C to 30°C), 5% (10°C to 40°C) referenced to 1 ms/cm @ 25°C. **Magnifier:** X5 (adds additional 2% to sweep accuracy). **External: Sensitivity:** 0.2 V/cm (approx.) **Impedance:** 200 kilohms (approx.). **Polarity:** Negative input causes right hand deflection. **Frequency Response:** DC to 1 MHz (−3 dB). **Connector:** BNC. **TRIGGER: Internal: Automatic:** Zero crossing ±0.5 cm. **Normal:** Adjustable over 8 divisions. **Slope Selection:** + or −. **External: Automatic:** Zero crossing ±0.2 volts. **Normal:** Adjustable over ±5 volts. **Slope Selection:** + or −: **Impedance:** 1 megohm shunted by approx. 30 pF. **Connector:** BNC. **X-Y: Y Channel:** Same as Vertical. **X Channel:** Same as Vertical, except response limited to 1 MHz and no delay line. **Phase Shift:** Less than 3° @ 100 kHz. **GENERAL: CRT: Type:** 6 x 10 cm spiral PDA. **Acceleration Potential:** 4 kV regulated. **Phosphor:** P31. **Graticule:** 6 x 10 cm illuminated, variable by front panel control. **Power: Voltage Range:** 100 to 140 VAC/200 to 280 VAC, switch selected, 75 watts. **Internal Supplies:** Fully regulated. **Operating Temperature Range:** 10°C to 40°C. **Dimensions:** 6.4″ H x 12.9″ W x 19.3″ D (handle extended). **Weight:** 24 lbs.

Get better performance for your Scope dollar

Heathkit IO-4530...perfect for TV service and home experimenting

$299.95 Kit

- *True X-Y operation*
- *DC-10 MHz bandwidth*
- *Mu-metal shielding helps eliminate interference*
- *Regulated HV power supply*
- *TV coupling*

Features like TV coupling, DC-10 MHz bandwidth, wide-band triggering capability, 10 mV/cm vertical input and calibrated X-channel input make it a versatile, easy to use general-purpose scope for the service technician or hobbyist.

Y-input has maximum sensitivity of 10 mV with 11-position attenuator to set deflection from 10 mV/cm to 20 V/cm. For true X-Y operation, a calibrated X-input is provided with maximum sensitivity of 20 mV. Its calibrated 3-position attenuator provides three AC or DC ranges from 20 mV/cm to 2 V/cm.

Trigger circuits are digitally controlled, requiring only a Level control and a Slope switch. The time base can be precisely triggered at any point along the positive or negative slope of the trigger signal. In automatic, triggering is at the zero crossing point. In normal, the level control is adjustable over the complete 8 cm span. In the TV trigger coupling, the 4530 can be precisely triggered on the vertical or horizontal signal in a complex TV signal. A low-pass filter with a 1 kHz cutoff is used in the TV coupling mode.

The IO-4530 is designed for easy kit assembly and servicing. Calibration requires a source of square waves such as the IO-4510-1 or IG-4505 on page 72.

Kit IO-4530, Shpg. wt. 31 lbs. **299.95**

Factory assembled and calibrated version of above.

SO-4530, Shpg. wt. 26 lbs. **425.00**

IO/SO-4530 SPECIFICATIONS

VERTICAL: Deflection Factor: Sensitivity: 10 mV/cm to 20 V/cm. **Attenuator:** 11 steps in 1,2,5 sequence. **Variable:** Continuous between steps to approx. 50 V/cm. **Accuracy:** Within 3%. **Vertical Response: DC Coupling:** DC to 10 MHz. **AC Coupling:** 2 Hz to 10 MHz. **Rise Time:** 35 ns. **Overshoot:** <5%. **Vertical Input: Impedance:** 1 MΩ shunted by ≈38 pF. **Maximum Input:** 400 V. **HORIZONTAL: Time Base: Ramp:** 0.2 S/cm to 200 ns/cm in decade sequence. **Variable:** Continuous between ranges to approximate 2 s/cm. **Accuracy:** Within 5%. **Magnifier:** X5. **External: Deflection Factor: Sensitivity:** 0.02 V/cm to 2 V/cm in decade sequence. **Variable:** Continuous between steps to approx. 20 V/cm. **Accuracy:** Within 3%. **Response: DC Coupling:** DC to 1 MHz. **AC Coupling:** 2 Hz to 1 MHz. **Rise Time:** 35 ns. **Overshoot:** <5%. **Input: Impedance:** 1 MΩ shunted by ≈40 pF. **Max. Input:** 400 V. **TRIGGER: Internal: Automatic:** Zero crossing ±0.5 cm. **Normal:** Adjustable over 8 divisions. **Slope Selection:** + or −. **External: Automatic:** Zero crossing ±0.03 V. **Normal:** Adjustable over 1.2 V. **Slope Selections:** + or −. **Impedance:** 1 MΩ shunted by ≈40 pF. **X-Y: Phase Shift:** Less than 5° @ 100 kHz. **GENERAL: CRT:** 5″ round. **Phosphor:** P31. **Graticule:** 8 x 10 cm. **Power:** 110-130/220-260 VAC, switch selected, 65 watts. **Operating Temperature Range:** 10°C to 40°C. **Dimensions:** 6.4″ H x 12.8″ W x 19.2″ D (without handle).

Heathkit IO-4550—Dual-Trace, DC to 10 MHz—with brighter trace and faster writing speed

$379.95 Kit

- *Regulated high-voltage power supply*
- *Extra-high sensitivity for low-level signals*
- *X-Y operation for precise phase measurements*

The IO-4550 is an excellent choice for TV service, electronics experimentation and design. Its extra-bright trace allows easy reading even in high ambient light; its two vertical input channels have a maximum sensitivity of 10 mV/cm for accurate measurements.

Input channels are displayed, chopped or alternate, as selected by the time base switch. A trigger select switch and level control allow the time base to be precisely triggered at any point along the positive or negative slope of the signal. The digitally controlled time base provides automatic triggering, so no stability control is necessary and fewer adjustments are required.

The fully regulated high voltage power supply assures operation to specifications on standard line voltages from 100 to 270 volts. Complete mμ-metal shielding helps prevent interference.

Improved circuitry and just 4 printed circuit boards make the IO-4550 an easy kit to assemble. Calibration requires a precise source of square waves such as IOA-4510-1 (with additional 6-volt power source) or IG-4505 on page 72.

Kit IO-4550, Shpg. wt. 27 lbs. **379.95**

Factory assembled and calibrated version of above.

SO-4550, Shpg. wt. 25 lbs. **525.00**

IO/SO-4550 SPECIFICATIONS

VERTICAL: Deflection Factor: Sensitivity: 10 mV/ cm to 20 V/cm. **Attenuator:** 11 steps in 1-2-5 sequence; **Variable:** Continuous between steps to approximately 60 V/cm. **Accuracy:** Within 3%. **Vertical Response: DC Coupling:** DC to 10 MHz. **AC Coupling:** 2 Hz to 10 MHz. **Rise Time:** 35 ns. **Overshoot:** Less than 5%. **VERTICAL: Deflection Factor: Sensitivity:** 10 mV/cm to 20 V/cm. **Attenuator: Vertical Input: Impedance:** 1 MΩ shunted by 38 pF. **Maximum Input:** 400 V. **HORIZONTAL: Time Base: Ramp:** 0.2 s/cm to 200 ns/cm. **Positions:** 19 steps in 1-2-5 sequence. **Variable:** Continuous between ranges to approximately 0.6 s/cm. **Accuracy:** Within 3%. **Magnifier:** X5 (adds additional 2% to sweep accuracy). **External: Sensitivity:** 0.1 V/cm (approx.). **Impedance:** 100 kΩ (approx.). **Frequency Response:** DC to 1 MHz. **Connector:** BNC. **TRIGGER: Internal: Automatic:** Adjustable over 10 divisions. **Normal:** Adjustable over 10 divisions. **Slope Selection:** + or −. **External: Automatic:** Adjustable over 0.8 V. **Normal:** Adjustable over 0.8 V. **Slope Selection:** + or −. **Impedance:** 1 MΩ shunted by 40 pF. **Connector:** BNC. **X-Y: Y Channel:** Same as Vertical: **X Channel:** Same as vertical except response is limited to 1 MHz. **Phase Shift:** Less than 8° @ 100 kHz. **GENERAL: CRT: Type:** 5″ round. **Acceleration Potential:** 1.8 kV regulated. **Phosphor:** P-31. **Graticule:** 8 x 10 cm. **Power: Voltage Range:** 100-135 VAC/200-270 VAC switch selected, 70 watts at 120 VAC (240 VAC). **Operating Temperature:** 10°C to 40°C. 6.9″ H x 12.9″ W x 19.3″ (without handle).

Order early for best selection! Phone (616) 982-3411 day or night.

Heathkit has the VALUES in Oscilloscopes

New

$119.95

The lowest priced auto-triggering oscilloscope anywhere! DC-5 MHz, 100 mV sensitivity

The low price of the IO-4560 now makes it possible for you to have the most universal of all test instruments on your bench — the oscilloscope. The 4560's ability to display many types of voltage waveforms permits study of complex signals, such as those found in audio devices, television receivers, transmitters and other electronic equipment. It's ideal for service techs and hobbyists.

Operation couldn't be easier. Special effort was expended in the design of the IO-4560 to keep the number of controls and switches to a minimum. In addition to the power switch, there are only nine switches and controls, for correct operation — even the first time. The large 8 x 10 cm screen makes for easy waveform measurements.

Auto-triggering provides automatic, positive locking of the displayed waveform. A stable display is assured for any frequency up to the full 5 MHz bandwidth. The uncalibrated sweep speed control provides continuous adjustment from 20 ms/cm to 200 ns/cm.

The DC to 5 MHz vertical bandwidth is more than adequate for general design and service work. Maximum vertical sensitivity is 100 mV with a front panel switch for X1, X10 and X100 attenuation, AC or DC. Vertical input impedance is 1 megohm for low circuit loading. Up to 400 VDC can be applied directly without circuit damage, making it a great scope for student use. For phase and frequency measurements, an external horizontal input can be applied directly through the front panel input jack. It has 250 mV sensitivity with DC to 100 kHz bandwidth. Display stability is excellent because the low voltage supplies for the amplifiers and sweep circuit are zener regulated. The primary circuit of the power transformer is fused for protection from overload.

The IO-4560 is an easy oscilloscope to build, making it a great kit for hobbyists and students. Just build the sweep circuit board, assemble the chassis, solder the components, install the CRT and calibrate. Instructions given in the assembly manual are easy to understand. And if something goes wrong, a trouble-shooting table helps you quickly find the problem.

Easy assembly and operation, reliable, accurate performance, and low price make the IO-4560 the best instrument buy in years.

Kit IO-4560, Shpg wt. 19 lbs. **119.95**

IO-4560 SPECIFICATIONS: VERTICAL CHANNEL: Input Impedance: 1 megohm. **Sensitivity:** 100 mV/cm. **Maximum Input Voltage:** 400 volts DC. **Frequency Response:** DC to 5 MHz ±3 dB. **Attenuator:** X1, X10, X100, AC or DC. **HORIZONTAL CHANNEL: Input Impedance:** 100 kΩ. **Sensitivity:** 0.25 volt/cm (uncalibrated). **Frequency Response:** DC to 100 kHz. **TIME BASE: Sweep:** 20 ms to 0.2 μs/cm (uncalibrated). **Trigger Mode:** Automatic. **GENERAL: CRT:** 5DEP31F, 8 x 10 cm viewing area. Blue-green, medium persistance phosphor. 5" round, flat-face tube. **Graticule:** 8 x 10 cm. **Power Requirements:** 110-130 or 220-260 VAC. 60/50 Hz 35 watts. **Dimensions:** 8" H x 13" W x 17" D.

$179.95

DC to 5 MHz Oscilloscope with complete triggering controls including TV coupling

The Heathkit IO-4541 is a triggered scope with controls and features that are not found in other scopes in this price range. A stable triggering circuit is used for solid waveform displays (not the recurrent type sweep generator normally used in other scopes). Trigger controls include selection of normal or automatic modes, switch controlled AC or DC coupling and front panel input of external triggering signals. All front panel trigger controls are clearly labeled for "no mistake" operation. A special TV position on the trigger selector control allows for low frequencies to pass while rejecting the high frequencies, so the 4541 will easily trigger on the vertical component of a complex TV signal.

Any one of seven calibrated time bases, from 200 ms/cm to 0.2 μs/cm can be selected by the time/cm switch. A variable control provides for settings between steps. The horizontal amplifier will accept external inputs from DC to 100 kHz.

Vertical input sensitivity of 20 mV/cm and nine calibrated vertical attenuator positions, up to 10 V/cm, will accommodate a broad range of input signals. A variable gain control gives precise control between settings.

Both vertical amplifier and horizontal sweep circuit power supplies are regulated to provide stable voltages to all circuits under varying line voltage conditions. Mu-metal shielding helps eliminate display error.

Accurate measurements are easily made from the bright 8 x 10 cm screen. The lightweight, durable cabinet combines professional appearance with easy-to-carry portability. The flush mounted handle allows stacking to avoid an instrument-crowded bench.

The DC-5 MHz bandwidth and excellent sensitivity input allow the IO-4541 to be used for nearly all types of waveform display and measurement applications. When you consider all the performance and features the IO-4541 provides, you can easily see why other scopes don't compare in value.

Kit IO-4541, Shpg. wt. 25 lbs. **179.95**

Factory assembled and calibrated version of above.

SO-4541, Shpg. wt. 25 lbs. **295.00**

IO-4541 SPECIFICATIONS: VERTICAL: Bandwidth: DC to 5 MHz ±3 dB. **Attenuator:** 1, 2, 5 sequence, calibrated and variable. **Rise Time:** 70 ns. **Overshoot:** 5% at 1 kHz. **Impedance:** 1 MΩ/38 pF. **Sensitivity:** 20 mV/cm. **SWEEP: Type:** Triggered. **Range:** 200 ms — .2 μs, 7 steps plus variable. **Trigger Source:** Int/Ext/Line. **Trigger Modes:** AC/DC/TV; +/— Slope; Auto/Norm. **HORIZONTAL: Sensitivity:** .25 V/cm. **Bandwidth:** DC to 100 kHz. **Impedance:** 1 MΩ/50 pF. **Ext. Horiz. Input:** X1 and X10 attenuator. **GENERAL: CRT:** 5DEP31F, 8 x 10 cm, green, medium-persistance phosphor, 5" round, flat-face tube. **Accelerating Potential:** Approx. 1.5 kV. **Graticule:** Painted, 8 x 10 cm. **Power Requirements:** 110-130 VAC or 220-260 VAC, 50/60 Hz, 35 watts. **Dimensions:** 8" H x 13" W x 17" D.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Precision Scope Switch and Calibrators

$39.95

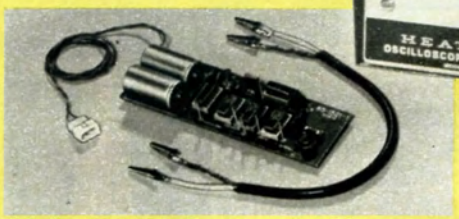
Heathkit ID-101 Scope Switch permits simultaneous display of two separate input signals

Gives any single beam scope with external trigger input dual-signal versatility! Provides simultaneous display of two separate input signals for comparison, observing phase relationships, etc. Also can be used as impedance coupler, preamp or square wave generator in experimental circuits. A sync output on each channel permits scope sweep to be locked to either input signal. DC coupling adds versatility. Frequency response — DC-5 MHz + 1½ dB, –3 dB.

Kit ID-101, Shpg. wt. 6 lbs. **39.95**

ID-101 SPECIFICATIONS

Signal gain: >10 times. **Maximum input signal:** 600 VDC or 600 VAC p-p. **Input impedance:** 1 megohm/50 pF. **Maximum signal output:** 8 V p-p. **Output loading:** 1000 ohm minimum. **Hum and noise:** (single channel only). <40 mV p-p. **Chopping rates:** Approx. 100, 500, 1000 and 5000 Hz. **Power requirements:** 120/240 V, 60/50 Hz, 6 W. **Dimensions:** 4¼" H x 10⅜" W x 5¼6" D.



IOA-4510-1 Scope Calibrator

The Heathkit IOA-4510-1 is an easy-to-build, easy-to-use crystal-controlled time base designed by Heath's 'scope engineers for oscilloscope calibration. It provides everything you need to accurately calibrate your new Heathkit IO-4510 or IO-4530. It generates a square wave signal with selected ranges from 1 MHz to 1 kHz at TTL output levels. The 1 kHz output level can be adjusted from 0 to 4.7 volts peak. Draws operating power from IO-4510 or IO-4530.

Kit IOA-4510-1, Shpg. wt. 1 lb. **14.95**

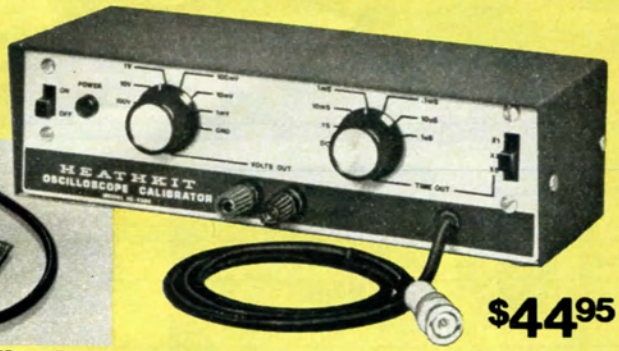
Useful Scope Books

Understanding and using the Oscilloscope — details basic functions, circuits, inputs, pulses & waveforms; outlines every electronic test you're likely to make. **EDP-139** **5.95**

101 Ways to Use your Oscilloscope — practical working handbook for faster servicing; new info on wide-band & triggered-sweep scopes; covers testing of b/w & color TV sets.

EDP-149 .....**4.95**

See page 52 for book-ordering information



$44.95

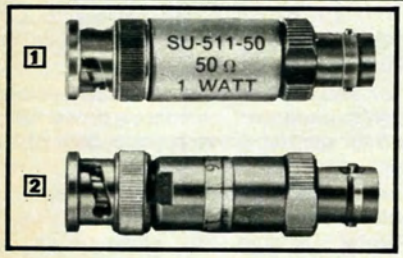
IG-4505 Deluxe Scope Calibrator for oscilloscopes with bandwidths to 35 MHz

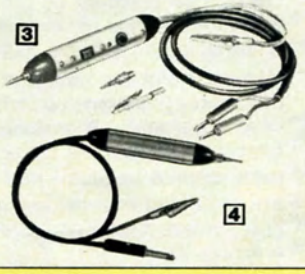
The IG-4505 is a practical oscilloscope calibrator at a sensible price. It provides all the waveforms necessary to adjust sweep speeds, vertical calibration, delay line terminations, high frequency compensation and attenuator compensation for oscilloscopes with bandwidths up to 35 MHz. Round out your test bench today...order the IG-4505.

Kit IG-4505, Shpg. wt. 4 lbs. **44.95**

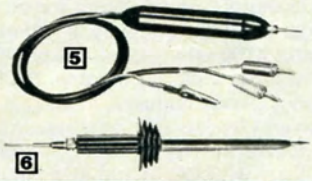
IG-4505 SPECIFICATIONS

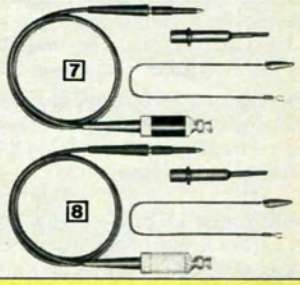
TIME CALIBRATION: Range: .5 sec. to 1 μs square wave in 1-2-5 sequence, accurate to within .01%. **Amplitude:** ≈200 mV peak. **Rise Time:** ≤4 ns. **Overshoot:** ≤3%. **Output:** 50 ohms terminated cable. **VOLTAGE CALIBRATION: Ranges:** 1 mV to 100V peak square wave in decade sequence. **Accuracy:** To within 2% with IMΩ load referenced to 1V position. **Rise Time:** ≤2 μs. **Frequency:** DC, 2 Hz to 10 kHz in 1-2-5 sequence. **Accuracy of Internal Voltage Standard:** Within 1%. **Power Requirements:** 120-240 Volts AC, 60/50 Hz, 12 watts.





Probes & accessories for Heathkit instruments





1 50-ohm Termination for frequency counters and scopes. DC to 1 GHz; power rating, 1 watt. VSWR; 250 MHz, 1.2:1; 600 MHz, 2:1.

Assembled SU-511-50; Shpg. wt. 1 lb. **15.00**

2 RF Fuse in UHF BNC-to-BNC connector. Prevents burnout. DC to 500 MHz range; 50 ohms; 12:1 VSWR (max.); insertion loss 1.80 dB max. at 500 MHz. With spare fuses.

Assembled SU-512-50, Shpg. wt. 1 lb. **45.00**

3 Low capacitance scope probe provides direct or X10 attenuated operation; options for 3.3 or 1 megohm input resistance. Banana plug/BNC wiring option.

Kit PK-1, Shpg. wt. 1 lb. **7.95**

4 Etched circuit RF probe for RF measurements from 1000 Hz to over 100 MHz; 11 meg input; 1000 VDC max. at tip; 90 V rms max.

Kit PK-3, Shpg. wt. 1 lb. **5.95**
Assembled PKW-3, Shpg. wt. 1 lb. **7.95**

5 Scope demodulator probe for distortion checks, RF & IF display. 30 V rms max., 500 VDC max. Banana plug/BNC wiring option.

Kit 337-C, Shpg. wt. 1 lb. **5.00**

6 30 kV High Voltage Probes...IMA-100-10 Probe multiplies DC ranges of any 10-megohm meter by 100. 1000 megohm input measures voltages as low as 1V in high-impedance circuits. Banana plug connector.

Kit IMA-100-10, Shpg. wt. 1 lb. **10.95**

IMA-100-11 Probe provides X100 measurement for meters with 11-megohm input impedance. (Incl. probe resistance). Phone plug, ground clip.

Kit IMA-100-11, Shpg. wt. 1 lb. **10.95**
Assembled SMA-100-11, Shpg. wt. 1 lb. ...**13.95**

MA-1000-1 Probe provides X1000 attenuation for meters with 1-megohm input impedance. Banana plug connector.

Kit IMA-1000-1, Shpg. wt. 1 lb. **10.95**

7 High frequency compensated scope probe features DC-60 MHz bandwidth; 10 megohm/11.5 pF input impedance; X10 attenuation; 500 V AC & DC rating. Ideal for IO-104, IO-4510 and IO-4530 scopes.

Assembled PKW-101, Shpg. wt. 1 lb. **27.95**

PKA-101-1 Accessory Pack. Includes three assembled tips, two 6-inch ground leads and one 12-inch ground lead.

PKA-101-1, Shpg. wt. 1 lb. **9.95**

8 Direct (X1) scope probe for scopes, frequency counters or checking waveforms and levels in any low impedance circuit. 1 megohm/30 pF input impedance. 600 V AC & DC rating. Range 17 MHz typical. Rise time 17 nsec. typical.

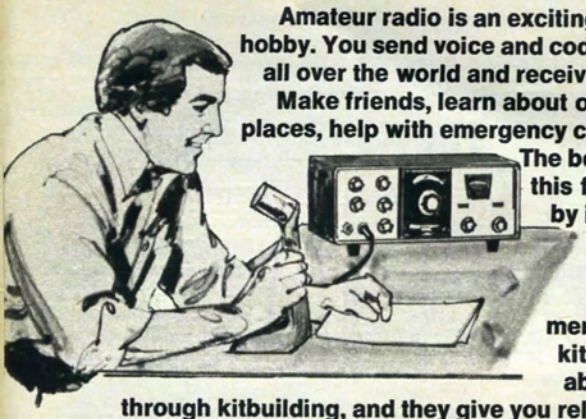
Assembled PKW-104, Shpg. wt. 1 lb. **21.95**

Accessory cables...for inter-connecting scopes, counters, etc. All cable is RG-58/U, 50 ohm impedance. Shpg. wt. (each), 1 lb.

Assembled SU-501-1, 1 ft., BNC/BNC **7.50**
Assembled SU-501-3, 3 ft., BNC/BNC **7.50**
Assembled SU-501-6, 6 ft., BNC/BNC **7.50**
Assembled SU-502-3, 3 ft., BNC/UHF **7.50**
Assembled SU-503-3, 3 ft., BNC/Banana **7.50**

Find out how easy it is to build a kit — order the manual. See page 53.

Start your amateur radio hobby with Heath!



Amateur radio is an exciting and rewarding hobby. You send voice and code transmissions all over the world and receive calls in return. Make friends, learn about other people and places, help with emergency communications. The best way to begin this fascinating hobby is with the easy-to-use courses below and Heathkit equipment. Our low-cost kits help you learn about electronics through kitbuilding, and they give you reliability and performance you'll appreciate even after you've got your ticket.

Learn CW the easy, low-cost way

"TUNE IN THE WORLD WITH HAM RADIO" Designed to prepare you for your Novice License. Includes a tape cassette with code speeds of up to five words per minute for easy practice, and an informative booklet with details on setting up a station, equipment, exams, etc. Produced by the ARRL, the official Amateur Radio organization.

