

MARCH 1974

HEATHKIT®

Read what the experts say about the new Heathkit DIGITAL COLOR TV—

"...combines peerless reception, anticipated ultra-reliability...and all the optional convenience features one could wish for (electronic digital clock, remote control, and 'hi-fi' audio tap). In our view, the color TV of the future is here — and Heath's GR-2000 is it!"

— Popular Electronics

APRIL, 1974

"Most technologically-advanced TV on consumer market is new Heathkit 25V" with 33 ICs. Set features on-screen channel number and optional digital clock display, 16-channel all-electronic varactor tuner, fixed-filter IF & built-in service instruments."

— Television Digest

JANUARY 7, 1974

"With manufacturers only now beginning to get the color excellence Heath has featured for years, it was time for Heathkit to once again move ahead of the industry, and move they did."

— RADIO-TV REPAIR

MARCH, 1974

"... this TV kit is something to be reckoned with. It provides new circuits that haven't been seen before... uses the latest in digital logic techniques... undoubtedly one of the best designed color sets available... a set you will want to own."

— Radio-Electronics

FEBRUARY, 1974



FACTORY MAIL ORDER CATALOG 800/95

Copyright 1974, Heath Company

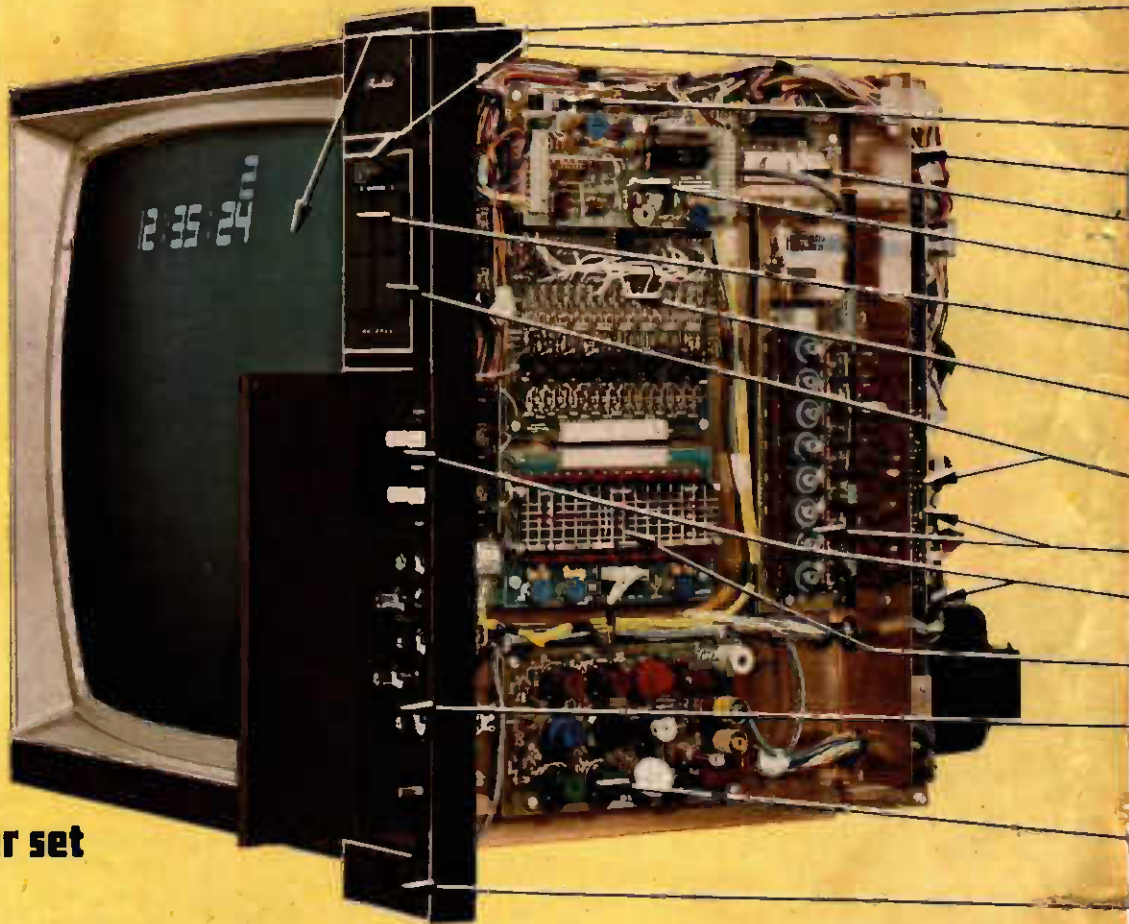
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**SEE
BACK COVER**

Heathkit® Digital Color TV-

Major electronic magazines have reviewed the Heathkit GR-2000 Digital Color TV. The consensus is it's the most advanced design they've ever seen... far ahead of any other set



Here's what the editors are saying:

Popular Electronics, April, 1974 — "It has been a long time since anything novel as far as electronics are concerned has been introduced to the color TV receiver market... But now there really is something new in color TV receivers: digital non-mechanical tuning is just one innovation... You can find it in the Heathkit Model GR-2000..."

Radio-Electronics, Feb., 1974 — "State-of-the-art! These four words are often associated with the space program, or the most recent developments in integrated circuits. But now they can be properly used to describe the brand new Heathkit GR-2000 color TV kit. In fact, this new set uses so much digital design and so many integrated circuits, that it can be said that it sets new standards for state-of-the-art in color TV.

"At first glance it looks just like any other color TV. At second glance you start noticing the differences — there are no knobs on the front panel; and when you turn the set on, something remarkable happens — the channel number and the time (hours, minutes, and seconds) appear on the screen! And that's just the beginning."

Radio-TV Repair, March, 1974 — "To many of us in the industry, the only way to get good color TV reception — deep saturation and true-to-life hue — was to build the TV ourselves, and that meant a Heathkit Color TV. For something like seven or eight years Heathkit color has been essentially the standard of comparison for all consumer TV sets... With manufacturers only now beginning to get the color excellence Heath has featured for years, it was time for Heathkit to once again move ahead of the industry, and move they did..."

Radio-Electronics, in assessing the Heathkit GR-2000, underscored "features that are not to be found in any other production color TV being sold in the U.S. There are six of these 'unique' features in the GR-2000..."

"On-screen electronic digital channel readout... In the GR-2000, the numbers appear on the screen each time you switch channels or touch

the RECALL button. The length of time that they are visible is adjustable.

"On-screen electronic digital clock readout. This is an optional low-cost feature. It will display time in 12- or 24-hour format, with your choice of hours and minutes or hours, minutes and seconds... The clock continues to run when the set is off. The readout appears on the screen whenever the channel number appears." Note: The channel and clock readout can be positioned anywhere on the screen.

"Silent, all-electronic tuning. It's done with uhf and vhf varactor diode tuners that are dc voltage-controlled... To change channels, the viewer taps either an up or down switch on the front panel of the set.

"Touch-to-tune, reprogrammable, digital channel selection. You program up to 16 channels, uhf or vhf; and in whatever order you wish to arrange them...there's no need to ever tune to an unused channel. You don't program them, so they never appear.

"LC IF amplifier with fixed ten-section LC IF bandpass filter in the IF strip...eliminates the need for critically adjusted traps for eliminating adjacent-channel and in-channel carrier beats. No IF alignment is needed ever. This is the first set we have seen that includes a filter-type IF. It has several obvious advantages — not only in performance, but in assembly ease (no instrument alignment), and in longevity of its picture-quality excellence.

"Touch volume control. Again, there is no knob, when the remote control is used. Instead, there are two more touch switches to use to raise or lower the volume in small steps."

The Heathkit GR-2000 Digital Color TV takes advantage of the most advanced components available today. The 100% solid-state chassis has 19 integrated circuits, including custom MOS designs, plus another 13 ICs with the remote control and yet another IC if you add the clock. There is DC controlled contrast for less picture interference. An IC color amplifier for truer colors. An IC color oscillator and automatic phase control for more precise and reliable tints. An IC automatic gain

it's the talk of the electronic press

● New Deluxe Black (Negative) Matrix Color Picture Tube. Fully illuminated dots for more vivid pictures. 2-year warranty.

● Instant On

● Digital True Dot Generator

● Slide-out Service Drawer

● Digital Clock Circuit Module (optional)

● On-Screen Digital Readout Module

● Electronic Up-Down Touch-Tune Channel Switches activate digital counter

● Programmable Digital Counter Channel Selection Module Selects DC Control Voltages for Varactor Tuner

● Electronic Up-Down Touch-Tune Volume Control (with remote)

● Remote Control Circuit Modules (optional)

● Electronic Color & Tint Control (with remote)

● Pre-Set Tuning Controls for 16 Channels

● Full Complement of Secondary Controls; for use without Remote: Vol., Color, and Tint; plus Peaking, Contrast, Master AC, Brightness, Horiz. & Vert. Hold, Height, AFT on-off, Tone Control, Speaker on-off, Drawer Latch & Lock.

● Built-in Color Convergence Panel

● Remote Control Receiver Microphone



Eleven-Function Touch-Tune Ultrasonic Remote Control for the Heathkit GR-2000... 79.95

This all solid-state ultrasonic system utilizes 13 integrated circuits, 28 transistors to give you wireless armchair control of on and off, volume, VHF/UHF channel selection, up or down color intensity, and tint. Plus, a touch of the volume button automatically recalls the digital readout to the screen. Kit includes receiver for in-chassis mounting and hand-held transmitter. Operates from 20-feet away from set.

Kit GRA-2000-6, 4 lbs., mailable 79.95

control for improved sensitivity, stability and noise immunity. Improved picture interlace for remarkable image definition and crispness. Sophisticated? Yes. But the components go together in an exclusive modular way that makes the GR-2000 easier to build, easier to service yourself.

On building the GR-2000, Popular Electronics said: "Each semiconductor has its own socket and there are 12 factory-fabricated interconnecting cables. The 25-in. CRT is enclosed in a sturdy Magna-Shield metal container... The preset tuning controls, remote control, readout board, convergence board, and clock module are all mounted in a slide-out service drawer, which is mounted beside the CRT enclosure... convergence is far easier than with most color sets. The built-in dot generator produces rock-steady, small dots that make adjustment easier... The complete color adjustments can be performed in less than an hour."

Here's what Radio-TV Repair said about servicing the GR-2000: "While there have been other attempts at modularizing color TV, the modules often represented many complex circuits, much too difficult for the average user or electronic hobbyist to trouble-shoot. But in the new Heathkit GR-2000 Digital Color TV, virtually every function of the TV receiver has been broken down to a miniature plug-in circuit assembly... In building and adjusting the GR-2000 you have learned what your particular color TV is all about, and if trouble develops you simply pop out the correct board and check it yourself. Heath provides free technical consultation, and if you do need factory service, as we said, the costs are low, well below that for insurance protection."

Now, what do digital design, state-of-the-art technology and modular construction bring to the color TV screen? Popular Electronics summed it up as follows:

"The picture obtained on the GR-2000 can only be described as superb. The Black (Negative) Matrix CRT, the tuner and IF strip, and the video amplifier provide a picture equal to that of many studio monitors... Blacks are intense and vivid and high-frequency outlines are very clean with no evident ringing. The color 'fit' is excellent and the

overall chroma spans the range from a light pastel to excessive coloration. The IF produces no herringbones, no adjacent-channel interference, and no moire patterns."

Radio-TV Repair concluded its study by simply stating, "the GR-2000 is the way all TV sets will have to be made in the future."

Why not see what the experts have seen. The Heathkit Digital Color TV — without question the most remarkable TV available today.

Kit GR-2000, chassis, tube, 1 speaker, (less cabinet), 147 lbs., Exp./Frt. 649.95

Kit GRA-2000-6, Remote Control, 4 lbs., mailable 79.95

Kit GRA-2000-1, Digital Clock Accessory, 1 lb., mailable 29.95

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.

Optional Digital Clock for your GR-2000



In just a couple hours' time you can build the GRA-2000-1 Digital Clock Accessory. Everything mounts on one small board that plugs into the readout board in the GR-2000 service drawer. That's all there is to it. Clock circuit board has slow, fast and hold pushbuttons for setting time, jumper wire for selecting 12 or 24-hour format. You set your on-screen display for hours and minutes, or hours, minutes and seconds using the programming circuitry on the channel readout board. Order with your GR-2000, or add it later, if you prefer.

Kit GRA-2000-1, Digital Clock Accessory, 1 lb., mailable 29.95

The GR-2000 offers these Color TV improvements:



Programmable Channel Selection through digital up-down counter with computer-like programming board—a breakthrough in new tuning convenience.



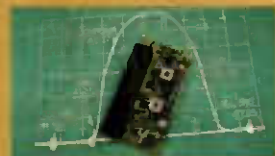
Silent All-Electronic Tuning with new combination UHF/VHF Varactor Tuner located inside the chassis where it is completely shielded.



On-Screen Channel Readout is displayed in big, bright 1½" numerals, with adjustable brightness, for both UHF and VHF—easily viewable from across the room and at any viewing angle.



On-Screen Clock Readout—gives you the correct time in four or six-digit format, and with your choice of 12 or 24 hour time.



Fixed Filter IF totally eliminates instrument IF alignment forever—gives ideally shaped bandpass to eliminate critical traps and interference—another Heath exclusive.



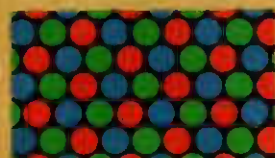
19 Integrated Circuits (ICs) simplify kit building and permit ultra-sophisticated technology with long term reliability.



Solid-State High Voltage Supply in tripler configuration adds efficiency and long life to the GR-2000 total solid-state circuitry.



Solid-State Low Voltage Supply has short-circuit-proof integrated circuit regulators for reliable performance and long life.



New Deluxe Black (Negative) Matrix Picture Tube—fully illuminated color dots, black matrix background for more brightness & contrast—new etched face plate cuts glare.



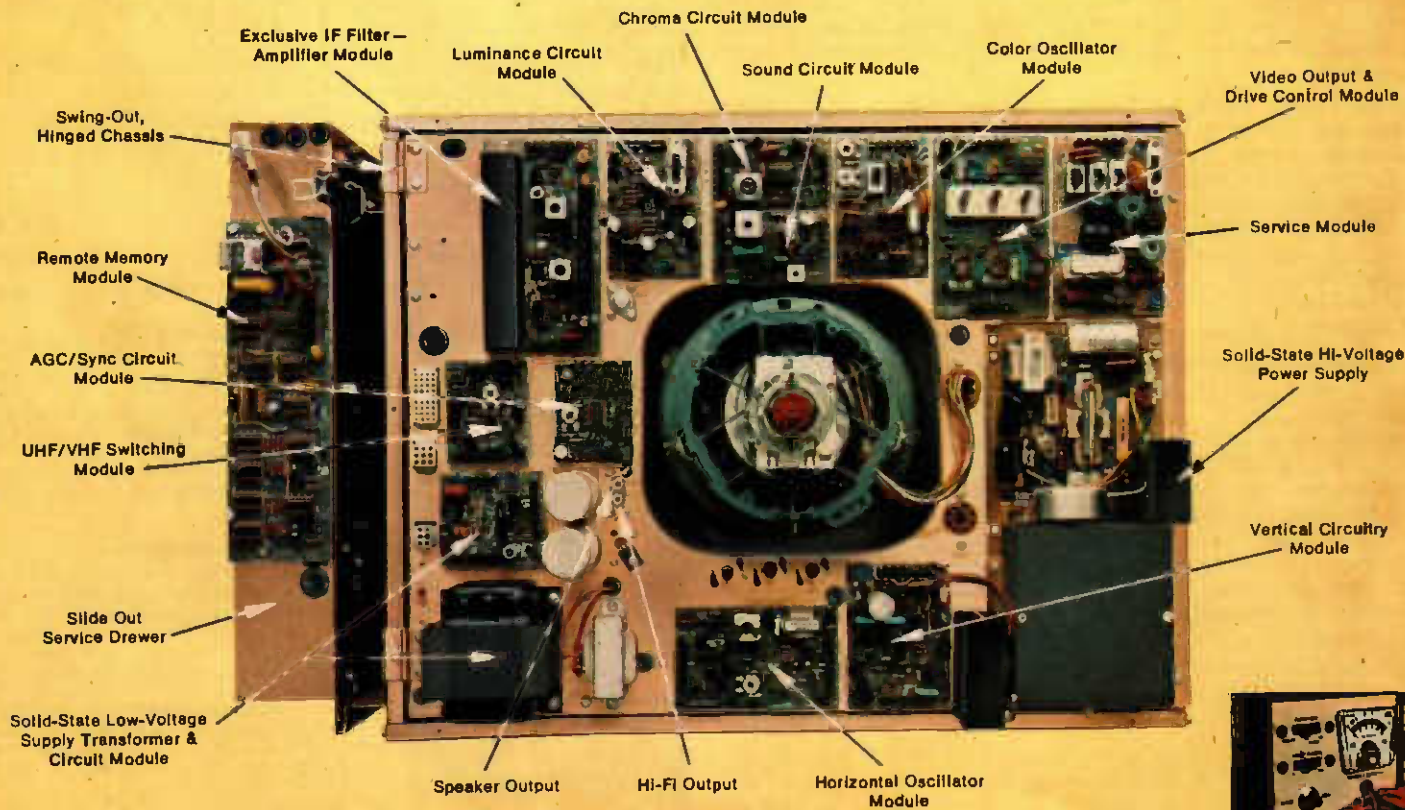
New Vertical Sweep Design for better picture interlace, improved detail; complementary power transistors eliminate output transformers for better linearity.



Digital Design True-Dot Generator makes picture convergence easier and more precise by projecting a greater number of smaller, better defined dots.



Twelve Wiring Harnesses—pre-fabricated, connectors installed, pre-stripped, ready to solder make this TV the easiest ever to build.



Test Meter Included

All TV picture tubes are warranted for 2 full years.

Exquisite new cabinetry for your new GR-2000 TV



A) Mediterranean Hideaway for the GR-2000

Beautiful Mediterranean cabinet with hideaway bi-fold doors, makes magnificent use of oak solids and veneers. The finish is a rich Spanish oak. Metal hardware is finished in Windsor Antique Gold tone. Shipped fully assembled and finished, and like all GR-2000 cabinets, accepts a second speaker (order separately) for full-width sound reproduction. Measures 29 $\frac{3}{4}$ " H x 48 $\frac{3}{4}$ " W x 23" D (26 $\frac{3}{4}$ " D including cup).

GRA-2000-5, 100 lbs., Exp./Frt. 179.95

B) Put your GR-2000 in a Mediterranean mood

Deep, rich Mediterranean styling gives the GR-2000 a fine-furniture appearance to match the brilliant color picture. Designed to accept two matching speakers (order second speaker separately) for exceptional sound. Crafted of oak solids and veneers, finished in lovely Spanish oak tones. Metal hardware has Windsor Antique Gold finish. Shipped fully assembled and finished. Measures 30 $\frac{3}{4}$ " H x 49 $\frac{3}{4}$ " W x 20 $\frac{3}{4}$ " D (23 $\frac{3}{4}$ " D including cup).

GRA-2000-4, 87 lbs., Exp./Frt. 139.95

Custom-install your GR-2000 — Heathkit TV was first with such flexibility!

Heath was the first to offer a TV chassis designed to permit mounting in a wall or custom cabinet installation. We continue this policy with the GR-2000 — while also providing the four newly designed cabinets shown on these pages — so that you have maximum freedom to place this remarkable TV where it's most viewable. Your GR-2000 kit includes a distinctive black and gray mask with nickel accents, black control panel, secondary control cluster behind hinged door, slide-out service drawer, and no protruding knobs for a truly elegant appearance. The speaker mounts away from the chassis in any location that's convenient. The GR-2000 Assembly Manual includes a complete set of templates for installing your TV in a wall or your own custom-built cabinet.

C) Clean, contemporary lines for your GR-2000

Modern cabinetry at its best — as new and refreshing as the amazing GR-2000 it was designed for. Has dual speaker capability (order second speaker separately) that places sound on both sides of the screen. Shipped fully assembled and finished. Constructed of select solids and veneers. Oil rubbed walnut finish. Measures 28 $\frac{3}{4}$ " H x 44 $\frac{3}{4}$ " W x 20 $\frac{3}{4}$ " D. (23 $\frac{3}{4}$ " D including cup).

GRA-2000-2, 85 lbs., Exp./Frt. 139.95

D) New Early American Motif for the GR-2000

Traditional Early American design to house the most advanced TV we've ever offered. Featuring twin speaker capability (order second speaker separately) for room filling sound. Constructed of fine hardwoods and veneers with beautiful distressed Maple finish. Hardware is metal with Windsor Antique Gold finish. Shipped fully assembled and finished. Measures 31 $\frac{3}{4}$ " H x 47 $\frac{3}{4}$ " W x 20 $\frac{3}{4}$ " D (23 $\frac{3}{4}$ " D including cup).

GRA-2000-3, 85 lbs., Exp./Frt. 139.95



Finished cabinets for the GR-900

Assembled GRA-405-25

Mediterranean console with hideaway doors and rich grained pecan veneers on hand rubbed furniture grade hardwoods. Measures 29 3/4" H x 46 1/4" W x 22 1/2" D (25 1/2" D incl. cup). 100 lbs., Exp./Frt.179.95



Assembled GRA-404-25

Mediterranean cabinet of furniture grade hardwoods & solids finished in pecan. 30 3/4" H x 48 3/4" W x 20 3/4" D (23 1/2" D incl. cup), 87 lbs., Exp./Frt.139.95



Assembled GRA-401-25

Contemporary walnut cabinet of hardwood solids & veneers with oil-rubbed walnut finish. 30 3/4" H x 37 1/2" W x 19 3/4" D (22 3/4" D incl. cup), 62 lbs., Exp./Frt.81.95



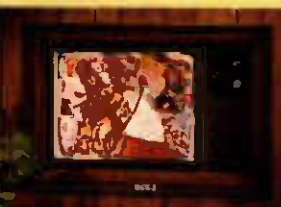
Assembled GRA-403-25

Early American cabinet in classic Salem Maple, constructed of fine hardwoods & veneers, 32 1/2" H x 38 1/2" W x 19 3/4" D (22 3/4" D incl. cup). 75 lbs., Exp./Frt.122.95



Heathkit TV Wall Mount with electronic doors

Tambour doors automatically glide open & close as you turn set on & off either with the frame-mounted button or by remote control. Comes complete with frame, doors, motor, & enclosure with tilt-out speaker baffle & convergence panel. Slides out for TV maintenance. 23 3/4" H x 28 1/8" W x 23 3/8" D (frame: 26 1/2" H x 39 3/8" W x 1 1/2" D.)