HDP-1142, Shpg. wt. 2 lbs. **7.00**

Ameco Junior Code Course. Includes an LP record containing 10 lessons going from start to 8 words per minute. The course prepares you for Novice and Technician Code examinations with an FCC-type code exam, a code instruction booklet, and charts for recording accuracy.

HDP-232, Shpg. wt. 2 lbs. **3.95**

Ameco Senior Code Course. Contains everything in the Junior course above, plus twelve additional lessons to bring your code speed to 18 WPM. Prepares you for Amateur Novice, Technician, General and Conditional Code exams, as well as Commercial Second Class Telegraph Code exams. For more advanced practice, you can adjust the speed of your record player to vary code speeds: i.e. 16⅔ rpm for beginners, 33⅓ rpm for normal, 45/78 rpm for advanced code operators.

HDP-332, Shpg. wt. 2 lbs. **7.50**

Ameco Junior Cassette Code Course. As above, cassette instead of LP.

HDP-432, Shpg. wt. 1 lb. **4.95**

Ameco Senior Cassette Code Course . As above, cassettes instead of LP's.

HDP-532, Shpg. wt. 1 lb. **8.95**

Learn About Amateur Radio

Amateur Radio License Study Guides — make getting any radio license easy — serve as a convenient reference.

NOVICE, EDP-122 .....**5.95**
GENERAL, EDP-123 .....**7.95**
ADVANCED, EDP-124 .....**5.95**
EXTRA, EDP-125 .....**5.95**

How to be a Ham — beginner's guide to Amateur Radio.
EDP-115 .....**3.95**

101 Questions and Answers About Amateur Radio — introduction for beginners, valuable reference for veterans.
EDP-118 .....**2.95**

ARRL Amateurs Handbook — up to date info & theory.
HDP-293 .....**6.00**

See page 52 for ordering information.

Heathkit HD-1416 Code Practice Oscillator

$9.95 ***The FUN way to practice code — it's an easy-to-build starter kit too***

Fun to build and use! Most components mount on a single circuit board for easy assembly. The unit operates from a single inexpensive 9-volt transistor battery (not supplied) and comes complete with telegraph key and phone jack. Has built-in speaker, volume and adjustable internal tone control. Once you get your license, the HD-1416 can serve as a side tone oscillator for any transmitter using grid block keying. Plastic cabinet matches Heathkit "SB" series.

Kit HD-1416, Shpg. wt. 2 lbs. **9.95**

HD-1416 SPECIFICATIONS

Mode of Operation: Speaker or headphones. **Tone Frequency:** 200-800 Hz adjustable. **Battery Required:** 9-volt transistor battery equivalent Neda #1604 (not supplied). **Headphones:** 8-2000 ohms. **Sidetone Oscillator:** Grid block keying transmitters (400 volts DC, negative maximum). **Dimensions:** 2⅝" H x 4¼" W x 4⅜" D.

SAVE $2 on this CW Starter Group!

Special CW Starter Price $14.95 **If purchased separately, $16.95**

Here's everything you need to start an exciting Amatur radio hobby — at a money-saving combo price! "TUNE IN THE WORLD WITH HAM RADIO" (HDP-1142) above, starts you sending and receiving Code up to five words per minute and prepares you for your Novice exam. Our HD-1416 Code Oscillator is ideal for practice because it's easy and fun to use, and easy to build.

HDS-1416, Shpg. wt. 8 lbs. **14.95**

"By the Word" Code Course

A fast, simple and effective way to learn Code! Three LP records teach speed and comprehension using the famous "by the word" method.

HDP-32, Shpg. wt. 2 lbs. **9.95**

Same course as above, but on two cassettes instead of LP records.

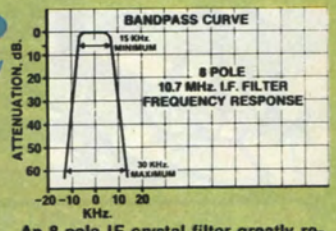
HDP-132, Shpg. wt. 1 lb. **9.95**

NEW! Frequency Synthesized 2-Meter Transceiver

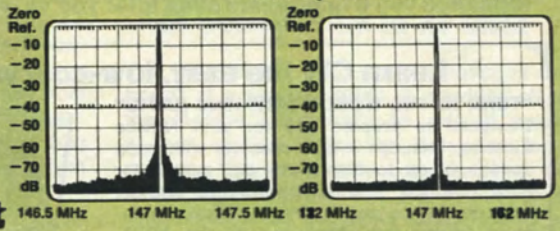
Shown with optional Micoder installed

The new Heathkit HW-2036 sets a value standard for synthesized 2-meter transceivers!

$269.95 with standard microphone



An 8-pole IF crystal filter greatly reduces adjacent channel interference.



Actual spectrum analyzer photos of the HW-2036 transmitter output operating at 147 MHz. Spurs within 20 MHz of carrier are down a full 70 dB!

New HW-2036 2-meter Transceiver with Frequency Synthesis and Built-in tone encoder

This is the new 2-meter transceiver you have been waiting for — combines state-of-the-art technology with operating ease, convenience and versatility in an easy to build kit that's priced at about HALF THE COST of other comparable synthesized transceivers! Compare the HW-2036's performance and specifications with any 2-meter transceiver at any price — and you'll be convinced!

The HW-2036 offers true digital frequency synthesis, the only way to go for real operating versatility. No extra crystals are needed, there are no channel limitations. Advanced digital technology uses a voltage-controlled oscillator (VCO) and a 10 MHz crystal time base. You control the frequency of the VCO with the front panel lever switches for fast, easy and precise frequency selection.

The front-panel lever switches select any frequency in any 2 MHz segment of the 143.5 to 148.5 MHz operating range. You select the last four digits, three with the lever switches which display the frequency directly, and the last with a 0/5 kHz miniature toggle switch. These lever switches are easier to use than conventional thumbwheels and the 5 kHz steps mean that ALL 2-meter frequencies in the band are available to you. And if you inadvertently dial up an out-of-band frequency, the transmitter will not key. Has LED status lights to warn that frequency synthesizer is not locked and indicate whether channel is in use.

The built-in continuous tone encoder, with three tones selectable on the front panel, lets you access most repeaters with the HW-2036. If you order the HW-2036 with Heathkit Micoder, you'll even be able to make telephone calls through repeaters equipped with auto-patch input. Has built-in simplex, + and − 600 kHz offsets, and an Aux. position that lets you add your own crystal for any other offset frequency you may want.

The HW-2036 puts out a minimum 10 watts. For even more output, you can use the HA-202 2-meter amplifier (see next page). And the HW-2036 operates into an infinite VSWR without failure! The transmitter output is extremely clean, with spurious output better than 70 dB below carrier (see spectrum analyzer photos above). True FM circuitry means you transmit and receive with outstanding audio quality, too.

Receiver sensitivity is an excellent 0.5 μV for 12 dB Sinad. An 8-pole IF crystal filter provides an ideally shaped receiver bandpass for outstanding adjacent channel rejection, and the HW-2036's excellent selectivity makes it ideal for use in crowded signal areas.

Has a Schmitt-Trigger squelch with a threshold of 0.3 μV or less, diode-protected dual-gate MOS FET's in the front end, IC IF and dual-conversion receiver. A big, built-in 2x6″ speaker provides excellent audio quality and there's a jack for an external speaker.

The HW-2036 is extremely compact for easy mounting in car or boat, and its convenient gimbal-mount (supplied) lets you remove it easily for storage or security. You can also use it as a fixed station transceiver with the HWA-2036-3 AC power supply, next page. Kit building is easy too, with just five printed circuit boards and a wiring harness. A built-in signal source lets you align the HW-2036's receiver section for maximum sensitivity using just the front panel meter (no signal generator is required). Total alignment requires a VTVM. A frequency counter with a range to 150 MHz is also recommended, but not necessary. You can order the HW-2036 with a standard PTT mike, or, for even greater convenience, add $30 and get our reg. $49.95 Micoder mike/auto patch encoder. We think the HW-2036 is one of the best 2-meter transceivers you can buy anywhere, add it to your operating equipment today.

Kit HW-2036-1, HW-2036 Transceiver with reg. $49.95 Heathkit Micoder microphone/auto patch encoder. Shpg. wt. 10 lbs. **299.95**

Kit HW-2036-2, HW-2036 Transceiver with standard push-to-talk microphone. Shpg. wt. 10 lbs. **269.95**

Order your HW-2036 with the Heathkit Micoder combination microphone, auto patch encoder and make telephone calls through repeaters equipped with auto patch input. See page 76 for complete description.

HW-2036 SPECIFICATIONS: Receiver: Sensitivity: 0.5 μV for 12 dB SINAD (or 15 dB of Quieting). **Squelch Threshold:** 0.3 μV or less. **Audio Output:** 1.5 watts at 10% T.H.D. typically 2 watts. (5 kHz deviation). **Image Rejection:** −45 dB or greater. **Spurious Rejection:** −50 dB or greater. **IF Rejection:** −80 dB or greater. **Internally Generated Spurious:** Below 1 μV equivalent. **Bandwidth:** 6 dB at 15 kHz min. and 60 dB at 30 kHz max. **Modulation Acceptance:** 7.5 kHz, min. **Transmitter: Power Output:** 10 watts min. at 25°C and 13.8 VDC, into a 50 Ω load. **Harmonic & Spurious Output:** −70 dB within 20 MHz of carrier; −50 dB elsewhere, −40 dB harmonics. **Modulation:** FM, 0 to 7.5 kHz, adjustable. **Duty Cycle:** 100% with infinite VSWR. **Tone Encoder:** 3 tones, 70 to 200 Hz, approx. ±700 kHz deviation. **Transmitter Offset:** 0 (simplex), −600 kHz, +600 kHz with crystals supplied. Provision for one additional offset crystal. **General: Frequency Coverage:** Any 2 MHz segment from 143.5 to 148.5 MHz. (Both receiver and transmitter must be aligned for the same 2 MHz segment.) **Frequency Increments:** 5 kHz. **Frequency Stability:** ±.0015%. **Operating Temperature Range:** 15° to 125° F. (−10° to 50° C). **Operating Voltage Range:** 12.6 to 16 VDC (13.8 VDC nominal). **Current Consumption:** RX: 700 mA max. squelched. TX: 2.6 A max. at 13.8 volts. **Dimensions:** 2¾″ high x 8¼″ wide x 9⅞″ deep. **Weight:** 6.25 lbs.

Order early for best selection! Phone (616) 982-3411 day or night.

40W 2-meter amplifier for HW-2036 and HW-202

Delivers solid 40W minimum for 10 watts in. Draws just 7A max. from your car battery. Has antenna changeover relay and sensing circuitry for completely automatic T/R switching, tuned input/output circuits provide low spurious radiation and allow coverage of any 1.5 MHz portion of the band. Special emitter ballasted configuration—withstands VSWR's of up to 3:1. Covers any 1.5 MHz portion of the 143-149 MHz band. Final alignment requires VTVM, wattmeter or SWR bridge. Mounts just about anywhere.

Kit HA-202, Shpg. wt. 4 lbs. **59.95**

HA-202 SPECIFICATIONS: **Power Output:** 20W @ 5W in. 30W @ 7.5W in. 40W @ 10W in. 50W @ 15W in. **Impedance:** 50 ohms nom. **Power Requirement:** 12-16 VDC, 7 A max. **Dimensions:** 3″ H x 4¼″ W x 5½″ D.

AC Power Supply for HW-2036 and HW-202

The 2036-3 supplies the necessary voltage and current to power your HW-2036 or HW-202 2-meter transceivers from a standard AC outlet for base station operation. Delivers 13.8 VDC (adjustable internally from approx. 10 to 15 VDC) at 2.7 amps with better than 1.0% regulation. Has 120/240 VAC wiring options, fused overload protection. With all cables for easy hookup and 3-wire line cord. Compact metal case sets up easily just about anywhere.

Kit HWA-2036-3, Shpg. wt. 7 lbs. . . **32.95**

HWA-2036-3 SPECIFICATIONS: **Output Voltage:** 13.8 VDC regulated (Adjustable internally from approx. 10 to 15 VDC). **Output Current:** 2.7 amps, intermittent, 20 minutes max. (1.8 amps continuous). **Regulation:** better than 1% from no load to full load. **Ripple:** better than 0.1% at 2.7 amps. **Transistor, IC and Diode Complement:** one 2N3055 Pass Transistor, one MPSU05 Driver Transistor, four IN4002 silicon diodes, one IN2071 silicon diode, one UA78GMT3C IC voltage regulator. **Power Requirements:** 110 to 130 VAC or 220 to 260 VAC, 60/50 Hz @ 80 watts full load. **Dimensions:** 3″ H x 7¼″ W x 10″ D (including switch and feet). **Net Weight:** 5 lbs.

Our low-priced 2-meter Transceiver

Optional Tone Burst Encoder shown installed

$179.95

Heathkit HW-202 — proven performance and outstanding value

Our HW-202 2-meter transceiver has become an industry standard with a reputation for excellent audio quality. And for the money, we don't think there's a better rig around. Just compare features and specifications.

Operates on any 2 MHz segment of the 143.9 to 148.3 MHz range with independent selection of 6 transmit and 6 receive channels. And all 12 crystals can be netted for optimum performance. The transmitter delivers a solid 10 watts minimum and will operate into an infinite VSWR without failure. Standard narrow band deviation adjustable up to 7.5 kHz with instant limiting.

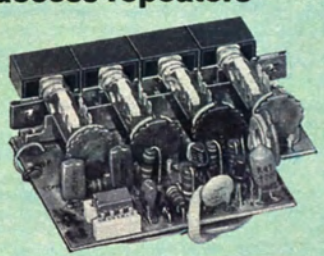
And the receiver is hot: 0.5 μV signal provides 15 dB of quieting... squelch threshold is 0.3 μV or less. Audio output to the built-in speaker is typically 2 watts at less than 3% harmonic distortion. Diode-protected dual gate MOSFETS in the front end... IC IF that limits at less than 10 μV... dual conversion... monolithic 4-pole 10.7 MHz crystal filter... built-in hash filter/voltage regulator to keep ignition noise out and maintain constant input voltage despite changing car system demand. Kit includes a set of crystals for 146.94 MHz to aid in tune-up and get you on the air quickly... cable for 12 V hook-up... heavy-duty alligator clips for use in a temporary installation. ...antenna coax jack...gimbal mounting bracket and a quick-release mobile mount so you can store it in the trunk when you leave the car. Get on 2 with maximum versatility and lowest cost with the HW-202. And check out the full line of accessories.

Kit HW-202, Shpg. wt. 10 lbs. **179.95**

HW-202 SPECIFICATIONS: **RECEIVER — Sensitivity:** 12 dB SINAD* (or 15 dB of quieting) at 0.5 μV or less. **Squelch threshold:** 0.3 μV or less. **Audio output:** 3 W at less than 10% total harmonic distortion (THD). **Operating frequency stability:** Better than ±.0015%. **Image rejection:** Greater than 45 dB. **Spurious rejection:** Greater than 60 dB. **IF rejection:** Greater than 80 dB. **First IF frequency:** 10.7 MHz ±2 kHz. **Second IF frequency:** 455 kHz (adjustable). **Receiver bandwidth:** 22 kHz nominal. **De-emphasis:** −6 dB per octave from 300 to 3000 Hz nominal. **Modulation acceptance:** 7.5 kHz minimum. **TRANSMITTER — Power output:** 10 watts minimum. **Spurious output:** Below −45 dB from carrier. **Stability:** Better than ±.0015%. **Oscillator frequency:** 6 MHz, approximately. **Multiplier factor:** X24. **Modulation:** Phase, adjustable 0-7.5 kHz, with instantaneous limiting. **Duty cycle:** 100%. **High VSWR shutdown:** None. **GENERAL — Speaker impedance:** 4 ohms. **Operating frequency range:** 143.9 to 148.3 MHz (will meet specifications ±1 MHz of alignment frequency within this range). **Current consumption:** Receiver (squelched): Less than 200 mA. Transmitter: Less than 2.2 amperes. **Operating temperature range:** −12° to 122°F (−25° to +50°C). **Operating voltage range:** 12.6 to 16.0 VDC (13.8 VDC nominal). **Dimensions:** 2.75″ H x 7.2″ W x 9.875″ D, excluding mount.

* *SINAD = $\frac{\text{Signal + noise + distortion}}{\text{Noise + distortion}}$

Optional Tone Burst Encoder to access repeaters



Add repeater versatility to your HW-202 **$26.95**

Accesses most closed repeaters for repeater association members, to give your 2-M rig more range and versatility. The four tone select buttons can be pre-set between 1800 Hz and 2500 Hz with bursts adjustable from 0.25 second to continuous. Frequency stability is ±1% from −30 to +50°C. Placing all buttons in "out" position removes encoder from circuit. All components mount on single circuit board which mounts behind the HW-202's removable bezel.

Kit HWA-202-2, Shpg. wt. 1 lb. **26.95**

HW-202 Crystal Certificates

We send certificates to you postpaid. You mail the certificate to the manufacturer and receive the crystals postpaid by return mail.

HWA-202-6, one Transmit Crystal Certificate, postpaid **5.95**

HWA-202-7, one Receive Crystal Certificate, postpaid **5.95**

Order early for best selection! Phone (616) 982-3411 day or night.

The versatile Heathkit MICODER™

Combination mobile microphone/auto patch encoder

An exciting break-through in Two-Meter operating convenience and versatility!

$49.95

- ***Electret condenser microphone***
- ***Compatible auto patch encoder***
- ***Self-powered — use with any high-impedance mike input — NO rewiring***

Now you can replace your old microphone with the new Heathkit Micoder — a real advance in Ham radio versatility and value. It combines a quality electret condenser microphone with a reliable auto patch encoder in a single, compact hand-held unit ideal for any mobile use. It eliminates the messy "haywire" hookups you get when you use separate pads and mikes; and it's priced at little more than a separate mike or pad alone!

The microphone section features excellent audio characteristics with 300-3000 Hz response for clean voice transmission. Has up to 30 mV rms maximum output for full modulation, push-to-talk bar for convenient one-hand use.

The auto patch encoder generates highly accurate and stable tones for making phone calls through repeaters equipped for auto patch input. It has easy-to-use telephone-type keyboard, adjustable tone level for use with most any transceivers.

The Micoder is completely self-contained and operates on its own 9-volt battery (not supplied). It is especially recommended for use with the Heathkit HW-202 2 meter transceiver, but it can be used with ANY transceiver with a high-impedance input.

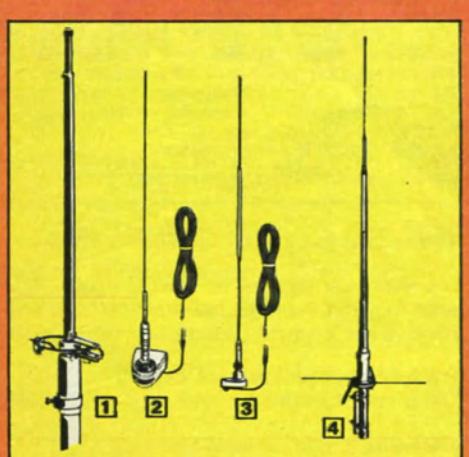
The unit measures just 3¾″ H x 2⅝″ W x 1¾″ D. Its rugged case and single PC board construction make it an easy-to-build kit you'll enjoy using for years to come. With 6 ft. coiled microphone cable, hanger clip. Alignment requires a frequency counter or decoding at repeater station.

Kit HD-1982, Shpg. wt. 2 lbs. **49.95**

HD-1982 SPECIFICATIONS

Operating Voltage: 9.0 VDC. **Current Consumption:** 12 mA. **Battery Life:** Approx. 6 months. **Microphone Type:** electret condenser. **Output Level:** 30 mV rms maximum. **Frequency Response:** 300-3000 Hz. **Output Impedance:** 10k min. **Encoder Frequency Tolerance:** ±1.5%. **Total Encoder Distortion:** less than 5% (harmonic plus IM). **Dimensions:** 3¾″ H x 2⅝″ W x 1¾″ D. **Weight:** 9 oz. (including battery).

Quality base and mobile 2-Meter Antennas really help improve reception



1 Standard gain fixed station 2-M omnidirectional. 3.75 dB gain (reference ¼ wave whip). Low angle of radiation with 1-1 SWR. 135-175 MHz, 100 watts power handling. 0.21 sq. ft. wind area. 52 ohm feed with PL-259 connector. Mounts to 1¼″ masts. Less coax. Preassembled.
HWA-202-11, Shpg. wt. 2 lbs. **17.95**

2 Standard gain mobile 2-M antenna. ⅝″ wavelength rear deck whip. 3.4 dB gain over ¼-wave vertical. SWR: typically 1.1.1 at resonance. 100 watts, 47″ stainless steel radiator. 17′ RG-58-U coax, connectors.
HWA-202-3, Shpg. wt. 2 lbs. **19.95**

3 Super gain mobile 2-M colinear antenna. Phased ¼ and ⅝ wave radiators. 5.2 dB gain over ¼ wave vertical. 180° swivel ball. 200 watts; 6 MHz bandwidth; 1.5:1 or better SWR. Typical SWR at resonance, 1.1:1. Height, antenna & mount, 85″. Removable stainless steel elements. 17′ RG-58-U coax, connectors.
HWA-202-9, Shpg. wt. 3 lbs. **37.95**

4 Super gain fixed station 2-M colinear. 6 dB gain from two ⅝ wave colinear radiators with ¼ wave phasing. 140-150 MHz, field adjustable. 6 MHz bandwidth for 2:1 or better SWR. Resonance SWR, 1.2:1 at antenna. 1000 watts for repeater, fixed station. Shunt fed with DC grounding. SO-239 connector. Alum. vertical element 117″ long. 4 radials; 21″ alum. rod. Wind load, 26 lbs. at 100 mph; wind survival, 100 mph. For 1¾″ mast. Less coax.
HWA-202-10, Shpg. wt. 7 lbs. **49.95**

Read all about 2-Meter Repeaters

2-Meter FM Repeater Circuits Handbook — a comprehensive guide to repeaters, antennas, transmitters, receivers, and much more. **EDP-114 ....6.95**

See page 52 for book ordering information.

Order early for best selection! Phone (616) 982-3411 day or night.

Your best value in a go-anywhere 2-M rig

1 watt out, 5 receive and 5 transmit channels plus repeater offset — PLUS valuable accessories at no extra cost!

Select any of 5 channels, adjust volume and squelch with convenient top-mounted controls.

Includes rechargeable nickel-cadmium battery pack and AC charger.

Flexible "rubber duckie" antenna, matched to transceiver is included, plus jack for external antenna.

Optional vinyl case, Auto-Patch Encoder for phone calls through repeaters with auto-patch input.

$169.95

Optional Auto-Patch Encoder Shown Installed

Super-Value HW-2021 Handheld 2-Meter Transceiver

Compare features, compare specs and you'll be convinced — the HW-2021 is the best handheld 2-meter rig around. A single crystal controls both transmit and receive. The simplex/offset switch selects —600 kHz or simplex crystals (included) to give you two transmit frequencies for each crystal you buy. Or, substitute your own crystals for any two offset frequencies desired. We include a 146.94 MHz crystal with the HW-2021 to get you on the air in a hurry. Transmitter output is one watt minimum with 0.005% or better stability. FM circuitry and a separate microphone contribute to better audio. The optional HWA-2021-3 encoder gives you access to telephone lines through repeaters with auto-patch input — adds telephone versatility at remarkably low cost. Pulse-type battery saver circuit extends battery life by about 75% in the standby/receive mode. The rechargeable battery pack operates the HW-2021 for approximately 10 hours on one charge. The battery charger recharges the batteries fully in about 16 hours. Compact and rugged, with textured black high-impact case. Weighs just 2 lbs. including batteries. Not recommended for beginning kit builders due to its compactness. Requires small 25-watt soldering iron such as Weller W-PS for construction, and VOM or VTVM for alignment. Order additional crystals at right.

Kit HW-2021, Shpg. wt. 4 lbs. **169.95**

HWA-2021-2, Carrying Case and Strap, Shpg. wt. 1 lb. **12.95**

HW-2021 SPECIFICATIONS

RECEIVER — Sensitivity: 0.5 µV for 12 dB SINAD; 0.75 µV for 20 dB quieting. **Squelch Threshold:** .3 µV or less. **Audio Output:** .5 watts at less than 10% THD. **Image Rejection:** Greater than —45 dB. **IF Frequency:** 10.7 MHz. **Modulation Acceptance:** ±7 kHz minimum. **TRANSMITTER — Power Output:** 1 watt minimum. **Oscillator Frequency:** Approximately 15 MHz. **Multiplier Factor:** x9. **Modulation:** Frequency (with limiting). **GENERAL — Speaker Impedance:** 8Ω. **Operating Frequency Range:** 143.9 to 148.3 MHz (unit will meet specifications ±1 MHz from alignment frequency within this range). **Operating Temperature Range:** +10° to +120° F (—12° to +47° C). **Operating Voltage:** 12 VDC nominal. **Size (overall):** 9¼" x 1⅞" x 3¼". **Weight (including batteries):** 2 lbs.