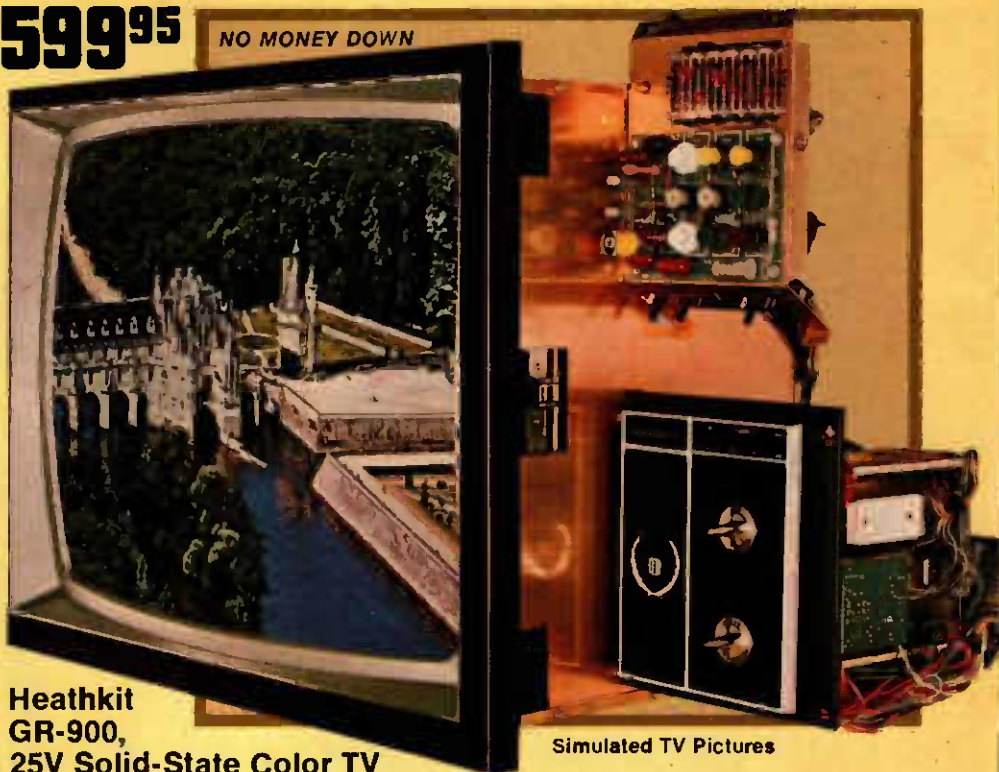
Kit GRA-402-25, walnut finish, 50 lbs., Exp./Frt. .114.95

Kit GRA-407-25, unfinished, 50 lbs., Exp./Frt. ...109.95

Total tuning convenience in two

599⁹⁵

NO MONEY DOWN



Heathkit GR-900, 25V Solid-State Color TV

You preselect any 12 of your favorite UHF channels 14 through 83. Then scan in both directions either with pushbutton power tuning or remote control, while detent tuning "clicks" in on each channel with the precision you're accustomed to on VHF. Other features include an angular tint control to reduce tint and flesh tone change when switching channels or when programs change; "Instant-On" with override switch; automatic fine tuning; automatic chroma control; adjustable video peaking; adjustable noise limiting with gated AGC; adjustable tone control, and hi-fi audio outputs.

The exclusive Heath MTX-5 ultra-rectangular tube lets you see the transmitted image in its entirety. A specially etched face plate cuts glare, increases contrast without sacrificing brightness, while a matrix screen around the phosphor dots stops reflected light. Advanced design includes a MOSFET VHF tuner, and varactor UHF tuner; plug-in glass epoxy modules containing 46 transistors, 57 diodes and four ICs; a three-stage solid-state high gain IF. The built-in dot generator and tilt-out convergence panel let you perform the periodic adjustments required of all color TV sets. A volt-ohm meter is also included, along with complete new step by step programmed trouble-shooting instructions.

Kit GR-900, TV less cabinet, 125 lbs., Express/Frt.599.95

Kit GRA-900-6, wireless remote control, 8 lbs., mailable79.95

GR-900 SPECIFICATIONS — Viewing area: 315 sq. in. Picture tube high voltage: 25,000 V. Deflection: Magnetic, 90°. Focus: Electrostatic. Convergence: Magnetic. Antenna Input Impedance: VHF: 300 ohm balanced or 75 ohm unbalanced. UHF: 300 ohm balanced. Tuning range: VHF TV channels 2 through 13. UHF TV channels 14 through 83, pre-settable in each of 12 detent positions. Picture IF carrier: 45.75 MHz. Sound carrier: 41.25 MHz. Color sub-carrier: 42.17 MHz. Sound frequency: 4.5 MHz. Video bandwidth: 3.58 MHz. Hi-Fi output: Output impedance: 2200 ohm. Frequency response: ±1 dB 50 Hz to 15 kHz. Harmonic distortion: less than 1% at 1 kHz. Output voltage: 1.0V rms nominal. Audio output: Output impedance: 4 ohm or 8 ohm. Output power: 2 W. Power requirements: 110 to 130 VAC, 60 Hz, 240 W. Dimensions: See "cabinets" for installed dimensions. For custom installation clearances & detailed dimensions, write for free spec sheet.

Simulated TV Pictures

Handy Heath TV Accessories

Coaxial Distributor for 4-room TV/FM network — Distribution amp takes single coax input from any all-channel antenna, amplifies & feeds 4 wall outlets. Everything supplied...200' coax cable, connectors, crimping tool, 4 matching transformers/frequency splitters. GD-248, 14 lbs., mailable89.95

Reception Proven Coax For Color TV

GD-228, 50' coax, w/connectors and antenna boot, 3 lbs., mailable7.95
GD-238, 75' coax, w/connectors and antenna boot, 4 lbs., mailable9.95
GD-328, 100' coax, w/connectors and antenna boot, 5 lbs., mailable11.95

75-300 Ohm Matching Transformer/Splitter — Matches one all-channel 75-ohm downlead to separate 300-ohm VHF and UHF TV inputs. GD-299, 1 lb., mailable4.95

New All-Channel Matching Transformer — Matches one all channel 75-ohm downlead to one set of 300-ohm VHF, UHF or FM antenna inputs. GD-1056, 1 lb., mailable2.65

75 Ohm Mixer-Splitter To Operate Two Sets — Operates two sets from one coax downlead, or combines two 75 ohm antennas into one lead. GD-318, 1 lb., mailable7.95

All Channel Coupler with FM Tap — For taking FM signal off coax line ahead of distribution system of TV set. GD-308, 1 lb., mailable10.95

New All-Channel Antenna Matching Transformer — Snaps on VHF, UHF, FM or all-channel antenna, converts 300 ohms to 75 ohms. GD-1054, 1 lb., mailable3.60

FM Band Rejection Filter — Reduces FM input signal strength by a minimum of 18 dB. Recommended where local FM stations cause overload. Insertion loss to VHF/UHF TV channels is 1 dB. 75 ohm Impedance. GD-250, 1 lb., mailable9.95

New Fully Automatic Antenna Rotator — Solid-state single-knob control. Synchronization is automatic — unaffected by wind, ice, snow, variations in line voltage or age. Rugged, high-tensile aluminum construction. GDP-1016, 8 lbs., mailable32.50

Cornell-Dubilier AR-33 Antenna Rotator — Solid-state control operated by dial or set-and-forget pushbuttons. ±1° accuracy, heavy duty rotor, instructions included. (5-wire cable not supplied). GDP-258, 16 lbs., mailable49.95

popular Heathkit® Color TV sizes

Armchair Wireless Remote
Control for GR-900 & GR-271

499⁹⁵
NO MONEY DOWN



Simulated
TV Pictures

Heathkit GR-271, 21V Solid-State Color TV

The famous GR-900 in a slightly smaller package. The only difference is the screen size — 21 inches viewable diagonal — and new "space-saver" cabinet options. All the other great features are the same.

The GR-271 lets you preselect any of 12 UHF channels, 14 through 83. Then you can detent-scan in both directions either with pushbutton power tuning or remote control. Controls for presetting the 12 UHF positions are conveniently located on the tilt-out convergence panel. The angular tint control is also featured on the GR-271 to reduce tint and flesh tone variations when switching channels or when stations change from one program to another.

The GR-271 gives you all of the famous state-of-the-art engineering features found in the GR-900, including: ultra-rectangular matrix tube; solid-state modular circuitry with 46 transistors, 57 diodes, and four ICs; three-stage solid-state high gain IF; high sensitivity varactor UHF tuner; MOSFET VHF tuner; automatic chroma control; adjustable video peaking; adjustable noise limiting with gated AGC; "Instant On" with defeat switch; automatic fine tuning, and adjustable tone control.

Traditional Heathkit service-it-yourself savings...common to all Heathkit TVs, are yours also in the new GR-271. Built-in dot generator & tilt-out convergence panel, volt-ohm meter and new step-by-step preassembled instructions make troubleshooting a snap. Install it in either of the attractive preassembled cabinet options shown at right — or save even more by installing it in your custom mount.

Kit GR-271, TV less cabinet, 121 lbs., Express/Freight **499.95**

Kit GRA-900-6, wireless remote control, 8 lbs., mailable **79.95**

GR-271 SPECIFICATIONS — Viewing Area: 226 sq. in. All other specifications same as GR-900, opposite.



Gives you across-the-room 8-function control of on/off; 3 pre-set volume levels, power tuning (up and down); color; tint; UHF/VHF channel selection. Build and install it in three evenings — even faster if you assemble it as you build your TV.

Kit GRA-900-6, 8 lbs., mailable **79.95**

Finished Cabinets for the GR-271

"Space-Saver" Table Model Cabinet

Shown with optional roll-around cart. Perfect for apartments, bedrooms, dens, etc. Ruggedly constructed of attractive walnut-grained Marlite. Measures a compact 20 $\frac{1}{2}$ " H x 31 $\frac{1}{4}$ " W x 12 $\frac{3}{4}$ " D (20 $\frac{1}{2}$ " D incl. cup).



Assembled GRA-501-21, 33 lbs., Exp./Frt. . . . **54.95**

GRA-204-20, roll-around cart, vinyl covered steel, walnut finished shelves and handles, satin finish steel legs, swivel casters, top shelf 14" high, 19 lbs., Exp./Frt. **19.95**

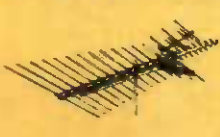
"Ultra-Compact" Mediterranean Cabinet

Luxuriously designed to complement the finest Mediterranean home decor...yet conservatively sized to unobtrusively blend with your existing furnishings. Hand crafted of furniture grade hardwoods and solids, beautifully finished in rich pecan. Measures a space-saving 26 $\frac{1}{2}$ " H x 34 $\frac{1}{4}$ " W x 18 $\frac{3}{4}$ " D (21 $\frac{1}{4}$ " incl. cup).



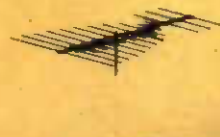
Assembled GRA-504-21, 85 lbs., Exp./Frt. . . **119.95**

Heath antennas for every reception area



"SUPER ANTENNA" FOR OPTIMUM RECEPTION: Includes 300 to 75 ohm antenna mounted matching balun. Gain, VHF Low 7 dB, High 12 $\frac{1}{2}$ dB; UHF 12 dB. Front to back ratio, VHF Low 23 dB, High 23 dB; UHF 24 dB. Elements, VHF 13 driven, 13 parasitics; UHF 1 driven, 4 passive. 196" L x 166" W x 116" radius.

GD-750, 22 lbs., less mast & cable, Exp./Frt. . . **79.95**



DEEP FRINGE VHF-UHF-COAXIAL: Gain, Low 8 $\frac{1}{2}$ dB, High 12 dB; UHF 11 dB. Front to back ratio, 20 dB. Elements, VHF 9 active, 14 passive; UHF 1 active, 27 passive. 112 $\frac{3}{4}$ " L x 106" W x 87 $\frac{1}{2}$ " radius.

GD-650, 16 lbs., less mast & cable, Exp./Frt. . . **49.95**



FRINGE/NEAR FRINGE VHF-UHF COAXIAL: Gain, Low 5 $\frac{1}{2}$ dB, High 10 dB; UHF 9 dB. Front to back ratio, Low 18 dB, High 17 dB; UHF 20 dB. Elements, VHF 8 active, 9 passive; UHF 1 active, 15 passive. 118" L x 106" W x 77 $\frac{1}{2}$ " radius.

GD-450, 12 lbs., less mast & cable, Exp./Frt. . . **39.95**



CITY-SUBURBAN VHF-UHF-FM COAXIAL: Gain, Low 5 dB, High 8 $\frac{1}{2}$ dB; UHF 8 dB. Front to back ratio, Low 14 dB, High 15 dB; UHF 20 dB. Elements, VHF 7 active, 7 passive; UHF 1 active, 13 passive. 106 $\frac{3}{4}$ " L x 102" W x 76" radius.

GD-550, 9 lbs., less mast & cable, Exp./Frt. . . **29.95**



CITY-SUBURBAN UHF COAXIAL: Includes 300 to 75 ohm antenna mounted matching balun. Gain, 12 dB. Front to back ratio, 19 dB. Elements, 11 active, 8 passive. 46" L x 8" W x 44" radius.

GD-188, 4 lbs., less mast & cable, mailable . . . **9.95**



FM ANTENNA: 100 mi. reception area. Gain, 7 dB. Front to back ratio, 20 dB. Elements, 9. 101" L x 66" W x 62" radius.

GD-1043, 7 lbs., less mast & cable, Exp./Frt. . . **21.50**

NOTE: Due to the 100 lb. minimum charge for Motor Freight, we suggest you combine your antenna order with your color TV or cabinet order for shipping charge economy.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit® Color TV "Compacts" and B&W



Simulated TV pictures

Heathkit GR-269, 18V Color TV... 349.95 less cabinet

Order it with the table-topping cabinet and roll-around stand and you can cart your entertainment off to the porch or patio when the hot weather sets in. Or get it with the contemporary cabinet for permanent installation anywhere indoors. Either way, the GR-269 is a beautiful kit to build, an incomparable set to see — and at this low price the GR-269 is an unbelievable value. Like all Heathkit TVs, the GR-269 gives you a full complement of alignment and self-service equipment — dot generator, convergence board, trouble-shooting meter and the troubleshooting book. The factory assembled & aligned AFT module gives you perfect picture and sound automatically at just a push of the front panel button. The exclusive Heath designed VHF tuner uses advanced MOSFET circuitry to assure higher sensitivity, less noise and lower cross-modulation. The UHF tuner uses hot-carrier diode design for lower noise and increased sensitivity. Both tuners are factory assembled & aligned. "Instant-On" and switch-controlled degaussing, hi-fi sound output; 75 and 300 ohm antenna inputs; exclusive Heath Magna-Shield are standard. The Heathkit GR-269 "Space-Saver" makes the ideal color TV for homes or apartments where space is at a premium.

Kit GR-269, all parts including chassis, 180 sq. in. picture tube, mask, VHF & UHF tuners, AFT, speaker, 100 lbs., Express/Frt. 349.95

GRA-403-18. Roll-around Cart (inset above) with wainut finished wood and pale brass accents. 27" W x 15 1/2" D x 22" H. 23 lbs., Express/Frt. 19.95

Assembled GRA-402-18 walnut-grained vinyl clad wood cabinet (shown above) 16 1/2" H x 25" W x 11" D (17 1/8" D. incl. cup), 27 lbs., Express/Frt. 29.95

Assembled GRA-401-18. Striking contemporary cabinet (inset at right) finished in hand-rubbed oiled walnut. 29" H x 28 1/4" W x 18 1/4" D. 41 lbs., Express/Frt. 59.95

GR-269 SPECIFICATIONS: Picture Size: 180 sq. in. viewing area. Tube-type: Non-etched. Deflection Magnetic, 90°. Focus: Electrostatic. Convergence: Magnetic. Antenna Input Impedance: VHF — 300 ohm balanced or 75 ohm unbalanced; UHF — 300 ohm balanced. Tuning Range: VHF — Channels 2-13; UHF — Channels 14-83. Picture IF Carrier: 45.75 MHz. Sound IF Carrier: 41.25 MHz. Color IF Frequency: 4.5 MHz. Video IF Bandwidth: 3.58 MHz. Audio Output Power: 1 watt, 8 ohm impedance. Power Requirements: 110-130 VAC, 140 watts. Dimensions: See "cabinets" for installed dimensions. For custom installation clearances & detailed dimensions, write for free spec. sheet.



Heathkit GR-169, 14V "Portable" Color TV... 299.95 includes cabinet

Built for unrivaled performance at home or away! Unlike so-called "bargain-price" portables, the Heathkit GR-169 color receiver is designed around the same advanced solid-state circuitry and quality components that account for the superior picture and sound in Heathkit consoles. The GR-169 incorporates all the secondary controls found in the best of the big sets: Color, Tint, Contrast, Horizontal & Vertical Hold, Height, AGC, Color Killer, Dots and Screen adjustments. And they're all up front for fast, precise tuning. Plus, there's front-panel switch-controlled degaussing so you can quickly demagnetize your GR-169 after moving it from one location to another.

Heathkit solid-state design sets the GR-169 apart from any other color portable you've seen. A total of 48 transistors, 45 diodes, 3 ICs and just 2 tubes (picture and high voltage rectifier) form the basic circuitry. What's more, the GR-169 utilizes a high resolution circuit & adjustable noise limiting; exclusive FET solid-state VHF tuner for lower noise, better cross modulation rejection in multi-station areas for cleaner pictures, and far greater sensitivity. The solid-state 3-stage IF provides increased gain for a better overall picture.

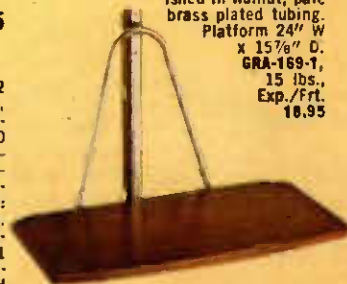
Plug-in circuit boards, transistors and ICs permit fast, trouble-free assembly. And the famous Heathkit manual makes the project a joy, detailing each operation, step by step. The GR-169 kit includes a handy volt-ohm meter, built-in dot generator and the comprehensive troubleshooting procedures so you can perform normal periodic adjustment and servicing. And the circuit board modules are covered by Heath's 48-hour warranty, too.

Kit GR-169, 69 lbs., Express/Frt. 299.95

GR-169 SPECIFICATIONS — Picture Size: 102 sq. in. viewing area. Deflection: Magnetic, 90°. Focus: Electrostatic. Convergence: Magnetic. Antenna Input Impedance: VHF — 300 ohm balanced or 75 ohm unbalanced; UHF — 300 ohm balanced. Tuning Range: VHF — Channels 2-13; UHF — Channels 14-83. 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: 3.58 MHz. Audio Output: Power — 1 watt, Impedance — 8 ohms. Power Requirements: 110-130 VAC watts. Dimensions: 16" H x 20 1/2" W x 16" D.

Handy Swivel Wall Shelf for Your GR-169

Mounts on any wall, swivels for most convenient viewing angle. Platform finished in walnut; pale brass plated tubing. Platform 24" W x 15 1/2" D. **GRA-169-1, 15 lbs., Exp./Frt. 16.95**



Portables for every room and every budget



Simulated TV pictures

Heathkit GR-104C, 12V B&W Portable TV...129.95 includes cabinet

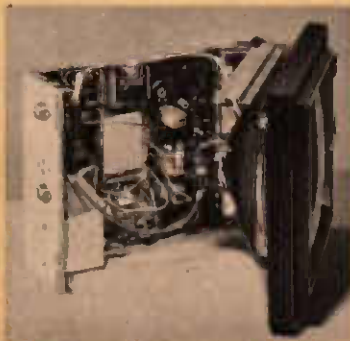
The stylish, easy-to-handle GR-104C gives all-channel UHF and VHF entertainment when and where you want it. At home, it plugs into any standard 120 VAC outlet. In the car, boat or camper it performs just as flawlessly with your 12 volt system. In the great outdoors the GR-104C becomes completely self-contained with the optional rechargeable battery-pack base and snap-on sun shield. The GR-104C gives you the latest in B&W TV circuitry, right down to an integrated circuit that takes the place of 39 parts, yet takes the space of a transistor. Automatic gain control gives rock-steady pictures, front-panel speaker puts the sound where you are. And there are 3 video IF amplifiers with superior gain and controlled bandwidth; deluxe 4 circuit VHF "memory" tuner; detent UHF tuner; transformer operated and regulated power supply for drift-free operation regardless of source; lighted channel indicators; double circuit breaker protection and hinged two-piece chassis for easy servicing. Kit includes beige (black front panel) high-impact plastic cabinet with carrying handle; preassembled and aligned tuners; built-in telescopic whip antenna for VHF; loop antenna for UHF. Most components mount on two roomy circuit boards. A single wiring harness connects the boards to chassis-mounted parts. Wire cutting and stripping are held to a minimum, and both the UHF and VHF tuners come factory assembled and aligned.

Kit GR-104C, 35 lbs., mailable 129.95

Kit GRA-104-3, battery pack & sun shield, 9 lbs., mailable 42.95

GRA-104-2, sun shield only, 1 lb., mailable 1.95

GR-104C SPECIFICATIONS: Picture Size: 74 sq. in. viewing area, picture diagonal 12". Deflection: Magnetic, 110 degrees, 20 mm neck. Focus: Electrostatic. Antenna Input Impedance: 300 ohm balanced. Tuning Range: VHF TV Channels 2 thru 13, UHF TV Channels 14 thru 83. Picture IF Carrier: 45.75 MHz. Sound Carrier: 41.25 MHz. Sound IF Carrier: 4.5 MHz. Video Response: To 3.5 MHz. Audio Power Output: 500 milliwatts into 24 ohm load. Controls (front panel): UHF channel selector; UHF fine tuning, VHF channel selector; VHF fine tuning. OFF/ON volume, brightness, contrast, vertical hold, horizontal hold. Controls (rear panel): Height, Low voltage adjust, AGC, Tube & Semiconductor Complement: 27 transistors, 16 diodes, 1 IC, 1 picture tube. Power Requirements: 110-130 volts, AC, 40 watts; 12 volts DC @ 24 watts. Overall Size: 11 1/2" H, x 15 3/4" W, x 9 3/4" D.



Heathkit GR-1900, 19V B&W "Portable" TV...179.95 includes cabinet

With the GR-1900, Heath meets the growing demand for a big screen portable black & white TV set incorporating the famous Heathkit quality, performance and dependability found in its color TV sets. For instance, you'll find detent tuning on all 70 UHF channels. It makes tuning your favorite UHF channel as precise and as convenient as VHF. Other convenient front panel controls include fine tuning for both VHF and UHF; off/on/volume; brightness; contrast, master on/off; vertical hold; AGC; and height. Adjustments are provided on the back panel for horizontal hold. The ultra-rectangular tube shows a picture that looks even bigger than its generous 19-inch viewable diagonal measurement. Plug-in circuit boards are used, just like our color sets. Most circuitry mounts on four of these circuit boards for easy assembly. Makes troubleshooting a snap, too. Four circuits (most sets have only 3) in the grounded-base VHF tuner assure superior cross-modulation rejection in dense station areas. And both VHF and UHF tuners come completely preassembled, aligned and ready for installation. Other features include the latest-design integrated circuit (IC) for signal processing, combined with gated AGC and noise limiting to give you rock-steady pictures; integrated circuit sound system; wideband video amplifier for top picture detail and crispness; three video IF amplifiers provide plenty of reserve gain for excellent picture contrast; hefty high voltage supply prevents picture blooming; built-in whip VHF antenna and UHF loop antenna for local reception. Twenty-three transistors, thirteen diodes, two ICs, a high-voltage rectifier tube, conservatively rated components, and built-in arc protection all add up to long life and trouble-free performance.

Kit GR-1900, 56 lbs.,
Express/Frt. 179.95

GRA-403-18, Roll-around Cart (at right) with walnut finished wood and pale brass accents. 27" W x 15 1/2" D x 22" H. 23 lbs., Express/Frt. 19.95

GR-1900 SPECIFICATIONS: Picture Size: 184 sq. in. Deflection: Magnetic, 114 degrees. Focus: Electrostatic. Antenna Input Impedance: 300 ohm balanced. Tuning Range: VHF TV channels 2 through 13 (memory-type Fine Tuning). UHF TV channels 14 through 83. (Detent-type tuner). Picture IF Carrier: 45.75 MHz. Sound IF: 4.5 MHz. Video Response: Greater than 3.5 MHz. Audio Power Output: 1 watt into 8 ohm load (Speaker Impedance - 8 ohm). Front Panel Controls: UHF Coarse Tuning, UHF Fine Tuning, VHF Coarse Tuning, VHF Fine Tuning. Off/On/Volume, Brightness, Contrast, Master On/Off, Vertical Hold, AGC, Height, Rear Chassis Coil: Horizontal Hold. Power Requirements: 110-130 volts AC 60 Hz at .58 amperes (70 watts). Dimensions: 16 1/2" H x 22 3/4" W x 12 3/4" D.



charg-a-kit - No money down on any kit - up to 2 years to pay - see page 42 for details.

Discover kitbuilding fun for as low as \$5



2 EVENING KIT

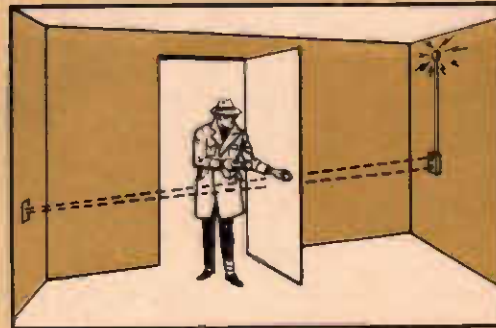
14⁹⁵

NO MONEY DOWN

New Heathkit Photoelectric Beam Relay

Hundreds of uses around home, office, stores, factories, warehouses, garages, etc. Use it as an alarm against intruders, for activating door openers, and turning on lights, for counting people entering or leaving an area, or counting units on production lines, etc. The GD-1021 will activate any external 120-volt alarm or lamps up to 150 watts. Kit consists of a light source, mirror assembly and a photocell-controlled relay which is activated when the reflected light beam is broken to energize the AC socket. Any lamp or warning device plugged into this socket, such as the Heathkit GDA-39-1 Indoor Buzzer Alarm on page 18, is then turned on to alert you. When the beam again becomes unobstructed, the relay turns off power to the alarm. Built-in light source operates at distances of up to 25 feet from reflecting mirror. Surrounding light has little effect on GD-1021 circuitry GD-1021 goes together easily in a single evening.

Kit GD-1021, 2 lbs., mailable **14.95**



Any object breaking light beam between GD-1021 light source & mirror activates the device. Use it to activate lights, alarms, door openers, etc. . . . hundreds of uses around home, shop or office.



1 EVENING KIT

5⁰⁰

Turn lamps on & off automatically — with the Heathkit Photoelectric Lamp Switch

The new Heathkit GD-600 is designed to automatically turn table or floor lamps on at night, off in the morning while you're at home or away, discouraging burglars or prowlers. Photoelectric switch features fully electronic circuit with relay control or external load. Adjustable sensitivity lets you set switch to operate at various levels of light or darkness at dusk and dawn. No timers to set — unit is fully automatic to compensate for changes in daylight hours during the year. Controls resistive loads to 300 watts. Operates on regular 120 VAC household current.

Kit GD-600, 1 lb., mailable **5.00**

Free service, too! During the normal 90-day warranty period, we will service your Heathkit Switch at no charge — regardless of the nature of the problem. Simply return the kit to the factory or any Heathkit Electronic Center.

2 EVENING KIT

14⁹⁵
NO
MONEY DOWN



Let the family listen in on calls — with the Heathkit Telephone Amplifier

The GD-1024 works with virtually any telephone — conventional, Slimline, princess type, etc. To use, simply place the handset in the amplifier cradle. The incoming voice only is amplified and reproduced at the external speaker . . . you adjust the loudness to suit your room size. Your own voice is picked up by the telephone itself and is not amplified.

The unique acoustic coupling between the handset earpiece end built-in microphone makes the GD-1024 one of the few devices of this kind that works with the newer type phones as it isn't dependent upon an external magnetic field. The all solid-state circuitry has low no-signal drain and operates from the low-cost 9-volt battery (not supplied). The external speaker has an 8-foot extension cord. Easy two-evening assembly time.

Kit GD-1024, 2 lbs., mailable **14.95**

with Heathkit® 1 and 2 evening projects



New Battery-Powered Electronic Thermometer

The versatile new Heathkit GD-1019 Electronic Thermometer could be the start of kit-building enjoyment for you or a friend. The GD-1019 is all solid-state and provides indoor & outdoor temperature readings in Fahrenheit degrees . . . on the same scale. To read indoor temperatures (from 0° F to 120° F) press the battery-saving Push-To-Read button on the front of the thermometer. To read outdoor temperatures (from -40° F to 120° F) slide the Indoor/Outdoor Selector Switch to the outdoor mode & press the Push-To-Read button. Power is supplied by a 9-volt battery (not included) so you can put the GD-1019 anyplace that's convenient. Simulated-woodgrain plastic cabinet, stained in rich walnut can be wall-mounted or placed on desk with bail stand provided. Kit includes built-in indoor sensor & outdoor sensor with 50' cable. Another great kit at traditional Heathkit savings!

Kit GD-1019, 3 lbs., mailable **23.95**

GD-1019 SPECIFICATIONS — Temperature range: Outdoor, -40°F to +120°F (±2°F accuracy typical); Indoor, 0-120°F (±2° accuracy typical). Power requirements: 9-volt battery NEDA #1604. 9 mA drain with switch depressed. Dimensions: 2¼" D x 7" W x 7" H approximately.

2 EVENING KIT

23⁹⁵
NO MONEY DOWN



2 EVENING KIT

14⁹⁵

NO MONEY DOWN

Heathkit Portable Solid-State AM Radio

Even a youngster can build it, yet the new Heathkit GR-1008 definitely is no toy. It's every inch a quality AM portable receiver capable of pulling in signals from far and wide over the complete broadcast band and reproducing them with outstanding fidelity and clean, crisp "big-set" sound. The all solid-state circuitry consists of eight transistors and four diodes for long life and dependable performance. The big 3½" speaker offers unusual fidelity for the size of the set. An RF amplifier stage, not usually found in low cost portables, pulls in distant or weak stations loud and clear, and Automatic Gain Control Circuit assures you of constant volume. Fixed ceramic filters in the IF circuit make alignment a snap. And the "now" look of the neatly styled high-impact plastic case makes this dandy little radio a conversation piece at home, at school, or wherever you take it with you. Power is supplied by an inexpensive readily available 9-volt battery (not supplied). The new Heathkit GR-1008 is priced right, so order yours today.

Kit GR-1008, 2 lbs., mailable **14.95**

GR-1008 SPECIFICATIONS — Tuning Range: 535 to 1605 kHz. Intermediate Frequency: 455 kHz. Sensitivity: 100 microvolts per meter for 10 dB signal-to-noise ratio. Audio Output Power: 200 milliwatts. Speaker: 3½" round, 16 ohm voice coil. Power Requirements: 9-volt transistor battery, Neda type 1604. Battery Drain: normal listening, 15 ma. Dimensions: 4" H x 7½" W x 2" D.



1 EVENING KIT

7⁹⁵

Control lamp brightness at a touch — with the Heathkit Solid-State Lamp Dimmer

The new Heathkit 1018 Lamp Dimmer fits attractively and neatly on the end table or night stand — lets you adjust the brightness of table or floor lamps smoothly from full ON to complete invisibility with absolutely no stop or flicker common to some other models. Turn it up to read, part way down for watching TV, still farther down for snoozing. It's handier than a 3-way lamp . . . saves you money too, since you can use lower cost bulbs . . . and eliminate the annoyance of burned-out elements in 3-way bulbs. Easy to install and use — you simply plug the Lamp Dimmer into a wall outlet, then plug the table or floor lamp into the socket provided on the rear panel of the Lamp Dimmer. Or, using extension cords, you can control any number of lamps (not to exceed 300 watts total) . . . or even control the temperature of warming trays not exceeding 300 watts.

Kit GD-1018, 2 lbs., mailable **7.95**

GD-1018 SPECIFICATIONS — Supply voltage: 105-135 VAC @ 60 Hz. Rated load: 300 watt maximum. Load type: Incandescent lamp (resistive). Control range: Less than 5% to more than 95% of rated power into load. Dimensions (overall): 3¼" x 3¼" x 2½" approximately.

FREE SERVICE OFFER

During the normal 90-day warranty period we will service your Heathkit Lamp Dimmer at no charge — regardless of the nature of the problem. Simply return the kit to the factory or any Heathkit Electronic Center.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Build your own Heathkit® Electronic Calculator

Heathkit Pocket Calculator

- True pocket size — less than 1" thin
- 1/8" LED display for 8-digit calculations
- MOS/LSI circuitry for full-function operation
- Powered by 9-volt battery, or optional AC converter

The Heathkit calculator you've been waiting for... the IC-2006 Pocket Calculator. Carry it anywhere in pocket, purse or briefcase — save time and trouble dozens of ways. Whether you use the IC-2006 in business or for personal use, you'll find it to be a useful tool in everyday calculations. Easy operation of the IC-2006 permits split-second addition, subtraction, multiplication, and division with computer accuracy. It features a 17-key keyboard, operation from a readily available battery and an 8-digit easy-to-read 1/8" high LED display with no distorting "magnifier".

A sophisticated integrated circuit is the heart of the IC-2006's circuitry. This MOS/LSI device performs all of the mathematical operations of the calculator. A constant (K) can be entered into the calculator to speed up repetitive calculations in multiplication and division. The complete Operations Manual included in the kit explains the operation of the IC-2006 with examples and includes valuable reference tables as an aid for many applications.

The IC-2006 circuitry mounts in an attractive matte-chrome and black cabinet. Operates on inexpensive, easily obtainable 9-volt battery. Or, with the optional GRA-43-1 AC Converter, you can have continuous operation from any 120 volt AC source.

The Heathkit IC-2006 Pocket Calculator makes a great companion for the businessman on the go, the shopping housewife, and the student. Like all Heathkit calculators, it's designed for easy assembly — even for a beginning kit-builder. Order yours now.

Kit IC-2006, 2 lbs., mailable, was 69.95 NOW 59.95

GRA-43-1, 1 lb., mailable 3.95

IC-2006 SPECIFICATIONS — Operation: Portable from internal battery (not supplied). Can also be operated continuously from optional AC converter. **Operating temperature:** 0 to 50° C (32° to 122° F). **Dimensions:** 5" L x 2 3/8" W x 1 3/4" D. **Weight:** 7 oz. (less battery).



Circuitry of the IC-2006 features a large-scale integrated circuit and an 8-digit LED 1/8" high display.



The battery-saving optional AC converter provides continuous desk-top operation.

Battery-operated.
Optional AC Converter
for desk-top use.



**SAVE
\$10⁰⁰**

now only 59⁹⁵



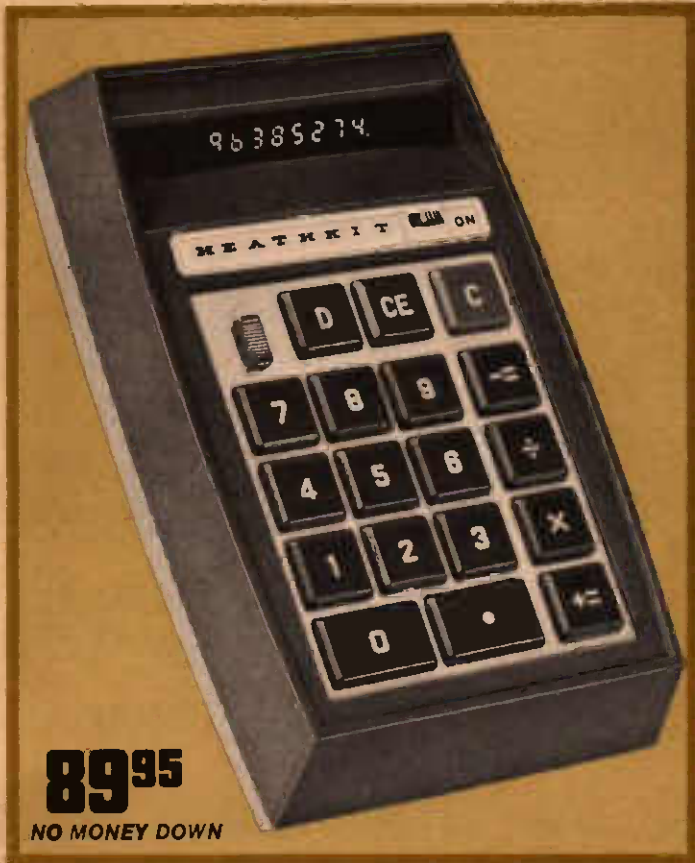
69⁹⁵

NO MONEY DOWN



Heathkit assembly manuals are famous for their simplicity and completeness

for added value, performance & satisfaction



89⁹⁵

NO MONEY DOWN

Heathkit Rechargeable Portable Calculator

Use this pocket-size, 11-oz. "electronic brain" either as a self-contained portable or as a desk-top model with the new Executive Desk Set below. The internal Nickel-Cadmium battery gives 4 to 8 hours of use before recharging. Or, leave it connected to the charger for indefinite operation. The heart of the IC-2009 is a MOS large-scale integrated circuit that performs addition, subtraction, multiplication and division with speed and accuracy. A special battery-saver circuit turns off the lighted digital display if 15 seconds pass without entries. However, the calculator retains all information and the display is instantly reactivated with the display recall key (D), or by entering a new number or operation. Unlike other portable calculators, the IC-2009 can be serviced by you. Both the keyboard and display board are plug-in modules. Your Heathkit Assembly Manual contains a complete trouble-shooting section.

Kit IC-2009, 3 lbs., mailable **89.95**

ICS-2009, calculator & desk set, 6 lbs., mailable... Now Only **95.95**

ICA-2009-1, carrying case, 1 lb., mailable **3.95**

IC-2009 SPECIFICATIONS — Operation: Portable (from internal battery). Calculator can also be operated while charging. Operating temperature: 0 to 50°C. (32 to 120°F.). Charger input voltage: 120/240 VAC, 50/60 Hz. Charger power requirements: 3 W. Operating time: 5 hours typical, depending on display and amount of use when starting with a fully charged battery. Charging time: 14 hours with calculator off. Dimensions: Calculator, 5½" H x 3¾" W x 1¾" D. Charger: 2½" L x 1½" H x 2¼" W.



Optional Naugahyde® carrying case has cushioned felt lining, zipper closure.



Includes separate battery charger that can be wired for 120 or 240 VAC.

SAVE ON THIS COMBINATION OFFER

NOW ONLY 95⁹⁵



Includes IC-2009 Calculator and Desk Set with built-in battery charger. Makes your IC-2009 an efficient desktopper. Automatically keeps batteries fully charged so calculator's always ready for portable use. See Model No. ICS-2009 above to order.

Save \$5 on the Heathkit Executive Desk Set

The new Heathkit Executive Desk Set — a perfect way to keep the IC-2009 Portable Calculator (above) ready for use. The built-in battery charger keeps the battery fully charged to insure that you get full operating time for portable operation. Pen and note paper are included for those noteworthy calculations.

The low-profile styling, attractive wood-grain finish along with a high-quality, easy-writing pen make the Desk Set a complement to any decor. An engravable nameplate is included so you can add a "personal" touch. Not for use with IC-2006.

Kit ICA-2009-2, 3 lbs., mailable, was 12.95... Now **7.95**

ICA-2009-2 SPECIFICATIONS: Operating temperature: 10 to 40° C (50 to 104° F). Input voltage: 120/240 VAC, 50/60 Hz. Power requirements: 3 watts. Paper requirements: 3" x 5". Pen cartridge: Schaeffer, type B, blue ink, medium point. Dimensions: 2¼" H x 8¼" W x 8¾" D (without pen). Weight: 18 oz. (excluding calculator).

Heathkit Desktop Calculator

The Heathkit IC-2108 adds up to be the best bargain we have ever offered in an electronic digital calculator. This distinctive desk-top unit has a sleek low-profile case with bright ½"-high readout tubes in an eight-digit display. The large color-coded keyboard is conveniently sloped so the user can rest his entire arm while operating the calculator. And it easily fits in an attache case.

The full-function IC-2108 is loaded with features that make addition, subtraction, multiplication and division operations even easier. A constant key (K) simplifies repetitive problem solving. The separate equal key (=) permits entering computations as you would write them out totaling-up as you go or working in a chain manner. The display has individual lighted indicators for entry and result overflow. A negative number sign gives the credit-balance capability. Reciprocals (1/x) are quickly found using the constant, divide and equal keys. A rocker switch places the decimal in either the floating mode or in a single fixed position, preselected during kit assembly. And there's no warm-up delay with the Heathkit IC-2108. Turn it on and the display lights up instantly.

The calculator kit is easy to build. The single-large-scale integrated

circuit mounts in a socket. Related circuitry goes on three single-sized printed boards that fit with room to spare in the cabinet.

Kit IC-2108, 4 lbs., mailable **69.95**

IC-2108 SPECIFICATIONS — Operating temperature: 10 to 40° C. (50 to 104°F.). Line voltage: 120/240 VAC, 50/60 Hz. Power requirements: 5 W. Protection: ¼ amp slow-blow fuse (120 VAC), ¼ amp slow-blow fuse (240 VAC). Dimensions: 2¼" H x 7" W x 9¾" D.



Components mount on 3 large circuit boards, and there's an internal adjustment to compensate for high or low line voltage.



Large scale integrated circuit mounts in socket for easy, trouble-free kitbuilding.



59⁹⁵

NO MONEY DOWN

54⁹⁵

NO MONEY DOWN

Heathkit® Digital Electronic Clock & Thermometer

Heathkit Indoor/Outdoor Digital Electronic Thermometer

Monitors indoor/outdoor temperature — or any other two temperatures — with big, bright digital readout. Switch selects either Fahrenheit or Centigrade readings. Another switch selects either Alternate or Hold modes of operation. In "Alternate," each temperature is displayed alternately for about 4 seconds. In the "Hold" position, one temperature of your choice is monitored continuously, with an updated reading every 4 seconds. Readout is displayed on large 7-segment planar gas discharge tube for highly readable across-the-room viewing. Display also includes plus & minus indications, as well as indoor/outdoor temperature indicator lights. Kit includes 85' cable for customizing your own two-temperature monitoring system — home freezer, hot house, garage, basement, pump house, swimming pool, aquarium, etc., or the obvious indoor/outdoor temperature application. A satisfying kitbuilding experience — modular circuit boards, plug-in ICs and color-coded wiring harnesses make the ID-1390 a simple project even for first-time kitbuilders. Style-matched to the Heathkit Electronic Clock, with black Cyclocac® cabinet accented by teak finish vinyl decorator panels.

Kit ID-1390, 5 lbs., mailable **59.95**

ID-1390 SPECIFICATIONS — Temperature range: Fahrenheit -30° to $+120^{\circ}$; Centigrade -30° to $+50^{\circ}$. Display: $2\frac{1}{2}$ Digit planar gas discharge with + and - sign. Typical Accuracy: Centigrade, $\pm 1^{\circ}$ C from -15° C to $+50^{\circ}$ C, $\pm 2^{\circ}$ C from -30° C to -15° C. Fahrenheit, $\pm 1^{\circ}$ F from $+20^{\circ}$ F to $+120^{\circ}$ F, $\pm 2^{\circ}$ F from -30° F to $+20^{\circ}$ F. Power requirements: 110-130 VAC, 60 Hz. Approx. 4 to 6 watts. Dimensions: $2\frac{1}{2}$ " H x 7" W x 5" D.

Heathkit Digital Electronic Alarm Clock

Features a 24-hour alarm cycle which means you can go to bed at 9 pm and set the alarm for 10 am without being awakened in an hour. A gentle electronic "beep" wakes you in the morning. Flip a switch on the back panel for seven more minutes of sleep — repeatable up to an hour. Assembly manual shows you how to wire your GC-1005 to read out in either 12-hour or international 24-hour format, (makes a great clock for ham radio operators). A hold-and-run switch on the base of the clock makes setting the time simple, and an am/pm indicator light on the front panel puts you in the proper 12-hour cycle when setting the alarm. Should power be interrupted for more than a few seconds, display shows all "eights" until reset to avoid a false reading. A simple kit to build, most components mount on two circuit boards, and display tubes plug into individual receptacles. Kit can be wired for either 120 or 240 VAC, 50 or 60 cycle operation during assembly. Black Cyclocac® cabinet blends with any decor, and teak-finish vinyl decorator panels can be used to dress up the top and front. Order your GC-1005 along with the Heathkit Electronic Thermometer for a perfectly matched set for home or office.

Kit GC-1005, 4 lbs., mailable **54.95**

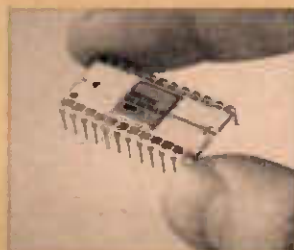
GC-1005 SPECIFICATIONS — Power requirements: 120/240 VAC, 50/60 Hz. Accuracy: Determined by line frequency. Display: 6 full digits, 7 segment neon Planar. Format: 12 hr or 24 hr. Dimensions: $2\frac{1}{2}$ " H x 7" W x $4\frac{3}{4}$ " D.



Modular circuit board design, plug-in ICs and color-coded wiring harnesses make the ID-1390 a simple and rewarding kit-building experience.



Switches on rear-panel provide for "Alternate," "Hold," Fahrenheit & Centigrade modes of operation.



Reliable MOSTEK MOS/LSI integrated circuit "chip", is the "brain" of the GC-1005.



Modular, circuit board design makes assembly an easy three evening project.

Heathkit® Weather Station



5 EVENING KIT



Four highly accurate instruments monitor the climate indoors and out

89⁹⁵

NO MONEY DOWN

Now you can own the same type of weather monitoring gear used by local airports and weather agencies. And it fits beautifully right into your den, kitchen—anywhere.

The Heathkit Weather Station monitors barometric pressure, wind speed, wind direction and indoor and outdoor temperature with outstanding accuracy. All readings, excepting barometric pressure are taken and displayed with solid-state circuitry via sensors mounted inside and outside your home. The barometer is a self-contained aneroid-type instrument using an exclusive Uni/Mag® movement. This mechanism makes accurate pressure readings easy by providing 2½-times more pointer motion than conventional barometers. Hence, it's easier to see pressure change after you have set the reference pointer, and this amplified deflection lets you see .02 inches of change without squinting.