Auto-Patch Encoder

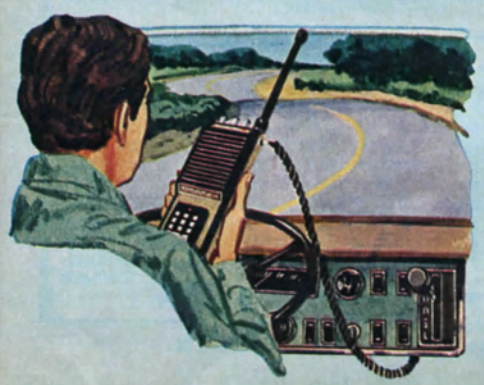
Places telephone calls through repeaters with auto-patch input — can even be used for repeater control. 12 digit keyboard with LED keying light and 2-sided epoxy board. Designed for HW-2021 but can be used in other rigs with high impedance inputs.

Kit HWA-2021-3, Shpg. wt. 1 lb. **39.95**

Crystal Certificates for HW-2021

Crystals designed to exacting Heath standards assure optimum performance from your HW-2021. A certificate will be sent to you postpaid. You specify frequency, mail the certificate to the manufacturer and get the crystals postpaid by return mail.

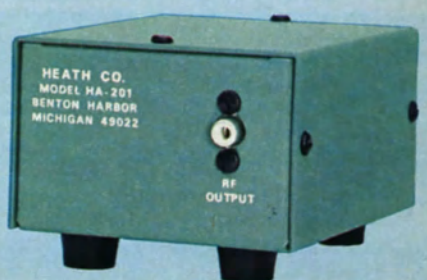
HWA-2021-4 . . . . . **6.95**



2-Meter Amplifier boosts the power of your handheld

For anyone who wants extra output at low cost, the HA-201 delivers up to 10 watts for a 1½ watt input, 8 watts for a 1 watt input — ideal for use with the HW-2021 above. Features fully automatic operation, solid-state transmit/receive switching, tuned input and output for maximum efficiency and reduced spurious emissions. *Withstands infinite VSWR load without failure.* Includes dummy load and RF detector. Easy 1 to 2 hour assembly. VTVM needed for tuneup. Operates from 12-16 VDC. (HWA-202-1 or car battery).

Kit HA-201, Shpg. wt. 3 lbs. **27.95**



Charge-A-Kit — no money down on any kit — see page 54 for details.

Heathkit 104 series SSB Transceivers...

Completely broadbanded — Instant QSY — no preset, load or tune controls!

Heathkit SB-104 Amateur Transceiver

Totally broadbanded, completely solid-state, with true digital frequency readout and much more. Operates USB, LSB or CW — you can go from CW on the low end of 80 to USB on the high end of 10 in seconds — and with perfect tune! Just choose the band, select mode and go; no more preselector, loading or tuning controls. True digital readout with 6 electronic digits provides resolution down to 100 Hz on all bands. Digital circuitry takes into account all three frequencies: VFO, HFO and BFO — you don't even need a calibrator.

Transmitter delivers 100 watts output; or QRP'ers can flick the switch for instant 1-watt output. The four final transistors are protected against high SWR and thermal runaway. Puts out a clear, strong signal with low harmonic and spurious radiation, third-order distortion down 30 dB or better. Has 15 MHz WWV position on the bandswitch, tune button for loading linears, PTT mike jack, pushbutton 100 Hz blanking. ALC/relative power/S-meter, switchable VOX with gain and delay, much more. Two wiring harnesses eliminate most point-to-point wiring. Alignment requires only a dummy load, mike and VTVM. Operates from 12V auto electrical system. For fixed station, hook up the HP-1144 Power Supply (below).

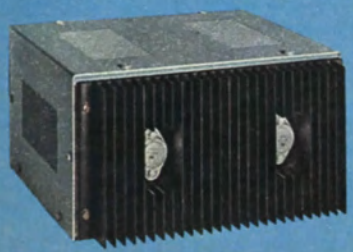
Kit SB-104, Shpg. wt. 31 lbs. **669.95**
Kit SBA-104-1, Noise blanker, Shpg. wt. 1 lb. **26.95**
Kit SBA-104-2, Mobile mount, Shpg. wt. 5 lbs. **36.95**
Kit SBA-104-3, 400 Hz CW crystal filter, Shpg. wt. 1 lb. **39.95**

Station Speaker. Designed to match the SB-104 Transceiver. Cabinet is large enough to house the HP-1144 AC Power Supply, too. 5″ x 7″ oval speaker (3.2 ohm with 3.16-oz. magnet) is response-tailored for SSB. Frequency response: 300-3000 Hz. Connector plug and cable are included. Dimensions: 7⅛″ H x 10⅛″ W x 14″ D.

Kit SB-604, Shpg. wt. 8 lbs. **34.95**

SB-104 SPECIFICATIONS

Frequency Coverage: 3.5 MHz through 29.7 MHz amateur bands, 15 MHz WWV receive only. **Frequency Stability:** Less than 100 Hz/hr drift after 30-min. warm-up; less than 100 Hz drift for ±10% change in primary voltage. **Readout Accuracy:** Within ±200 Hz ±1 count. **Dial Backlash:** 50 Hz max. **Phone Patch Impedance:** 4 ohm output to speaker; high impedance to transmitter. **TRANSMITTER — RF Power Output: High Power** (50-ohm non-reactive load). **SSB:** 100 watts PEP ±1 dB; **CW:** 100 watts ±1 dB. **Low Power SSB:** 1 watt PEP (minimum); **CW:** 1 watt (min.). **Output Impedance:** 50 ohms, less than 2:1 SWR. **Carrier Suppression and Unwanted Sideband Suppression:** −50 dB down from 100 watt single-tone output at 1000 Hz reference. **Harmonic Radiation:** 40 dB below 100 watt output. **Spurious Radiation:** −40 dB within ±4 MHz of carrier; −60 dB farther than ±4 MHz. **Microphone Input:** High impedance, −45 to −55 dB; approx. 22k ohms. **RECEIVER — Sensitivity:** 1 μV for 10 dB S+N/N for SSB. **Selectivity:** 2.1 kHz minimum at −6 dB, 5 kHz max. at −60 dB. (2:1 nominal shape factor). **CW Selectivity:** (with accessory CW filter) 400 Hz at −6 dB, 2 kHz max. at −60 dB. **Audio Output:** 2.5 watts into 4 ohms, 1.25 watts into 8 ohms, less than 10% THD. 4-8 ohm headphones. **AGC:** Less than 1 millisecond attack time; switch selectable 100 msec and 1 sec. release, and OFF. **IM Distortion:** −65 dB min.; −57 dB typ. with noise blanker. **Image Rejection:** −60 dB min. **Dimensions:** 5¾″ H x 14 15/32″ W x 13⅞″ D.



Fixed Station Power Supply

120 or 240 VAC operated supply provides 13.8 VDC required by SB-104 Transceiver. Full-wave bridge circuit has triple Darlington regulation with an IC which samples at the transceiver, compares and automatically maintains a fixed voltage — almost no change in voltage from no load to full load. Mounts inside SB-604 speaker cabinet.

Kit HP-1144, Shpg. wt. 27 lbs. **89.95**

HP-1144 SPECIFICATIONS

Output Voltage: 13.8 VDC regulated (adjustable from approximately 11 to 16 VDC). **Maximum Output Current:** 20 amperes, intermittent. 8 amps continuous. **Power Requirement:** 110 to 130 VAC @ 6A or 220 to 260 VAC @ 3A, 50/60 Hz maximum. **Regulation:** Less than 2% output voltage variation from no load to 20 amperes. **Ripple:** Less than 1% at 20 amperes. **Fuses:** 7-amp, 3AG, slow-blow primary. 20-amp, 3AG, output. **Dimensions:** 5½″ H x 9¼″ W x 10¼″ D. **Net Weight:** 23 lbs.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Digital or Dial, they're your BEST for the money!

Completely solid-state design — including the finals!

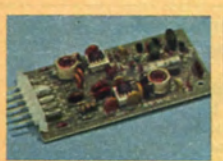
SB and HW-104 Features to please any Ham

All solid-state...including the finals. Output warranted for one year.

Built-in 100 kHz & 25 kHz calibrator. Keeps your dial scale accurate to 2 kHz.

Optional noise blanker for up to 50 dB effective blanking.

Completely broadbanded. No tuning from 80-10 meters... instant QSY.



Circuit board construction. 7 major boards can extend for adjustment.

Complete back-panel connections. Full access in & out.

Heathkit HW-104 SSB 5-Band Transceiver — now more hams than ever can afford broadband design

Instant QSY! Choose the band, frequency and mode (USB, LSB or CW) and it stays tuned — without preselector, load or tuning controls. Delivers a clean signal at 100 watts, or in the 1-watt low-power position. At 100 watts, third order distortion is down 30 dB, carrier and unwanted sideband suppression down 55 dB. Reception is super clear, thanks to the broadband design that minimizes cross-modulation and intermodulation. Sensitivity is less than 1 μV. Has a 4-pole crystal filter, CW sidetone, and VOX provision. For convenience, there's a 15 MHz WWV receive position on bandswitch and "pull-to-calibrate" position on the RF control.

The smooth action dial covers 3.5 MHz to 29.0 MHz with 15 kHz per knob revolution. The VFO is the same basic circuitry as the SB-104, with less than 100 Hz/hour drift after warmup. Want the top end of 10 meters? Just add the HWA-104-1 accessory.

Assembly is clean and precise. All you need for alignment are a dummy load, microphone and VTVM. And you can add the matching SB-614 Station Monitor and SB-634 Console (see page 64) to your HW-104 rig, too. Requires 13.8 VDC power; for fixed station use, order HP-1144 supply (described on preceding page).

Kit HW-104, Shpg. wt. 29 lbs. **489.95**
Kit HP-1144, AC power supply, Shpg. wt. 27 lbs. **89.95**
Kit HS-1661, Matching speaker (shown above), Shpg. wt. 5 lbs. **19.95**
Kit HWA-104-1, 10-meter accessory (coverage to 29.7 MHz), Shpg. wt. 1 lb. **16.95**
SBA-104-1, Noise blanker, Shpg. wt. 1 lb. **26.95**
SBA-104-2, Mobile mount, Shpg. wt. 5 lbs. **36.95**
SBA-104-3, 400 Hz CW crystal filter, Shpg. wt. 1 lb. **39.95**

HW-104 SPECIFICATIONS

Frequency Coverage: 3.5 MHz through 29.0 MHz — (to 29.7 MHz with optional 10M accessory). **Frequency Stability:** less than 100 Hz/hour drift after 30-min. warmup. **Dial Accuracy:** Within 2 kHz after calibration at nearest 100 kHz marker. **Tuning Backlash:** 50 Hz or less. **Phone Patch:** 4-ohm output to speaker, high impedance to transmitter. **TRANSMITTER — RF Power Output: High Power** (50-ohm nonreactive load). SSB: 100 watts PEP ±1 dB, CW: 100 watts ±1 dB. **Low Power:** 1 watt (minimum). **Output Impedance:** 50 ohms; less than 2:1 SWR. **Harmonic Radiation:** 40 dB below 100 watt output. **Spurious Radiation:** −40 dB within ±4 MHz of carrier, −60 dB greater than ±3 MHz from carrier. **Mike Input:** High impedance, −45 to −55 dB. **RECEIVER — Sensitivity:** 1 μV for 10 dB S+N/N for SSB. **Selectivity:** 2.1 kHz min. at 6 dB down, 7 kHz max. at 60 dB down. **Overall Gain:** Less than 1 μV for 0.5 watt output. **Audio Output:** 2.5 watts into 4 ohms, 1.25 watts into 8 ohms, at less than 10% THD. **AGC:** Less than 1 msec attack; selectable 100 μsec and 1 sec. release. **IM Distortion:** −60 dB. **Image/IF Rejection:** −60 dB. **Power Requirement:** 13.8 VDC nominal (max. 16 VDC) at: Receive, 2 amps; Transmit, low power, 3 amps; Transmit, high power, 20 amps. **Dimensions:** 5¾" H x 14$^{13}/_{32}$" W x 13⅞" D.

Versatile Station Accessories for the 104's

SB-644 Remote VFO

Designed exclusively for use with the SB-104. Provides split transmit/receive capability without a separate transmitter and receiver. Multi-mode capability allows transceive operation on either the "644" or the "104." Use either of the two crystal positions in the "644" for fixed-frequency control. "644" tuning scale gets you into the right frequency area, exact frequency readout takes place in the "104." Switch from transmit to receive and the display automatically changes to the correct frequency. Uses the same kit VFO as the SB-104. Requires no modifications to "104."

Kit SB-644, Shpg. wt. 10 lbs. **119.95**

SB-644 SPECIFICATIONS

Frequency Coverage: 5.0–5.5 MHz allowing 80, 40, 20, 15, 10 meter operation in the SB-104. **Frequency Stability:** Less than 100 Hz drift per hour after thirty minute warmup. **Modes of Operation:** Remote VFO Main VFO; Receive Remote/Transmit Main; Receive Main/Transmit Remote; Crystal frequencies (2) (crystals not supplied). **Dial Backlash:** 100 Hz max. **Power Requirement:** 11V and 13.6V at 500 mA supplied by SB-104. **RF Output:** 0.34 to 0.4V RMS over 5 to 5.5 MHz into a 5 ohm load. **Dimensions:** 7¼" H x 10¼" W x 15¼" D. **Net Weight:** 6½ lbs.

SB-614 Station Monitor

Monitors transmitted SSB, CW, & AM signals up to 1 kW from 80-6 meters. Shows nonlinearity, insufficient or excessive drive, poor carrier or sideband suppression, regeneration, parasitics and key clicks. Manual includes 40 CRT displays and explanations. Solid-state circuit, easy-to-build with a circuit board and wiring harness to simplify assembly.

Kit SB-614, Shpg. wt. 17 lbs. **159.95**

SB-614 SPECIFICATIONS

RF SAMPLING SECTION: Power Limits: Exciter input (50 –75 ohm) 10 to 300 watts; Antenna input (50 –75 ohm) 10 to 1000 watts. **Insertion Loss:** Negligible. **VERTICAL AMPLIFIER:** Input Impedance: 1 Megohm shunted by 75 pf. **Sensitivity:** 60 mV rms/¼" vertical deflection. **Attenuator:** 2-position; x1, 2 volts rms max. input; x10, 20 volts rms max. input. **HORIZONTAL AMPLIFIER: Input Impedance:** 1 Megohm shunted by 50 pf. **Sensitivity:** 50 mV rms/¼" horizontal deflection. **SWEEP GENERATION: Type:** Recurrent, automatic sync. **Frequency Range:** 10 Hz to 10 kHz in three ranges. **GENERAL: Graticule:** .250 inch squares 6 x 8 (1.5 x 2.0 inches total viewing area). **Power Requirement:** 110-130 or 220-260 VAC, 60/50 Hz. **DIMENSIONS:** 7¼" H x 10¼" W x 15¼" D. **Net Weight:** 12 lbs.

SB-634 Five-function Console

Adds real operating versatility to your station! Provides five of the necessary station functions every amateur needs. 24-hour digital clock; ten-minute ID timer; RF wattmeter with 200 or 2000 watt full scale ranges; SWR bridge with sensitivity control; phone patch that can be used manually or with VOX control.

Kit SB-634, Shpg. wt. 13 lbs. **179.95**

SB-634 SPECIFICATIONS

CLOCK — Display: Six digits. **Time Base:** 24 hours. **TIMER — Display:** Three full digits. **Time Interval:** 10 minutes with automatic reset. Manual reset at any portion of 10-minute period. **Signal:** Visual only or both visual and aural. **RF POWER/SWR METER — Frequency Range:** 1.8 to 30 MHz. **Wattmeter Accuracy:** ±10% of full-scale reading. **Power Handling Capability:** 2000 watts (maximum). **SWR Sensitivity:** Less than 10 watts. **Impedance:** 50 ohm nominal. **Connectors:** UHF type SO-239. **PHONE PATCH — Circuit:** Telephone hybrid for VOX or manual operation. **TELEPHONE LINES — Input Impedance:** Approximately 600 ohm. **Null Depth:** At least 30 dB isolation between transmit and receive circuits. **Power Requirement:** 120/240 VAC, 60/50 Hz, 15 watts. **DIMENSIONS:** 7¼" H x 10¼" W x 15¼" D. **Net Weight:** 10 lbs.

The business end of the SB-230 — a conduction-cooled triode final and efficient heat sink. No blower needed.

SB-230 1kW Conduction-Cooled Linear

The lowest cost conduction-cooled linear on the market. Uses a husky Eimac 8873 triode in proven, stable, grounded grid circuitry to deliver up to 1200 watts PEP SSB, 1000 watts CW input from less than 100 watts drive. It's also rated at 400 watts input for slow-scan TV and RTTY. And the final is completely enclosed in a double-shielded compartment. Bandswitching is done with a single knob... Load and Tune controls are clearly marked so *you can return* to a favorite operating frequency just by noting the control positions. A five-position switch, coupled with the backlighted meter, indicates Relative Power, Plate current, Grid current and plate High Voltage at a glance. Relative Power sensitivity is adjustable with the front panel knob.

Built-in safety features include microswitch interlocks on both the top and bottom to shut down primary power when cabinet shells are removed; a temperature monitored heat sink that shuts down the unit if temperature goes too high. Built-in delay circuit allows sufficient tube warmup. An Exciter light indicates the linear is running straight through, without amplification. The On-Off switch includes a circuit breaker for the primary side of the power transformer. And the cathode of the tube is fused.

Kit SB-230, Shpg. wt. 40 lbs. **369.95**

SB-230 SPECIFICATIONS

Band Coverage: 80, 40, 20, 15 and 10 meter. **Duty Cycle: SSB:** continuous voice modulation; **CW:** continuous (max. key-down time 30 seconds); **RTTY/SSTV:** 50% (max. transmit time 10 minutes at 400 watts). **Driving Power Required:** less than 100 W. **Third Order Distortion:** –30 dB or better. **Output Impedance:** 50 ohms at 2:1 SWR max. **Input Impedance:** 52 ohms at 1.5:1 SWR max. **Zero Signal Plate Current:** 25 mA. **Power Requirement:** 120 VAC, 50/60 Hz, 14 A max. or 240 VAC, 50/60 Hz, 7 A max. **Dimensions:** 14¾" W x 16" D x 7" H. **Net Weight:** 33½ lbs.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Heathkit Linears — Packed with Power and Features

1 The Heathkit SB-200 has a 1 kW kick that's great for SSB

$329.95

2 Put full 2 kW power in your station with the Heathkit SB-220

$469.95

1 Heathkit SB-200 1 kW Linear Amplifier

- **Complete 80 through 10 meter band coverage**
- **Fully shielded, fan-cooled amplifier compartment**
- **Circuit-breaker power supply protection**

Delivers a full 1200 watts PEP input, 1 kW on CW. Requires only 100 watts drive, so it's ideal for use with most any popular transmitter or transceiver. And the SB-200 has the features you need for top performance.

The heavy-duty final amplifier tubes are fan-cooled for maximum tube life and completely shielded for excellent TVI protection. A pre-tuned cathode-input circuit provides maximum efficiency and low distortion. The ALC output provides automatic exciter control.

Has a built-in solid-state power supply with circuit breaker protection. The switchable front panel meter shows SWR, grid current, plate current, relative power and plate voltage. For extra operating convenience, an antenna relay automatically switches the antenna to the exciter input when the SB-200 is "off".

The sturdy yet lightweight construction of the SB-200 is achieved by using a heavy-gauge one-piece aluminum chassis that is partitioned for extra strength and isolation of components. The SB-200's clean, open chassis layout assures easy assembly.

Kit SB-200, Shpg. wt. 45 lbs. **329.95**

SB-200 SPECIFICATIONS

Band coverage: 80, 40, 20, 15 & 10 meters. **Maximum power input:** 1200 watts P.E.P. SSB, 1000 watts CW. **Driving power required:** 100 watts. **Duty cycle:** SSB, continuous voice modulation; CW, 50% (key down time not to exceed 5 min.). **Third order distortion:** −30 db or better at 1000 watts P.E.P. **Output impedance:** 50 to 75 ohm unbalanced; variable pi-output circuit. SWR not to exceed 2:1. **Input impedance:** 52 ohm unbalanced; broad-band pretuned input circuit requires no tuning. **Meter functions:** 0-100 ma grid current, 0-1000 ma plate current, 0-1000 relative power, 1:1 to 3:1 SWR, 1500 to 3000 volts high voltage. **Front panel controls:** Load; Tune; Band; Relative Power Sensitivity; Meter Switch, Grid-Plate-Rel. Power-SWR-HV; and Power Switch, on/off. **Tube complement:** Two 572B/T-160-L (in parallel). **Power requirement:** 120 volts AC @ 16 amperes (max.), 240 volts AC @ 8 amperes (max.). **Cabinet size:** 14⅞" W x 6⅝" H x 13⅜" D. **Net weight:** 35 lbs.

2 Heathkit SB-220 2 kW Linear Amplifier

- **High-efficiency pre-tuned broadband pi-input**
- **Zener-diode regulated power supply**
- **Front-panel current and voltage meters**

The one that's making Amateur Radio history because it offers more features and performance for the price! Uses a pair of conservatively-rated Eimac 3-500Z's to deliver up to 2000 watts PEP SSB input. It can be loaded to a full 1 kW on both CW and RTTY. A broadband pre-tuned pi-input delivers maximum efficiency with low distortion over the complete 80-10 meter bands. And it requires just 100 watts drive!

Tune-up couldn't be easier! Just set the band-switch, set the CW-tune/SSB rocker switch to CW-tune position, adjust tune and load controls for maximum relative power. Push the switch back to SSB and you're "on" with up to a full 2 kW input! And you've got up to a full 1000 watts on CW or RTTY.

The power supply can be wired for 120 or 240 volts. Zener diode regulated operating bias reduces idling current for cooler running and extended tube life. There's built-in circuit breaker protection and a large, quiet-running fan. Other features include ALC to prevent overdriving, front-panel switch-selected monitoring of grid current, relative power and high voltage. Kit assembly is easy and enjoyable, too.

Kit SB-220, Shpg. wt. 64 lbs. **469.95**

SB-220 SPECIFICATIONS

Band coverage: 80, 40, 20, 15 and 10 meters. **Driving power:** 100 W. **Max. power input:** SSB, 2000 W. PEP; CW, 1000 W.; RTTY, 1000 W. **Duty cycle:** SSB, Continuous voice modulation. CW, Continuous (maximum key-down 10 minutes). RTTY, 50% (maximum transmit time 10 minutes). **Third order distortion:** −30 dB or better. **Input impedance:** 52 ohm unbalanced. **Output impedance:** 50 ohm unbalanced; SWR 2:1 or less. **Front panel controls:** Tune, Load, Band, Sensitivity Meter Switch, Power, CW/Tune — SSB, Plate meter, Multi-meter (Grid mA, Relative Power and High Voltage). **Rear panel:** Line cord, circuit breakers (two 10 A). Antenna Relay (phono). ALC (phono). RF Input (SO-239). Ground post. RF Output (SO-239). **Tubes:** Two Eimac 3-500Z. **Power requirement:** 120 VAC, 50/60 Hz at 20 amp. max. 240 VAC, 50/60 Hz, at 10 amp. max. **Cabinet size:** 8¼" H x 14⅞" W x 14½" D.

Find out how easy it is to build a kit — order the manual. See page 53.

Heathkit HW-101 Deluxe 5-Band Transceiver

Heathkit HW-101 Deluxe 5-Band Transceiver

$339.95 ***Its price/performance ratio makes the HW-101 an exceptional value in amateur radio***

The HW-101 is a 5-band SSB/CW transceiver with the features you NEED for operating ease, convenience and versatility. Provides 180 watts input PEP, 170 watts CW. Features 0.35 μV sensitivity, a high stability FET VFO; both PTT (push-to-talk) and VOX (voice-operated transmit) operation. A crystal-controlled heterodyne oscillator assures accurate, stable operation. Triple action level control prevents overdriving the finals.

A built-in crystal calibrator lets you accurately calibrate the HW-101 at 100 kHz intervals. Smooth dial drive with 36-1 ratio and an extra-large tuning knob provide back-lash free tuning. The front panel meter shows signal strength on receive, ALC voltage on transmit, and switches to read relative power output or final amplifier cathode current.

The well-designed hybrid circuit uses 20 tubes and 19 semi-conductors. Kit assembly is easy, with an open chassis layout, uncrowded circuit boards and a color-coded wiring harness. Special "Switch Boards" with built-in wafer switches help eliminate intricate switch wiring to greatly simplify assembly. Buy and build the HW-101 — join the thousands of Hams who've found you can't beat it.