Precision meters with long scales are used for both temperature and wind speed. The temperature readout gives you -40°F to +120°F with 2° divisions. The indoor temperature sensor can be positioned on the back of the panel or anywhere else in the home. A front-panel switch lets you continuously monitor indoor temperature readings or outdoor readings as transmitted from the mast-mounted sensor. The wind speed indicator has switch-selected ranges of 0-30 and 0-90 mph so you can watch gentle breezes or accurately measure a gale. Wind direction is indicated by soft orange lights on the wind direction dial. Each of the eight principal compass points is individually lighted. And when the wind direction is between any two of these principal points, both points light up to indicate that the wind direction is between the two—such as NNW, WNW, ESE, etc. Thus the wind direction indicator has 16 point resolution.

All four dial faces are mounted in an attractive simulated wood-grained plastic cabinet, stained in rich walnut. This "framing" beautifully sets off the black dials with gold graphics. What's more the entire panel is designed to be mounted vertically, horizontally, or on a desk with the stands included. The meter faces can be rotated for proper positioning when the Weather Station is used horizontally or vertically. The remote transmitter assembly is designed to clamp in a jiffy to an existing TV antenna mast. Wind cup, weather vane and outside temperature sensor are integrated in this weather-proof assembly and connect to the indoor instrument panel with a single 8-

wire cable (order the length you need from model numbers below). The transmitter assembly uses corrosion-resistant parts with Teflon® bearings and hermetically sealed reed switches in the wind-speed and wind direction assemblies. In short, the outdoor half of your Heathkit Weather Station has been designed to last as long as the TV mast that holds it up.

Finally, there's a weather book included with your Heathkit ID-1290, because we know this kit will instill in you and your family, a new fascination in the weather around us. In addition to an excellent discussion of weather and how it develops, this book covers the subject of weather forecasting and how you can make your own forecasts. All in all, the Heathkit Weather Station is one of the most exciting kits for the whole family we have ever offered. Order yours now and get in on the fun.

- Kit ID-1290, 9 lbs., mailable **89.95**
- IDA-1290-1, 50 ft. cable, 2 lbs., mailable **5.95**
- IDA-1290-2, 100 ft. cable, 4 lbs., mailable **9.95**
- IDA-1290-3, 150 ft. cable, 6 lbs., mailable **14.95**

ID-1290 SPECIFICATIONS — WIND SPEED: 0-30 mph over 250° dial ±10%; 0-90 mph over 250° dial ±10%. WIND DIRECTION: 8 point readout over 360° dial with 16 points of resolution. SENSITIVITY: 3 mph. TEMPERATURE: Indoor: 0° to +120° F ±2° F Typ. Outdoor: -40° to +120° F ±2° F Typ. over 250° dial scale. BAROMETRIC PRESSURE: 29 to 31 inches of mercury within .05 inches. OPERATING TEMPERATURE: Receiver console: 32° to 100° F. Transmitters: -40° to +120° F. PRIMARY CONTROLS: Barometer preset; windspeed, 0-30 mph or 0-90 mph switch; temperature, indoor/outdoor switch. SECONDARY CONTROLS: Wind calibrate, 32° cal., 120° cal., indoor sensor balance adjust. POWER REQUIREMENTS: 105-130 VAC, 50/60 Hz, 3.5 watts. DIMENSIONS: Cabinet, 20½" L x 7" W x 2" D (7" D with desk side-stands). Transmitter assembly boom, 24½" ft. long.



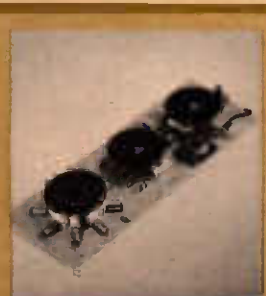
Wind direction is displayed with soft-orange lighted triangles within the "arrows."



Wind cup uses hermetically sealed reed switch. Cup also contains outdoor temperature sensor.



Reed switches also make-up wind direction sensor.



All panel components mount on one roomy circuit board.



Outdoor sensor mast mounts on conventional TV mast with handy U-bolt.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Self-service savings add to the value



Optional roll-around cart.



Extra large oven capacity.



Front panel lights.



Automatic timer.



Heathkit Big-Capacity Microwave Oven

Get Mom away from the kitchen fast with the amazing Heathkit Microwave Oven. Just pop in the food, set the timer and you have meals in minutes. A baked potato in 7 minutes, a 5-lb. roast in 45! And while the Heathkit Microwave Oven is just right for houseboat, cruiser or mobile home use, it also has one of the largest oven cavities in the industry. Other deluxe features include an exclusive 3-way door safety interlock; warm-air purging device to eliminate condensation; long-life Litton magnetron tube; vinyl-clad steel case luxuriously styled in textured antique white with "stainless" front panel accents. Measures 15 1/8" H x 25 1/2" W x 14 3/4" D (15 1/8" including handle). Operates on standard household current. Kit includes self-service instructions and illustrated cookbook by Home Economist Ann Balcam with recipes and timing charts for your favorite dishes. Cut cooking time up to 70%...put a Heathkit microwave oven in your kitchen, camper, or boat now! Magnetron tube warranted two full years.

NOTE: The GD-29 complies with all requirements of the Performance Standard for Microwave ovens (42 CFR 78.212) as set forth by the U.S. Dept. of Health, Education & Welfare. If at any time during the life of your oven, you wish to check its operation, it will be tested free of charge at any Heathkit Electronic Center or at the factory.

Kit GD-29, 98 lbs., Exp./Frt. **379.95**

GDA-29-1, Cart of hardwood solids, walnut finish, 5/8" x 1" tubing, disc casters. 31 5/8" H x 27" W x 15 5/8" D., 25 lbs., Express/Frt. **27.50**

ATTENTION HEATHKIT ELECTRONIC OVEN OWNERS: If your present GD-29 cookbook has only three (3) index pages, you can now add 94 new recipes and 65 pages to put more exciting variety into your electronic cooking. Order part No. 500-35, priced at only 1.75 plus 25¢ handling.

Save \$20 on Heathkit Minimizer™

Today's most modern refuse handling method in easy-to-assemble kit form! And since you build it, you can service it should the need ever arise. The Heathkit Minimizer lets you throw out the unsightly waste baskets and garbage cans for the latest in clean, convenient odor-free disposal. The Minimizer handles all normal household trash — glass and plastic containers, tin cans, wrappings, boxes, floor sweepings, light bulbs, etc. The packing ram descends with 2000-lb. force to reduce refuse to almost 1/4 of its original size, packaging the material in a neat disposable bag — one bag holds an entire week's trash for an average family of four! When the bag's full, simply fold over the top and remove a neat, dry package for normal rubbish pickup. And the Minimizer deodorizes the contents each time the drawer is opened and closed. Your Heathkit Minimizer can be built-in under the kitchen counter or left free-standing. Its bright white enamel finish with marble-tone vinyl-clad top complements any decor. And you can build it yourself in 6 to 10 hours. The check-by-step manual has complete operational servicing and trouble-shooting instructions. Has long-life 1/3-hp. motor, plugs into 110-120 VAC conventional household outlet. Kit includes 5 plastic-lined bags, one can of deodorant. Measures 34 3/8"-35 1/8" H x 15" W x 25 1/2" D.

Kit GU-1800, 210 lbs., Express/Frt.

Was 179.95 **Now 159.95**

GUA-1800-1, 15 plastic-lined bags, 10 lbs., mailable **4.99**



Bag lock-folds for neat disposal.



Safety key-lock switch.



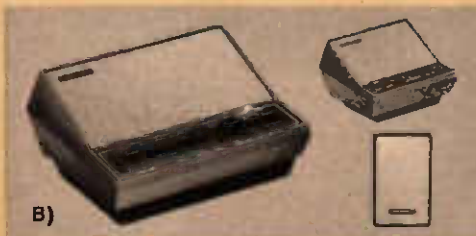
Built-in deodorizer.



Accepts up to 1 week's trash before emptying.



A



B



C



Home communicators

A) Heathkit "Wireless" Intercom ... 29.95 each

Easy installation. Just assemble the intercoms you need, plug them into your home electrical outlets. That's all there is to it. You can move units at will.

Each intercom has three channels. In a three-unit installation one station can talk to another without disturbing the third. In a six-intercom system, you can carry on three separate conversations at the same time. Pushbuttons provide channel selection. "Talk" mode, and "Dictate" position to hold channel open for extended one-way conversation. Linear slide controls volume, and internal squelch adjustment suppresses noise when no signal is present. Each GD-113 uses about as much current as an electric clock, so you leave them plugged in all the time. Attractive light green cabinet measures 4 1/8" H x 8 1/2" W x 6 3/4" D.

Kit GD-113, 4 lbs., mailable (each) **29.95**

of Heathkit[®] appliances for your home



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NO MONEY DOWN

The Heathkit Ultrasonic Cleaner handles all those "impossible" cleaning chores

- Ultrasonic sound waves deep clean most jewelry, brushes, microscopic hardware
- Assembles easily in one or two evenings.

The Heathkit Ultrasonic Cleaner makes light work of all those items that you could never get clean without tedious labor. Art and decorator paint brushes, intricate jewelry (except pearls), watches, glasses and contact lenses (except plastic), dentures. Whatever your "impossible" cleaning chore, odds are the GD-1150 Ultrasonic Cleaner can handle it — thoroughly and automatically.

To use, you simply fill the stainless steel tank with any safe detergent or solvent you would normally use for the item to be cleaned. Place the object or objects in the tank, set the timer and that's all there is to it. No matter what goes into the ultrasonic tank, 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. There is simply no more efficient method for getting agitating cleansing power into the most minute crevice of the most intricate object. Now, this low cost kit-form cleaner lets everyone take advantage of this scientific clean-up process.

Kit GD-1150, 5 lbs., mailable **54.95**

GD-1150 SPECIFICATIONS — Power requirements: 105-130 VAC, 60 Hz, 100 watts maximum. Operating frequency (transducer): Approximately 41 kHz. Operating temperature: 0°C to 50°C. Timer: 0 to 5 minutes (adjustable). Timer accuracy: ±10% of full scale after calibration at 25°C. Tray size: Approximately 6" long by 4" wide by 2 3/4" deep. (1" solution equals approximately 1 1/2 cups. Overall size: 11" L by 5 3/4" W by 3 3/8" H.



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NO MONEY DOWN

Heathkit Electronic Air Purifier

- Removes up to 99% of airborne pollen and 95% other contaminants regardless of size or concentration

Now your whole family can breathe easier at home with the Heathkit Electronic Air Purifier. It has been estimated in some highly industrial areas that as much as 125 tons of contaminants per square mile per month are spewed into the atmosphere. The GD-1003 removes up to 95% of these harmful contaminants even as small as .01 micron in size — quietly and efficiently.

The GD-1003 easily cleans the air in a 400 sq. ft. room, and the completely self-contained unit can be handily carried from room to room at will — plugging into any 120 VAC electrical outlet. A two-speed switch allows you to move large volumes of air — fast — in the "high" position, and to enjoy whisper quiet continuous operation in the "low" position. The big, efficient 5-bladed fan is lifetime lubricated for trouble-free operation. The fuse-protected solid-state selenium rectifier power supply is further assurance of long, reliable operation and minimum power consumption.

Cleaning's a breeze, too. Simply flip off the rear grille screen, lift out the collector cell and wash in plain detergent and water. The activated charcoal deodorant filters also slip out easily for replacing when needed. 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.

Kit GD-1003, 55 lbs. **139.95**

GD-1003 SPECIFICATIONS — Power requirements: 120 VAC; 50/60 Hz; 55 watts. Type: 2-stage. Air volume: Low, 110 cfm; High, 185 cfm. Efficiency: 95% determined by the National Bureau of Standards Dust Spot Method. Efficiency is higher at lower speed. Cabinet: wood-grained vinyl-coated steel. Dimensions: 15" H x 13 1/2" W x 17 3/4" D. Weight: 46 lbs.

help any household run smoother

B) Heathkit Indoor/Outdoor Intercom

GD-110 master functions include "All Call", "Talk", "Dictate" and volume control...plus monitoring of up to four Remotes. Individual Indoor Remotes can be rendered private to shut out monitoring. GD-110 and GD-120 have light green cabinets, measure respectively 4 1/2" H x 8 1/2" W x 6 3/4" D and 3 3/4" H x 6" W x 5 3/4" D. GD-130 has weather-proof crinkle finish, cabinet measures 5 3/4" H x 3 3/4" W x 2 5/8" D.

Kit GD-110, Master Station, 5 lbs., mailable **39.95**

Kit GD-120, Indoor Remote, 2 lbs., mailable **12.95**

Kit GD-130, Outdoor Remote, 2 lbs., mailable **9.95**

GDA-110-2, 100' 4-conductor Indoor cable, 2 lbs., mailable **5.95**

GDA-110-4, 100' 2-conductor outdoor cable, 2 lbs., mailable **2.95**

C) Heathkit 2-Station Intercom System ...29.95 complete

Master station accommodates up to two remotes. Either remote can initiate "private" only 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. Both Master and remotes feature big 3" x 5" combination microphone-speakers for crisp, clear sound reproduction. Low-profile cabinets come with plastic feet for desk, shelf or tabletop use, as well as mounting holes for wall mounting if desired. For a home intercom that's sure to cause a lot of talk, order your Heathkit GD-140 today. Measures 3 3/4" H x 6" W x 5 3/4" D.

Kit GD-140, one Master, one Remote, 4 lbs., mailable **29.95**

Kit GDA-110-2, 100 ft. 4-conductor cable, 2 lbs., mailable **5.95**

Kit GD-120, one extra Remote, 2 lbs., mailable **12.95**

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Protect your home and loved ones

The Heathkit "Informer" — Ultrasonic Intrusion Alarm

Disguised as your copy of "The Informer", the Heathkit Intrusion Alarm unobtrusively sits on a table or shelf. But behind the two decorative circles on the spine is a sophisticated solid-state ultrasonic transceiver. Flip the out-of-sight switch to activate the system, and the transmitter disperses a soundless signal through the room. This signal bounces off walls and returns to the internal receiver where it is monitored for any change. Any movement within the field of surveillance produces a change in the signal that is perceived by the receiver, which then triggers the lamp outlet, followed approximately 30 seconds later by the alarm outlet. This built-in delay time between light and alarm allows you to enter the room and deactivate the Intrusion Alarm without tripping the audible signal. A second hidden switch lets you set the lamp and alarm for automatic reset after the alarm has sounded for 25 seconds. Or this switch can be left in the normal position and the alarm will stay on until manually reset.

The Heathkit Intrusion Alarm also can do double duty as an automatic light switch in a dark hallway or sick room, or alert parents to night-walking children. Here is reliable home protection in an inconspicuous, easy-to-install package. Order one, or more, for your own family security, today! Note: As the GD-39 Ultrasonic Alarm operates in the same frequency range as Ultrasonic TV Remote Controls, interference between the two is possible.

Kit GD-39, 5 lbs., available 49.95
 GDA-39-1, indoor buzzer alarm, 3 lbs., available 9.95
 GDA-39-2, outdoor bell, 6 lbs., available 26.95

GD-39 SPECIFICATIONS — Operating range: Varies with installation. Typical maximum range is 25 ft. Operating times: Turn-on delay: Approximately 10 sec. Alarm delay: 20 to 30 sec. (lamp-on time). Automatic reset delay: 20 to 30 sec. (alarm-on time). Ultrasonic frequency: Approximately 41 kHz. Power outlets: Two AC sockets: One for Lamp, one for Alarm. Power outlet current: Three amperes total for both. Power requirements: 120/240 VAC, 50/60 Hz, 1½ watts. Dimensions: Chassis only, 2" W x 9¼" H x 7" D (approximately). In book-style cover, 2¾" W x 10¼" H x 7½" D (approximately).



Book cover leaves rear panel exposed for access to switches and outlets. Unit can also be used without cover.



Indoor Buzzer Alarm. Plugs into GD-39, can be hidden away. 2½" H x 3¾" W x 3¾" D.

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 NO MONEY
 DOWN



Outdoor Alarm Bell. Plugs into back of Intrusion Alarm, measures 7" x 7" x 3". Mounting plate included.

Heath-quality tools add to

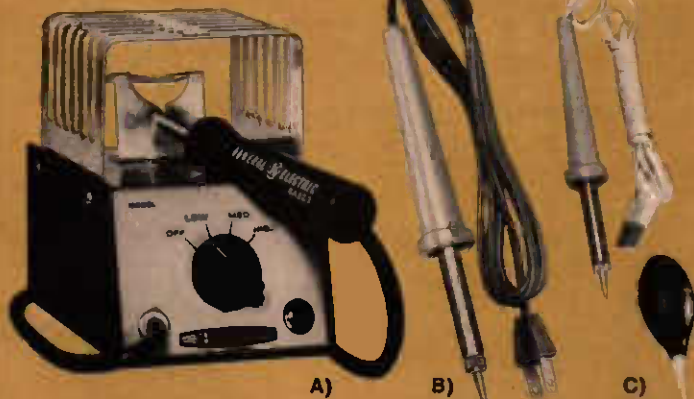
A) Heathkit 3-heat soldering iron kit Handy stand with metal cage keeps iron safe and secure. 3 heat ranges; low, medium and high, for all types of circuit work.

Kit GH-17A, 5 lbs., available 15.95
 Replacement Heater Tips for GH-17A:
 GDP-317, ¼" chisel, 1 lb., available 5.45
 GDP-327, ⅜" pyramid, 1 lb., available 5.75
 GDP-337, ⅜" chisel, 1 lb., available 5.75

B) Weller W-PS 25-watt pencil soldering iron Develops 860° heat fast, ready to go to work in seconds. U.L. and C.S.A. Approved.
 Model GDP-207, 1 lb., available 5.50

C) New Heath solder / de-solder set Weller W-PS 25-watt pencil soldering iron that develops 860-degree heat fast. Includes de-solder squeeze-bulb with heat and solder-resistant nozzle.
 GDP-1009, 1 lb., available 6.95

D) Vaco hollow shaft nut driver set Seven drivers accommodate most commonly used nut sizes; ⅜", ¼", ⅜", ⅝", 1½", ⅞" and ½". Plastic handles are color-coded for quick, easy identification.
 Model GDP-204, 2 lbs., available 7.95



with a Heathkit® Home Security System

Heathkit Home Protection System

- Alerts you to dangers of fire, smoke or intrusion
- "Wireless" operation — your house wiring system transmits the warning signals
- "Fail-safe" circuitry — a built-in battery triggers receiver alarm in case of power failure

Here's the complete home protection system in modular form, so you buy as much or as little as you need. Just plug the sensors into the transmitter. Then plug transmitter into any wall outlet. Your home wiring carries the alert signal to the remote receiver alarm which can be placed anywhere it's most effective.

A) Early-Warning 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 "fail-safe" continuously charged nickel-cadmium battery to trigger Receiver Alarm in case of power failure. Just plug into 110 VAC, no other wiring needed to receive signals.

Kit GD-77, 4 lbs., mailable 49.95

B) Fire detector/transmitter

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

Kit GD-87A, 4 lbs., mailable 49.95

C) 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 new, improved easily-mounted heat sensor switch GDA-97-4 (135°F).

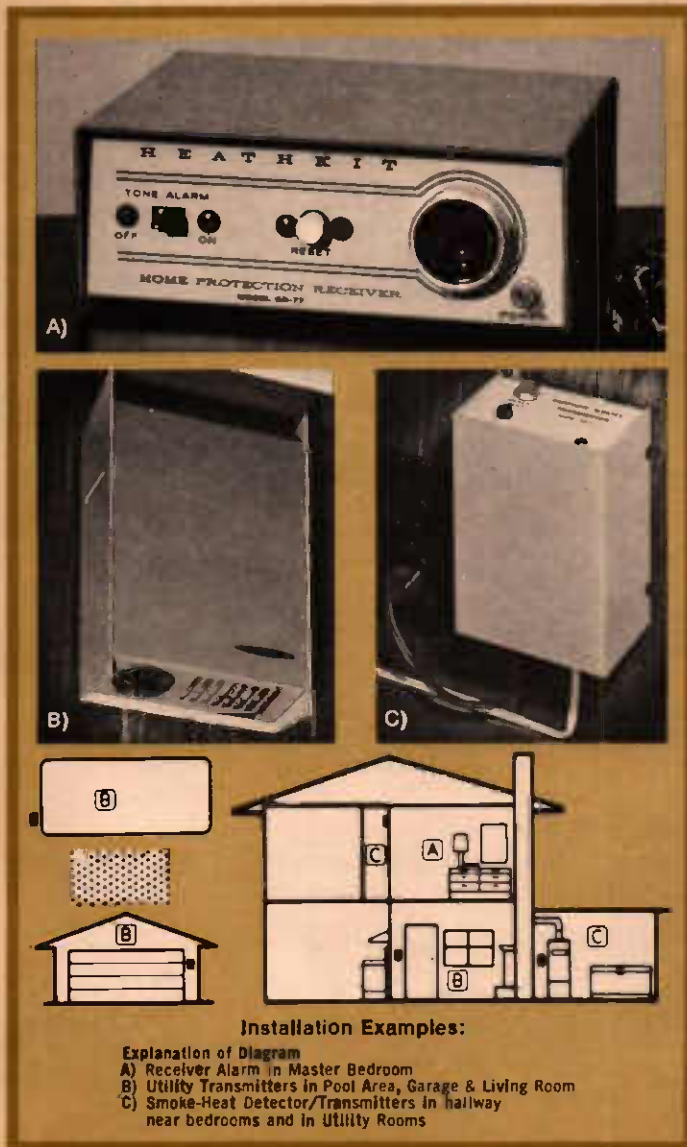
"Fail-safe" circuit. Uses AC line to transmit signal to GD-77 receiver.