Kit HW-101, Shpg. wt. 22 lbs. **339.95**

SBA-301-2, 400 Hz CW crystal filter, Shpg. wt. 1 lb. **29.95**

HW-101 SPECIFICATIONS

RECEIVER: Sensitivity: <0.35 μV for 10 dB S+N/N for SSB operation. **SSB selectivity:** 2.1 kHz min. @ 6 dB down; 7 kHz max. @ 60 dB down (3.395 MHz filter). **CW selectivity:** (optional SBA-301-2 CW crystal filter); 400 Hz min. @ 6 dB down; 2.0 kHz max. @ 60 dB down. **Input:** Low impedance for unbalanced coaxial input. **Output impedance:** 8 ohm speaker, and high impedance headphone. **Power output:** 2 watts with <10% distortion. **Spurious response:** Image and IF rejection >50 dB. **TRANSMITTER: DC power input:** SSB 180 watt PEP (normal voice, continuous duty cycle). CW 170 watts (50% duty cycle). **RF power output:** 100 watts on 80 through 15 meters; 80 watts on 10 meters (50 ohm non-reactive load). **Output impedance:** 50 ohm to 75 ohm with <2:1 SWR. **Oscillator feed-through or mixer products:** 45 dB below rated output: **Harmonic radiation:** 35 dB below rated output. **Transmit-receive operation: SSB:** PTT or VOX. **CW:** Provided by operating VOX from a keyed tone, using grid-block keying. **CW sidetone:** Internally switched to speaker or headphone in CW mode. Approx. 1000 Hz tone. **Microphone input:** High impedance with a rating of −45 to −55 dB. **Carrier suppression:** 45 dB down from single-tone output. **Unwanted sideband suppression:** 45 dB down from single-tone output at 1000 Hz reference. **Third order distortion:** 30 dB from two-tone output. **RF compression (TALC*):** >10 dB at .1 mA final grid current. **GENERAL: Frequency coverage:** 80-10 M amateur bands. **Frequency stability:** <100 hertz per hour drift after 45 minutes warmup from normal ambient conditions. <100 Hz for ±10% line voltage variations. **Modes of operation:** Selectable upper or lower sideband (suppressed carrier) and CW. **Dial calibration:** 5 kHz. **Calibration:** 100 kHz crystal. **Audio frequency response:** 350 to 2450 Hz. **Power requirements:** 700 to 850 volts at 250 mA with 1% maximum ripple; 300 volts at 150 mA with .05% maximum ripple; −115 volts at 10 mA with .5% maximum ripple; 12 volts AC/DC at 4.76 amps. (see fixed & mobile power supplies below). **Cabinet dimensions:** 6 5/16" H x 14 7/16" W x 13 3/8" D.

*Triple Action Level Control.

Deluxe Heathkit HP-23B Fixed Station AC Power Supply

$57.95 ***Provides fixed station operation for the HW-101 above, also can be used with other Heathkit SSB Transceiver, many others as well***

Provides the operating voltages needed for fixed station transceiver use — high voltage, two low voltages, fixed bias, 12.6 volt filament. The improved HP-23B now features a higher voltage rating on B+ filter capacitors; improved filtering on bias voltage; fixed bias voltage, and heavier filament wires in the power cable. Now the popular Heathkit power supply is better than ever.

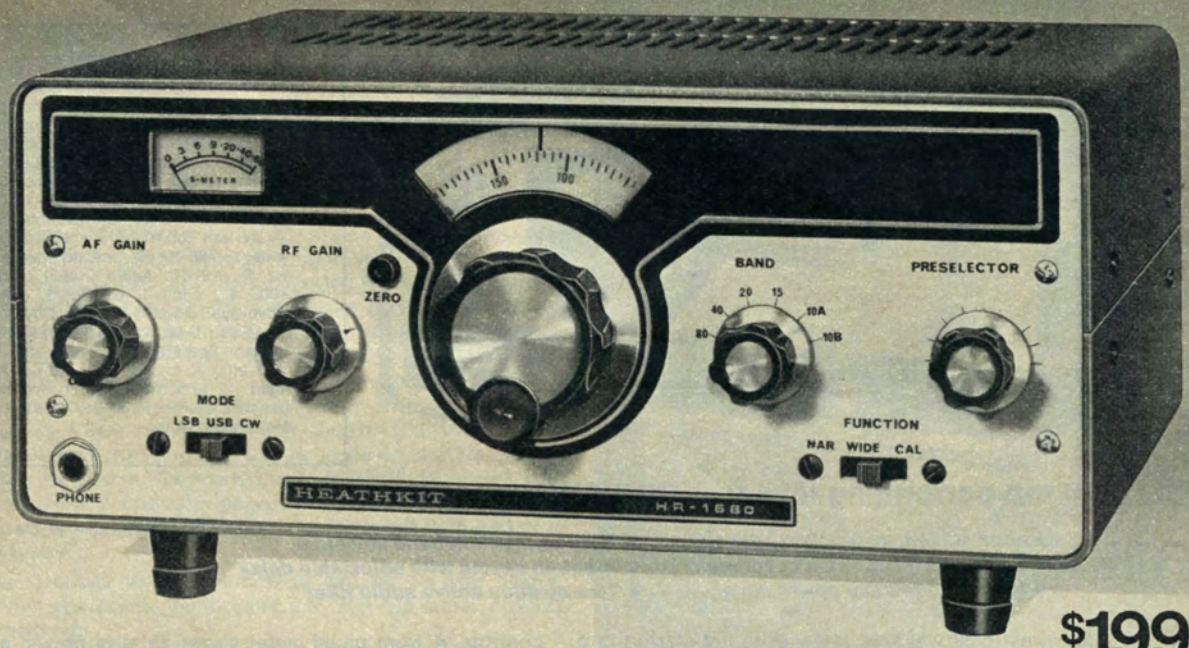
Kit HP-23B, Shpg. wt. 18 lbs. **57.95**

HP-23B SPECIFICATIONS

Power requirements: 120/240 VAC, 60/50 Hz, 350 watts maximum. **High voltage output:** 820 VDC no load; 700 VDC @ 250 mA ±10%. AC ripple. Less than 1% @ 250 mA. **Duty cycle:** 150 mA continuous to 300 mA @ 50%. **Low voltage output:** (High tap) 350 VDC, no load; 300 VDC @ 150 mA ±10%, (Low tap) 275 VDC, no load, 250 VDC @ 100 mA; ±10%. Less than .05% AC ripple @ 150 mA, continuous duty to 175 mA. **Fixed bias:** −130 VDC ±10%, no load; −100 VDC @ 20 mA. **Filament voltage:** 12.6 VDC @ 5.5 amps. **Dimensions:** 9" L x 4 3/4" W x 6 3/4" H.

Charge a kit — no money down on any kit — see page 54 for details.

Here's an SSB/CW Receiver with EVERYTHING!



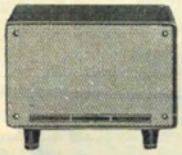
$199.95

HR-1680 High-performance solid-state SSB/CW Receiver

HR-1680 SPECIFICATIONS

Frequency Coverage (MHz): 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.0-28.5, 28.5-29.0. **Sensitivity:** Less than 0.5 μV for 10 dB S+N/N for SSB operation. **IF Selectivity:** 2.1 kHz minimum at 6 dB down, 7 kHz maximum at 60 dB down. **Overall Audio Response:** Wide; 2100 Hz minimum at 6 dB down, 7 kHz maximum at 60 dB down. Narrow; 250 Hz minimum at 6 dB down, 2.5 kHz maximum at 60 dB down (center frequency approx. 750 Hz). **Overall Gain:** Less than 1.5 μV input for 0.25 watts audio output. **Audio Output Power:** 2 watts into an 8-ohm load or 1.2 watts into a 4-ohm load at less than 10% THD. **AGC Characteristic:** Blocking level, 3 volts, Dynamic range, 120 dB. Time Constant, attack time less than 1 mS. Release time switch selectable at 100 μS (CW) or 1 second (SSB). **Intermodulation Distortion:** −60 dB. **Image Rejection:** 50 dB or better. **IF Rejection:** 60 dB or better. **Internally Generated Spurious Signals:** Below 1 μV equivalent antenna input except at 3.74, 21.2, 28.6 and 28.9 MHz. **Frequency Stability:** Less than 100 Hz per hour drift after 30 minutes warmup. Less than 100 Hz drift for 10% change in line voltage. **Tuning Rate:** approx. 15 kHz per turn. **Dial Accuracy:** Within 2 kHz after calibration at nearest 100 kHz marker. **Muting:** Shorted external ground at mute socket. **Sidetone Input Level:** 10 mV or greater (300 mV maximum). **Dial Backlash:** 50 Hz or less. **IF Frequencies:** First IF, 8.395-8.895 MHz; Second IF 3.395 MHz. **Antenna Input Impedance:** 50 ohms unbalanced. **Temperature Range:** −10°C to +50°C. **Meter Calibration:** 0 to S-9 + 60 dB. **Power Requirement:** 120 or 240 volts AC (60/50 Hz) 27 watts maximum or 11.5 VDC to 15 VDC at 0.75 amperes maximum. **Dimensions:** 12¾" W x 6¾" H x 12" D. **Net Weight:** 9¾ lbs.

Matching Station Speaker



Styled to match the HR-1680, with response tailored to SSB. 4 ohm impedance for use with most other gear too. Includes cable and plug.

Kit HS-1661, Shpg. wt. 5 lbs. **19.95**

Heathkit HP-13B Mobile Power Supply

Supplies all the necessary operating voltages for mobile use of SSB transceivers — high, low and fixed bias voltages, also switches filament voltage for equipment with which it is used. Features relay control of all primary power, individual circuit breaker protection.

Kit HP-13B, Shpg. wt. 7 lbs. **84.95**

HP-13B SPECIFICATIONS

Input voltage: 12 to 16 VDC (neg. ground only). **Input current:** 25 amp. max. full load. **High voltage output:** 800 VDC, no load: 750 volts DC @ 250 mA. AC ripple: less than 1% @ 250 mA. **Low voltage output:** (high tap) 310 VDC, no load; 200 VDC @ 150 mA. (low tap) 265 VDC, no load; 250 VDC @ 150 mA. AC ripple: Less than .05% @ 150 mA. **Fixed bias:** −130 VDC @ 20 mA. **Dimensions:** 7¾" W x 7 5/16" L x 2⅜" D. All voltages referenced at 13 VDC.

An outstanding addition to ANY Station

- ***Easy kit assembly, easy NO-INSTRUMENT ALIGNMENT***
- ***Built-in AC power supply, or external battery operation***
- ***Excellent sensitivity lets you work weak signals***
- ***Stable operation for drift-free SSB and CW reception***

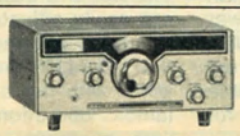
Listen to world-wide SSB and CW with the HR-1680. This high-performance, low-cost Amateur radio receiver covers 500 kHz segments of the 80, 40, 20 and 15-meter Amateur bands plus two 500 kHz segments for the lower 1 MHz of 10 meters. Its advanced solid-state circuit and convenience features make it ideal for Novice, General or Extra-Class operators.

The superhet double-conversion receiver features a double-tuned RF stage to provide maximum signal on each band. AGC controlled IF and RF stages permit signals of varying strengths to be received without fading or blasting. A four pole crystal filter provides excellent SSB reception and a two-stage active audio filter provides a very sharp bandpass for excellent CW operations. The use of solid-state components throughout eliminate heat buildup and drift, and contributes to the HR-1680's outstanding frequency stability.

Has a front panel "S" meter to indicate relative signal strength, AF and RF gain controls, and preselector. The extra-large, easy-tune spinner and easy-to-read dial calibrated in 500 kHz increments make "right on" station selection fast and easy. Even uses the same dial readout for all four bands — simply flip the bandswitch to change bands. Has mode and function selectors, front panel headphone jack for low-impedance headphones, diode bandswitching, built-in 100 kHz crystal calibrator. The mode switch selects LSB, USB and CW with fast or slow AGC automatically engaged.

Kit construction is easy, with most parts mounted on printed circuit boards, an open chassis layout, and a wiring harness to simplify assembly. The HR-1680 can be aligned completely without external equipment. Its handsome "101 series" styling and clean functional look makes it ideal for use with Heathkit transmitters and many others. Its built-in AC power supply makes it useful in any base station operation.

Kit HR-1680, Shpg. wt. 14 lbs. **199.95**



COMING SOON!

HX-1675 CW Transmitter. The perfect companion for the HR-1680. Use 'em both for a sophisticated station.

Find out how easy it is to build a kit — order the manual. See page 53.

Here's all you need for CW FUN!

HW-8 SPECIFICATIONS

TRANSMITTER: DC Power Input: 3.5 watts (80 M); 3.0 watts (40 M); 3.0 watts (20 M); 2.5 watts (15 M). **Frequency Control:** built-in VFO. **Output Impedance:** 50 Ω, unbalanced. **Spurious & Harmonic Levels:** −35 dB or better. **Offset Frequency:** approx. −750 Hz, fixed on all bands. **RECEIVER: Sensitivity:** 0.2 μV for readable signal; 1 μV or less for 10 dB S+N/N. **Selectivity:** wide, −750 Hz @ −6 dB narrow, −375 Hz @ −6 dB. **Audio Output Impedance:** 1000 Ω, nominal. **GENERAL: Frequency Coverage:** 3.5-3.75 (80 M); 7-7.25 (40 M); 14-14.25 (20 M); 21-21.25 MHz (15 M). **Frequency Stability:** less than 100 Hz/hour drift after 30 min. warmup. **Power Requirement:** 12-16 VDC, 90 mA, receive; 430 mA, transmit. **Dimensions:** 9¼″ x 8½″ x 4¼″. **Net Weight:** 4 lbs.

Heathkit HW-8 top-performing low-cost QRP CW Transceiver

$129.95

- ***High sensitivity receiver section***
- ***Full 80-15 meter band coverage***
- ***Front end relative power meter***
- ***Easy pushbutton band selection***
- ***Break-in keying with adjustable delay***
- ***Two-position active audio filter***

One of the best and lowest-cost ways we know of to get started in a rewarding Amateur Radio hobby — and it's battery operation makes it great for portable and vacation use. The HW-8 covers the CW (Code) portions of the eighty, forty, twenty and fifteen meter Amateur radio bands. It lets you send and receive Code signals from all over the world, and uses only a couple of watts transmit power for real fun and challenge!

Has instant pushbutton selection of any of four bands: 3.5-3.75, 7-7.25, 14-14.25 and 21-21.25 MHz. Special crystal heterodyne circuitry premixes the variable and heterodyne oscillator signals to allow easy frequency tuning from a single dial scale for all four bands. This also provides excellent frequency stability and a fixed frequency offset for all bands when you transmit.

The direct-conversion receiver boasts dramatically improved resistance to overload and reduced microphonics and hum thanks to a well-designed RF stage and a two position active audio filter. Its improved sensitivity and selectivity gives the HW-8 the finest receiver section in its price class. You get solid copy from all over with as little as 0.2 μV input; 1 μV or less produces 10 dB S+N/N!

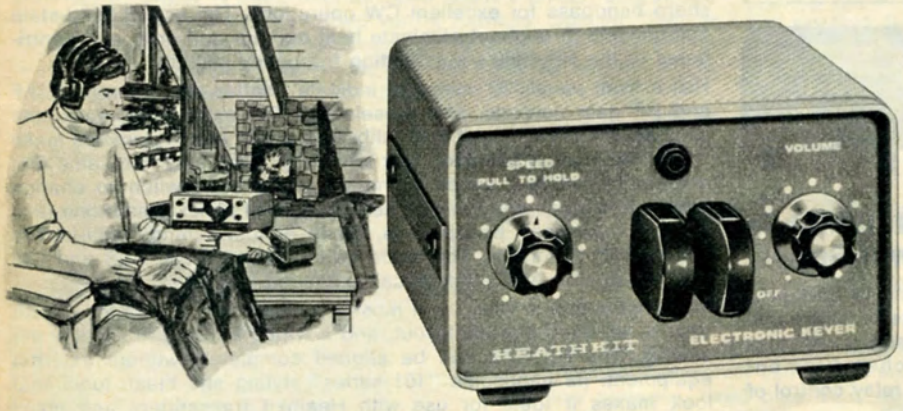
Features include adjustable sidetone volume, diode band switching and break-in keying with adjustable T/R delay, an RF gain control, built-in headphone jack, adjustable AF gain, preselector and tune controls. A front panel meter shows relative power, and is also used during alignment. The HW-8 can be operated from its optional AC power supply for fixed station use, or from any 12 VDC power source — great for vacations or emergencies.

The HW-8 is an easy and enjoyable kit to build, too, most parts mount on a single printed circuit board, and there's minimum point to point wiring. Now's the time to get into the fun and excitement of low-power CW operation. Order your HW-8 today!

Kit HW-8, Shpg. wt. 7 lbs. **129.95**

Kit HWA-7-1, AC Power Supply. Operates your HW-8 from standard 117 VAC house current. Ideal for fixed station use.
Shpg. wt. 3 lbs. **14.95**

FOR FASTEST SERVICE — USE THE HEATHKIT HOTLINE!
(616) 982-3411 day or night



Heathkit solid-state Electronic Code Keyer

Sending code is easier and more fun than ever with the HD-1410. Its built-in AC power supply makes it ideal for base station use, and there's a polarity protected jack for external battery operation. Sends selectable 10-35 wpm for Novices, or 10-50 wpm for "Pro's".

The dot and dash paddle travel and tension are easily adjustable for a professional feel. When the two paddles are operated together, the HD-1410 operates like a single-paddle keyer with dot and dash memories. Special iambic operation lets you form characters with minimum wrist movement. Dots and dashes are self-completing, and always in the proper proportion. Solid-state output prevents bouncing and sticking problems.

Has built-in sidetone oscillator and speaker with adjustable tone and volume. Rear panel headphone jack.

A special weighted cabinet helps keep the HD-1410 stable to prevent sliding or fumbling. Its low-profile styling and compact size let you use it with most any rigs without blocking other knobs and controls.

Kit HD-1410, Shpg. wt. 4 lbs. **49.95**

HD-1410 SPECIFICATIONS

Keying Output, Positive Line to Ground: max. voltage open circuit or spikes — 300 volts. Max. current — 200 mA. **Keying Output, Negative Line to Ground:** max. voltage open circuit or spikes — 200 volts. Max. current — 10 mA. **Audio:** internal speaker or jack for optional hi-Z (at least 500 ohms) headphones. **Sidetone:** adjustable from 500 to 1000 Hz. **Internal Controls:** sidetone frequency, paddle tension, paddle travel. **Rear Panel Connections:** AC power cord, 12-volt power input, keyer out, headphones, receiver audio in, ext. key. **Power Requirement:** 120/240 VAC (±10%), 60/50 Hz, 3.5 watts or 10-14.5 VDC, negative ground, 150 mA. **Dimensions:** approx. 3″ H x 5″ W x 7½″ D. **Net Weight:** 3 lbs.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Useful Heathkit station accessories

Add more versatility to transceivers and separates with these accessories...

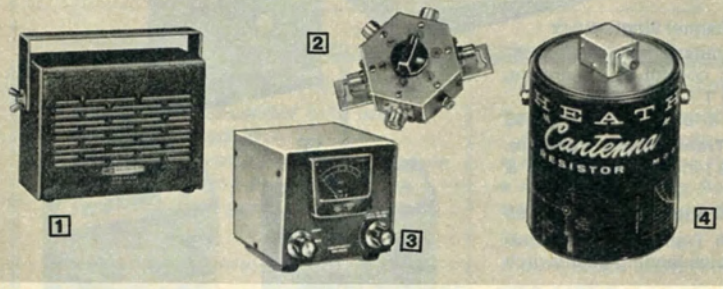
Heathkit solid-state Dip Meter delivers more performance at big savings

Another Heath value triumph — a better dip meter at lower cost. The Colpitts oscillator covers 1.6 to 250 MHz in fundamentals with a MOS-FET paraphase amplifier and hot-carrier diodes for more sensitivity and a better dip. It uses a Q-multiplier for greater detector sensitivity and a responsive 150 μA meter movement for positive resonance indications. It includes a phone jack for modulation monitoring. It's smaller and lighter than others, too. Completely portable. Whether you're checking resonant frequencies, adjusting traps, looking for parasitics, or using it as a signal generator, the HD-1250 is designed to go anywhere. It fits your hand and thanks to its solid-state design and 9-volt battery operation, it's ready to use instantly wherever you are. The custom molded gray carrying case protects the meter and the 7 color-coded, pre-adjusted, plug-in coils in transit, and makes a handy storage place.

Build it in one evening. Nearly everything mounts on two circuit boards. And when you finish, you'll have the best dip meter around — for a lot less money.

Kit HD-1250, less battery, Shpg. wt. 4 lbs. **59.95**

Here's low-cost operating convenience



1 Heathkit Mobile Speaker for improved audio

8 ohm speaker in rugged steel cabinet. Gimbal mount for fast and easy installation included. 6½" W x 4¾" H x 2½" D.
Kit HS-24, Shpg. wt. 4 lbs. **14.95**

2 Heathkit Coax Switch for multiple antennas

Switches RF source to any one of several antennas or loads; unused outputs grounded. Use two to switch up to four different transmitters, receivers, etc. 1.1:1 max. SWR to 250 MHz. 2 kW PEP max. power rating.
Kit HD-1234, Shpg. wt. 1 lb. **10.95**

3 Low-priced Heathkit VHF Wattmeter

Reads 1-25 and 10-250 W FS. Built-in SWR bridge, adjustable sensitivity.
Kit HM-2102, Shpg. wt. 4 lbs. **37.95**

HM-2102 SPECIFICATIONS: **Frequency Range:** 50 MHz to 160 MHz. **Wattmeter Accuracy:** ±10% of full-scale.* **Power Capability:** To 250 W. **SWR Sensitivity:** Less than 10 W. **Impedance:** 50 ohms nominal. **Connectors:** UHF type SO-239. **Dimensions:** 5¼" W, 5¹⁄₁₆" H and 6½" D. *Using a 50Ω noninductive load.

4 "Cantenna" dummy load helps check your rig

1 kW max. input; 1.5-300 MHz w/SWR 1.5:1 or less. Oil not incl.
Kit HN-31, Shpg. wt. 3 lbs. **14.95**

Useful Books for your Ham library

U.S. Callbook. EDP-126 .....**13.95**
DX Callbook. EDP-127 .....**12.95**
Amateur Tests and Measurements. EDP-119 .....**5.50**
91 Dipole and Long-Wire Antennas — data for 73 different antennas. **EDP-180** **4.95**
73 Vertical, Beam and Triangle Antennas. EDP-181 .....**5.50**
ARRL Antenna Handbook. EDP-182 .....**4.00**
Radio Handbook. Offers comprehensive coverage of radio theory and operation. **EDP-117** **19.50**

See page 52 for book-ordering information.

Our most popular station accessories *Acclaimed by Hams the world over!*

5 Heathkit Wattmeter/SWR Bridge

SWR bridge with adjustable sensitivity. Remote detector permits placement of meter in any location. Cable supplied.
Kit HM-102, Shpg. wt. 4 lbs. **37.95**

HM-102 SPECIFICATIONS
Frequency Range: 1.8 to 30 MHz. **Wattmeter Accuracy:** ±10% of full-scale reading. **Power Capability:** 10 to 2000 watts. **Impedance:** 50 ohm nominal. **Connectors:** UHF type SO-239. **Dimensions:** 5¹⁄₁₆" H x 2¼" W x 6½" D.