Kit GD-97, 3 lbs., mailable 35.95

GDA-97-1, 1 lb., mailable 1.80

GDA-97-2, 1 lb., mailable 2.00

GDA-97-4, 1 lb., mailable 2.95



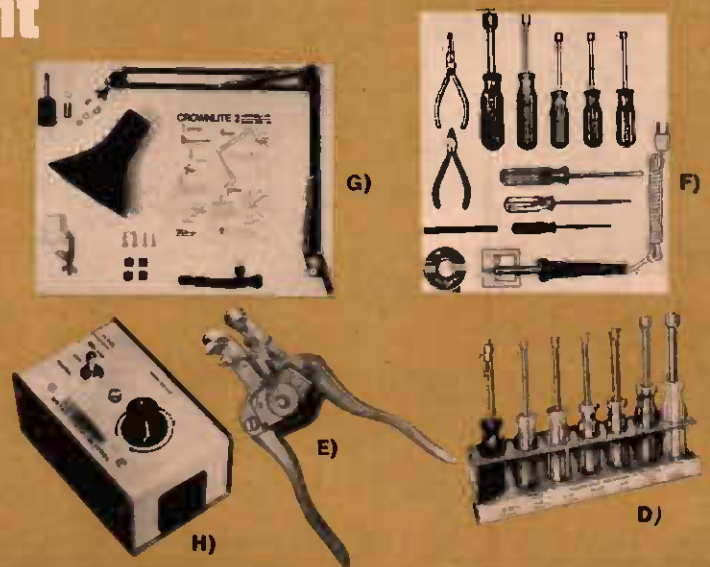
your kitbuilding enjoyment

E) Speedex wire & cable stripper A rugged, dependable, precision-made tool that takes the guesswork and nicks out of wire stripping. Graduated jaws accept No. 10, 12, 14, 16 and 22 wire. Model GDP-663, 2 lbs. (mfrs. list \$9.95), mailable 6.50

F) Kit builders tool set Set includes combination wire stripper and diagonal side cutter; midjet long-nose pliers; three screwdrivers (3/32", 1/8", 3/16"); Weller W-PS soldering iron; five nut drivers (3/16", 1/4", 5/16", 3/8", 1/2"); nut starter; soldering aid; solder, and information-packed "Kit-Builder's Guide." Model GH-25, 4 lbs., mailable 19.95

G) Workbench extension lamp kit The extension arm comes already assembled. All you do is attach the socket, shade and cord. Lamp features a 45" reach and 360° sweep; vented shade, and movable base clamp. Incandescent bulb not included. Kit GDP-202, 5 lbs. (mfrs. list \$14.50), mailable 12.95

H) Heathkit 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 portable drills, sabre saws, food mixers, sewing machines, etc. Kit GD-973A, 2 lbs., mailable 17.95



Heathkit valves in Garage Door Openers



Heathkit Deluxe Screw-Drive Opener

Just touch the wireless transmitter button in your car—your garage door opens & the light turns on. Touch the button again when you're inside, the door closes, and the light stays on long enough to see you safely inside before automatically shutting off. Door travel reverses, returns to full open if obstructed while closing. Adjustable slip clutch provides opening safety. Self lubricating screw drive & husky 1/4 hp motor give dependable, maintenance-free performance. Assembles easily in a couple of evenings—with no soldering. Leads are cut to length with push-on connectors installed. Pocket-size transmitter & solid state receiver come preassembled, ready to use.

- Kit GD-3209B, system with 2 transmitters, 49 lbs., Express/Frt. 154.95
- Kit GDA-3209-1, mechanism only, 47 lbs., Express/Frt. 104.95
- Kit GDA-3209-2, adaptor for jamb & pivot doors, 7 lbs., mailable 14.95



New permanently-installed up/down-limit adjusters provide easy adjustment with no need for special tools.



New handsomely-styled rugged plastic cabinet features built-in time-delay safety light.



Powerful new 1/4 hp motor opens the heaviest residential doors with power to spare.



New self-lubricating screw drive mechanism for quiet, reliable, maintenance-free operation.

- GDP-99, transmitter, 1 lb., mailable, specify frequency 17.95
- GDP-119, 1 transmitter, 1 receiver, 2 lbs., mailable 39.95
- GDP-129, 2 transmitters, 1 receiver, 2 lbs., mailable 54.95

KIT MECHANISM SPECIFICATIONS: 120" L x 12" H x 9" W. 117 VAC 1/4 HP. Open and Close Time: Approx. 11 seconds. **Safety:** Door travel reverses, returns to full open position, and stops if obstructed while closing. **Mounting Clearance:** 2 1/2" above highest point of door travel. **Safety Lamp:** 75 watt max., automatically turns on when mechanism is activated. Delay circuit keeps lamp on for approx. 90 sec. after motor stops. **UHF TRANSMITTER SPECIFICATIONS:** Powered by standard 9-volt transistor type battery. **RF Frequencies:** 290 to 320 MHz. **Useful Temperature Range:** -50°F. to +140°F. **UHF RECEIVER SPECIFICATIONS:** Powered by 24 VAC from opener mechanism. Usable on any mechanism having 24 volt AC NEC class II circuit. **R.F. Frequencies:** 290 to 320 MHz. **Useful Temperature Range:** -55°F. to +140°F.



Heathkit "Economy" Chain-Drive Opener

Operates standard 7 1/2' track doors, 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. Factory-assembled receiver has adjustable tone coding to prevent interference from neighboring units. Solid-state transmitter is preassembled, operates door from up to 150 feet away. Fits in your pocket or clips to your visor.

- Kit GD-309A, system with 1 transmitter, 51 lbs., mailable 99.95



Portable transmitter is your personal electronic key. Fits pocket, purse, clips on sun visor. Operates door from up to 150' away. Comes factory-assembled, ready to use.



Solid-state UHF Receiver comes factory assembled & adjusted—takes just minutes to install. Selectable tone coding prevents interference with neighboring units. Operates on 290 to 320 MHz.

- Kit GD-309-B, system with 2 transmitters, 51 lbs., mailable ... 114.95
- Kit GDA-309-1, mechanism only, 52 lbs., mailable 69.95
- Kit GDA-309-2, adaptor for jamb & pivot door, 3 lbs., mailable ... 3.95
- Kit GDA-309-3, adaptor for "California" style doors, 4 lbs., mailable 9.95

(For ordering additional transmitters & receivers, see listing under GD-3209A above.)

SPECIFICATIONS: Door Size and Type: Overhead residential garage doors up to 7' high. (Max. travel of opening mechanism 8'2"). **Control:** Wall-mounted, doorbell-type push-button switch, or optional devices (transmitter-receiver, key switch, etc.). **Opening Force:** 100 lbs. **Closing Force:** Adjustable up to 100 lbs. **Maximum Door Opening or Closing Time:** Approx. 9 seconds (on 7' high door). **Safety:** Door travel reverse, returns to fully open position, and stops if obstructed while closing. **Overhead Mounting Clearance:** 2 1/2" above highest point of door travel. **Safety Lamp:** Automatically turns on when the door is fully open and stays on until door starts to close. **Motors:** 120 VAC, 60 Hz, 1/4 hp, capacitor-run, 1500 rpm. **Power requirements:** 120 VAC, 60 Hz, 660 W (excluding lamp). **Dimensions:** 123" L x 10" H x 8 1/2" W.

Heathkit® savings in automotive gear



Heathkit 15-Amp Automatic Battery Charger with 50-Amp "Boost" . . . 49.95

- Big, 15-amp normal charging rate charges car, boat, camper, RV batteries . . . fast!
- 50-amp boost delivers dead-battery starts within one minute

A powerful performer in a portable package, the Heathkit GP-1044 is the perfect solution to dead battery problems in cars, boats, campers, or other recreational vehicles using 12-volt lead-acid batteries of automotive size or larger. Just plug the unit into a 120 VAC outlet, hook up the generous 10 ft. battery cables, flip the switch to "on" and the 15-amp charging circuit starts bringing your battery back to life. Or, depress the spring-loaded toggle switch for not more than a minute, and the 50-amp boost circuit surges enough energy into a dead battery to start an operable engine instantly. Completely automatic, the GP-1044 charges the battery to full charge, then automatically shuts down, turning on again only when needed to compensate for the normal internal leakage of the battery. The charger can be used on either negative or positive ground systems. A thermo sensing automatic resetting circuit breaker protects against overcharging in the boost mode, and the all-solid-state circuit features circuit breaker protection. Chassis has provision for either temporary wall mounting or permanent mounting on a flat surface. The on-off switch, power-on indicator lamp, 10 ft. battery leads and 6 ft. power cord make the GP-1044 ideally suited for permanent installation in marine or RV applications.

Kit GP-1044, 19 lbs., mailable 49.95

GP-1044 SPECIFICATIONS — Charge Rate at 120 VAC (primary): Boost; 50 amperes (maximum 1 minute). Normal; 15 amperes, decreasing to less than 2 amperes at full charge. Output Voltage: Charger shuts off when voltage at terminals reaches 14.5 volts. Power Requirement: 110 to 130 VAC, 60 Hz, 1450 watts at 50 ampere charge rate, 250 watts at 15 ampere charge rate. Dimensions: 6 1/4" H x 11 1/2" W x 7 3/4" D.



Heathkit 2-Way Intercom for campers, trailers and boats

The Heathkit "Mobilink" provides instant 2-way communication between camper and cab, car and trailer, ship's bridge and cabin, or for any other mobile application with a 12-volt, 250 milliamp DC power source. The 3-position switch on the Master selects "Stand-By," "Monitor" and "Talk" modes. The Remote also has a "Radio" position which brings entertainment into the camper direct from the car radio. The "Talk" position on both Master and Remote overrides all other functions, so either station can initiate a call. Mounting brackets and a 15' five-conductor cable are furnished. Optional plug features chrome-plated 5-prong plug and socket allowing removal of camper from cab without disturbing the interconnecting cable.

Kit GD-160, Master, Remote and cable, 5 lbs., mailable 25.95
GDA-160-1, Accessory Plug, 1 lb., mailable 2.50



39.95

NO MONEY DOWN

The Heathkit CD Ignition makes points and plugs live longer. Better performance, up to 50,000 miles between tune-ups. That's what the Heathkit Capacitive Discharge Ignition System can do for any car or truck with a conventional (battery, generator/alternator) negative ground system. The CP-1060 delivers higher voltage to the plugs for more complete combustion automatically varies the spark duration, giving a longer firing on cold-morning starts, shorter firing for high rpm running. Finally, it puts very little current through the points, reducing heat that causes pitting and burning. An external override button permits switching to conventional system. Also works with inboard, I/O and outboard marine engines having a standard, automotive type battery-distributor-coil system. Build it in a couple of hours, install it in less than that. The two connectors supplied screw on the coil terminal posts. Unit mounts to wheel well or other convenient location. Measures 3 1/4" H x 3 3/4" W x 6" D.

Kit CP-1060, 4 lbs., mailable 39.95

Heathkit Solid-State Tachometer

Wide angle 250° edge lighted dial with white indicator, adjustable pointer, non-scratch glass face. Available with black and chrome case, or for panel mount. Triggers from breaker points or Inductive pickup.

Kit MI-18-1, panel model, 3 lbs., mailable 29.95
Kit MI-18-2, with case, 3 lbs., mailable 32.95



MI-18 SPECIFICATIONS — Trigger Sensitivity (Minimum Requirements): Pickup Coil, 25 mA peak, 2 μS rise time. Tach Connection: 30 V negative pulse, 20 μS rise time. Meter Range: 0-6000 rpm or 0-9000 rpm. Engine Capability: 1 to 6 cyl., 2 cycles; 2 to 8 cyl., 4 cycles. Accuracy: ±3% at calibrating temperature (when calibrated at full scale), ±5% from 0°F. to +120°F. Power requirements: 10.5 to 17.5 V DC, 25 mA at 12 V DC, 125 mA with lamp. Dimensions: Model MI-18-1: 3 3/4" hole, 2 1/4" over-all case depth. Model MI-18-2: 3 3/4" overall face diameter, 4 1/4" high, 3" overall case depth.

Heathkit 10-amp automatic battery charger



For 12 VDC lead-acid batteries. Will not start unless it's correctly connected. Won't overcharge no matter how long it's hooked up. Just plug it into a convenient 120 VAC outlet and hook up the terminal cables. When battery voltage reaches full charge, the GP-21 shuts itself down, maintaining just enough current to compensate for leakage.

Kit GP-21, 13 lbs., mailable 29.95

GP-21 SPECIFICATIONS — Charge rate: 10 amperes maximum at 120 VAC line, decreasing to leakage rate of battery. Output voltage: Between 13.2 VDC and 13.6 VDC depending on battery condition. Power requirements: 105-130 VAC, 60 Hz, 200 watts maximum (at 10 amperes charge rate). Dimensions: 5 1/2" H x 9" W x 6 3/4" D.

Keep your car energy-efficient

Kit, or Assembled, Tested, Calibrated



129⁹⁵ Kit
NO MONEY DOWN

199⁹⁵ Assembled
NO MONEY DOWN

Diagnose ignition problems on this 5" scope

- Features built-in rpm indicator and handy clamp-on inductive pickup
- Add the optional 12-volt inverter and it's an on-the-road dynamometer

The Heathkit CO-1015 Ignition Analyzer can be used with any standard, transistorized or capacitive discharge system on three, four, six or eight-cylinder engines to detect shorted spark plugs, bad points, defective wiring, worn distributor parts, incorrect dwell time, coil, condenser or transistor or CD circuitry problems. It features a built-in tachometer, constant pattern width circuitry. You select four different patterns — primary or secondary, in either parade or superimposed displays. For detailed analyses, 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. Operation handbook supplied, illustrates typical auto engine waveforms to aid in troubleshooting.

- Kit CO-1015, 21 lbs., mailable **129.95**
 Kit COA-1015-1, 12V Inverter, 4 lbs., mailable **24.95**
 Assembled WO-5104, 22 lbs., mailable **199.95**
 Assembled WOA-5104-1, 12V Inverter, 4 lbs., mailable **32.95**

CO-1015 SPECIFICATIONS — Power Requirements: 120/240 VAC, 50/60 Hz, 16 W. RPM Range: 400-5000. Cylinders: 3, 4, 6 or 8. Ignition Systems: Standard, Transistorized or Capacitive Discharge. Displays: Parade or superimposed on both primary and secondary waveforms. Vertical Expand: Approx. 2 to 1. Horizontal Expand: Approx. 10 to 1. Sweep Length: (Referenced to Calibrate Position) ±5% over entire RPM range. Intensity: Fixed. Presets: Focus, Astigmatism, Trigger Adjust, Tac Cal. Connection Cables: 12' pick-up clamp; ground and secondary clip leads extend 2' beyond pick-up clamp. Front Panel Controls: Vertical Position; Vertical Expand (Pull Vert. Pos.); Horizontal Expand; Horizontal Position; Parade/Superimposed (Pull Horiz. Pos.); Power On/Off; Function Switch — Standard ignition primary, secondary; Calibrate; Capacitive Discharge primary, secondary. Tac Hi/Lo. Tac 6/8 cyl. (pull Horiz. Exp.). Tachometer: 0-1000 RPM, 0-5000 RPM ±5% of full scale. Dimensions: 7" H x 10½" W x 17½" D.

Kit, or Assembled, Tested, Calibrated



29⁹⁵ Kit
NO MONEY DOWN

39⁹⁵ Assembled
NO MONEY DOWN

This timing light has "sunshine" bulb plus handy inductive pickup

This timing light has all the great features of our popular CI-1020, plus handy inductive pickup that snaps around #1 spark plug wire. DC power leads clamp to battery terminals and you're ready to go. Rugged insulated blue plastic housing. Circuit protected against reversed polarity.

- Kit CI-1040, 4 lbs., mailable **29.95**
 Assembled WD-5105, 4 lbs., mailable **39.95**

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. Connecting cables: 7-ft. battery cable with clips. 5-ft. trigger pickup cable with clips. Power requirements: 12 VDC automotive storage battery or separate 15 VDC power supply with 1.5 amp capacity. Dimensions: 6½" H x 2" W x 10" L.

The timing light you can use in the sunshine

The Heathkit CI-1020 provides a flash that won't wash out even in direct sunlight. Connect one cable to the car's battery, the other to spark plug. Adapter is included for distributor cap hook-up. Insulated housing, circuit protected against reversed polarity.

- Kit CI-1020, 3 lbs., mailable **19.95**

CI-1020 SPECIFICATIONS — Useful light range: Up to 2 feet in daylight. Engine speed range: Full flash brightness up to 2000 rpm. Triggering requirements: Direct connection to number one spark plug of engine ignition system. Connecting cables: Battery cable with clips (7 feet). High voltage cable with clip (5 feet). Adapter/connector connects to either a spark plug or distributor. Power requirements: Automotive storage battery or separate 15 volt DC power supply. Size: 6½" H x 2" W x 10" L.



119⁹⁵
NO MONEY DOWN



GM regulator drops into footproof fixture. When top is closed, regulator is heated to maximum under-the-hood temperature.

New Heath Voltage Regulator Tester for GM Solid-state systems

This unique automotive testing tool is shipped fully assembled, ready to use. The new Heath Voltage Regulator Tester is designed to show the condition of all four basic circuits contained in the GM integral charging system regulator. To use, you simply insert regulator in self-heating holder, then follow procedure listed inside case top. Easy one-knob control activates meter and two indicator lights as called for in test. For greater versatility, order with the optional plug-in test leads for under-hood testing of regulator and generator continuity.

- CTW-1170, sold only in assembled form, 16 lbs., mailable **119.95**
 CTW-1170-2, optional external leads, 1 lb., mailable **6.00**

CTW-1170 SPECIFICATIONS — Test voltage: 16.5 VDC. Sense voltage: Adjustable 0-17 VDC. Current through regulator under test: 3.5A and .26A. Voltmeter: 0-20 VDC ±3%. Holder temperature: 118°C (240°F) within 5 minutes. Operating temperature range: 0-40°C. Short circuit current: 0.1A. Power requirements: 120 VAC, 60 Hz, 150W. Case: Aluminum. Dimensions: 7" H x 11" W x 7" D.

with Heathkit® Automotive Test Gear

The portable engine analyzer that does a lot more

- Checks-out the complete electrical system on most cars and trucks

This professional-grade instrument tests conventional, magneto, transistor, and most capacitive discharge ignition systems, regardless of voltage or grounding, on any 3, 4, 6 or 8-cylinder engine. It permits rapid servicing of storage battery, generator or alternator, voltage regulator, starter, distributor, ignition circuit (points, condenser and coil), accessories and all electrical wiring. The large 6" meter is color coded for easy-reading.

Unlike most other analyzers, there is no need to recalibrate between functions. Accuracy is ±3% on all ranges over a wide temperature range. Three C cells supply power, with no drain unless leads are hooked up. All necessary leads and accessories included.

Kit CM-1050, batteries not included, 8 lbs., mailable 64.95
Assembled WM-5100, includes batteries, 9 lbs., mailable .99.95

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. Temperature coefficient: Tref = 77°F; Change less than ±5% of full scale over the temperature range of 32°-120°F (except Alternator - 65°-83°F). Operating temperature range: RPM and Dwell: 0-140°F with alkaline batteries. 32°-140°F with zinc-carbon batteries. All other functions: 0-140°F. Battery Life: 100 hours average (with intermittent use of Low Ohms function). Meter: 6", 200 μA, 105° movement. 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). For use to 0°F; Three 1.5V, C-cell, alkaline batteries (NEDA #14A). Dimensions: 7 1/2" H x 10 1/2" W x 8 3/4" D.



Kit, or Assembled, Tested, Calibrated

64⁹⁵ Kit
NO MONEY DOWN

99⁹⁵ Assembled
NO MONEY DOWN



Inductive pickup for tachometer clips around any spark plug wire for quick, easy hook-up. Tachometer can be used with virtually any engine.



At last, a 5-function analyzer for small engines... only 39.95

Here's the solid-state tune-up tool for all your 1 to 4 cylinder, and 4 cycle engines. Now you can set-up your garden tractor, lawn mower, motorcycle, outboard, trail bike, snowmobile, etc., with electronic accuracy.

The new Heathkit CM-1045 is a completely portable instrument that tests volts, ohms, dwell, and continuity—in many cases permits checking the entire ignition system on a small engine without tearing down to get to the ignition points behind the flywheel. Plus, there's a built-in tachometer with snap-on inductive pickup and 0-3000 and 0-15000 rpm ranges.

The CM-1045 is powered by three 1.5 volt C batteries (not supplied) and is self-contained in a snaplock oil-gas-water-resistant case. There's no neater meter for the price, and you can assemble it easily in two evenings.

Kit CM-1045, 5 lbs., mailable 39.95

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°. Continuity: Lamp indicator. Operating temperature range: 0°F-140°F with alkaline batteries. 32°F-140°F with zinc-carbon batteries. Meter accuracy: Ohmmeter: ±3 degrees arc at 76°F, ±5 degrees arc at 0°F and 140°F. Other functions: ±3% at 76°F, ±5% at 0°F and 140°F. Power source: Three 1.5 V C batteries. Dimensions: 9 1/4" H x 9 3/8" W x 5 1/4" D.



Kit, or Assembled, Tested, Calibrated

Our Tach/Dwell meter measures voltage too

29⁹⁵ Kit
NO MONEY DOWN

42⁹⁵ Assembled
NO MONEY DOWN

Three automotive test instruments in one. Measures dwell on most 4-cycle 3, 4, 6 and 8-cylinder engines having conventional (Kettering) ignitions. Shows RPM on two scales—0-1500 and 0-

4500. Checks voltage from 0 to 15 volts. It can be used with both 6 and 12-volt systems having either positive or negative ground. It has just two leads and uses no batteries since the engine provides both signal and power.

Kit ID-29, 5 lbs., mailable 29.95
Assembled WM-5102, 5 lbs., mailable 42.95

ID-29 SPECIFICATIONS — Dwellmeter: Four direct reading scales; 8 cyl. — 0-45 degrees; 6 cyl. — 0-60 degrees; 4 cyl. — 0-90 degrees; 3 cyl. — 0-120 degrees. Tachometer: Two RPM ranges; Low range — 0-1500 RPM; High range — 0-4500 RPM. Voltmeter: Direct reading scale, 0-15 VDC. Power requirements: 10mA approximate average current. Meter: 4 1/2", 1 mA (100 degree movement). Accuracy: ±3% of full scale. Dimensions: 4 1/4" H x 8 1/2" W x 7 1/4" D (including handle).

The three basic tune-up tools for every amateur and professional mechanic



The Hanson Basic Tester Set Includes Model 714 Remote Starter Switch with new squeeze-handle starter operation; Model 715 Deluxe Compression Tester with pushbutton pressure release, ±2% accuracy, easy-to-read English & metric calibrations; Model 709 Vacuum & Fuel Pump Tester for testing valves, fuel pump, intake manifold, compression, carburetor adjustment, rings, cylinder walls, spark plug, etc.

CGP-1036, 3 lbs., mailable 10.95

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit® values in mobile electronics



Heathkit Stereo FM Tuner/Cassette has 3-way system flexibility

The Heathkit CR-1000 FM Stereo Tuner brings living-room fidelity in stereo broadcasting to the privacy of your own automobile. And simplified circuit board assembly plus a factory-assembled & aligned FM tuning unit make it all an enjoyable four-evening project. Performance specifications rival those of many costly home stereo tuners: less than 2% THD; frequency response ± 1 dB, 30 Hz to 15,000 Hz; 3 μ V sensitivity; 60 dB selectivity; 40 dB min. separation. Ten transistors, 4 ICs and 4 diodes make up the reliable solid-state tuner circuitry. Advance-design features include a muting circuit for noise quieting between stations; automatic frequency control (AFC) for locking-in FM stations. Front-panel convenience features include large Tuning, Volume, Tone and Balance control knobs; on-off rocker switch; high-visibility stereo indicator light and center-tune indicator light . . . all designed to give you fingertip control of FM stereo programming without taking your eyes off the road.

The CT-1001 Stereo Cassette Deck puts high fidelity stereo cassette entertainment — as well as single-channel dictation — right in your front seat. To use, simply insert a cassette cartridge into the front-panel slot and the unit starts to play. An electronic shut-off circuit automatically ejects the cartridge when tape plays through. An automatic "record interlock" protects prerecorded tapes from being accidentally erased. Three knobs give you fingertip control of Volume, Tone and Balance, while another control and indicator lamp give you peripheral-vision control of recording level. A single 3-way Reject

Bar performs fast-forward, rewind and reject functions. Microphone plugs into side panel. Solid-state circuitry and regulated motor deliver 30 Hz to 10kHz response; 45 dB S/N; 0.3% wow & flutter; 2% THD; and 30 dB channel separation. Microphone Included.