6 Heathkit hybrid Phone Patch

Individual rcvr-line & line-rcvr gain controls; VU meter. 30 dB isolation. Matches 3-16 ohm speakers & hi-Z or 600 ohm inputs. VOX or PTT operation. 2⅝" H x 9¼" W x 3⅝" D.
Kit HD-15, Shpg. wt. 3 lbs. **36.95**

7 Fully assembled Heathkit Desk Mike

Hi-Z dynamic; grip-to-talk. For convenient VOX or PTT operation with base station transceivers. With cables.
HDP-121, Shpg. wt. 4 lbs. **39.95**

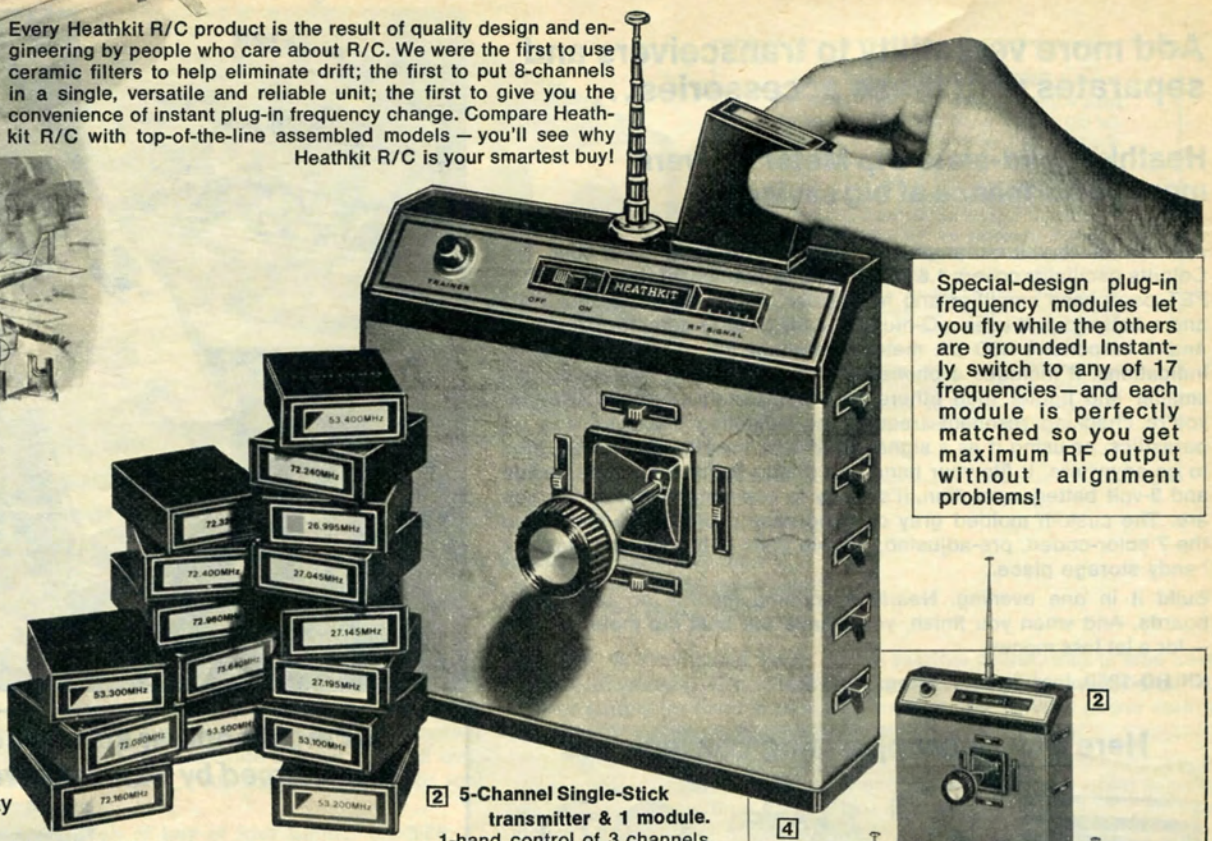
8 Fully assembled Heathkit Mobile PTT Mike

Rugged, hi-Z ceramic mike ideal for mobile work. With cable, less connector. Ideal for "single banders".
GH-12A, Shpg. wt. 1 lb. **11.95**

Heathkit Pack-17™ R/C–

Every Heathkit R/C product is the result of quality design and engineering by people who care about R/C. We were the first to use ceramic filters to help eliminate drift; the first to put 8-channels in a single, versatile and reliable unit; the first to give you the convenience of instant plug-in frequency change. Compare Heathkit R/C with top-of-the-line assembled models — you'll see why Heathkit R/C is your smartest buy!

5-Channel Transmitter
AS LOW AS
$129.95
Incl. 1-module



Special-design plug-in frequency modules let you fly while the others are grounded! Instantly switch to any of 17 frequencies—and each module is perfectly matched so you get maximum RF output without alignment problems!

HEATHKIT PACK-17™ R/C gives you the performance and reliability every RC'er wants — PLUS build it yourself kit value! The transmitters, receivers and servos have the quality and reliability you NEED for serious R/C competition; the positive-action control sticks are smooth and responsive; and the easy-to-handle transmitters are compact and comfortable. Heathkit R/C is easy and fun to build too — with a thorough and complete instruction manual that even shows you how to solder. Buy and build Heathkit R/C gear — it's the winning way to fly!

[1] 5-Channel Dual-Stick Transmitter & 1 module. 2-stick control of 4 channels, plus 1 aux. channel.
Kit GDA-505-D, Shpg. wt. 5 lbs. **129.95**

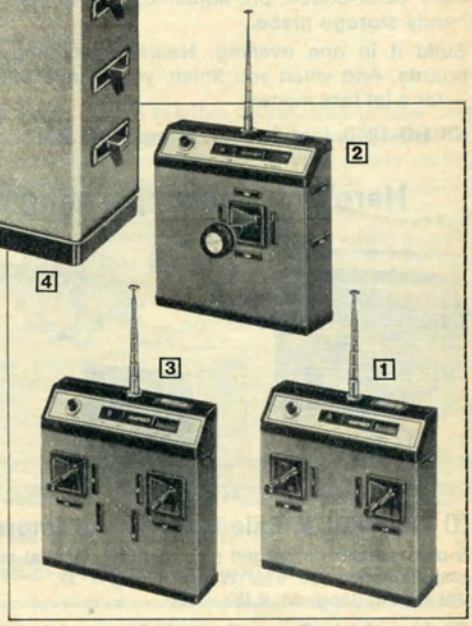
[2] 5-Channel Single-Stick transmitter & 1 module. 1-hand control of 3 channels, throttle control with trim & 1 aux. channel.
Kit GDA-505-S, Shpg. wt. 5 lbs. **139.95**

[3] 8-Channel Dual-Stick Transmitter & 1 module. Same as GDA-505-D, plus landing gear switch & 2 additional channels.
Kit GDA-1205-D, Shpg. wt. 6 lbs. **139.95**

[4] 8-Channel Single-Stick Transmitter & 1 module. Same as GDA-505-S, plus landing gear switch & 2 additional channels.
Kit GDA-1205-S, Shpg. wt. 5 lbs. **159.95**

Receiver & 1 module (less batteries).
Kit GDA-1205-2, Shpg. wt. 1 lb. **59.95**

Receiver battery pack.
Kit GDA-1205-3, Shpg. wt. 1 lb. **9.95**



GDA-1205 AND GDA 505 SERIES SPECIFICATIONS

TRANS. — **RF Frequency:** crystal controlled, all bands. **Frequency stability:** within ±.005% on 27 MHz; within ±.002% on 53 MHz, 72 MHz. **Temp. Range:** 0 to 160°F. **RF Output Circuit:** pi network. **RF Input Power:** at least 500 mW. **Modulation:** on-off carrier keying. **Approx. Current Drain:** 100 mA on all bands. **Controls:** GDA-1205, 8 channels (4 with trim), on/off, trainer button; GDA-505, 5 channels (4 with trim), on/off switch, trainer button. **Power Supply:** Internal 9.6V 500 mAH Ni-Cad. battery. Rechargeable simultaneously with receiver battery at 35 to 40 mA from 120 volt power line. **Dimensions:** 7″ H x 7″ W x 2″ D. **Net Weight:** 2½ lbs., with battery.

GDA-1205-2 SPECIFICATIONS

RECEIVER — **Local Oscillator Operating Frequency:** crystal-controlled, all bands. **Temperature Range:** 0 to +160°F. **Sensitivity:** 5 μV or better. **Selectivity:** 6 dB down at ±4 kHz; 30 dB down at ±9 kHz. **Current Drain:** 10 mA. **Intermediate Frequency:** 453 kHz. **Power Supply:** 4.8 V battery pack (GDA-1205-3). **Controls:** On/off switch. **Dimensions:** ⅝″ H x 1¾″ W x 1¾″ D. **Net Weight:** 2 ozs.

Additional Frequency Modules

When ordering specify frequency desired (see list below).

Transmit Module, Shpg. wt. 1 lb. **17.95**

Receive Module, Shpg. wt. 1 lb. **11.95**

FREQUENCIES AVAILABLE (MHz): 26.995, 27.045, 27.095, 27.145, 27.195, 53.1, 53.2, 53.3, 53.4, 53.5, 72.08, 72.24, 72.16, 72.32, 72.40, 72.96, 75.640 MHz. (When ordering, specify transmit or receive.)

SPECIAL 5-MODULE OFFER — SAVE $20!
5 Transmit and 5 Receive Modules of your choice — specify frequencies ▶ **Only $129.50** Shpg. wt. 6 lbs.

Get BIG SAVINGS on these complete 5 and 8-Channel Systems

5-Channel Dual-Stick

• Transmitter with 1 module • Receiver with 1 module • Receiver battery pack • Four servos (choose miniature, subminiature or both). Shpg. wt. 27 lbs.

If purchased separately, up to **299.65**

GDS-505-D, System Price **249.95**

8-Channel Dual-Stick

• Transmitter with 2 modules • Receiver with 2 modules • Receiver battery pack • Four servos (choose miniature, subminiature or both). Shpg. wt. 30 lbs.

If purchased separately, up to **339.55**

GDS-1205-D, System Price **284.95**

5-Channel Single-Stick

• Transmitter with 1 module • Receiver with 1 module • Receiver battery pack • Four servos (choose miniature, subminiature or both). Shpg. wt. 27 lbs.

If purchased separately, up to **309.65**

GDS-505-S, System Price **249.95**

8-Channel Single-Stick

• Transmitter with 2 modules • Receiver with 2 modules • Receiver battery pack • Four servos (choose miniature, subminiature or both). Shpg. wt. 30 lbs.

If purchased separately, up to **359.55**

GDS-1205-S, System Price **284.95**

When ordering, specify module frequencies and type(s) of servos. All systems include batteries, a value worth up to $39!

Charge-A-Kit — no money down on any kit — see page 54 for details.

Uncompromised Performance and VALUE!

NEW 3-channel Pack-17™ with plug-in module versatility! Even includes rechargeable batteries

Now the convenience and versatility of plug-in frequency change is available in a basic 3-channel system — and it's the ONLY 3-channel system we know of that INCLUDES rechargeable batteries and an external charger so you fly with full power and uncompromised performance — you'll never have to worry about losing power with "dry cells" again! Has 2-axis stick assembly, easy to handle transmitter with convenient strap for one-hand operation. An optional conversion pack lets you go 4 channels by adding another channel to the stick. All three stick channels have trim control, the 4th channel is controlled by a thumb tab. Compatible with all Heathkit servos; ideal for use as trainer transmitter with GDA-1205 and GDA-505 systems. Specify frequency when ordering (see specs below).

Kit GDA-1405-1, 3-ch. transmitter with 1 Module. 5 lbs. **94.95**
Kit GDA-1405-3, 4-ch. conversion. 1 lb. **12.95**
Kit GDA-1205-2, receiver with 1 Frequency Module. 1 lb. **59.95**
Kit GDA-1205-3, receiver battery pack. 1 lb. **9.95**
Additional Frequency Modules: Shpg. wt. 1 lb.
Transmit . . . . . **17.95** **Receive** **11.95**

Transmitter with one Module only
$94.95

GDA-1405-1 SPECIFICATIONS

TRANSMITTER — RF Carrier Frequency: One frequency, crystal-controlled on 27 MHz, 53 MHz or 72 MHz bands. **Operating Temperature:** 0°-160°F. **Controls:** 3 channels (two with trim); ON-OFF switch. Optional fourth channel. **Power Supply:** Internal 9.6V, 500 mA hours, nickel-cadmium battery. Rechargeable simultaneously with receiver battery at 35-40 mA from external charger. **Frequencies Available:** 27 MHz (11 meters) — 26.995, 26.045, 27.095, 27.145 & 27.195. 53 MHz (6 meters) — 53.100, 53.200, 53.300, 53.400, 53.500. 72 MHz (4 meters) for R/C planes only — 72.080, 72.240, 72.400, 75.640. (All Models — 72.160, 72.320, 72.960. **Dimensions:** 9½" H x 3$^{13}/_{16}$" W x 2¼" D.

System with Miniature Servos

- *3-Channel Transmitter with one Frequency Module*
- *Receiver with one Frequency Module*
- *Receiver Battery Pack*
- *Two Miniature Servos*

Shpg. wt. 25 lbs.
If purchased separately, **$214.75**
GDS-1405-1 . . . . . **$189.95**

System with Subminiature Servos

- *3-Channel Transmitter with one Frequency Module*
- *Receiver with one Frequency Module*
- *Receiver Battery Pack*
- *Two Subminiature Servos*

Shpg. wt. 25 lbs.
If purchased separately, **$214.75**
GDS-1405-2 . . . . . **$189.95**

BUY THE SYSTEM AND SAVE $24.80

Complete 3-Channel Pack-17 R/C Systems.

When ordering, specify module frequency. Systems include batteries, a value worth up to $39!

Servos and Accessories for Heathkit R/C

[1] **Miniature Servo.** For use with GD-1205 and 505 systems only.
Kit GDA-1205-4, Shpg. wt. 1 lb. **24.95**

GDA-1205-4 SPECIFICATIONS

Input Signal: Pulse 1-2 msec. wide, 4 V P-P. **Thrusts:** 4 lbs. min. at rotor. **Travel Time:** 0.5 sec. **Rotary Output Travel:** 90° rotation. **Temperature Range:** 0°-160°F. **Power Requirements:** Battery — 4.8 VDC. Idle current — 15 mA maximum. Stall current — 450 mA; no load current, 80 mA. **Gear Train Backlash:** Less than .002". **Mechanical Output:** 1 rotary arm, 1 rotary wheel. **Position Accuracy:** 1.0%. **Dimensions:** 1⅝" H x $^{15}/_{16}$" W x 2$^{23}/_{32}$" L (length includes mounting ears; height includes outputs). **Net Weight:** 1.75 ozs.

[2] **Sub-Miniature Servo.** For use with GD-1205 and 505 systems only.
Kit GDA-1205-5, Shpg. wt. 1 lb. **24.95**

GDA-1205-5 SPECIFICATIONS

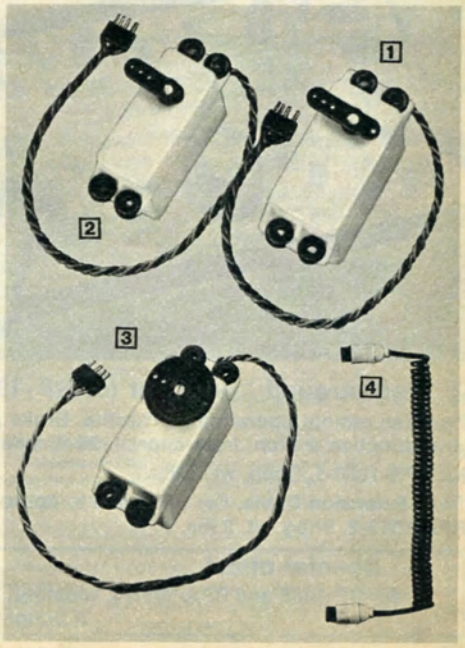
Power Requirements: Battery — 4.8 VDC. Idle current, 15 mA maximum. Stall current, 450 mA nominal; no load current, 80 mA. **Mechanical Output:** 1 rotary arm, 1 rotary wheel. **Position Accuracy:** 1.0%. **Dimensions:** 1$^{13}/_{16}$" H x ¾" W x 2$^{23}/_{32}$" L (length includes mounting ears, height includes the outputs.) **Net Weight:** 1.25 ozs. Other specifications same as GDA-1205-4 above.

[3] **High Torque Servo.** Quality low-cost servo for use with all Heathkit R/C transmitters and receivers. Features high power (torque) and fast transition (rotational speed) for use with most any R/C plane, car or boat. During assembly, you can wire the GDA-1205-8 to operate 90° for cars and boats; 180° for planes with retractable landing gear. Has heavy-duty gearing, rugged case for long life. Easy kit assembly too.
Kit GDA-1205-8, Shpg. wt. 1 lb. **34.95**

GDA-1205-8 SPECIFICATIONS

Input Signal: Pulse 1-2 msec wide, 4 V p-p. **Torque:** 38 in-oz. at rotor. **Travel Time:** 0.4 sec. **Rotary output travel:** 90° or 180° rotation. **Temperature range:** 0-160° F. **Power Requirements:** Battery, 4.8 V. Idle current, 20 mA maximum. Stall current, 1000 mA. No load current, 150 mA. **Mechanical output:** 1 rotary arm, 1 rotary wheel. **Position Accuracy:** 1%. **Dimensions:** 1⅝" H x $^{15}/_{16}$" W x 2$^{23}/_{32}$" L. (length Includes mounting ears, height includes outputs). **Net Weight:** 1.75 oz.

[4] **Trainer link accessory.** Six-foot coiled cord connects two GDA-1205 or 505 Transmitters for in-flight instruction — one unit is "master" with override, the other is "slave."
GDA-1205-6, Shpg. wt. 1 lb. **10.95**



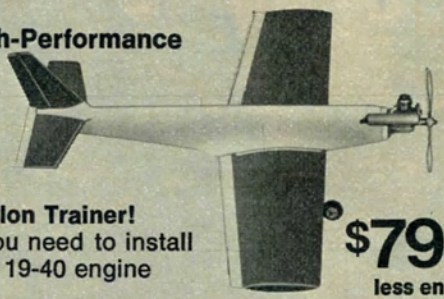
Find out how easy it is to build a kit — order the manual. See page 53.

Here's "Model" value at low Heath prices

[1] Hobie "Hawk" R/C Glider

$89.95 Kit

[2] Delthon High-Performance R/C Plane



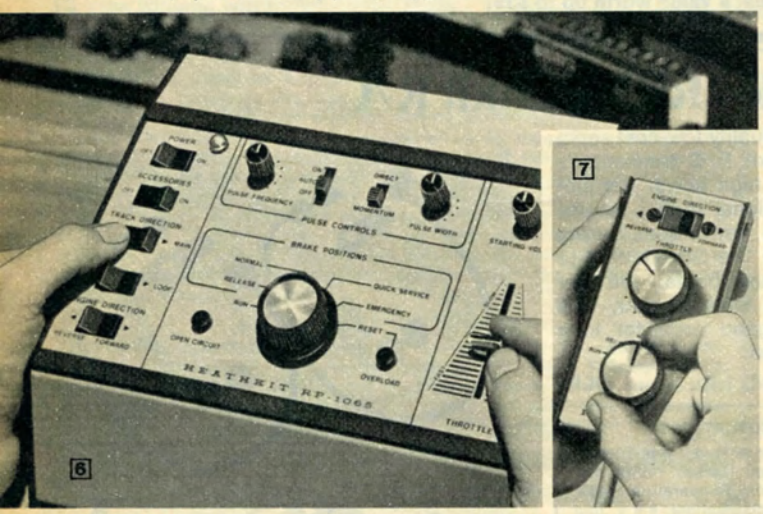
Ideal Pylon Trainer!
Everything you need to install your own 19-40 engine

$79.95 Kit less engine

Due to the nature of these products, the standard Heath warranty does not apply.

[3] **Servo Simulator for easy adjustment.** Takes the place of both transmitter and receiver for making adjustments on all Heathkit servos, and a wide variety of others. Operates servos from 120 VAC line or from the optional internal battery pack. Charges receiver and glo-plug batteries when plugged into 120 VAC. Bulb shows battery condition.

Kit GD-1053, Shpg. wt. 2 lbs. **24.95**
Kit GDA-19-3, optional battery pack, Shpg. wt. 1 lb. **4.95**



[7] Walk-Around Controller for RP-1065

Provides remote operation of Throttle, Brake position switch and Engine direction switch, from approx. 20-ft. away from RP-1065.

Kit RPA-1065-1, Shpg. wt. 3 lbs. **22.95**

10-ft. Extension Cable. For operation to approx. 30-ft.
RPA-1065-2, Shpg. wt. 2 lbs. **7.95**

Special offer!
Order RP-1065 and RPA-1065-1 together, for only $99.95
If bought separately, $102.90

[1] **Build and fly the Hobie Hawk** and you'll find out what the excitement of R/C is all about. Has strong 1/32" plywood main wing sheeting; 1/64" plywood stabilizer sheeting; ABS plastic root rib and tips, 98" wing span; 590 sq. in. wing area. Kit includes all parts and hardware needed for complete construction, you use your own covering materials and paints to "custom design" the Hawk to your preference. Ideal for use with Heathkit R/C control systems, especially the 3-channel systems described on page 87.

Kit RP-1206, Shpg. wt. 7 lbs. **89.95**

Semi-Kit RP-1207, just connect wings and tail, add R/C gear, and you're ready to fly. Shpg. wt. 7 lbs. **134.95**

[2] **A FUN-FLY plane** designed for intermediate and advanced flyers. Unique symmetrical airfoil provides the lifting capabilities of a much larger conventional wing, combined with the characteristics of a high speed wing. The high strength plastics used in construction make the Delthon lighter than comparably-sized balsa planes, but much more rugged. Has 46½" wingspan, 33½" body. Assembles easily with readily available glues and epoxies and common household tools. Ideal for use with all Heathkit R/C systems. With detailed manual.

Kit RP-1028, Shpg. wt. 6 lbs. **79.95**

[4] **Thumb® Tach peaks performance.** Measures model engine rpm without physical connection to engine. Two ranges — 0-5000 and 0-25,000. Perfect for needle valve adjustment, selection of glow plugs, gears and props.

Kit GD-69, Shpg. wt. 2 lbs. **24.95**

[5] **Servo Centering Standard.** Calibrates all Heath Servos with variable pots to 1.4 millisecond pulse width standard. Eliminates recentering when changing control units. Included in all Pack-17 transmitters!

Kit GD-1189, Shpg. wt. 1 lb. **9.95**

Radio Control Manual — 1 & 2 channel types to digital & pulse code. **EDP-157** **4.95**

Advanced Radio Control — "how-to" book for planes, boats, robots, trucks, tractors, autos — introduction to automation in rockets & robots at the hobby level. **EDP-158** **4.95**

Radio Control Handbook — covers most control systems. **EDP-159** **6.95**

Model Radio Control — simple control projects in R/C. **EDP-160** **4.95**

NEW! Radio Control for Models! With emphasis on solid-state step and proportional controllers. **EDP-219** **6.95**

R/C Maintenance Manual. Comprehensive, detailed information on the use and maintenance of Heathkit R/C gear. Shows you how to get the most from Heath R/C gear, others too. **GDA-1205-7** **1.00**

See page 52 for book-ordering information

[6] Heathkit Transistorized Power Supply/Throttle makes your line even more realistic

$79.95 ***Get top performance from every engine in your line***

The Heathkit RP-1065 makes any HO or N-gauge layout dramatically more realistic! Just operate the slide throttle control to make your engines gradually build up speed just like a real train or, at slow speeds, maintain realistic acceleration and braking. Braking is independent of the throttle and controlled by a five-position knob. "Run" allows the train to gather speed until it reaches the throttle setting; "Release" maintains speed without accelerating or braking. Momentarily turning the knob to normal puts a short "burst of air" on the brakes; "Quick Service" and "emergency" brake the train more rapidly while still maintaining a realistic effect.

The RP-1065's load compensation circuitry prevents stalling out when climbing grades, even lets you precisely simulate a real train, slowing as it climbs, then accelerating as it goes down. Helps overcome side rod and gear train binding, tight spots in wheel bearings, even tight sections of track. Easily powers two HO or N-gauge engines — has built-in short protection with an indicator light and a time delay to prevent false triggering.

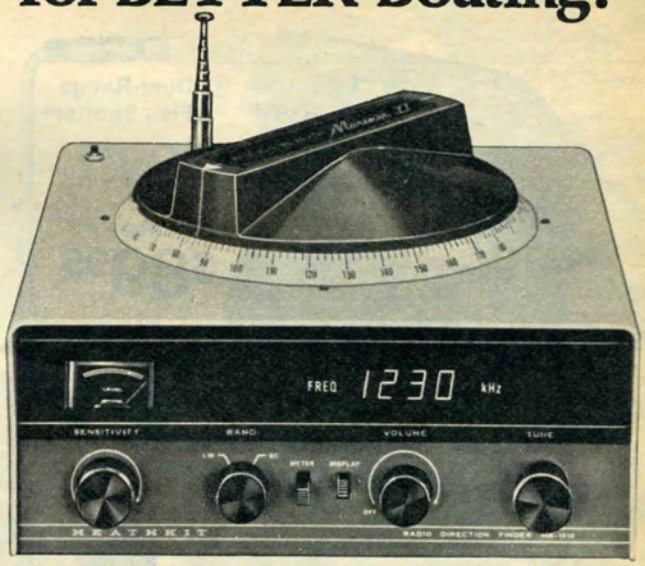
The RP-1065's pulse circuitry can be used three ways — on continuously, off or automatic. There's a starting voltage control, main and loop switches to reverse track polarity instantly, a forward/reverse switch for engine direction and two low-voltage AC accessory outputs, one with front panel on-off switch.

The RP-1065 goes together in just a couple of evenings, even if it's your first kit. There's just one circuit board to wire, and a plug-in IC simplifies assembly. Operates on 120 VAC. 4¾" x 9½" x 8½".

Kit RP-1065, Shpg. wt. 9 lbs. **79.95**

Order early for best selection! Phone (616) 982-3411 day or night.

It's Heath for BETTER Boating!



Heathkit Digital Depth Sounder

$149.95 ***Lets you know depth of water below you from 2.5 to 199 ft.***

Accurate depth readings at a glance. Dual-range digital display automatically reads depth in 0.1 foot increments from 2.5 to 19.9 feet and in 1 foot increments from 20 to 199 feet. A red light signals clearance of 10 feet or less. A single knob controls power on/off and brightness of the readout digits. Regulated power supply maintains accuracy over wide range of DC voltages. Rugged Cycolac® case; gimbal mounting bracket; 15 feet cable for through-hull installation, 25 feet for transom mount.

Kit MI-101-1, With through-hull transducer, Shpg. wt. 7 lbs. **149.95**

Kit MI-101-2, With high-speed transom transducer, Shpg. wt. 6 lbs. **149.95**

MI-101 SPECIFICATIONS

Sounding frequency: 200 kHz. **Sounding rate:** Maximum of 11/sec. on both ranges for a total of 22/sec. Normal rate of approx. 1/sec. **Accuracy:** ±2%, ±1 digit. **Current drain:** 300-500 mA. **Power requirement:** 10-17 VDC @ 500 mA. **Transducer:** Barium titanate ceramic element encased in waterproof housing. **Dimensions:** 2¼" H x 6⅝" W x 8½" D (less gimbal hardware).

Heathkit Digital Radio/Direction Finder

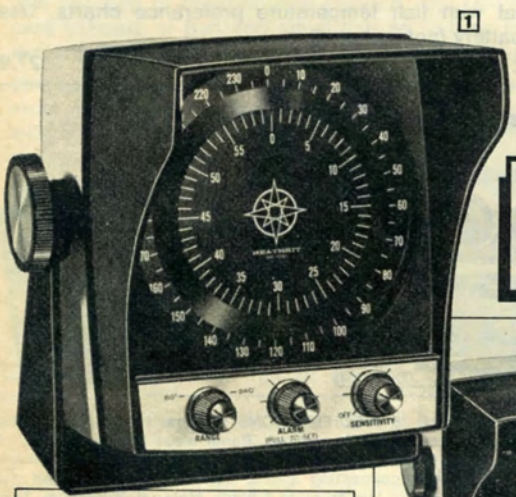
$199.95 ***Digital readout pinpoints AM or beacon stations — no more waiting for station identification.***

Find your way with the versatile Heathkit MR-1010! It keeps you informed on the 190-410 kHz LW band and standard AM. It identifies stations with a digital frequency readout, and gives you a heading from its big easy-read azimuth ring marked in 2° increments! Has excellent sensitivity, lighted meter for accurate null indications, telescoping sense antenna for an impressive bearing accuracy of ±3°. A front panel control adjusts RF sensitivity to allow accurate readings from weak or strong stations. Operates from your boat's 12 VDC system, or its own built-in power source (6 "D" cells, not included.) Battery-saver circuit cuts display off after 20 seconds, can be recalled instantly. Easy kit assembly.

Kit MR-1010, Shpg. wt. 14 lbs. **199.95**

MR-1010 SPECIFICATIONS

Bands: 190-410 kHz (LW); 535-1605 kHz (AM). **Sensitivity:** Typically 30 μV/m (LW) for 10 dB S+N/N. **Selectivity: (6 dB points):** 3 kHz (LW); 5 kHz (AM). **Readout Accuracy:** ±2 kHz. **Audio Output:** 1 watt. **Speaker:** built-in 3x5". **Current Drain:** 450 mA (with display & meter); 110 mA (meter only); 30 mA (radio at typical listening level). **Dimensions:** 7¼" H x 11½" W x 12" D.



Was ~~$99.95~~
NOW $89.95
YOUR CHOICE

SAVE $10

Was ~~$69.95~~ **NOW $59.95**

Choice of Transducers

1 Heathkit Dual-Range Depth Sounder

Shows depth, type of bottom, schools and individual fish, submerged objects. A high-pitched "beep" alerts you to shoals or objects projecting above any preselected depth from 5 to 240 ft. Has switch-selected 0-60 and 0-240 ft. ranges; electronically controlled motor; fixed noise rejection circuit; polarity protection; super-bright neon indicator. Water-resistant Cycolac case with glare-free bezel and sun shield. Gimbal mount, quick-disconnect power and transducer leads.

Kit MI-1031-1, sounder with thru-hull transducer, 15' coax. Shpg. wt. 8 lbs. ..... **Was 99.95 — NOW 89.95**

Kit MI-1031-2, sounder with transom transducer and 25' coax. Shpg. wt. 7 lbs. ..... **Was 99.95 — NOW 89.95**

2 Heathkit Single-Range Depth Sounder

As above, single 0-240 ft. range, no alarm.

Kit MI-1030-1, sounder with thru-hull transducer and 15' coax. Shpg. wt. 8 lbs. ..... **Was 69.95 — NOW 59.95**

Kit MI-1030-2, sounder with transom transducer and 25' coax. Shpg. wt. 7 lbs. ..... **Was 69.95 — NOW 59.95**

MI-1030 and MI-1031 SPECIFICATIONS: **Frequency:** approx. 200 kHz. **Accuracy:** Within 2% of actual depth. **Transducer:** Barium titanate ceramic element encased in waterproof housing. **Power requirement:** 0-60' range, 225 mA @ 11-15 VDC (MI-1031 only), 0-240' range, 125 mA 11-15 VDC with one return pulse: **Dimensions:** 6½" H x 5¾" W x 7¼" D.

Your Choice of Transducers. These depth sounders are available with either through-the-hull or transom-mount transducers. The transom mount unit (B) is recommended for high-speed craft with planing hulls. The through-the-hull transducer (A) is ideal for a permanent mount on large boats with displacement hulls.

Charge-A-Kit — no money down on any kit — see page 54 for details.

Build yourself Better Fishing!

1 Dual-Range Fish Spotter®
Was ~~$99.95~~
Now $89.95

2 Economy Fish Spotter®
Was ~~$69.95~~
Now $59.95

3 Transducer Bracket
$19.95

4 Thermo-Spotter® Thermometer
$27.95

1 Heathkit Dual-Range Fish Spotter® Sounder

The Heathkit MI-2901 Fish Spotter® Sounder has adjustable audible alarm you set to sound off at any depth to 240 ft. Fish swimming between surface and preset depth will trigger alarm. *Includes two switch-selected ranges* (0-60′ and 0-240′) for sharper definition; bright neon-flasher for precise depth reading; noise rejection circuitry to eliminate engine ignition interference. Rugged aluminum cabinet. The transducer features a barium titinate ceramic element encased in a durable waterproof housing. Portable suction-cup transducer bracket. Powered by two 6-volt lantern batteries (not included).

Kit MI-2901, Shpg. wt. 9 lbs. . . . . **Was 99.95 Now Only 89.95**
Kit MIA-2900-1, Scanning Transducer Bracket, Shpg. wt. 4 lbs. **19.95**

MI-2901 SPECIFICATIONS

Accuracy: ±2% with motor speed of 2400 rpm in the 0-60′ range and with motor speed of 600 rpm in the 0-240′ range. **Sounding Rate:** 40 times per second on the 0-60′ range, 10 times per second on the 0-240′ range. **Frequency:** 200 kHz, ±5%. **Noise Rejection:** Fixed at approximately 500 microseconds integration time. **Receiver Sensitivity:** 75 μV nominal at 200 kHz. **Depth Indication:** Neon lamp flashes at zero and again at the indicated depth from the object. **Alarm:** 5-59′ on the 0-60′ range. 5-239′ on the 0-240′ range. **Transducer Cable Length:** 15′. **Power Requirement:** 12 VDC. **Dimensions: (Less Handle):** 7″ H x 6″ W x 11″ D.

2 Heathkit Economy Fish Spotter® Sounder

An excellent choice for the fisherman on a budget. Similar to MI-2901 above, but with single range to 120-ft. Reads 240′ max. Has bright neon indicator. No audible alarm.

Kit MI-2900, Shpg. wt. 8 lbs. . . . . **Was 69.95 Now Only 59.95**

3 Heathkit Scanning Transducer Bracket

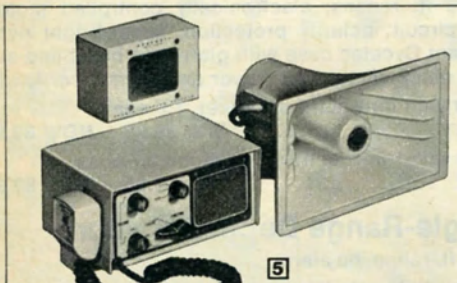
Designed for use with Heathkit MI-2901 and MI-2900 Fish Spotter® sounders. "C" clamp mounting. Scans 360°, locks in any position. Accepts any 1⅜″ cylindrical transducer.

Kit MIA-2900-1, Shpg. wt. 4 lbs. **19.95**

4 The Thermo Spotter® thermometer finds the depth where your fish feed

Completely self-contained with submersible sensing element on a 100-ft. cable. Battery-powered meter circuitry in high-impact plastic take-up reel case. Simply lower the line, press spring-loaded meter button for temperature readout, check depth on cable. Kit includes operations manual with fish temperature preference charts. Uses 1.5-volt penlight battery (not included).

Kit MI-104, Shpg. wt. 3 lbs. **27.95**



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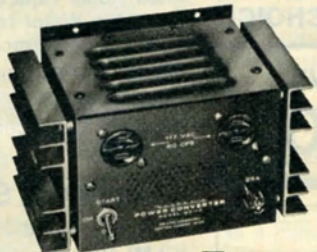

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5 Automatic Foghorn/Hailer. Features a husky 55-watt amplifier; foghorn rate and duration controls; separate "listen" & "hail" gain controls. optional remote speaker for ship's intercom use. Easy to assemble, and includes low-profile weather-resistant deck horn, 20 ft. speaker cable, gimbal mount. Styled in marine white and blue. Operates on 12 VDC power system, positive or negative ground. 4¾″ H x 9¾″ W x 9¼″ D.

Kit MD-19A, Shpg. wt. 15 lbs. **99.95**

Kit MDA-19-1, Optional remote speaker for intercom use. Shpg. wt. 2 lbs. **11.95**

6 Economy Power Inverter. Operates small appliances from 6 or 12-volt input. Up to 175 watts continuous. Not for high starting current or sine wave AC equipment. 25-amp fuse.

Kit MP-10, Shpg. wt. 8 lbs. **39.95**

7 Fuel Vapor Detector. Gives a meter indication of safe — dangerous — explosive bilge conditions. Sounds an alarm when fumes are present. Solid-state circuit. Fail-safe provision triggers alarm should any component fail. Built-in relay controls blower or other warning devices.

Kit MI-25, Shpg. wt. 3 lbs. **74.95**

MI-25 SPECIFICATIONS: Voltage: 12 VDC, ±10%. Current: 1.0 A nominal. Panel size: 2 1/16″ H x 5 11/16″ W. Depth: 5″. Detector head size: 1½″ round x 2½″ long. Interconnecting cable: 15′. May be shortened 1½′. Color: Marine white & black. Material: Aluminum. Temp. range: –30°C.

8 Marine Electronics Handbook—covers radios, codes, antennas, direction finders; clearly written. **EDP-134** **4.95**

9 Easi-Guide to Boat Radio — how to select, install & maintain a boat radio; FCC rules governing marine radio; a real asset to boating safety. **EDP-133** **3.50**

See page 52 for book-ordering information

Find out how easy it is to build a kit — order the manual. See page 53.

Find fish faster and easier!

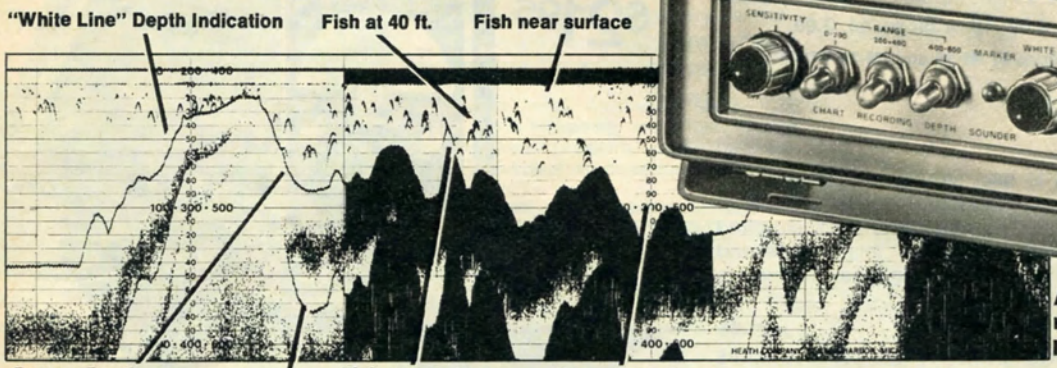
Straight Line/White Line Depth Recorder —

THE SEEKER™

A supremely sensitive and dependable fish-finding aid that shows you exactly where they are! An important navigation aid for following coast line depths when operating in any weather.

HEATH charg-a-kit REVOLVING CHARGE

ONLY $289.95



Actual MI-2910 recording made at Lake Mead, Nevada 1976

Compare features and specifications with units costing up to $900 and more!

The new Heathkit MI-2910 is one of the most useful boating and fishing accessories you can own. It helps you find the fish, and it provides a permanent record of the best spots and depths so you can find your favorite spots again and again easily. Its bottom recording accuracy also makes it a valuable navigation aid for following coast line depths and mapping lakes. Best of all, it's priced at about ⅓ the cost of comparable recording depth sounders.

An on-off sensitivity control adjusts the MI-2910 to indicate the bottom and fish or other objects above it. The MI-2910 will clearly indicate schools of bait and small fish as well as individual large fish. Holes and dropoffs are clearly shown for lake mapping purposes too.

The extra-wide-beam transducer covers a larger area of water than most conventional units, so you get a better and wider "picture" of what's below you. Its three ranges (5′ to 200′, 200-400′, and 400-600′) makes it useful for virtually any lake or coastal area.

Uses a straight line recording system for easier and more accurate chart reading and interpretation. A white line control lets you adjust the bottom indication to a fine line so objects or fish close to the bottom can be distinguished easily. A switch controlled marker puts a vertical line on the chart for easy reference marking. A roll of paper lasts approx. 13 hours for continuous charting. And the two-piece case opens easily for convenient paper replacement.

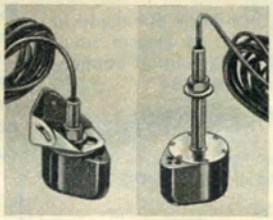
The MI-2910 has two lamps to light the chart for easy operation at night. The weather-resistant case with gasket seals helps prevent water from getting in the recorder. A universal gimbal mount lets you install the MI-2910 just about anywhere, and remove it for theft protection and storage when not in use. With one roll chart paper.

Kit MI-2910-1, recorder with through-the-hull transducer and 30′ cable. Shpg. wt. 16 lbs. **289.95**

Kit MI-2910-2, recorder with transom mount transducer and 30′ cable, Shpg. wt. 17 lbs. **289.95**

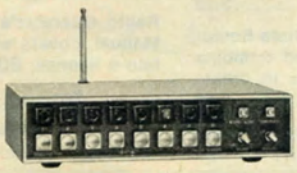
MIA-2910-1, Two Rolls Chart paper. Shpg. wt. 2 lbs. **9.95**

Special transducer has extra-wide beam to show larger underwater area. Supplied with 30′ cable for easy installation and placement on most any boat. Available with through-the-hull or transom mount.



Easy to Install and Use! The MI-2910 is compact for easy mounting on the instrument panel and near the wheel of most any boat. The convenient control panel and easy-to-read lighted chart makes finding the fish a lot easier. Shows other submerged objects too, important for safe navigation.

MI-2910 SPECIFICATIONS: **Power Requirement:** 11-16 VDC at 1.6 amperes maximum. **Depth Range:** 5′ to approx. 600′. **Display:** straight (vertical) line plotting on high contrast paper. **Accuracy:** better than 97% of indicated depth with belt motor speed at 320 rpm. **Controls:** Sensitivity control with power on-off switch. White line control with on-off switch. 0-200′, 200-400′ and 400′ to 600′ range switches. Marker pushbutton. **Transducer:** frequency, 50 kHz, ±4 kHz. **Beam Width:** 35° at 3 dB. **Cable length:** 30 ft. **Mounting:** through-hull or transom. **Chart Paper:** Size, 3 15/16″ x 50′ with pre-marked depth scales. **Take-up speed,** approx. ¾″ per minute. **Running time per roll:** approx. 13 hours. **Dimensions:** less gimbal bracket, 11″ W x 8″ H x 7″ D. **Net Weight:** less transducer 6½″ lbs.



Marine Scanner

Read about the new Heathkit Marine VHF Scanner on page 101. Listen to weather reports, ship-to-shore communications, coastguard warnings. A real aid to boating safety!

Heathkit Educational Kits and Books

"Master" your basic test instruments with these fun-to-use, effective self-study aids. Learn how to make and interpret measurements on radios, hi-fi equipment, TV, even home appliances. The information you'll pick up will help you enjoy your electronics hobby more, and it could start you on a profitable electronics service career.

$16.95

How to Understand and Use your VTVM

Designed by the experts at Heath to help you learn the theory, applications and advantages of the Vacuum Tube Voltmeter. The EF-1 combines a special power supply to let you make a variety of measurements, and a thorough, easy to understand text. You learn by doing, using your VTVM to make measurements and do experiments as outlined in the text. Text material is written to help the beginner and professional alike.

Kit EF-1, Text and Power Supply. Shpg. wt. 3 lbs. **16.95**

Kit EF-1-5, EF-1 and Heathkit IM-18 VTVM. 13 lbs. **49.95**

Kit EF-1-6, EF-1 and Heathkit IM-28 VTVM. 15 lbs. **59.95**

Manuals only for EF-1. Single copy, **5.00;** 10 or more, ea. **3.00.**

See page 57 for complete descriptions of IM-18 and IM-28 VTVM's.

$21.95

How to Understand and Use Your Signal Generator

Teaches you all you need to know to use, service and align signal generators. The easy to read text covers theory, function and use of RF and audio frequency generators. The special chassis supplied lets you perform experiments quickly and easily, to illustrate and clarify text material. Chassis has solderless spring-type connectors so you can make fast, simple circuit changes.

Kit EF-3, Text and chassis, Shpg. wt. 3 lbs. **21.95**

Kit EFS-3, EF-3 and IG-102 Signal Generator. 17 lbs. **62.95**

Manuals only for EF-3. Single copy, **5.00;** 10 or more, ea. **3.00.**

See page 61 for complete description of IG-102 Signal Generator

$32.95

Heathkit Basic Electricity Educational Kit

An excellent way to begin a rewarding electronics hobby! A clearly written and illustrated text covers the principles of basic electronics — voltage, current and resistance. You learn theory, do interesting experiments to demonstrate principles. You also build a handy volt-ohm-milliammeter that lets you make voltage, current and resistance measurements on a variety of electrical equipment. The text includes quizzes at the end of each chapter so you can check your progress as you study. This basic electricity kit and text will give you a good background in testing and measuring electronic equipment.

Kit EK-1, Shpg. wt. 4 lbs. **32.95**

Informative, Heath-approved Books for Your Electronics Library

How to Build & Use Electronic Devices without Frustration, Panic, Mountains of Money, or an Engineering Degree — a practical guide to using op-amps and other electronic devices. **EDP-202** **9.95**

Electronic Data Handbook, a convenient single-source of formulas and facts for solving virtually any electronic problem. **EDP-171 5.95**

CMOS Integrated Circuits, easy to understand explanation of how CMOS IC's work and how they are made. Build-it-yourself projects include a digital timer, wrist watch, capacitance meter and more. **EDP-197** **4.95**

Metrics for Millions, a simplified, thorough explanation of metric weights and measures — shows how to convert from metric to U.S. and from U.S. to metric. **EDP-173** **3.50**

How to Custom Design your Solid-State Equipment shows you how to adapt and combine scores of "building block" circuits to create the equipment you want. **EDP-199** **5.50**

Reference Data for Radio Engineers, a complete and comprehensive reference work that has been a favorite of radio & electronic engineers, universities and libraries for years. **EDP-176** **30.00**

TTL Cookbook, explains what TTL is, how it works, and how to use it. **EDP-183** **8.95**

IC OP-AMP Cookbook, first book published to cover basic theory of the IC op amp in detail — includes over 250 practical circuit applications, liberally illustrated. **EDP-184** **12.95**

The Electronic Invasion — a probing look at electronic snooping including technical explanations of how the equipment operates, written by a former private investigator. **EDP-203 5.45**

Modern Dictionary of Electronics. Clear, non-technical explanations of more than 18,000 terms. **EDP-177** **14.50**

Radio Operator's License Question & Answer Manual, covers what you need to know to obtain a license. **EDP-193** **7.45**

Informative CB Books

ABC's of Citizens Band Radio; new updated 128 page edition tells how to get started, choose equipment, channels, accessories, and get your license. **EDP-212** (SAMS) **4.25**

99 Ways to Improve Your CB Radio; 2nd edition. **EDP-214** (SAMS) **3.95**

Citizens Band Radio Handbook; 4th edition. **EDP-213** (SAMS) **5.95**

From CB to Ham Beginner; all the information needed to make the transition to ham radio; techniques, code, 144 p. **EDP-215** (SAMS) **4.75**

Questions & Answers About CB Operations; new edition. **EDP-216** (SAMS) **3.75**

Learn about the hottest subject in electronics — MICROPROCESSORS!

An Introduction to Microcomputers. Microprocessor basics and a complete discussion of popular types 8080, 6800, F8, etc. **EDP-217** **7.50**

Microcomputer Dictionary and Guide. Complete reference source on microcomputers. **EDP-218** **17.95**

See page 52 for book-ordering information.

Order early for best selection! Phone (616) 982-3411 day or night.

Heathkit Continuing Education Series— the fast, easy, low-cost way to learn electronics!

Heathkit Individual Learning Programs have been extensively field tested for effectiveness!

Get a complete, detailed overview of electronics — from DC to AC to Semiconductor Devices — all the way to advanced Digital Techniques

- ***Step-by-step, programmed text lets you study at your own pace***
- ***"Hands-on" projects give you a true FEEL for the subjects — far better than a regular textbook***
- ***The optional final exam gets you a Certificate of Achievement plus Continuing Education Units****

*Continuing Education Units (CEU's) are a nationally recognized means of acknowledging participation in non-credit adult education.

Programs start as low as

$39.95

(Less Trainer)

See pages 94-95

Thousands of people like you are already experiencing these unique Heathkit Individual Learning Programs. They're ideal for hobbyists who want to learn more about electronics, and they're an excellent way for experienced service technicians and advanced hobbyists to brush up! Read more about these exciting programs on pages 94 and 95.

Each Individual Learning Program is complete with a text, audio records to personalize text material, even parts for "hands on" experiments and measurements. The electronic "trainer" kits provide signal sources, power supplies and controls. All you need is a record player, small tools, and a VOM (Heathkit IM-17, page 49, or equivalent). It's the interesting, challenging FUN way to learn about electronics!

Electronic Fundamentals—3 Basic Programs

These three basic programs provide an excellent overview of contemporary electronics — they'll provide you with the fundamentals you need to follow your interests wherever they may lead you. The programmed learning text is clearly written, with technical material fully explained as it is introduced. Built-in quizzes let you test your knowledge at each step. The records give you a "personal" outline of text material and additional information, and electronic parts are included for use in the experiments. Each course leads logically into the next, and when you complete all three, you'll have a thorough knowledge of basic electronics.

Buy all three programs with the ET-3100 electronic trainer and SAVE $24.85

$154.95 Complete

See ETS-3100 below

$179.80 if purchased separately

Part 1: DC Electronics — electrical fundamentals, theory and practice —

1. *Electron Theory*
2. *Voltage*
3. *Resistance*
4. *Ohm's Law*
5. *Magnetism*
6. *Electrical Measurements*
7. *Network Theorems*
8. *Inductance and Capacitance*

Includes all texts, records, 56 parts for 20 experiments. Average completion time, 20 hours. 2.0 CEU and certificate for passing optional exam.

Program EE-3101, Shpg. wt. 6 lbs. **39.95**

SAVE $9.95!
EES-3101, Above program with Kit Trainer **ET-3100,** Shpg. wt. 17 lbs. **89.95**

Part 2: AC Electronics — sine waves, inductive and capacitive reactance, impedance, phase shift, transformers and filters

1. *AC Fundamentals*
2. *AC Measurements*
3. *Capacitive Circuits*
4. *Inductive Circuits*
5. *Transformers*
6. *Tuned Circuits*

Includes all texts, records, 16 parts for 8 experiments. Average completion time, 15 hours. 1.5 CEU and certificate for passing optional exam.

Program EE-3102, Shpg. wt. 6 lbs. . . .**39.95**

SAVE $9.95!
EES-3102, Above program with Kit Trainer **ET-3100,** Shpg. wt. 17 lbs. **89.95**

Part 3: Semiconductor Devices — transistors, zeners, SCR's, FET's, digital and linear IC's, LED's, opto-electronics

1. *Fundamentals*
2. *Diodes*
3. *Zener Diodes*
4. *Special Diodes*
5. *Bipolar Transistor Operation*
6. *Bipolar Characteristics*
7. *FET'S*
8. *Thyristors*
9. *IC's*
10. *Optoelectronic Devices*

Includes all texts, records and 27 parts for 11 experiments. Average completion time, 30 hours. 3.0 CEU and certificate for passing optional exam.

Program EE-3103, Shpg. wt. 6 lbs. **39.95**

SAVE $9.95!
EES-3103, Above program with Kit Trainer **ET-3100,** Shpg. wt. 16 lbs. **89.95**

We suggest you use the Heathkit IM-17 VOM with all these programs. Order it from page 69!