Add the amp and speakers and you're ready to go — The CRA-1000-1 Power Amp fits on the back of either the FM Tuner or Cassette Deck. One amp powers both units in tandem installations. Power output is 3.5 watts minimum per channel into 4 ohms; response ± 1 dB, 30-15,000 Hz; less than 0.5% THD. Operates on 12V battery negative ground only. For door panel installation choose the 4 1/2" speakers. Select 6" x 9" speakers for rear-deck installation.

**NOTE: Tuner not available until April
due to parts delays from suppliers.**

- Kit CR-1000, Tuner only, 7 lbs., mailable **64.95**
- Kit CT-1001, Cassette Deck only, 9 lbs., mailable . . **89.95**
- Kit CRA-1000-1, Power Amplifier, (for use with CR-1000 & CT-1001 only) 3 lbs., mailable **29.95**
- CRA-1000-2, 4 1/2", 4-ohm door-mount hi-fi speakers for Radio or Cassette (including grilles, adapter plates for most speaker size openings and 24' speaker lead) 6 lbs., mailable (pair) **19.95**
- CRA-1000-5, 6" x 9" 4-ohm rear deck mount hi-fi speakers for Radio or Cassette (including grilles and 24' speaker lead). 7 lbs., mailable (pair) **19.95**



For automobiles with a mission — Heathkit Siren/PA System

The Heathkit GD-18 Siren/PA System assembles in only two evenings. Functions as an electronic siren at a full 55 watts, with adjustable pitch. Functions as a PA system with 20 watts for booming voice communication. Functions as a radio call alert by letting you hear calls away from your vehicle. Choice of speakers, concealed or exposed horn. Concealed speaker requires 4 1/2" x 4 1/2" x 13" behind grille. *Note: Since this product is a kit, it is often not included in type-acceptance listings for individual municipalities and states. Please check the required standards for mobile sirens in your area.*

- Kit GD-18, Siren/PA Amplifier, 6 lbs., mailable . . . **59.95**
- Assembled GDA-18-1, exterior horn, 10 lbs., mailable **49.95**
- Kit GDA-18-2, concealed horn, 11 lbs., mailable **49.95**
- GD-18A (GD-18 & exterior horn), 16 lbs., mailable **104.95**
- GD-18B (GD-18 & concealed horn), 16 lbs., mailable **104.95**

Learn electronics the easy Heathkit® way



1995

NO MONEY DOWN

Heathkit Jr. Electronic Workshop "36"

- Offers 36 interesting experiments
- Completely safe to use — no soldering required, operates on flashlight batteries

The Electronic Workshop "36" presents 36 interesting and educational experiments for a complete introduction to basic electronics: continuity tester, 1½-volt battery tester, 6-volt battery tester, transistor tester, wheatstone bridge, diode tester, capacitor bridge, code flasher, timing device, earphone code oscillator, rain alarm, electronic flasher, metronome, sound level meter, public address amplifier, siren, loudspeaker code oscillator, experimental multivibrator, electronic organ, capacity switch, field strength meter, two-transistor receiver, three-transistor receiver, code transmitter, voice transmitter, light meter, listening device, intercom, electronic target hit alarm, light sensing alarm, L.D.R. flasher, L.D.R. oscillator, voice indicator, four-transistor receiver, automatic radio, burglar alarm. Kit includes master and remote control consoles, four working platforms.

Kit JK-1033, 10 lbs., mailable 19.95



Basic Electricity Kit/ Course

- Teaches the principles of voltage current and resistance

Whether an adult or student here is the perfect way to learn about electricity and electronics. Learn theory, do interesting experiments to demonstrate principles. And at the same time you build a handy

volt-ohm milliammeter. Youngsters enjoy a whole new world of electronics that can start them off on a profitable career. Adults, too, can learn and profit in this expanding age of electronics.

Kit EK-1, 4 lbs. 24.95



2-part Basic Radio Kit/ Course

Start by building a simple crystal receiver. Follow the text and improve it chapter by chapter. Result: a regenerative tube-type receiver! In Part II you learn more advanced electronic circuits and build a 2-band superheterodyne receiver. Requires EK-1 meter or equivalent... EK-2A required for completion of EK-2B.

EK-2A, part I, 7 lbs., mailable 21.95

EK-2B, part II, 5 lbs., mailable 21.95

AK-8, cabinet for radio, 3 lbs., mailable 3.95



Basic Transistors Kit/ Course

Simple yet thorough introduction to transistors — how they work, why they're necessary, what their association is to circuitry. No difficult mathematics; interesting experiments support the text.

Background and understanding gained from course provide basic transistor theory for faster, simplified servicing and trouble-shooting of transistorized circuitry and equipment.

Kit EK-3, 4 lbs., mailable 21.95

How to Understand and Use your Vacuum Tube Voltmeter

Learn theory, and applications of the VTVM. Special power supply lets you learn by doing.

Kit EF-1, text and power supply (for VTVM owners), 3 lbs., mailable 10.95

Kit EF-1-5, includes EF-1 and IM-18, 13 lbs., mailable ... 39.95

Kit EF-1-6, includes EF-1 and IM-28, 15 lbs., mailable 49.95

Manuals Only for EF-1, (single copy) 5.00; (10 or more) ea. 3.00.



How to Understand and Use Your Oscilloscope

Learn theory and application of the oscilloscope. This specially designed kit includes an experimental chassis for construction of many different circuits for tests used to illustrate and support the text.

Kit EF-2, text, special chassis and parts, 4 lbs., mailable 11.95

Manuals Only for EF-2 (single copy) 5.00; (10 or more) ea. 3.00.



How to Understand and Use Your Signal Generator

This easy-to-understand text covers theory, function and use of RF and audio generators.

Kit EF-3, text, test chassis and parts, 4 lbs., mailable 14.95

Kit EF-3-2, includes EF-3 and IG-102, 17 lbs., mailable 44.95

Manuals Only for EF-3 (single copy) 5.00; (10 or more) ea. 3.00.



Heathkit Electronic Photo Timer

34.50

NO MONEY DOWN

A prerequisite to any well-equipped darkroom. And an accessory any photographer will appreciate. Provides accurate exposure control of all contact and enlarging operations. Two switch-selected ranges — up to 99 sec. in 1-sec. steps, 9.9 sec. in 0.1 sec. steps. Repeatable to 2%. AC outlets for enlarger and safelight.

Kit PT-15, 4 lbs., mailable 34.50



Heathkit® product values for outdoor fun

Our Deluxe Metal Locator has professional features and a low kit price

The Heathkit GD-348 Locator offers you accurate, sensitive metal detecting capabilities comparable to detectors costing far in excess of this low kit price. With easy check-by-step instructions and simplified circuit board solid-state design, three evenings puts it all together...and you're ready for treasure hunting the next day. The GD-348 uses an improved "Induction balance" system in which no tone is heard until a metal object enters the field of the search coils and upsets the balance between them. This unbalanced condition results in a signal which is amplified and coupled to the built-in speaker, producing a loud tone which increases or decreases in volume as you get closer or farther away from the metal object. New solid-state circuitry results in more "transmitted" power, offers improved stability, minimum drift, and less need for readjustment. Convenient front-panel pinpoints your "find." Built-in jack is provided for use with optional headphones. The null and ten-turn sensitivity controls are conveniently located on the carrying handle for precision fingertip setting. The new pistol grip and control console are designed for perfect balance and effortless use. The search coil features new stainless steel hardware, lightweight anodized aluminum and space-age plastic parts for durability and long life. The handle telescopes down and rotates so that search coil, handle and control console all fold into a neat, flat, compact, portable package you can slip into a suitcase, or carry with you in the optional leatherette case with shoulder strap (below).

Kit GD-348, Locator only, 6 lbs., mailable	89.95
GDA-48-1, 9-volt battery, 1 lb., mailable	1.50
GD-396, headphones, 600 ohm (Superex), 1 lb., mailable	4.50
GDA-348-1, carrying case, 2 lbs., mailable	6.95



Convenient handle-mounted controls



Easy, three evening circuit board assembly



Black grain simulated leather carrying case with sturdy adjustable shoulder strap. Top snaps shut for positive protection. Folds up neatly for packing away when not in use. For GD-348 only.



3 EVENING KIT

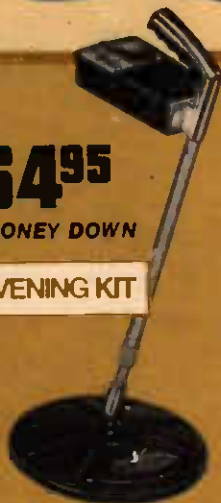
89⁹⁵

NO MONEY DOWN

64⁹⁵

NO MONEY DOWN

3 EVENING KIT



Build the Heathkit Economy Locator and you'll never travel without it

- Detects metal objects as small as a dime
- Both visual and audible detection signals with built-in meter and speaker
- Adjustable sensitivity control — locator can be set to work at specific levels

Detects metal objects as small as a dime and performs prospecting jobs comparable to detectors selling for much more. Produces no tone until a metal object enters the field of the search coils. You hear the tone either through the speaker or earphone. As buried metal is approached, the tone gets louder. A built-in meter helps you estimate size/depth ratio of find. You can set the locator to work at specific levels, too. All solid-state circuitry means light weight, reliable operation and minimum battery drain (typical battery life is about 80 hours). Power is supplied by a single 9-volt battery (not supplied).

Kit GD-48, Metal Locator, 6 lbs., mailable	64.95
GDA-48-1, 9-volt battery, 1 lb., mailable	1.50
GD-396, headphones, 600 ohm (Superex), 1 lb., mailable	4.50



Locate the big ones with Heathkit[®] tackle

A) Heathkit Dual-Range Fish Spotter[®] sounder with Audible Alarm

- Built-in audible alarm signals fish-find
- Controls for range and alarm depth

Set it to read from 0 to 60 ft. for sharp definition in shallow waters, or from 0 to 240 ft. where deep water fish feed. Set the adjustable audible alarm for any depth, and your Fish Spotter[®] sounds off loud and clear when individual fish or schools swim between the surface and preset depth. The Super-bright long-life neon flasher gives you precise depth reading. A noise rejection circuit eliminates engine ignition interference. Solid-state circuitry offers exceptional sensitivity, reliability and minimum battery drain. Powered by two 6V lantern batteries (not supplied.) Features rugged, compact aluminum cabinet with sun-shielded dial face and portable suction-cup transducer bracket. Or order the scanning transducer bracket below.

Kit MI-2901, 9 lbs., available 99.95

Kit MIA-2900-1, Scanning Transducer Bracket, 4 lbs., available 12.95

MI-2901 SPECIFICATIONS: Range: 0 to 60 feet on hard bottom, 0 to 240 feet on hard bottom. Accuracy: $\pm 2\%$ 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, $\pm 5\%$. Amplitude at the transducer: 150 volts peak-to-peak minimum. Pulse width: 0.8 millisecond on the 0-60' range, 1.4 milliseconds on the 0-240' range. Noise Rejection: Fixed at approximately 500 microseconds integration time. Receiver Sensitivity: 75 μ V 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 0-249' range. Controls: Sensitivity, with on-off switch. Alarm, with a pull-to-read alarm depth and off position. Range, with two depth indicating ranges (0-60 feet and 0-240 feet). Transducer: Barium titanate ceramic element encased in a watertight housing. Transducer Cable Length: 15'. Power Requirements: 12 VDC. Dimensions: (Less Handle): 7" H x 6" W x 11" D.

B) Heathkit "Economy" Fish Spotter[®] sounder

A compact, completely self-contained battery powered unit (batteries not supplied) that spots schools and individual fish down to 240 feet. Also doubles as a reliable depth sounder. All solid-state circuitry for outstanding accuracy, sharp definition, dependability and low battery drain. Built-in noise rejection circuit eliminates ignition interference. Improved disk and slip-ring assembly result in quieter operation. New, super-bright neon indicator lamp gives you high visibility, even in direct sunlight. Kit includes transducer and suction-cup transducer

mount. Or order the scanning transducer mount for even greater fishing convenience.

Kit MI-2900, 9 lbs., available 69.95

Kit MIA-2900-1, Scanning Transducer Bracket, 4 lbs., available . . 12.95

MI-2900 SPECIFICATIONS Range: 0-240 feet on hard bottom. Accuracy: $\pm 2\%$ @ 240 rpm. Sounding: Rate: 20 times per second. Frequency: 200 kHz $\pm 5\%$. Amplitude at the transducer: 150 volts peak-to-peak minimum. Pulse width: 1.0 millisecond. Noise Rejection: Fixed at approximately 500 microseconds integration time. Receiver Sensitivity: 75 μ V nominal at 200 kHz. Depth Induction: Neon lamp flashes at zero and again at the indicated depth from the object. Control: Sensitivity, with on-off switch. Transducer: Barium titanate ceramic element encased in a watertight housing. Transducer Cable Length: 15'. Power Requirements: 12 VDC, 2 6V lantern batteries. Dimensions: 7" H x 6" W x 11" D.

C) Heathkit Scanning Transducer Bracket

Adds scanning convenience to your Heathkit Dual-Range and "Economy" Fish Spotters. Rugged "C" clamp mounting. Scans 360° and locks in any position. Accepts any 1 1/2" cylindrical transducers.

Kit MIA-2900-1, 4 lbs., available 12.95

D) Heathkit Thermo Spotter[®] fishing aid pin-points temperature where fish feed

Seeks out the water temperature where your favorite fish feed. The unit is completely self-contained with a submersible sensing element on a 100-ft. cable. All of the battery-powered meter circuitry is housed in the rugged, high-impact plastic take-up reel case. To use, you simply lower the line, press the spring-loaded meter button for temperature readout, then check depth as indicated by marks on the cable. Since electronics are located inside reel hub, there are no rubbing contacts to malfunction. Kit includes operation manual with fish temperature preference charts by Stanley J. Lievense; calibrating thermometer, sensor line depth marking material. Easy one evening assembly. Uses 1.5V penlight battery (not supplied).

Kit MI-104, 3 lbs., available 24.95

MI-104 SPECIFICATIONS — ELECTRICAL: Circuit: Bridge type with thermistor sensor in one arm. Indicator: 50 μ A meter. Temperature scale: 32°-86°F. (0°-30°C). Accuracy: within $\pm 3^\circ$ F. Current drain: Less than 3 mA when in use. Battery: Size AA penlight cell (NEDA 15). **PHYSICAL:** Case: Molded high-impact plastic. Cable length: 100 ft. Reeling speed: 1 ft. per turn (approx.). Dimensions: 10 3/4" x 5 3/4" x 3 1/4".

Build your own Heathkit® Marine Gear



Transom-mount transducer (left) is recommended for high-speed craft with planing hulls. Through-hull transducer (right) is ideal for permanent installation in larger boats with displacement hulls.

99⁹⁵

NO MONEY DOWN

Heathkit Dual-Range Visible/Audible Depth Sounder

The Heathkit MI-1031 Visible/Audible Depth Sounder sets a new precedent in kit-form value — with accuracy, convenience and safety features never before available at such a low price. The Super Bright flasher-type readout provides the big picture of what's below — depth to bottom, terrain and vegetation — shows schools and individual fish, submerged floating objects. For extra security afloat, high-pitch beep alerts you to shallow waters or objects above any pre-selected depth from 5-240 ft. Just set the front-panel alarm control and forget it. The two switch selected ranges make reading depths to 240 ft. easier and permit far more accurate readings in waters 60 ft. or less.

The state-of-the-art design features all-transistor circuitry with electronically controlled silent-running motor and built-in fixed noise rejection circuit to eliminate ignition interference. Diode protection against accidental reversal of polarity when connecting to your ship's 12 VDC system. The marine-white water-resistant Cyclopedia® cabinet has a glare-free black bezel and integrated sun shield that lets the Super Bright neon indicator light stand out even in bright sunlight. The gimbal mount and quick-disconnect power and transducer leads let you easily remove your depth sounder when your boat is not in use. The MI-1031 is available with transom mount for permanent installation on planing hulls, or thru-hull transducer for installation on displacement hulls (see below). Build this kit in just four evenings.

Kit MI-1031-1, sounder with thru-hull transducer & 15' cord, 9 lbs., mailable 99.95

Kit MI-1031-2, sounder with transom transducer & 25' cord, 10 lbs., mailable 99.95

MI-1031 SPECIFICATIONS — Range: 0-240' on hard bottom. Sounding: 60' range; rate 2400/min. or 40/sec. 240' range; rate 600/min. or 10/sec. Frequency on both ranges approx. 200 kHz. Accuracy: Within 2% of actual depth. Depth indication: Neon lamp flashes at zero and again at indicated depth from object. Transducer: Barium titanate ceramic element encased in watertight housing. Controls: Range, 0-60' or 0-240'; ALARM adjustable from 5'-240' with on-off capability; SENSITIVITY, with on-off switch. Transistor & diode complement: 26 transistors, 10 diodes. Power requirements: 0-60' range, 225 mA @ 11-15 VDC; 0-240' range, 125 mA 11-15 VDC with one return pulse. Dimensions: 6½" H x 5¾" W x 7¼" D.



- Reads depths to 240 ft.
- Easy three-evening assembly

69⁹⁵

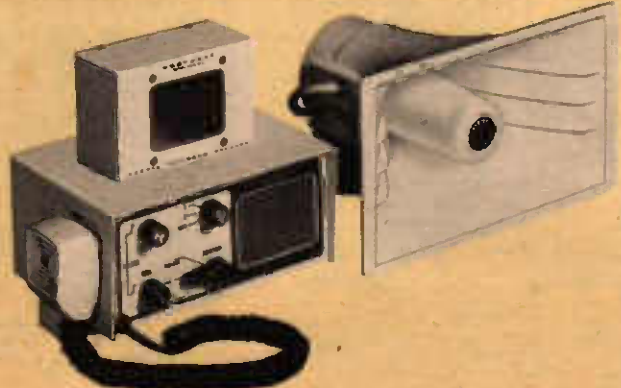
NO MONEY DOWN

Heathkit "Economy" Depth Sounder

This top-value sounder reads depths to 240 ft., displays underwater terrain, spots fish and other submerged objects. Circuitry includes electronic motor control, noise-rejection circuit, diode protection against polarity reversal, 12 VDC power requirement. Super Bright neon light for visibility in direct sunlight. Quick-disconnect jacks and gimbal bracket. Includes 15' power cord. Measures 6½" H x 5¾" W x 7½" D.

Kit MI-1030-1, sounder with thru-hull transducer & 15' cord, 8 lbs., mailable 69.95

Kit MI-1030-2, sounder with transom transducer & 25' cord, 9 lbs., mailable 69.95



Heathkit Foghorn/Hailer

Functions as a foghorn, hailer, boathorn and intercom . . . all in one system. Features powerful 55-watt amplifier; foghorn rate & duration controls; separate "listen" & "hail" gain controls; optional remote speaker for use as ship's intercom. Easy-to-assemble kit includes low-profile weather-resistant deck horn, 20' speaker cable, gimbal mount. Styled in marine white with blue trim. Operates on your ship's 12 VDC power system, positive or negative ground.

Kit MD-19A, with horn speaker, 15 lbs., mailable . . 89.95
Kit MDA-19-1, remote speaker, 2 lbs., mailable 9.95

MD-19A SPECIFICATIONS — Output power: 55 W peak. Boat horn frequency: Approx. 530 Hz. Foghorn frequency: Approx. 390 Hz. Foghorn rate: Approx. 2-90 sec., variable. Foghorn duration: Approx. 2-20 sec., variable. Speaker: 8 ohm weather resistant horn. Microphone: Ceramic with push-to-talk switch. Controls: Call volume; Listen volume; Station select; Function; Foghorn rate and duration. Power requirements: 12 VDC nominal, 4.5 A max. Idle current: 750 mA or less. Dimensions: 4¾" H x 9¾" W x 9¼" D. Color: White wrinkle and dark blue.

for the best electronic values afloat



Heathkit Digital Depth Sounder

The Heathkit MI-101 offers the latest developments in digital depth sounders. Bright numerical display tubes show you the depth at a glance. Solid-state digital circuitry eliminates the need to interpret dials or meter scales. Dual-range scale automatically switches to give depth from 2.5 to 19.9 ft. in increments of 0.1 ft., and from 20 to 199 ft. in increments of 1 ft. A red warning light alerts you to shoals of 10 ft. or less. A single knob gives you control of on-off, and light intensity to suit conditions either below decks or up on the bridge. Noise rejection is automatic, as is gain control for maximum sensitivity. 42 silicon transistors, seven TTL integrated circuits with regulated power supply maintain accuracy over a wide range of varying DC power supply voltages. Other features are a handsome Cyclocac® case with blue and white finish; matching gimbal mounting bracket; optional through-hull transducer or high speed transom mount transducer; 15-ft. cable for through-hull installation, 25 ft. for transom mount.

Kit MI-101-1, with through-hull transducer, 8 lbs., mailable 139.95

Kit MI-101-2, with transom transducer, 9 lbs., mailable 139.95

139⁹⁵
NO MONEY DOWN

MI-101-1 & -2 SPECIFICATIONS — Ranges: 2.5-19.9' and 20-199', automatically switched. 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: $\pm 2\%$, ± 1 digit. Current drain: 300-500 mA. Power requirements: 10-17 VDC @ 500 mA. Display: 7 segment incandescent display tubes — 3 digit red warning indication for depths 10' or less. Controls: Display intensity with on-off switch. Transducer: Barium Titanate ceramic element encased in watertight housing. Dimensions: 2 1/4" H x 6 5/8" W x 8 1/2" D (less gimbal hardware).



Heathkit Fuel Vapor Detector

Make your craft secure below with the Heathkit MI-25 Fuel Vapor Detector. This kit-form instrument gives a meter indication of safe-dangerous-explosive conditions. . . sounds an audible alarm when gasoline fumes are present. Fully transistorized circuit has fail-safe provision that triggers alarm when any component fails. Built-in relay circuits provided for control of bilge blower or additional warning devices.

Kit MI-25, 3 lbs., mailable 47.95

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NO MONEY DOWN

MI-25 SPECIFICATIONS — Voltage: 12 VDC, $\pm 10\%$. Current: 1.0 A nominal. Panel size: 2 1/8" H x 5 1/8" W. Depth: 5". Detector head size: 1 1/2" round x 2 1/2" long. Length of interconnecting cable supplied: 15'. Color: Marine white & black. Material: Aluminum. Temp. range: -30°C . Audio alarm: 2500 Hz.

Low-Cost Heathkit Power Inverter

The Heathkit MP-10 Power Inverter converts your boat's 6 or 12 VDC electrical system to 117 VAC square wave with up to 175 watts continuous at 12 volts for operating electric razors, lamps and other small appliances. It features an all-transistor circuit and two receptacles for plugging-in appliances. A 25-ampere fuse protects the DC power source from overheated wires and battery discharge if a short should occur. Not recommended for equipment requiring high starting current or sine wave AC. Build it in one or two evenings.