SAVE $24.85!
ETS-3100, All three programs and trainer, Shpg. wt. 38 lbs. **154.95**

Heathkit Experimenter/Trainer

For the Heathkit DC, AC and Semiconductor programs — helps you perform each project quickly and easily. And after you finish the programs, it's ideal for "breadboarding" your own design projects. Has solderless breadboarding sockets, 2-range variable sine and square wave signal source, dual-variable power supplies for positive and negative voltages (both variable over 1.2 to 16 volts, 120 mA, both regulated and short-circuit protected). Built-in 1k and 100k linear potentiometers. Center tapped power transformer secondary provides 30 V rms, 60 Hz for line experiments.

Kit ET-3100, Shpg. wt. 5 lbs. **59.95**

COMING SOON:

Part 4: Electronic Circuits and Applications Covers power supplies, amplifiers, oscillators, regulators, op amps, AM/FM, pulse circuits. Emphasizes integrated circuit applications.

For information on Continuing Heathkit Educational quantity discounts, see page 52.

Digital Techniques—An Advanced Program

For the experienced technician, engineer or experimenter, a thorough analysis of the latest digital techniques, with particular emphasis on circuit design.

ONLY
$49.95
Text, records and parts

Buy the Digital Techniques Program with the Digital Trainer and SAVE $9.95

$109.95

$119.90 if purchased separately

Shown with optional Trainer

Learn digital fundamentals, circuit design, TTL, ECL, CMOS, PMOS, NMOS integrated circuits; SSI, MSI and LSI; ROM's, PLA's; microprocessors

1. ***Introduction: techniques and uses, binary numbers, digital codes.***
2. ***Semiconductor Devices for Digital Circuits.***
3. ***Digital Logic Circuits: AND gates, OR gates, NAND/NOR logic, etc.***
4. ***Digital Integrated Circuits: TTL, ECL, CMOS, nMOS, pMOS, how to choose.***
5. ***Boolean Algebra.***
6. ***Flip-Flops and Registers: latches, D & JK flip-flops, storage registers, applications.***
7. ***Sequential Logic Circuits: binary, BCD, modulo N, up/down counters, dividers, shift registers.***
8. ***Combinational Logic Circuits: encoders, decoders, exclusive OR, comparators, multiplexers, ROM's, PLA's.***
9. ***Digital Design: combinational and sequential circuits, procedures.***
10. ***Digital Applications: counters, computers, microprocessors.***

Update your knowledge of electronics with this program in digital fundamentals. Provides a solid background with particular emphasis on circuit design. Covers the latest integrated circuits; ROM's and PLA's; even microprocessors. Helps you learn to design digital circuits for virtually any application.

The program assumes a prior knowledge of electronics fundamentals, either completion of the Heathkit basic electronics programs or equivalent knowledge. It can be successfully completed by technically-oriented people with a math or science background.

The program includes all texts, records and 44 parts for 24 experiments. Av. completion time: 40 hours. Credit: 4.0 CEU and certificate for passing optional exam.

Order with optional trainer below and SAVE!

Program EE-3201, Shpg. wt. 9 lbs. **49.95**

SAVE $9.95!

EES-3201, Above program with Kit Trainer ET-3200, Shpg. wt. 20 lbs. **109.95**

Heathkit Digital Design Experimenter/Trainer

Use it to perform all the experiments in the Heathkit Digital Techniques Program, also to develop projects, build and test prototypes, verify circuit operation, check digital IC's. Has solderless breadboard sockets, four binary data switches, 2 "no-bounce" switches to pulse logic circuits, 3-frequency pulse clock generator, 4 LED's for visual indication of logic states. Three regulated power supplies: +12 V, 100 mA current limited; −12 V, 100 mA current limited; +5 V, 500 mA, overload protected. Accommodates up to eight 14 or 16-pin dual-in-line IC's, also 24, 28 and 40-pin DIP's.

Kit ET-3200, Shpg. wt. 6 lbs. **69.95**

For information on quantity discounts, see page 52.

Fight Pollution with Heathkit Electronics

These Heathkit Electronic Air Cleaners will help you maintain a healthier, happier home

1 NEW! Furnace electronic Air Cleaner

$179.95 ***Installs on standard furnaces or air conditioners directly in place of present filter — usually without cutting or altering ductwork***

A truly important home improvement from Heath — it lets you breathe cleaner air throughout your house, for better health, and it removes most dust, dirt and pollen so you clean less. Helps remove smoke and reduce odors too. Helps cut down on dust and dirt so you save money on cleaning bills. The GD-1196 installs easily right in place of the air filter on your furnace or air conditioner, usually without cutting or altering ductwork. The GD-1196 removes particles—dust, dirt, pollen, even smoke — as small as 1/100th of a micron from the air in your home. It's far more efficient and effective than an ordinary fiberglass filter. It's designed for use with most gas, oil or electric furnaces, and it can be used in both heating and cooling systems. The GD-1196 consists of a power supply and filter panel that replaces your present filter. Power is obtained directly from your furnace blower motor, or from a standard AC outlet (with accessory switch below). NOTE: Kits below differ in size of filter panel. Check your furnace's filter size/capacity before ordering. For two-zone homes, two filters may be used with a single power supply. CFM, cubic ft. per min.

Kit GD-1196-1, 20″ x 25″ x 2″, 1000 CFM. Shpg. wt. 29 lbs. **179.95**

Kit GD-1196-2, 20″ x 20″ x 2″, 800 CFM. Shpg. wt. 27 lbs. **179.95**

Kit GD-1196-3, 16″ x 25″ x 2″, 800 CFM. Shpg. wt. 27 lbs. **179.95**

Kit GD-1196-4, 16″ x 20″ x 2″, 640 CFM. Shpg. wt. 26 lbs. **179.95**

Extra Filters. Use order nos. above, with GDA prefix i.e., GDA-1196-1, 20″ x 25″ x 2″ Filter only. Av. Shpg. wt. 10 lbs. . . . . each **99.95**

Accessory Air Flow Switch. Lets you operate the GD-1196 from standard 120 VAC wall outlet. (Required when GD-1196 is used with 240 VAC furnaces and air conditioning systems.)

Kit GDA-1196-5, Shpg. wt. 2 lbs. **24.95**

GD-1196 SPECIFICATIONS

Air Cleaning Efficiency: 70% nominal. **Generated Ozone Concentration:** 0.02 PPM maximum. **Static Pressure Drop:** 0.15 in. w.g. (clean filter). **Power Supply Dimensions:** 12″ W x 8″ H x 4″ D. **Power Requirement:** 110-130 VAC, 60 Hz. 25 watts max. **Note:** In some cases, a licensed electrician may have to make the electrical connections. Check with local building inspectors. Filter panels are 2″ thick, so some adjustment in your present holding brackets may be required.

2 Room-size electronic Air Cleaner

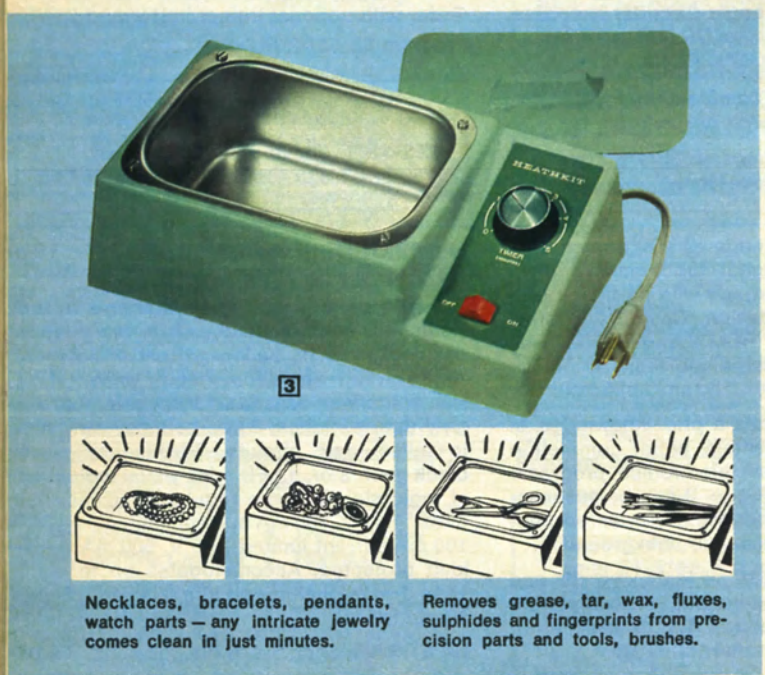
Clean air is important in maintaining the overall good health of your family. And the Heathkit GD-1003 cleans the air of 99% of airborne pollen and 95% of other contaminants... regardless of size or concentration. Plugs into any 120 VAC electrical outlet. A two-speed fan moves large volumes of air — fast — in the "high" position, and provides whisper quiet continuous operation in the "low" position. The big, efficient 5-bladed fan is lifetime lubricated for trouble-free operation. Everything's accessible for easy cleaning, too. A built-in safety interlock switch offers positive shock-hazard protection while cleaning (should you forget to unplug the unit), and against the prying fingers of small children. Cabinet of wood-grained vinyl-coated steel measures 15″ H x 13½″ W x 17¾″ D.

Kit GD-1003, Shpg. wt. 55 lbs. **149.95**

3 Ultra-convenient Ultrasonic Cleaner

Get the benefits of ultrasonic cleaning for those almost impossible cleaning chores. The Heathkit GD-1150 makes fast work of deep-cleaning watch parts, most jewelry, glass and contact lenses (except plastic), dentures, and even decorator paint brushes — any delicate items that could be harmed by scrubbing or abrasives. Simply fill the stainless steel tank with any safe detergent or solvent for the item to be cleaned. Place the object or objects in the tank, set the timer and that's it! You'll be amazed how quickly and easily your possessions come clean. Professional artists, jewelers and watchmakers have known about and used ultrasonic cleaning equipment for years. Now this low cost kit-form cleaner lets everyone take advantage of this scientific clean-up process. Tank measures 6″ L x 4″ W x 2⅜″ D. Overall, 11″ L x 5¾″ W x 3⅛″ H. For 120 VAC.

Kit GD-1150, Shpg. wt. 5 lbs. **69.95**



Necklaces, bracelets, pendants, watch parts — any intricate jewelry comes clean in just minutes.

Removes grease, tar, wax, fluxes, sulphides and fingerprints from precision parts and tools, brushes.

Order early for best selection! Phone (616) 982-3411 day or night.

Garage Door Openers Are Year 'Round Work-Savers

No longer a luxury, but an important home improvement that saves you strain and struggle...gives you added security and protection too!

$159.95

Heathkit deluxe Garage Door Opener

- ***Stop Fighting Heavy Garage Doors in Bad Weather***
- ***Extra Safety Too—Stay in your car until you're safely in the garage***
- ***75-Watt light stays on until you're safely in the house—then turns itself off—automatically***
- ***Safety-Reverse Feature—Door instantly reverses and returns to full open if obstructed***

HEATH charg-a-kit REVOLVING CHARGE

The GD-3209 garage door opener BELONGS in every home with a garage...it's an investment that really pays off in time and labor saved, convenience and extra security. Simply touch the button on the wireless transmitter in your car—your garage door opens automatically and the garage light turns on. Drive into the garage, touch the button again, and the garage door closes behind you, but the light stays on long enough to see you safely in the house.

The GD-3209 has a powerful ⅓ hp motor that opens even the heaviest residential garage doors (up to 7½′ maximum height) with ease. Its self-lubricating screw drive provides quiet, responsive operation and low-maintenance long life. The motor is housed in a rugged plastic case with the built-in time delay safety light.

The adjustable slip clutch provides opening safety, stopping the door automatically if obstructed. When the door is closing, the important safety reverse feature takes over. If the door encounters ANY obstruction (car rear, garbage can, etc.), it stops and reverses instantly, and returns to full open position. When the obstruction is removed, the door will close properly.

Assembly is really easy, with most of the work already done for you. The transmitter and receiver units are fully wired, so there's absolutely no soldering! You put together the motor mechanism and install the unit on your door tracks. Connecting leads are cut to the proper length, and pushbutton connectors are already installed. We even include a separate doorbell-type switch and 20′ cable so you can operate the unit from inside your house, or anywhere you may choose.

Kit GD-3209A, System w/1 transmitter, Shpg. wt. 45 lbs., Motor Frt. **159.95**
Kit GD-3209B, System w/2 transmitters, Shpg. wt. 46 lbs., Motor Frt. **174.95**
Kit GDA-3209-1, Mechanism only, Shpg. wt. 44 lbs., Motor Frt. **124.95**
Kit GDA-3209-2, Adaptor for jamb & pivot doors, Shpg. wt. 3 lbs. **9.95**
GDP-99, Transmitter, specify frequency, Shpg. wt. 1 lb. **19.95**
GDP-119, 1 transmitter, 1 receiver, Shpg. wt. 1 lb. **39.95**
GDP-129, 2 transmitters, 1 receiver, Shpg. wt. 2 lbs. **54.95**

Up-Down Limiters

Permanently installed limiters let you adjust amount of door travel so door coasts smoothly to proper position, open or close.

Fully assembled transmitter

Portable transmitter is factory assembled and adjusted. Has range up to 150′. (For use with Heathkit systems only).

Fully assembled receiver

Solid-state UHF receiver is factory assembled and adjusted, in a rugged enclosed case for long-life and low-maintenance service.

GD-3209A SPECIFICATIONS

Overall Size: 120″ L x 12″ H x 9″ W. **Motor:** 117 VAC ⅓ HP. **Open and Close Time:** Approx. 12 seconds. **Mounting Clearance:** 3″ above highest point of door travel. **Safety Lamp:** Delay circuit keeps lamp on 1 to 3 minutes. **UHF TRANSMITTER:** Powered by standard 9-volt battery. **RF Frequencies:** 290 to 320 MHz. **Useful Temperature Range:** −50°F. to +140°F. **UHF RECEIVER:** Powered by 24 VAC from opener mechanism. Usable on any mechanism having 24 volt AC NEC class II circuit. **RF Frequencies:** 290 to 320 MHz. **Temperature Range:** −55°F. to +140°F.

Build and install this "economy" chain-drive opener over the weekend

$129.95

- ***Safety-Reverse Feature—Door instantly reverses and returns to full open if obstructed***
- ***Factory-assembled transmitter and receiver***

A powerful quarter-horsepower chain-drive opener at a great kit price! Operates standard 7½′ track doors or jamb and pivot doors with GDA-309-2 adaptor, or "California" style doors with GDA-309-3 Speed Reducer Adaptor. Self-locking, automatic reversing, Quick-release pin. Includes "doorbell" button & wire for manual door operation.

Kit GD-309A, System with 1 transmitter, Shpg. wt. 50 lbs. **129.95**
Kit GD-309B, System with 2 transmitters, Shpg. wt. 51 lbs. **144.95**

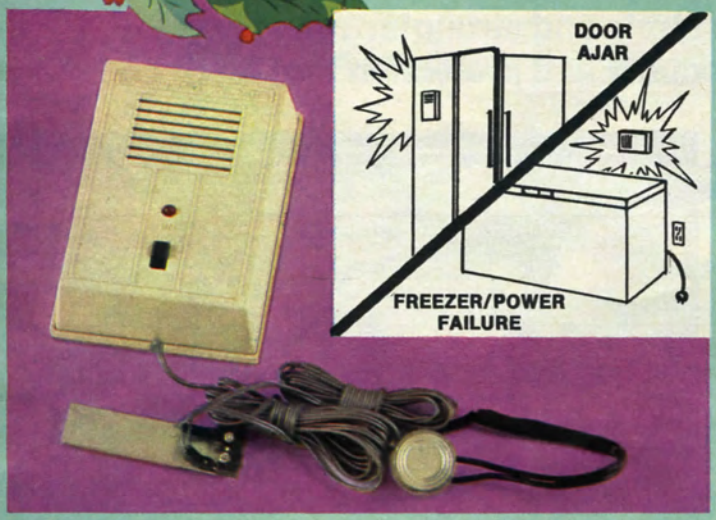
Kit GDA-309-1, Mechanism only, Shpg. wt. 42 lbs. **99.95**
Kit GDA-309-2, Adaptor for jamb & pivot door, Shpg. wt. 2 lbs. **4.95**
Kit GDA-309-3, Adaptor for vertical-opening 1-pc "California" style doors, Shpg. wt. 4 lbs. **9.95**
(To order additional transmitters & receivers, see listing under GD-3209A above.)
NOTE: This economy opener is mailable—for lower shipping costs!

GD-309A SPECIFICATIONS

Overall Size: 120″ L x 12″ H x 9″ W. **Motor:** 117 VAC ⅓ HP. **Open and Close Time:** Approx. 12 seconds. **Mounting Clearance:** 3″ above highest point of door travel. **Safety Lamp:** Delay circuit keeps lamp on 1 to 3 minutes. **UHF TRANSMITTER:** Powered by standard 9-volt battery. **RF Frequencies:** 290 to 320 and 340-400 MHz. **Useful Temperature Range:** −50°F to +140°F. **UHF RECEIVER:** Powered by 24 VAC from opener mechanism. Usable on any mechanism having 24 volt AC NEC class II circuit. **RF Frequencies:** 290 to 320 and 340-400 MHz. **Temperature Range:** −55°F to +140°F.

Assembled transmitters and receivers listed in order numbers above are FCC certified as Heathkit Model Nos. 30 and 38.

Practical, fun-to-build Kit Gifts



New — Freezer Alarm — an easy to build kit that could save you hundreds of dollars

If you own a freezer — chest-type or upright, even smaller freezers in boats, campers or motorhomes — you NEED the GD-1183! Provides two-way protection for the contents of your freezer — it signals if the freezer door is left open; and it signals if freezer temperature reaches 20° F even though the door is closed. The dual-alarm system uses both an audible "beep" and a flashing light. The visual alarm is especially useful for mobile or commercial uses where high noise levels may mask the audible alarm. Has two alarm speeds — fast to indicate that freezer door is open, slow to indicate thawing even though door is closed. The alarm shuts off automatically when freezer temperature returns to about 10° F. The temperature and door sensors install easily in any freezer; the alarm box can be mounted by the freezer or in any convenient remote location (includes 20 ft. connecting cable). Battery operation — keeps working even if AC power fails. Low-current-drain circuit assures long battery life. Operates on two standard "C" cells (not supplied). Best of all, the GD-1183 is one of our easiest kits to build. It's a low-priced, practical gift for every freezer-owner on your list!

Kit GD-1183, Shpg. wt. 2 lbs. **14.95**

New — Mount-Anywhere "touch-control" Light Switch puts power where you want it

One of the most convenient and practical kits we've ever offered — adds low-cost lighting versatility anywhere in your home! Gives you on-off switch control wherever you need it, without the bother and expense of extra outlets, wall boxes and rewiring. Even has a half-brightness position so you save energy and increase bulb life when you don't need full light. Consists of a control unit and a touch plate. Simply plug your lamp (up to 150 watts incandescent) into the control unit, plug the unit into an AC outlet. The remote touch-plate mounts anywhere and connects to the unit by an easily concealed wire. Then simply touch the plate briefly for half-bright, longer for full "on", and touch again for "off". We supply 20-ft. of wire, or you can use your own wire for longer runs. You can use more than one touch-plate too — or use any other metal — door knob, rail, etc. as a touch plate. Control unit 1 1/64" x 2 3/8" x 3 17/32". For 105-135 VAC, 60 Hz. An excellent gift kit for first-time builders.

Kit GD-1187, Shpg. wt. 1 lb. **12.95**

[1] **Photoelectric Lamp Switch.** Turns lights on in the evening, off in the morning — automatically. Helps discourage burglars while you're away from home. Just plug it in to any wall outlet, adjust the sensitivity and the GD-600 does the rest. For incandescent lamps up to 150 watts. A great 1-evening get-acquainted kit.

Kit GD-600, Shpg. wt. 1 lb. **5.95**

[2] **Tabletop Lamp Dimmer.** Set the mood for any activity with just the right amount of light — smoothly adjusts the brightness of table or floor lamps up to 300 watts. Eliminates annoying burned out elements in 3-way bulbs, even helps bulbs last longer. For 120 VAC. Makes a great heat-control, too, for pencil-type soldering irons used in circuit board work, installing ICs, etc. Measures 3¼" H x 3¼" W x 3¼" D.

Kit GD-1018, Shpg. wt. 2 lbs. **7.95**

[3] **Eye Spy™ Photobeam Relay.** The kit consists of a light source, a mirror assembly, and a photo-cell controlled relay which is activated whenever the reflected light beam is broken. Any warning devices or lamps plugged into photocell are then activated. Works up to 25 ft. from reflecting mirror. Electronics, 5⅜" H x 4⅜" W x 5¼" D. Mirror assembly, 5" H x 4" W x 2¾" D.

Kit GD-1021, Shpg. wt. 3 lbs. **14.95**

[4] **Electronic Darkroom Timer.** A "must" for every well-equipped darkroom — a true electronic timer with no moving parts to reduce reliability or accuracy. Has two switch-selected ranges — up to 99 seconds in 1 second steps or up to 9.9 seconds in 0.1 second steps. A time/focus switch turns the safelight off when focusing and printing. 2% accuracy.

Kit PT-15, Shpg. wt. 4 lbs. **36.95**

Find out how easy it is to build a kit — order the manual. See page 53.

Here's Heathkit Convenience for your home or office

These Heathkit telephone amplifiers make your telephone even more useful

AS LOW AS $49.95

- ***Talk and listen to calls "hands free"***
- ***Great for conference and family calls***
  Includes connectors for easy installation

These two fine telephone amplifiers make phone calls easier and more convenient than ever. And you can select one with or without a built-in dialer. In performance, features and value, they equal the best telephone amplifiers you can buy or rent. To answer the phone, just press the Power button; to hang up, press it again. Voice-activated circuitry instantly and silently switches the GD-1112 and GD-1162 from talk to listen. The built-in microphone lets you talk from up to 10 ft. away. Pressing the Listen button disables the microphone, but still lets you monitor the line. That makes it a perfect "hold" button and more. When you talk through the handset of an external phone, pressing the Listen button allows others in the room to hear both sides of the conversation. To return your phone to normal operation, just turn the amplifier off. The GD-1112 requires an external phone to place calls, the GD-1162's built-in dial and ringer makes it a completely self-contained phone. Both units operate on a standard 9-volt battery (not supplied) or optional GRA-43-1 AC Converter, order below. For easy installation, the GD-1112 includes a ¼" phone plug and 4-pin telephone plug; the GD-1162 has a 4-pin phone plug and, for business phones, a 15-pin data-phone connector. Both come with 6', 4-conductor cable. Each unit, 2½" H x 8½" W x 5¾" D. Good-looking plastic case may be used on desk or wall-mounted.

Kit GD-1112, Amplifier, Shpg. wt. 4 lbs. **49.95**
Kit GD-1162, Amplifier with Dialer, Shpg. wt. 5 lbs. **69.95**
Kit GRA-43-1, AC Converter, Shpg. wt. 1 lb. **4.95**

NOTE: Customer-owned equipment connected to telephone lines may be subject to local tariff.

Save time, steps and money with these easy-to-build Heathkit Intercoms

1 Heathkit "Wireless" 3-Channel Intercom

Just build the intercoms you need, plug them into wall outlets—that's all there is to it. They use your home electric wiring for transmissions—and you can move units from room to room at will. Versatile 3-channel operation—ideal for multi-unit setups. Pushbuttons provide channel selection. "Talk" mode, and "Dictate" position. Volume control, internal squelch. Each GD-113 uses about as much current as an electric clock. Attractive light green cabinet 4⅛" H x 8½" W x 6¾" D.

Kit GD-113, Shpg. wt. 4 lbs. **34.95**

2 Indoor/Outdoor Intercom System

Master functions include "All Call," "Talk," "Dictate"...plus monitoring of up to four Remotes. Indoor Remotes can be rendered private to prevent monitoring. GD-110 and GD-120 are light green and measure respectively 4½" H x 8½" W x 6¾" D and 3¾" H x 6" W x 5¾" D. GD-130 has weatherproof crinkle finish. 5⅜" H x 3⅝" W x 2⅝" D.

Kit GD-110, Master Station, Shpg. wt. 5 lbs. **44.95**
Kit GD-120, Indoor Remote, Shpg. wt. 2 lbs. **12.95**
Kit GD-130, Outdoor Remote, Shpg. wt. 2 lbs. **9.95**
GDA-110-2, 100' 4-conductor cable, Shpg. wt. 2 lbs. **9.95**
GDA-110-4, 100' 2-conductor outdoor cable, Shpg. wt. 2 lbs. **4.95**

3 Heathkit 2-Station Intercom System

Master station accommodates up to two remotes. Remotes can initiate "private" calls to Master. Master can call either or both remote stations. Master controls include Sta. 1, Sta. 2, Talk, Dictate, & Volume. Remotes have Talk & Dictate controls. 3" x 5" microphone-speakers for crisp, clear sound. Low-profile cabinets with plastic feet for surface use, holes for wall mounting. 3¾" H x 6" W x 5¾" D.

Kit GD-140, one Master, one Remote, Shpg. wt. 4 lbs. **36.95**
Kit GD-120, one extra Remote, Shpg. wt. 2 lbs. **12.95**
GDA-110-2, 100' 4-conductor cable, Shpg. wt. 2 lbs. **9.95**

Order early for best selection! Phone (616) 982-3411 day or night.

Give Shortwave Listening fun from Heath

Six bands...AM, SSB and CW...plus portability

$169.95 ***An ideal standby receiver for your station... a top performer for general listening too***

The Heathkit GR-78 is a favorite of discriminating SWL's, Hams, travelers, vacationers — anyone who wants a take along portable receiver for lively and interesting listening. Covers 190 kHz to 30 MHz for foreign broadcasts, ships at sea, local Ham radio operators, AM stations too.

Features an Automatic Volume control to prevent fading and blasting when tuning through weak or strong signals: Automatic Noise Limiter to cut annoying noise and static. Has a front panel "S" meter for all bands, 500 kHz crystal calibrator, receiver/standby switch, muting connection and headphone jack.

A built-in telescoping antenna helps pull in stations, there's even an external antenna input. Includes built-in nickel-cadmium rechargable and AC charger. Easy kit construction too.

Kit GR-78, Shpg. wt. 13 lbs. **169.95**

GR-78 SPECIFICATIONS: **Frequency coverage:** 190 kHz-410 kHz; 550 kHz-1300 kHz; 1.3 MHz-3.0 MHz; 3.0 MHz-7.5 MHz; 7.5 MHz-18.0 MHz; 18.0 MHz-30 MHz. **Sensitivity*:** 0.2 μV — 10 μV depending on band and portion thereof. **Selectivity:** 7.5 kHz ±1 @ 6 dB down. **Battery:** 9.6 VDC 500 mAh Nickel-Cadmium rechargable. **Dimensions:** 6¼" H x 11½" W x 9" D.

4-Band Shortwave — just right for the beginner

$69.95 ***Listen in on World-wide Shortwave broadcasts, CB, marine — even AM radio***

If you're looking for a great first-time kit — or just a great low-priced shortwave receiver — the SW-717 is for you. It's an ideal introduction to kit construction — and the assembled radio will bring you years of entertainment. It's an all time favorite Christmas gift too!

Tunes foreign broadcasts from all over the globe — amateur and CB radio bands — local and marine weather reports — ships at sea — plus standard AM — it's a world of exciting listening at your fingertips!

Features wide slide-rule tuning dial with logging scale; bandspread tuning for easy separation of crowded stations, variable BFO for code reception; built-in speaker; front panel jack for external speaker or headphone; switchable automatic noise limiting; signal-strength tuning meter; built-in AM rod antenna plus connection for SWL antenna. It's the one to buy and build to start a fascinating kit hobby!

Kit SW-717, Shpg. wt. 10 lbs. **69.95**

SW-717 SPECIFICATIONS: **Frequency coverage:** 550 kHz-1500 kHz, 1.5—4 MHz. 4—10 MHz. 10—30 MHz. **Meter:** Indicates relative signal strength. **Headphone Jack:** Accepts low impedance headphone or external speaker. **Loudspeaker:** Built-in. **Power Requirement:** 120/240 VAC, 60/50 Hz, 8 W. **Dimensions:** 5⅓ H x 14½" W x 8" D.

Exciting Portable VHF/FM Monitor

Covers 152-174 MHz VHF for fascinating local police, fire and emergency service listening! Has telescoping antenna to help pull in stations, rugged case with carrying handle for easy portability. It's an easy and enjoyable kit to build too, a great gift idea. Tunes the complete band, no extra crystals are needed.

Kit GR-88, Shpg. wt. 5 lbs. **49.95**

GR-88 SPECIFICATIONS: **Tuning Range:** 152-174 MHz. **Antenna Input:** 50-75 ohms. **Sensitivity:** 2.0 μV or less for 20 dB quieting. **IF Selectivity:** ±40 kHz @ 6 dB down. **Image Rejection:** 40 dB or greater. **IF Rejection:** 80 dB or greater. **Speaker:** 3" round. **Batteries:** Six 1.5 V "C" cells, not supplied. **Dimensions:** 7½" H x 8¾" W x 3½" D.

SWL Accessories

Superex Headphones. Ideal for use with both Heathkit SWL's above, many others. Feature dual coils for excellent sensitivity, wide headband for comfortable listening. 600 ohms impedance. **GD-396,** assembled. Shpg. wt. 1 lb. **5.95**

Long-wire SWL antenna. Really helps you pull in stations! 75' long wire with 30' lead-in, all insulators and hardware for easy setup. A must for serious listeners. **GRA-72,** Shpg. wt. 2 lbs. **4.50**

NEW! Police-Call, Fire, Emergency Radio Directories

Latest edition. Lists city, county and state emergency services. Order the one for your region.

GRA-1100-10, Vol. 1 — Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont **4.95**

GRA-1100-11, Vol. 2 — Delaware, Maryland, New Jersey, Pennsylvania **4.95**

GRA-1100-12, Vol. 3 — Ohio, Michigan **4.95**

GRA-1100-13, Vol. 4 — Illinois, Indiana, Kentucky, Wisconsin **4.95**

GRA-1100-14, Vol. 5 — Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota **4.95**

GRA-1100-15, Vol. 6 — DC, Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia **4.95**

GRA-1100-16, Vol. 7 — Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, Texas **4.95**

GRA-1100-17, Vol. 8 — Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming **4.95**

GRA-1100-18, Vol. 9 — California, Oregon, Washington **4.95**

See page 52 for book ordering information.

Informative SWL books

SWL Guide. Invaluable reference for beginners or "Pros"- Latest updated edition lists call signs, frequencies and addresses for Shortwave, FM and TV stations worldwide. Easy-to-read type and tables. **GDP-315,** 2 lbs. **8.95**

Shortwave Listener's Handbook — covers basic equipment to modifications, characteristics of receivers and antennas, schedules and reception reports, lists major shortwave stations by country and frequency. **EDP-196** **4.90**

ABC's of Shortwave Listening — programs available, how to enjoy SW listening; receivers and antennas in non-technical terms. **EDP-154** **3.50**

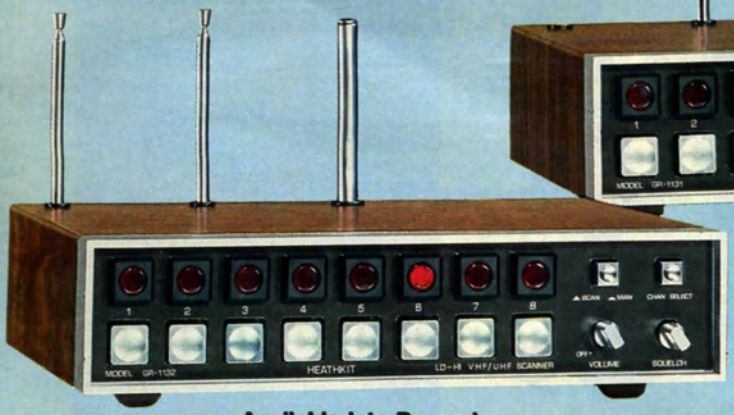
99 Ways to Improve your Shortwave Listening — antennas and their installation, receivers, accessories, listening techniques, special bands, troubleshooting. **EDP-155** **4.50**

How to Hear Police, Fire and Aircraft Radio — a guide to VHF reception; home and mobile installations. **EDP-156** **3.50**

See page 52 for book ordering information.

Order early for best selection! Phone (616) 982-3411 day or night.

New Exciting Heathkit Scanning Monitors



Available late December

Available early December

Emergency

Fire

Police

Weather

GR-1132 3-Band VHF/UHF Monitor

Tune in ALL the action with the GR-1132! Covers any combination of 8 channels in the 30-50 MHz and 146-174 MHz VHF bands, and the 450-500 MHz UHF band. It automatically scans each channel, stopping on any signal, then resumes scan after broadcast. Let's you monitor fire calls, police, ambulances, Amateur 2-meter FM, marine emergency vehicles, gov't weather stations, more. Priority feature — checks priority channel every 4 seconds even when locked on another channel and overrides if there is activity on the priority channel. 4-pole crystal filter (for even better selectivity in crowded signal areas, order the optional 8-pole filter, right); channel lockout buttons; extra-large lighted channel indicators. Telescoping antennas are supplied for each band, plus provision for external antenna. The large built-in speaker provides good audio quality. Volume and squelch controls, manual channel selection too. Built-in AC and 12 VDC power supplies. Rugged walnut-grain metal case, brown tone front panel with chromed channel buttons. Easy kit assembly, easy no-instrument alignment. Order crystal certificates below at right.

Kit GR-1132, Shpg. wt. 9 lbs. **139.95**

GR-1132 SPECIFICATIONS: **Scanning Range:** LO-VHF, any 10 MHz segment of 30-50 MHz frequency range. Hi-VHF, any 8 MHz segment of 146-174 MHz frequency range. UHF, any 8 MHz segment of 450-500 MHz frequency range. **Sensitivity:** Lo and Hi VHF: 0.5 μV or less for 12 dB SINAD. UHF: 0.7 μV or less for 12 dB SINAD. **Adjacent Channel Rejection:** (30 kHz channel spacing) — 40 dB typ. (—55 dB typ. with optional 8-pole filter). **Scan Rate:** approx. 16 channels per second. **Scan Delay:** approx. ½ second. **Priority Channel Check:** approx. 4 seconds. **Antenna Impedance:** 50 ohms. **Audio Output:** AC operation, 1 watt; DC operation, 2 watts; less than 10% distortion. **Power Requirement:** 120 VAC, 60 Hz. 12 watts or 13.8 VDC, 300 mA squelched; 500 mA at full output. **Dimensions:** 3¾" H x 8½" D x 11¼" W. **Net Weight:** 5 lbs.

GR-1131 Hi-band VHF Scanning Monitor

Covers 146-174 MHz VHF — if the emergency services in your area use this frequency band — this is the low-cost way to listen in! Has many of the deluxe features of the GR-1132 (left) — built-in telescoping antenna, external antenna provision, volume and squelch, priority channel, lighted indicators, automatic or manual channel selection. 4-pole crystal filter provides good selectivity for normal areas, or order the optional 8-pole filter for better selectivity in crowded signal areas. Walnut-grained metal case, AC or 12 VDC operation. Order crystal certificates below.

Kit GR-1131, Shpg. wt. 9 lbs. **89.95**

GR-1131 SPECIFICATIONS: **Scanning Range:** any 8 MHz segment of the 146-174 frequency range. **Sensitivity:** 0.5 μV or less for 12 dB SINAD. Other specifications same as GR-1132 at left. **Dimensions:** 3¾" H x 8½" D x 11¼" W. **Net Weight:** 5 lbs.

Accessories for all Scanners on this page

Mobile Mounting Bracket. GRA-1131-1, Shpg. wt. 1 lb. **3.95**

Crystal Certificate. You send to crystal mfr. with specific frequency. Crystal is returned postpaid. Order one for each frequency.
GRA-1100-1 .....**each 4.95**

Optional 8-pole crystal filter. Improves selectivity for use in crowded signal areas. **GRA-1100-2,** Shpg. wt. 1 lb. **9.95**

MR-1134 Marine-Band VHF Automatic Scanning Monitor

- ***Priority channel selection***
- ***Large, lighted channel indicators for easy reading even at night***
- ***Automatic or manual channel selection***

An important accessory for every boat owner, fisherman, even people who live near harbors or lakes. Lets you automatically monitor up to 8 marine frequencies on the 156-163 MHz VHF marine band. Listen to weather frequencies, marine emergency channels, harbor instructions, fishing reports, ship-to-shore and ship-to-ship communications, more. Includes many of the GR-1132's deluxe features (see above)—channel lockout, priority scanning and more. Manual scanning too, simply push the button for the channel you wish to monitor. A 4-pole crystal filter provides good selectivity (for crowded signal areas, use the optional 8-pole filter above). A built-in telescoping antenna brings in plenty of signals, there's also provision for an external antenna. Has volume and squelch controls, automatic or manual scan selector, channel selector button. Handsome blue and white marine styling, rugged splashproof case. AC or 12 VDC operation. Easy kit assembly and no-instrument alignment. Order crystal certificates above.

Kit MR-1134, Shpg. wt. 9 lbs. **99.95**

Available early December

Note: Some states prohibit use of scanners in vehicles. Check with local authorities.

MR-1134 SPECIFICATIONS: **Scanning Range:** any 8 MHz segment of the 146-174 MHz frequency range. **Sensitivity:** 0.5 μV or less for 12 dB SINAD. **Adjacent Channel Rejection:** —40 dB typ. (—55 dB typ. with optional 8-pole filter). **Scan Rate:** approx. 16 channels per second. **Scan Delay:** approx. ½ second. **Priority Channel Check:** approx. 4 seconds. **Dimensions:** 3¾" H x 8½" D x 11¼" W. **Net Weight:** 5 lbs.

Outdoor Scanner Antenna

For VHF and UHF. Really helps improve reception. Covers all bands, VHF and UHF. For masts to 1½" diameter. SO-239 receptacle.

GRA-1132-1, Shpg. wt. 2 lbs. **21.95**

Heathkit Music Accessories help you perform BETTER!

[1] Deluxe Guitar Amplifier. Gives professional performance and a full 120 watts of EIA music power at a low kit price. Switchable harmonic modifier for that "fuzzy" sound; a brightness switch to enhance high-frequency presence. Separate bass and treble controls, a dual-spring variable reverb and a tremolo variable in rate and depth. A dual footswitch gives hands-free on-off control of tremolo & reverb. Has three channels with two inputs for each — ideal for small groups. Can be used with guitar, bass, electronic combo organ, microphone/phonograph. 27⅜" W x 6¾" H x 14½" D. For 120/240 VAC, 60/50 Hz.
Kit TA-17, amplifier only, Shpg. wt. 40 lbs. **199.95**

[2] Deluxe Instrument Speaker. Matched to TA-17 above. Two 12" woofers and horn driver. 25⅞" W x 38" H x 14½" D. With 20-ft. cable.
Kit TA-17-1, Shpg. wt. 112 lbs. Motor Freight **189.95**

[3] 25-watt Guitar Amplifier. The rugged one-piece case with carrying handle houses full control amplifier and two heavy-duty 12" woofers. Has two dual-input channels. Features double-spring variable reverb and tremolo with variable rate and depth. Two footswitches permit hands-free control of reverb and tremolo. ¾" vinyl covered wood cabinet. 28" W x19 ¾" H x 9" D. For 120/240 VAC, 60/50 Hz.
Kit TA-16, Shpg. wt. 48 lbs. **139.95**

[4] Electronic Metronome. Ideal for students and teachers. A front panel control turns the unit on and adjusts tempo from 40 to 210 beats per minute. A rear panel control adjusts volume. Chart relates tempos to beats per minute. Requires two 9-V batteries (not supplied).
Kit TD-17, Shpg. wt. 2 lbs. **17.95**

[5] Harmonic Distortion Booster. Add "fuzz" effect to your guitar sound. Has footswitch, tone and distortion degree controls. Operates on penlight cell (not supplied).
Kit-TA-28, Shpg. wt. 4 lbs. **24.95**

Build yourself a lifetime of music enjoyment

This deluxe Heathkit/Thomas Spinet Organ puts an orchestra in your home

The TO-1260 is our most versatile organ, yet exclusive Color-Glo keys will have you playing complete songs in just minutes. A breathtaking range of voices helps you create exciting orchestral effects. And the optional TOA-60-1 (below) lets you add your own "Rhythm Section" for even more fun. In addition to two 44-note overhanging manuals with tilted keys, the TO-1260 features a 13-note radial arc pedal board, two 25-watt RMS amplifiers and two 12" speakers. A convenient accessory panel lets you plug in headphones for silent practice, use an external cassette deck to play or record, or plug in an external tone cabinet. The handsome cabinet comes completely assembled and finished in your choice of Contemporary or Mediterranean styles. The cabinets are handcrafted using furniture-grade hardwoods with decorative plastic trim, finished in hand-rubbed walnut (distressed antique in the Mediterranean).

Kit TO-1260M, Mediterranean, Shpg. wt. 255 lbs., Motor Freight **1195.00**

Kit TO-1260W, Contemporary, Shpg. wt. 247 lbs., Motor Freight **1145.00**

HEATH charg-a-kit REVOLVING CHARGE

TO-1260 SPECIFICATIONS: VOICES: UPPER KEYBOARD (Solo): Flute 16′ Flute 8′, Flute 4′, Trombone 16′, Bassoon 16′, Trumpet 8′, Diapason 8′, Clarinet 8′, Oboe 8′, Violin 8′, Mando (Pre-Set), Harpsichord (Pre-Set), Piano (Pre-Set), Accordion (Pre-Set). LOWER KEYBOARD — (Accomp.): Tuba 8′, Diapason 8′, French Horn 8′, Melodia 8′, Cello 8′. PEDAL KEYBOARD — Bourdon 16′, Major Flute 8′, String Bass 8′. CONTROLS: Solo — Bright, Accomp. — Bright, Solo Sustain — Long, Auto — Sostenuto, Solo O — Tremulant, Solo Flute — Tremulant Accomp. □ —Tremulant, Pedal Sustain — On/Off, WAH WAH — On/Off, Variable Slide — Pedal Volume, Variable Slide — Reverb Balance, Variable Slide — Percussion Volume, Variable Slide — Manual Balance, Expression Pedal. **Dimensions:** 37½" H x 44" W x 23½" D.

Add "Rhythm Section" versatility to your organ

Touching a button adds automatic bass patterns, alternating bass pedal notes, complete drum section, piano, guitar, banjo or harpsichord accompaniment and your choice of 8 rhythm patterns.

Kit TOA-60-1, (not shown). Shpg. wt. 5 lbs. **279.95**

TOA-60-1 SPECIFICATIONS: PRE-PROGRAMMED RHYTHM PATTERNS: Waltz, Fox Trot, Rock, Soul, Polka, Samba, Bossa Nova, Rhumba. **Controls:** Drums (On/Off), Tempo, Volume. **RHYTHM VOICES:** Add Cymbal, Snare/Tom Tom. **FANCY FOOT:** (Alternating bass pedal notes that fit into rhythm pattern chosen — automatic when foot pedal is held). **Control:** Syncopated or Alternating Bass. **PRE-SET ACCOMPANIMENT — Voices:** Piano (Pre-Set), Guitar (Pre-Set), Harpsichord (Pre-Set). **Controls:** ACC Pre-Sets (On/Off), Volume.

LEARN ABOUT ELECTRONIC MUSIC WITH THESE AUTHORITATIVE BOOKS

Experimenting with Electronic Music — from sine wave generators to synthesizers. **EDP-209** (Tab) **4.95**

Electronic Musical Instruments — amplification to synthesizers. **EDP-211** (Tab) **4.95**

Electronic Music Production — how to use ring modulators, multivibrators, etc. **EDP-210** (Tab) **3.95**

See page 52 for ordering information

Charge-A-Kit — no money down on any kit — see page 54 for details.

New Heathkit/Thomas Keyboard Kombo

The instrument that looks like an organ, but does a whole lot more — build it for a lifetime of musical entertainment!

HEATH charg-a-kit REVOLVING CHARGE

$549.95

Create the sound of an entire musical combo by playing simple one-finger chords!

- ***Provides solo instruments, rhythm accompaniment and drums***
- ***Wide-selection of built-in tempos for real versatility***
- ***BIG, FULL sound from the built-in 12" wide-range speaker***

The Heathkit/Thomas Keyboard kombo is the "Christmas kit" to delight your family and friends with years of fine music! With it, you'll be playing professional sounding music with solos, rhythms and accompaniments all at the touch of one finger! The TO-1102 will make you the "life of the party" as you dazzle your friends and family with exciting and creative musical entertainment!

The TO-1102 accurately reproduces the sounds of these solo instruments: Flute, Clarinet, Trumpet, Violin, Accordian, Guitar, Piano, Banjo, Mandolin, Harpsichord, Vibes and Hawaiian Guitar. As you play the "solos" with these instruments, the TO-1102 automatically accompanies you with a wide assortment of rhythm instruments: piano, guitar, banjo, harpsichord and flute. These rhythms are automatically accompanied by alternately bass pedal notes.

And the drums provide the beat! Variable slide controls for drums tempo and volume let you create your own tempo's or you can choose automatic tempos of Waltz, Fox trot, Swing, Rock and Latin.

The Keyboard Kombo has 24 major and minor one-finger chords. Simply press the key with one finger and the chord automatically plays — depressing a foot pedal switch lets you change the chord from major to minor. A special memory-chord circuit keeps the last chord sounding until you play the next, providing a smooth, professional-sounding flow of music. Vibrato and reverb controls let you create special effects for even more musical versatility!

The TO-1102's sound system delivers the music you produce with outstanding sound quality. There's a deluxe all-solid-state amplifier with a heavy-duty wide-range 12" speaker system. And its unique electronic circuits insure that all instrument and rhythm sounds are accurately reproduced.

Has on-off switch with pilot light, volume control, slide controls for keyboard balance and reverb, a balanced expression control. There's even a headphone jack so you can entertain yourself or practice in complete privacy. The keyboard is clearly marked with each note, so learning to play is easy and fast. Just sit down with it for awhile and you'll find yourself sounding like a "Pro"! We include full instructions and a songbook to get you started!

Finally, the TO-1102 is as good to look at as it is to play and listen to. The contemporary designed cabinet is fully assembled with selected wood veneers and has a simulated rosewood finish for a rich, expensive look. The matching bench even includes storage space for sheet music. The TO-1102 is an easy-to-build kit too, with IC's and plug-in circuit boards to simplify assembly. And it's priced a lot lower than assembled units, so you get big kit-form savings. Treat yourself and your family to musical entertainment at its best — order the TO-1102 today!

Kit TO-1102, Shpg. wt. 189 lbs. Motor Freight **549.95**

TO-1102 SPECIFICATIONS: **Solo Instruments:** Flute, Clarinet, Trumpet, Violin, Accordian, Guitar, Piano, Banjo, Mandolin, Harpsichord, Vibes, Hawaiian Guitar. **Accompaniment Instruments (Rhythm):** Piano, Guitar, Banjo, Harpsichord and Flute: **Drums:** Waltz, Fox Trot, Swing, Rock, Latin. **Drum Controls:** Tempo — Variable Slide; Volume — Variable Slide. **Chords:** 24 one-finger Chords, Memory Chord. **Controls:** Vibrato Cancel; Reverberation, variable slide; Keyboard Balance, variable slide. On-off switch with pilot indicator. Balanced Expression control. Headphone Jack. **Cabinet:** Contemporary Design with Rosewood Finish. **Sound System:** solid-state amplifier with 12" heavy-duty Speaker. **Dimensions:** 34¼" H x 36" W x 21¼" D. **Net Weight:** 150 lbs.

Heathkit/Thomas Spinet Organ

Gives you plenty of fine performance for the price! Has 44-note overhanging manuals, 13-note radial arc pedal rack; exclusive Color-Glo keys and a "quick-play" organ course so you'll be playing the first time you sit down. 25-watt amplifier and 12" speaker. Fully assembled cabinet and bench of walnut veneers and solid hardwoods. Shpg. wt. 233 lbs.

Kit TO-1160, Motor Freight **549.95**

Give your guests a musical "Hello"

Unique Heathkit "Programmable" Electronic Doorbell

Change tunes fast 'n easy

ONLY $44.95

"Ring in" Happy Holidays with this exclusive Heathkit Doorbell — every time a visitor touches the door button, your favorite 16-note tune sounds throughout the house!

A FUN to build and use kit that will brighten your home all year 'round! A C through C "keyboard" located behind the front-panel access door lets you program any tune up to 16 notes — celebrate the season, a birthday, an anniversary, a special party — whatever you like. Change notes by simply rearranging the leads, there are also controls for tuning, volume, speed and decay characteristics of the electronically synthesized sound. Single circuit board construction makes it easy to build, even for first time builders. And installation is easy too — just wire between existing bell transformer and TD-1089. The TD-1089 is loud enough to be heard throughout most homes, but you can add extra speakers to the "extension" terminals and spread the sound throughout the house. The TD-1089 is a unique, creative and FUN addition to your home or office. It's the new, exciting way to greet your friends and let them know they're welcome.

Kit TD-1089, Shpg. wt. 3 lbs. **44.95**

TD-1089 SPECIFICATIONS: **Power Requirement:** 16 Volts AC, 50/60 Hz, from standard doorbell transformer (not supplied) with 10 VA Rating. **Tone Characteristics:** Decaying, mellow. **Maximum Power Into Speaker:** 1 watt. **Speaker Size:** 3″ x 5″ oval — 16 Ohm. Extra speakers can be added for a total of not less than 16 Ohms. **Actuating Inputs:** Two, for front and rear doors. **Programming Matrix:** 13 notes x 16 beats — same note up to 9 beats. **Dimensions:** 5¾″ H x 8⅝″ W x 2⅝″ D. **Net Weight:** Approx. 1½ lbs. **Power Drain:** Idle, 6 watts, Maximum 12 watts.

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See pages 10-11

Educational FUN for the Kids!

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See page 6

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See page 51 for details.

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See pages 22-23

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