Kit MP-10, 8 lbs., mailable 34.95

MP-10 SPECIFICATIONS — Power source: 6 or 12V storage battery. Power output: Nominal 117 V, 60 Hz AC; 12 V operation 175 W continuous, 240 W max; 6 V operation, 120 W continuous and max. Input current for continuous ratings: 6 V operation 25 A, 12 V operation, 16.5 A.



34⁹⁵
NO MONEY DOWN

Go globetrotting with a Heathkit® SWL Receiver

Four bands of action for just 59.95

Ideal beginner's kit... most components mount on single circuit board for easy check-by-step assembly in about five evenings. Tunes foreign broadcasts from around the globe — weather reports — ships at sea — amateur and CB bands — plus local AM entertainment. Features slide-rule tuning; log-scale; bandspread tuning for separating adjacent stations; variable BFO for clear code reception; built-in speaker; front panel jack for headphone or external speaker; switched automatic noise limiting; signal strength meter; built-in AM rod antenna plus connection for SWL antenna.

Kit SW-717, 10 lbs., mailable 59.95

SW-717 SPECIFICATIONS — Frequency Coverage: Band A — 550 kHz — 1500 kHz. Band B — 1.5–4 MHz. Band — 4–10 MHz. Band D — 10–30 MHz. Meter: Indicates relative signal strength. Headphone Jack: Accepts low impedance headphones or external speaker. Loudspeaker: Built-in. Controls: Volume with on/off switch; Mode (AM, Standby & CW); BFO; Main Tuning; Bandspread Tuning; ANL on/off. Transistor Complement: 40673, Mixer & RF amplifier; 2N3393, Audio preamplifier; 2N5232A, IF amplifier, AGC amplifier; 2N5308, IF amplifier; MPF105, oscillator; S2090, final audio amplifier; S2091, final audio amplifier; X29A829, Audio driver. Power Supply: Transformer operated; full-wave bridge rectifier. Voltage Requirements: 120/240 VAC, 50-60 Hz, 8 W. Dimensions: 5½" H x 14½" W x 8" D.



59.95
NO MONEY DOWN

6 EVENING KIT

This Heathkit 6-Band Radio is fully portable

A favorite of discriminating SWLs, hams needing a reliable standby receiver, and campers, hunters, travelers and vacationers wanting a ready-to-go portable. 190 kHz to 30 MHz coverage in 6 bands; AM or SSB/CW reception; AVC; switched ANL; signal meter; external antenna connection; receiver/standby switch; muting connection; headphone jack; 500 kHz crystal calibrator; carry-handle; whip antenna. Runs on nickel-cadmium battery with built-in charger.

Kit GR-78, 14 lbs., mailable 129.95

GR-78 SPECIFICATIONS — Frequency coverage: Band A, 190 kHz-410 kHz; Band B, 550 kHz-1300 kHz; Band C, 1.3 MHz-3.0 MHz; Band D, 3.0 MHz-7.5 MHz; Band E, 7.5 MHz-18.0 MHz; Band F, 18.0 MHz-30 MHz. Meter: Indicates relative signal strength. Intermediate frequency: Band A thru E: 455 kHz; Band F (Double conversion): 1st IF, 4.034 MHz; 2nd IF, 455 kHz. Sensitivity*: 0.2 µV — 10 µV depending on band and portion thereof. Selectivity: 7.5 kHz ±1 @ 6 dB down. Audio output: 300 milliwatts @ 10% distortion. Battery: 9.6 VDC 500 mAh Nickel-Cadmium rechargeable. Battery charge rate: The battery is always being charged at 20 to 25 mA when the built-in trickle charging circuit is connected to an external power source with the Receiver turned off. A full battery charge will be maintained if the Receiver is connected to an external power source and used an average of 5 hours daily at a normal listening level. Overall size: 6¼" H x 11½" W x 9" D.

*Signal level for 10 dB signal + noise/noise ratio.



129.95
NO MONEY DOWN

12 EVENING KIT

Shortwave listening at its finest

The Heathkit SB-313 covers 9 switch-selected shortwave bands between 3.5 and 21.8 MHz; receives SSB, CW, and AM with professional performance. A 5 kHz AM crystal filter is supplied with the kit, with separate SSB and CW crystal filters available as optional accessories. Outstanding stability, selectivity and sensitivity are the result of advanced-design all solid-state circuitry. Preassembled and aligned Heath LMO for good linearity and highly stable tuning. An IC crystal calibrator provides markers every 100 kHz or 25 kHz. Other features are a transistor-regulated power supply; an RF attenuator; and virtually backlash-free dial tuning. An 11 megohm input VTVM, an 8-ohm speaker or headphones, and an antenna are all you need for alignment.



Kit SB-313, 22 lbs., mailable 339.95

Kit SB-600, 8-ohm, 6"x9" speaker & cab., 7 lbs., mailable 19.95

SBA-301-2, deluxe CW Filter, 1 lb., mailable 22.95

SBA-310-2, deluxe SSB Filter, 1 lb., mailable 39.95

SB-313 SPECIFICATIONS — Frequency Range (MHz): 3.5 to 4.0, 5.7 to 6.2, 7.0 to 7.5, 9.5 to 10.0, 11.5 to 12.0, 14.0 to 14.5, 15.0 to 15.5, 17.5 to 18.0, 21.3 to 21.8. Intermediate Frequency (IF): 3.395 MHz. Frequency Stability: Less than 100 Hz per hour after 10 minutes warmup under normal ambient conditions. Less than 100 Hz drift for ±10% line voltage variation. Sensitivity: Less than 0.5 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. Selectivity: AM: 5.0 kHz at 6 dB down, 15 kHz maximum at 60 dB down (crystal filter supplied). SSB: 2.1 kHz 6 dB down, 5.0 kHz maximum at 60 dB down (crystal filter available as an accessory). CW: 400 Hz at 6 dB down, 2.0 kHz maximum at 60 dB down (crystal filter available as an accessory). Image Rejection: 60 dB or better. IF Rejection: 3.395: Greater than 55 dB. 8.595: Greater than 40 dB. Spurious Response: All below 1 microvolt equivalent signal input except at 10.0 MHz and 15.375 MHz. Dial Accuracy: Electrical: Within 400 Hz after calibration at nearest 100 kHz point. Visual: Within 200 Hz. Calibration: Every 100 kHz or 25 kHz. Dial Backlash: No more than 50 Hz. Antenna Input Impedance: 50 Ω nominal unbalanced. Audio Output Impedance: Matching Speaker: 8Ω. Matching Headphones: Low impedance. Audio Output Power: 4 watts at less than 10% distortion. Muting: Open external ground at Mute socket. Power Requirements: 105 to 130 or 210 to 260 volts AC, 40 watts max. Overall Dimensions: 7¾" H x 12¼" W x 14" D.

Handy accessories to heighten the shortwave-listening fun

Superex headphones

... Ideal for all Heath SWL receivers except GR-43A. Dual coils; wide headband; 600 ohm impedance.

GD-396, 1 lb., mailable 4.50



SWL guide

1974 edition... lists world-wide SW, FM, TV stations, call signs, frequencies & addresses.

GDP-315, 2 lbs., mailable 6.95



Long-wire antenna

... includes a 75' long-wire antenna with 30' of lead-in all insulators & hardware.

GRA-72, 2 lbs., mailable 2.95

Heathkit® Scanning Monitor

6 EVENING KIT

119⁹⁵
NO MONEY DOWN



The GR-110 automatically monitors your local public service channels

The Heathkit GR-110 Scanning Monitor seeks and locks-in on ham, radio, fire, police, marine, weather, 2-way commercial radio, mobile telephone calls. The eight-channel crystal-controlled, VHF receiver tunes any selected 9 MHz segment of the 146 through 174 MHz band of frequencies. You can choose up to eight separate crystals to cover the active VHF frequencies used in your locality (check state and local laws regarding use of monitors in vehicles in your area). In the manual scanning mode, depress the "manual" switch to step to any channel 0 through 7, which is displayed digitally on a bright 7-segment indicator. The Monitor then stays locked to that frequency until you step up to another, or go to automatic scan. In the automatic mode, the Monitor scans rapidly through all eight channels and locks on to the first one that starts a transmission. After the transmission stops, the monitor waits four seconds and then resumes scanning. A priority channel "0" takes precedence over all other channels and the Monitor will return to "0" whenever a station is transmitting on that frequency. Front panel push-buttons lock-out any channels you desire. The Monitor then bypasses these channels as it scans. During assembly, the readout indicator can be wired to display a channel

number only when the Monitor locks on a transmitted signal, or to continuously display each channel number in sequence while scanning the channels. Two line cords and plugs are provided—one for operating from 120 VAC 50/60 Hz power and one for operating from your 12 VDC vehicle or boat battery. A gimbal bracket is also supplied for vehicle or boat mounting. Other features are a built-in speaker plus rear panel jack for connecting an external 4-ohm speaker; rear panel antenna jack; front panel controls for on/off, volume, squelch, manual/automatic scan. Modular circuit board design and check-by-step manual make assembly an enjoyable 5-evening project. Includes complete Instructions on alignment procedure and how to order crystals.

Kit GR-110, 9 lbs., mailable **119.95**
GRA-110-1, Crystal Certificate, postpaid each **4.95**

GR-110 SPECIFICATIONS — Frequency Range: 146 to 174 MHz. Scanning Range: Any 9 MHz segment of frequency range. Sensitivity: Less than 1 μ V for 20 dB of quieting. Usable Sensitivity: Less than 0.5 μ V. Adjacent Channel Rejection: -40 db (\pm 30 kHz spacing). Intermediate Frequency (IF): 10.7 MHz, crystal filter. IF Rejection: Greater than -80 dB. Image Rejection: Greater than -40 dB. Modulation Acceptance: 7.5 kHz maximum. Antenna Input Impedance: 50 ohms. Scan Rate: Approximately 17 channels per second. Audio Output: 2 watts into a 4-ohm load, with less than 10% distortion. Solid-State Devices: 29 transistors, 8 integrated circuits, 17 diodes. Readout Device: 3015A, 7-segment indicator tube. Power Requirements: AC: 120 volts, 50/60 Hz; 13 watts. DC: 13.8 volts. Squelched .275 amperes. Unsquelched with full audio, 0.8 amperes. Dimensions: 3" H x 8 $\frac{1}{4}$ " W x 9 $\frac{3}{4}$ " D.

Heathkit Portable Monitors for fire, weather, police, aircraft



49⁹⁵
NO MONEY DOWN

Catch the local action wherever you go. Both of these fine monitors feature vernier tuning, single channel crystal (not supplied), squelch, solid-state battery operation, carrying handle/stand, whip antenna, external antenna jack, rugged brown leatherette case.

Kit GR-88, Fire, Weather, Police Monitor, 5 lbs., mailable **49.95**
Kit GR-98, Aircraft Monitor, 5 lbs., mailable **49.95**
Kit GRA-88-1, AC power supply for both above, 2 lbs., mailable **8.50**

GR-88 SPECIFICATIONS — Tuning range: 152-174 MHz. Antenna Input: 50-75 ohms. Sensitivity: 2.0 μ V or less for 20 dB quieting. IF frequency: 10.7 MHz. IF selectivity: \pm 40 kHz @ 6 dB down. Image rejection: 40 dB or greater. IF rejection: 80 dB or greater. Audio output: 250 mW at less than 10% distortion. Speaker: 3" round, 24 ohms, permanent magnet. Transistor complement-tuner: (2) 2SC784 and (1) SE-5006. Transistor complement-IF audio: (5) 2N2369, (4) 2N3393, (1) X29A829, (1) 2N2430, (1) 2N2431, (1) 40481. Diode complement: (2) 1N191 and (2) 1N4646. Batteries: Six 1.5 V "C" cells, not supplied. Dimensions: 7 $\frac{1}{2}$ " H x 8 $\frac{3}{4}$ " W x 3 $\frac{1}{2}$ " D.

GR-98 SPECIFICATIONS — Tuning range: 108-136 MHz. Antenna Input: 50 to 75 ohms. Sensitivity: 1.5 μ V or less for 10 dB signal-to-noise plus noise ratio @ 1000 Hz 30% modulation. IF frequency: 10.7 MHz. IF selectivity: 40 kHz @ 6 dB down; 100 kHz @ 30 dB down. Image rejection: 40 dB or greater. IF rejection: 80 dB or greater. Audio output: 250 mW at less than 10% distortion. Speakers: 3" round, 24 ohms, permanent magnet. Transistor complement-tuner: (2) 2SC784 and (1) SE-5006. Transistor complement-IF & audio: (4) 2N2369, (3) 2N3393, (2) X29A829, (1) MPF-105, (1) 2N2430, (1) 2N2431 and (1) 40481. Diode complement: (2) 1N191, (1) 1N4646 and (1) S-160. Batteries: Six 1.5 V size "C" cells (not included). Dimensions: 7 $\frac{1}{2}$ " H x 8 $\frac{3}{4}$ " W x 3 $\frac{1}{2}$ " D.

Famous Heathkit® CW and Novice gear

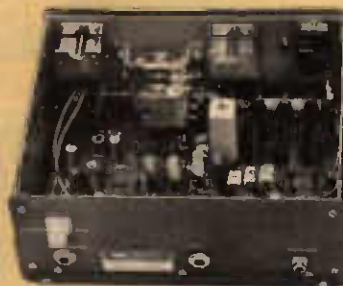


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NO MONEY DOWN

Heathkit 3-Band QRP CW Transceiver

- 1 μ V input sensitivity
- Input powers of 3 watts on 40 meters, 2.5 watts on 20 meters, 2 watts on 15 meters

Experienced amateur, QRP fan, or novice, you'll appreciate the dependability, versatility and take-along portability of this rugged little performer. The reliable solid state transceiver circuitry featuring both built-in VFO and crystal transmit capabilities, makes the HW-7 ideally suited for novice use. The sensitive direct conversion receiver circuitry offers you a readable signal with 1 V input or less. Carefully designed transmitter circuitry provides input powers of 3 watts on 40 meters, 2.5 watts on 20 meters, and 2 watts on 15 meters.



All circuitry mounts on single PC board for easy 2-evening assembly



Actual Log Sheet entries & QSL cards from contacts by Heath Hams using the HW-7

Band changing and tune-up are a snap, with pushbutton band selection and single-control main tuning featuring 6 - 1 vernier drive with virtually backlash-free operation. Pushbutton crystal transmit provision is great for the novice or QRP roundtables. Built-in sidetone and a relative power meter are other top quality features. The HW-7 can be operated from the accessory Heathkit AC power supply, HWA-7-1 (below), an equivalent low impedance power supply, or 12V batteries. Order your Heathkit "mini-rlg" today... and stay in touch with the world.

Kit HW-7, Transceiver, less batteries, 6 lbs., mailable 69.95

Kit HWA-7-1, low voltage power supply provides 13 VDC to power the HW-7 Transceiver from an AC power source. 120/240 VAC operation. 4 lbs., mailable 14.95

HW-7 SPECIFICATIONS — TRANSMITTER: RF Power Input: 3 watts on 40 meters, 2.5 watts on 20 meters, 2 watts on 15 meters. Frequency Control: 40 meter crystal, or built-in VFO on 40 meters, 20 meter crystal or built-in VFO on 20 meters, 15 meter crystal, or built-in VFO on 15 meters. Output Impedance: 50 Ω unbalanced. Sidetone: Built-in. Spurious and Harmonic Levels: At least 25 dB down. **RECEIVER:** Sensitivity: Less than 1 microvolt provides a readable signal. Selectivity: 1kHz at 6 dB down. Type of Reception: CW. Audio Output Impedance: 1000 Ω nominal. **GENERAL:** Frequency Coverage: 40 meters, 7.0 to 7.2 MHz, 20 meters, 14.0 to 14.2 MHz, 15 meters, 21.0 to 21.3 MHz. Frequency Stability: Less than 100 Hz drift after 10 minutes warmup. Power Required: 13 volts DC, 35 mA receive and 450 mA transmit. Dimensions: 4 1/4" H x 9 3/4" W x 8 1/2" D, including knobs and feet.



99⁹⁵
NO MONEY DOWN

High-performance CW for only

- Better than 1 μ V sensitivity
- 75-W input for novice CW, 90-W for general class

The Heathkit HW-16 is one of the most outstanding values on the market for CW hams. Here are just a few of the reasons: provides optimum CW operation on the first 250 kHz of the 80, 40, and 15 meter bands; true "break-in" CW operation with solid-state TR switching and receiver muting; 75-watt input for novice class CW; up to 90 watts input for general operation; crystal control transmit with VFO receiver tuning; provisions for VFO control in transmit with the Heathkit HG-10B VFO; high quality crystal lattice filter for 500 Hz CW selectivity; RF amplifier stage in receiver for better than 1 μ V sensitivity; built-in sidetone; grid-block keying.

Easy assembly gets you on the air fast and checkout requires only a VTVM, dummy load and appropriate crystals. Headphones, a key, and an antenna are all you need to get on the air. Who said getting a good start in amateur radio is expensive? Order your HW-16 today.

Kit HW-16, 25 lbs., mailable 99.95

HW-16 SPECIFICATIONS — TRANSMITTER SECTION: RF power input: 50-90 W (adjustable). Frequency control: 80-meter crystal or VFO on 80-meter band, 80- or 40-meter crystal, or VFO on 40-meter band, 40-meter crystal or VFO on 15-meter band. Keying: Grid-block. Break-in with automatic antenna switching and receiver muting. Output Impedance: 50 ohm unbalanced. SWR less than 2:1. Sidetone: Neon lamp relaxation oscillator. **RECEIVER SECTION:** Sensitivity: Less than 1 μ V for 10 dB signal-plus-noise to noise ratio. Selectivity: 500 Hz at 6 dB down. Intermediate frequency: 3396 kHz. Antenna impedance: 50 ohm, unbalanced. External speaker impedance: 8 ohm. **GENERAL:** Frequency coverage: 3.5 to 3.75 MHz, 7.0 to 7.25 MHz, 21.0 to 21.25 MHz. Power: 120 VAC, 50-60 Hz. Dimensions: 6 3/4" H x 13 3/4" W x 11 1/2" D.

Heathkit Solid-State Electronic Keyer

15-60 wpm with 10-20 slow-speed option; self-completing dashes; adjustable paddle "feel"; right or left hand and semi-automatic adaptability; variable dot-space ratio; built-in sidetone speaker. Use only with grid-block keyed transmitters, — 105V, 35 mA max.

Kit HD-10, 6 lbs., mailable 39.95



Heathkit Code practice oscillator

For beginning CW ops. Unijunction transistor with separate controls for tone and volume. Built-in speaker; headphone jack; blinker light. Includes key, phone plug, cord. Uses 2 - 9V and 1 "C" batteries, not supplied.

Kit HD-16, 3 lbs., mailable 9.95

puts you on the air on a budget



A) Heathkit DX-60B Phone & CW Transmitter... 79.95

Run 75 watts CW input for novice operation — a full 90 watts phone or CW when you move up to general. Pi output provides fast, easy tuneup into any 50-75 ohm resistive load. Drive Level control, grid/plate current meter and Drive Tune control enable proper tune-up for maximum output, minimum harmonics, best quality audio. Four crystal sockets and provision for operation with external VFO such as the HG-10B provide maximum operating versatility. Easy assembly... requires only a VTVM for alignment. Get on the air now, with a rig that'll last a lifetime — order your Heathkit DX-60B today.

Kit DX-60B, 24 lbs., less crystals, mailable 79.95

DX-60B SPECIFICATIONS — Power input: 90 watts, peak; controlled carrier phone, or CW. Output impedance: 50-75 ohm (coaxial). Output coupling: Pi-network. Operation: CW or AM phone — crystal or VFO control. Band coverage: 80 through 10 meters. Power requirements: 120/240 VAC, 50/60 Hz, 225 watts. Dimensions: 6½" H x 13¾" W x 11½" D.

B) Heathkit HR-10B 5-Band Receiver... 79.95

Ideal for the novice or beginning general class ham who demands top performance at a modest price. Tunes AM, CW & SSB, with excellent stability for CW & sideband. Full 80 through 10 meter coverage with each band separately displayed on the accurately calibrated illuminated slide-rule dial. Separate RF and AF gain controls provide extra convenience... BFO allows easy, fast sideband tuning. A high quality crystal lattice filter delivers sharp 3 kHz selectivity. 1 μV sensitivity provides capability that puts many more expensive receivers

out of the QSO. Built-in "S" meter, switchable AVC and automatic limiter provide the versatility you expect in a first-rate communications receiver. Provision for the optional HRA-10-1 kHz crystal calibrator. Alignment requires an RF signal generator and VTVM.

Kit HR-10B, less speaker, 20 lbs., mailable 79.95

Kit HRA-10-1, plug-in 100 kHz crystal calibrator, 1 lb., mailable . . 9.95

HR-10B SPECIFICATIONS — Frequency coverage: 80 Meter Band, 3.5 to 4.0 MHz; 40 Meter Band, 7.0 to 7.3 MHz; 20 Meter Band, 14.0 to 14.35 MHz; 15 Meter Band, 21.0 to 21.5 MHz; 10 Meter Band, 28.0 to 29.7 MHz. Intermediate frequency (IF): 1681.0 kHz. Sensitivity: 1 microvolt for a 10 dB signal plus noise-to-noise ratio. Selectivity: 3 kHz at 6 dB down, 9 kHz at 40 dB down. Image rejection: 40 dB or better. Input impedance: 50 to 75 Ω, coaxial. Audio output impedance: 8 Ω, or 500 Ω. Panel controls: AF GAIN, AC OFF-ON; RF GAIN; BFO TUNE; BAND Switch; MAIN TUNING; CALIBRATE; ANTENNA TRIMMER; RESTBY Switch; CALIBRATE ON-OFF; BFO On-OFF; AVC On-OFF; ANL On-OFF. Tube complement: 6BZ6 RF Amplifier; 6EA8 Mixer Oscillator; 6BA6 1st IF Amplifier; 6EA8 2nd IF Amplifier-BFD; 6BJ7 Detector-AVC-ANL; 6EB8 1st Audio-Audio Output; 6X4 Rectifier. Power requirements: 120/240 VAC, 50/60 Hz, 50 watts. Cabinet size: 6½" H x 13¾" W x 11½" D.

C) HG-10B 80-2 Meter VFO... 47.50

Our HG-10B VFO covers 80 through 2 meters with separate calibrated scales for each band. Has smooth 28:1 vernier tuning; temperature compensated circuitry for drift free tuning. Provides 5 V rms in the 3.4-4, 7-7.425 and 8-9 MHz ranges. Compatible with virtually all grid-block keyed transmitters and most cathode-keyed transmitters. Alignment requires receiver of known accuracy covering either the 80-2 meter bands or 3.5 to 8.222 MHz range.

Kit HG-10B, 12 lbs., mailable 47.50

Ham starter group

Group includes 4 ARRL handbooks, HD-16 code practice oscillator, 3 code-teaching records.

HDP-22, all above, 6 lbs., mailable 18.95

HDP-32, records only, 3 lbs., mailable 9.50

HDP-42, books only, 2 lbs., mailable 2.50

Kit HD-16, osc. & key, 3 lbs., mailable 9.95



Amateur's handbook

Latest edition of ARRL handbook with reliable, up-to-date info on radio communications & electronics. Covers theory, construction and operation of HF, UHF, FM and SSB equipment.

HDP-293, 3 lbs., mailable 4.50

Heathkit® 2-Meter Gear

dB quieting. Maximum output at the built-in speaker is 3 watts at less than 10% total harmonic distortion. The receiver circuitry utilizes diode-protected dual-gate MOSFETS in the front end; an IC IF that completely limits with less than a 10 μ V signal; dual conversion, 10.7 MHz and 455 kHz via a 4-pole monolithic 10.7 MHz crystal filter. All this gives you excellent overload and adjacent channel interference rejection, excellent impulse noise rejection and a built-in hash filter. Image response is -45 dB or better. Spurious is -60 dB or better. The Heathkit HW-202 comes with two crystals that are used in initial set-up alignment, and give you simplex operation on 148.94. The kit includes microphone, quick-connecting cable for 12-volt hook-up, heavy duty alligator clips for use with a temporary battery, antenna coax jack, gimbal bracket, and a quick-release mobile mount.

Kit HW-202, 11 lbs., mailable 179.95

HW-202 SPECIFICATIONS — RECEIVER — Sensitivity: 12 dB SINAD* (or 20 dB of quieting) at .5 μ v or less. Squelch threshold: 0.3 μ v or less. Audio output: 3 W at less than 10% total harmonic distortion (THD). Operating frequency stability: Better than \pm 0.015%. Image rejection: Greater than 45 dB. Spurious rejection: Greater than 60 dB. IF rejection: Greater than 80 dB. First IF frequency: 10.7 MHz \pm 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 \pm 0.015%. Oscillator frequency: 6 MHz, approximately. Multiplier factor: X 24. Modulation: Phase, adjustable 0-7.5 kHz, with instantaneous limiting. Duty cycle: 100%. High VSWR shutdown: None. **GENERAL —** Specifications measured with 13.8 VDC supply voltage within \pm 1 MHz of alignment frequency. Speaker impedance: 4 ohms. Operating frequency range: 143.9 to 148.3 MHz. 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 3/4" H x 8 1/4" W x 9 7/8" D.

*SINAD = $\frac{\text{Signal} + \text{noise} + \text{distortion}}{\text{Noise} + \text{distortion}}$



HW-202 shown with Tone Burst Encoder installed.

Push-to-talk mike included

179.95

NO MONEY DOWN

Heathkit HW-202 2-Meter Transceiver

The Heathkit HW-202 has 36-channel capability via independent selection of 6 transmit and 6 receive crystals. Solid-state circuitry with complete built-in alignment procedures using only the manual and the front-panel meter allow operation from 143.9 to 148.3 MHz. Removable front-panel bezel permits installation of the Heathkit HWA-202-2 Tone Burst Encoder. Operational stability over a wide -25° to +50° C range. Designed for operation into an infinite VSWR without failure, the HW-202 needs no automatic shutdown — it continues to generate a signal regardless of antenna condition. Transmitter deviation is fully adjustable from 0 to 7.5 kHz, with instantaneous deviation limiting.

Harmonic output is greater than -45 dB from carrier. The push-to-talk ceramic microphone supplied has an audio response tailored to the HW-202. Plug it in and you have one of the clearest audio transmissions on 2-meters. Excellent reception — even under the most rigorous mobile conditions. 0.5 μ V or less produces 12 dB Sinad, or 20

ATTENTION HW-202 OWNERS:

Circuitry changes have resulted in improved transmitter performance of HW-202 Transceivers shipped after Oct. 1, 1973. If your HW-202 was purchased prior to that date (with numbers from 00316 to 02334 showing on the blue & white identification label), we'll be happy to send you — at no charge — the complete modification package, plus installation instructions. Simply drop us a note asking for Part No. HWM-202-1, and include your name and return address.

A) Heathkit 2-Meter Amp

The Heathkit HA-202 2-Meter Amplifier can boost your mobile output to 40 watts (nominal), while pulling a maximum of 7 amps from your car's 12-volt battery. You can mount it conveniently in the trunk or under dashboard. Use it with your HW-202 2-Meter Transceiver, or with any 2-meter exciter delivering 5-15 watts drive. Fully automatic — an internal antenna changeover relay and sensing circuitry provide automatic transmit-receive switching. The all solid-state design features rugged, emitter-ballasted transistors, combined with a highly efficient heat sink. This permits the HA-202 to withstand high VSWR loads, yet remain cool and continue to transmit without complex sensing circuits. Tuned input/output circuits provide a low spurious content yet allow coverage of any 1.5 MHz segment of the 2-meter band without readjustment. Easy, 4-hour assembly — all components mount on one printed circuit board. Then you align your HA-202 with either a VOM or VTVM. The manual shows you how, every step of the way. Installation is even faster. Kit includes transceiver connecting cable, antenna connector. The HA-202 is designed for operation from a 12 VDC system. Additional power supplies are not required.

Kit HA-202, 4 lbs., mailable 69.95

HA-202 SPECIFICATIONS — Frequency range: 143-149 MHz. Power output: 20W @ 5W in, 30W @ 7.5W in, 40W @ 10W in, 50W @ 15W in. Power input (rf drive): 5 to 15W. Input/output impedance: 50 ohms, nominal. Input VSWR: 1.5:1 max. Load VSWR: 3.1 max. Power supply requirements: 12 to 16 VDC, 7 amps max. Operating temperature range: -30° F to +140° F. Dimensions: 3" H x 4 1/4" W x 5 1/2" D.

B) Heathkit Regulated AC Power Supply

Styled to match the Heathkit HW-202-2 Meter Transceiver, the HWA-202-1 AC Supply makes for a great-looking base station. It produces 13.8 VDC at 2.2 amps and can be wired during kitbuilding for either 120 or 240 VAC, 50 or 60 Hz. The solid-state cir-

cuitry uses an IC for regulation better than 1%, and is circuit-breaker protected against overload. The HWA-202-1 AC Supply goes together in an evening, includes grounded line cord and transceiver leads. There's no neater way to get a 2-meter rig off the road and on the air.

Kit HWA-202-1, 7 lbs., mailable . . 29.95

C) Heathkit Tone Burst Encoder

An integral option for your Heathkit HW-202 2-Meter Transceiver, The HWA-202-2 Tone Burst Encoder mounts behind a removable bezel on the front panel of the transceiver; provides four tone select buttons. Buttons can be preset for any desired tones between 1800 Hz and 2500 Hz, with burst duration also fully adjustable from 0.25 second to continuous. Frequency stability is \pm 1%, -30° to +50° C. The Encoder can be completely disengaged by placing all selector buttons in the off position. Build it and install it in a couple of hours. All components mount on one glass epoxy board for easier assembly.

Kit HWA-202-2, 1 lb., mailable . . 24.95

D) Heathkit Mobile 2-Meter Antenna

Popular rear deck whip includes clip for attaching to trunk lid edge to eliminate drilling. 3/4-wave design gives 3-dB gain over a 1/2-wave vertical. Kit includes 17 feet of coax cable and antenna adjustment instructions to assure proper tuning.

Kit HWA-202-3, 2 lbs., mailable . . 17.95

E) Heathkit Fixed-Station 2-Meter Antenna

Mast mounting 3/4-wave vertical gives 3-dB gain over a 1/2-wave vertical. Comes with mounting clamps and antenna adjustment instructions for perfect alignment. (Coax not included).

Kit HWA-202-4, 4 lbs., mailable . . 15.95



A



B



C



D



E

Heathkit® Transceivers for versatility & value

The 5-band Heathkit HW-101 — more SSB performance for less

12 EVENING KIT

259⁹⁵

NO MONEY DOWN

Optional mobile mount puts your rig on the road.



Direct descendant of the widely acclaimed Heathkit HW-100, the "101" brings you even greater performance...with improved receiver circuitry & dial drive, new front-panel SSB/CW filter selection, and superior overall performance specifications. Check them yourself, then order your HW-101 today.

- Kit HW-101, 23 lbs., mailable 259.95
- Kit HP-23B, AC power supply, 19 lbs., mailable 51.95
- Kit HP-13B, DC power supply, 8 lbs., mailable 69.95
- SBA-301-2, 400 Hz crystal filter, 1 lb., mailable 22.95
- SBA-100-1, mobile mount, 6 lbs., mailable 15.95
- Kit HS-24, mobile speaker, 4 lbs., mailable 9.50

HW-101 SPECIFICATIONS — RECEIVER: Sensitivity: Less than 0.35 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. SSB selectivity: 2.1 kHz minimum at 6 dB down; 7 kHz maximum at 60 dB down (3.395 MHz filter). CW selectivity: (with optional SBA-301-2 CW crystal filter installed); 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 less than

10% distortion. Spurious response: Image and IF rejection better than 50 dB. **TRANSMITTER:** DC power input. SSB (A3J emission), 180 watt PEP (normal voice, continuous duty cycle). CW (A1 emission) 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 less than 2:1 SWR. Oscillator feed-through or mixer products: 55 dB below rated output. Harmonic radiation: 45 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. Approximately 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 down from two-tone output. RF compression (TALC*): 10 dB or greater at .1 mA final grid current. **GENERAL:** Frequency coverage: 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.0 to 29.5; 29.5 to 30.0 (megahertz). Frequency stability: Less than 100 Hz per hour after 45 minutes warmup from normal ambient conditions. Less than 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. Transistors: MPF105 FET-VFO; 2N3393—Voltage regulator. plug; RF output; Spare. 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. Cabinet dimensions: 6 1/2" H x 14 3/4" W x 13 3/4" D.

* Triple Action Level Control

Heathkit 80, 40 & 20-Meter Single Banders stay home or go mobile

The Heathkit transceivers designed to get you on the air on a budget. Choice of 80, 40, or 20 meter models with full 200W PEP input SSB; choice of fixed or mobile operation with Heathkit power supplies (page 37); 2 kHz dial calibration, ALC Input; S-meter; VOX & PTT. Order your favorite model today.

- Kit HW-12A, 80-meter, 15 lbs., mailable .. 112.50
- Kit HW-22A, 40-meter, 15 lbs., mailable .. 112.50
- Kit HW-32A, 20-meter, 16 lbs., mailable .. 112.50
- Kit HRA-10-1, plug in 100 kHz crystal calibrator, 1 lb., mailable 9.95
- Kit HP-13B, DC Power Supply, 8 lbs. 69.95
- Kit HP-23B, AC Power Supply, 19 lbs., mailable 51.95

SPECIFICATIONS — RF Input: 200 watts PEP. Sideband generation: Crystal lattice bandpass filter method. Stability: 200 Hz per hour after warm-up. Carrier & unwanted sideband suppression: 45 dB. Frequency coverage: HW-12A, 3.8 — 4.0 MHz; HW-22A, 7.2 — 7.3 MHz; HW-32A, 14.2 — 14.35 MHz. Receiver sensitivity: 1µV for 15 dB (S+N/N) ratio.



Mobile PTT Mike

Rugged, high impedance ceramic mike ideal for mobile work. Color matches SB & HW-Series gear. With cable, less connector. Excellent accessory for "Single-Band" gear.

GH-12A, 1 lb., mailable 9.95



Mobile Speaker

Rugged 8 ohm mobile speaker in steel forest green cabinet. Gimbals mount included. 6 1/2" W x 4 3/4" H x 2 1/2" D. A "must" for mobile Single-Banders.

Kit HS-24, 4 lbs., mailable 9.50

Move up to the finest-

The Incomparable Heathkit SB-102 80-10 Meter Transceiver

Proud descendant of the SB-100 & 101, the Heathkit SB-102 gives you an all solid-state, factory-assembled and aligned Linear Master Oscillator. Result: a rig that stabilizes from a cold start in half the time and tracks more accurately than ever. Other features include front panel selection of built-in 2.1 kHz SSB or optional 400 Hz crystal filters; built-in CW slide-tone; built-in VOX; full coverage of 10 meters; complete metering facilities. Find out why the Heathkit SB series has become the talk of the ham bands — order your SB-102 today.

- Kit SB-102, 24 lbs., mailable **385.00**
- Kit SB-600, 8 ohm desk speaker, matches SB-Series gear; provides mounting space for AC supply, 7 lbs., mailable **19.95**
- SBA-301-2, optional 400 Hz CW crystal filter, 1 lb., mailable ... **22.95**
- Kit HP-23B, AC supply, 19 lbs., mailable **51.95**
- Kit HP-13B, DC supply, 8 lbs., mailable **69.95**
- SBA-100-1, mobile mount, 8 lbs., mailable **15.95**



385⁰⁰
NO MONEY DOWN

Heathkit SB-303 works the world at kit-form savings

The Heathkit SB-303 delivers all the signal seeking capability any ham could possibly want, plus a complement of performance features most other receivers can only offer as a lengthy (and costly) list of options. The "303" brings you USB, LSB, AM, CW and RTTY, 80-10 meters; 15 MHz WWV reception; solid-state instant on, 100 Hz stability in 10 minutes, and superior tracking. The exclusive Heath LMO with 1 kHz dial readout is factory-assembled and aligned for peak performance and incredibly smooth linear tuning. And an RF attenuator lets you adjust sensitivity for optimum signal handling. Other standard features are complete SSB/CW transceive compatibility with the famous Heathkit "400" or "401"; three-position AGC (off, fast, slow); 25 kHz and 100 kHz crystal calibrator for spotting the new subbands; antenna & power connections for up to two VHF converters, with front panel switch eliminating need for changing cables; four spare sockets on rear panel for connecting a wide range of Heathkit station accessories.

- Kit SB-303, 22 lbs., mailable **319.95**
- SBA-301-1, optional 3.75 kHz AM crystal filter, 1 lb., mailable .. **21.95**
- SBA-301-2, optional 400 Hz CW crystal filter, 1 lb., mailable ... **22.95**



319⁹⁵
NO MONEY DOWN

Heathkit SB-401 SSB Transmitter

Covers 80-10 meters; USB, LSB & CW. Front panel switch selects transceive or independent operation of "401" and 300-series receiver. Usable with any receiver with optional SBA-401-1 crystal group. Built-in 120/240 VAC power supply.

- Kit SB-401, 36 lbs., mailable **299.95**
- SBA-401-1, crystal pack, 1 lb., mailable **29.95**

SB-401 SPECIFICATIONS — Emission: SSB (upper or lower sideband) and CW. Power Input: 170 W CW, 180 W P.E.P. SSB. Power output: 100 W (80-15 meters), 80 W (10 meters). Output impedance: 50-75 ohm — less than 2:1 SWR. Frequency range: (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; 29.0—29.5; 29.5—30.0. Frequency stability: Less than 100 Hz/hr. after 20 min. warmup. Carrier suppression: 55 dB below peak output. Unwanted sideband suppression: 55 dB @ 1 kHz. Intermodulation distortion: 30 dB below peak output (two-tone test). Keying characteristics: Break-in CW provided by operating VOX from a keyed tone (Grid block keying). CW sidetone: 1000 Hz. ALC characteristics: 10 dB or greater @ 0.2 mA final grid current. Noise level: 40 dB below rated carrier. Visual dial accuracy: Within 200 Hz (all bands). Backlash: Less than 50 Hz. Oscillator feedthrough or mixer products: 55 dB below rated output (except 3910 kHz crossover which is 45 dB). Harmonic radiation: 35 dB below rated output. Audio input: High Impedance microphone or phone patch. Audio frequency response: 350-2450 Hz \pm 3 dB. Power requirements: 80 W STBY, 260 W key down @ 120/240 VAC, 50/60 Hz. Dimensions: 6 $\frac{1}{2}$ " H x 14 $\frac{1}{4}$ " W x 13 $\frac{3}{4}$ " D.



299⁹⁵
NO MONEY DOWN

the Heathkit[®] SB-Series

SB-102 SPECIFICATIONS — RECEIVER SECTION: Sensitivity: Better than 0.35 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. SSB selectivity: 2.1 kHz minimum at 6 dB down, 5 kHz maximum at 60 dB down — 2:1 nominal shape factor — 6 to 60 dB. CW Selectivity: (With optional CW filter SBA-301-2 installed) 400 Hz minimum at 6 dB down, 2.0 kHz maximum at 60 dB down. Input Impedance: Low impedance for unbalanced coaxial input. Output impedance: Unbalanced 8 and 600 ohm speaker, and high impedance headphone. Power output: 2 watts with less than 10% distortion. Spurious response: Image and IF rejection better than 50 dB. Internal spurious signals below equivalent antenna input of 1 microvolt. **TRANSMITTER SECTION:** DC power input: SSB 180 watts P.E.P. continuous voice. 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 ohms to 75 ohms with less than 2:1 SWR. Oscillator feed-through or mixer products: 55 dB below rated output. Harmonic radiation: 45 dB below rated output. Transmit-receive operation: SSB: Push-to-talk or VOX. CW: Provided by operating VOX from a keyed tone, using grid-block keying. CW side-tone: Internally switched to speaker in CW mode. Approx. 1000 Hz tone. Microphone input impedance: High impedance. Carrier suppression: 50 dB down from single-tone output. Unwanted sideband suppression: 55 dB down from single-tone output at 1000 Hz reference. Third order distortion: 30 dB down from two-tone output. Noise level: At least 40 dB below single-tone carrier. RF compression (TALC): 10 dB or greater at .1 ma final grid current. **GENERAL:** Frequency coverage: 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.0 to 29.5; 29.5 to 30.0 (megahertz). Frequency stability: Less than 100 Hz per hour after 10 minutes warm-up from normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variations. Modes of operation: Selectable upper or lower sideband (suppressed carrier) and CW. Visual dial accuracy—"Resetability": Within 200 Hz on all bands. Electrical dial accuracy: Within 400 Hz after calibration at nearest 100 kHz point. Dial mechanism backlash: Less than 50 kHz. Calibration: 100 kHz crystal. Audio frequency response: 350 to 2450 Hz ± 3 dB. Phone patch impedance: 8 ohm receiver output to phone patch; high impedance phone patch input to transmitter. Front panel controls: Main (LMO) tuning dial; Driver tuning and Preselector; Final tuning; Final loading; Mic and CW Level Control; Mode switch; Band switch; Function switch; Freq. Control switch; Meter switch; SSB-CW filter switch; Audio Gain control. Internal controls: VOX Sensitivity; VOX Delay; Anti-Trip; Carrier Null (control and capacitor); Meter Zero control; CW Side-Tone Gain control; Relative Power Meter Adjust control; P.A.—Bias; Phone Vol (headphone volume); Neutralizing. Rear Apron Connections: CW Key jack; 8 ohm output; Spare A; Spare B; Phone patch input; ALC Input; Power and accessory plug; RF output; Driver Output for SB-500. Power requirements: 700 to 800 volts at 250 ma; 300 volts at 150 ma; ± 115 volts at 10 ma; 12 volts at 4.76 amps. Cabinet dimensions: 14 $\frac{1}{4}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{4}$ " D.

SB-303 SPECIFICATIONS — Frequency range (MHz): 3.5 to 4.0, 7.0 to 7.3, 14.0 to 14.5, 15.0 to 15.3, 21.0 to 21.5, 28.0 to 30. Intermediate frequency (IF): 3.395 MHz. Frequency stability: Less than 100 Hz drift/hr, after 10 min. warmup under normal ambient conditions. Less than 100 Hz drift for $\pm 10\%$ line voltage variation. Frequency selection: Built-in Linear Master Oscillator. Modes of operation: SSB, CW, AM, RTTY. Sensitivity: Less than 0.25 μ V for 10 dB S+N for SSB operation. Overall gain: Less than 1.5 μ V input for 0.5 audio output (single tone SSB). AGC Characteristics: Blocking — Greater than 3.0 V CW/SSB/RTTY. Dynamic Range — Greater than 150 dB CW/SSB. RF Attenuator — Variable 0-40 dB nominal. Selectivity: SSB — 2.1 kHz @ 6 dB down, 5.0 kHz maximum at 60 dB down (crystal filter supplied). CW — 400 Hz at 6 dB down, 2.0 kHz maximum at 60 dB down (crystal filter available as an accessory). AM — 3.75 kHz at 6 dB down, 10 kHz maximum at 60 dB down (crystal filter available as an accessory). RTTY — 2.1 kHz at 6 dB down, 5.0 kHz maximum at 60 dB down (uses SSB crystal filter). Image rejection: 60 dB or better. IF rejection: 3.395 — greater than 55 dB, 8.595 — greater than 50 dB. Spurious response: All below 1 μ V equivalent signal input. Temperature ranges: 10°C-50°C ambient. Dial accuracy: Electrical — Within 400 Hz after calibration at nearest 100 kHz or 25 kHz point. Visual — Within 200 Hz. Calibration: Every 100 kHz or 25 kHz. Dial Accuracy: No more than 50 Hz. Antenna input impedance: 50 ohm nominal unbalanced. Audio response: SSB — 350-2420 Hz nominal at 6 dB. CW (with accessory filter) — 800-1200 Hz nominal at 6 dB. AM (with accessory filter) — 200-3500 Hz nominal at 6 dB. RTTY — 1840-3940 Hz nominal at 6 dB. Audio output impedance: Speaker — 8 ohm. Headphones — Low impedance. Audio Output Power: 4 W at less than 10% distortion. Mutings: Open external ground at mute socket. Power Requirements: 120/240 VAC, 40 W max. Front Panel Controls: Main tuning dial; function switch; mode switch; band switch; AGC switch; AF gain/power on-off; RF gain/speaker disable; preselector; RF Attenuator. Circuit board controls: IF/Audio — Bias adjust, meter zero; meter full scale. Power Supply/BFO — ± 15 V adjust; 100 kHz adjust. RTTY — Wide shift; narrow shift; CW shift. Connections: Rear Panel — Phones; HF antenna; VHF antenna #1, VHF antenna #2; mute, anti-vox; speaker; HFO out; LMO out; BFD out; CW shift; 3 spare sockets; 3-wire line cord socket; accessory, VHF Converter, ± 15 VDC @ 25 mA switched. RTTY Keyboard. Cabinet Dimensions: 6 $\frac{1}{4}$ " H x 12 $\frac{1}{4}$ " W x 13" D. Overall Dimensions (with knobs & feet installed): 7 $\frac{3}{4}$ " H x 12 $\frac{1}{4}$ " W x 14" D.



Heathkit Digital
Frequency
Display — only

179⁹⁵

NO MONEY DOWN

Counts the three different frequencies produced in your receiver, then computes and displays operational frequency to within 100 Hz accuracy. Six bright digital readout tubes show you exactly where you are as you tune across the 80 through 10 meter bands. Reads kHz to five places, plus tenths of a kHz. No bandswitching necessary. Designed to operate with SB-300/301/303 Receivers; SB-100/101/102 Transceivers; and HW-100/101 Transceivers. With transceivers the counter calculates and displays both transmitted and received frequencies.

Kit SB-650, 10 lbs., mailable 179.95

SB-650 SPECIFICATIONS — Frequency range: 3-40 MHz (80-10 meters). Frequency display: 6 display tubes (kHz to 5 places, plus tenths of kHz). Maximum viewing distance: 30 ft. Maximum input signal: 5V rms. Accuracy: 100 Hz ± 1 count after 20 min. warmup. Compute time: 160 msec. Sensitivity: Adjustable. Input impedance: 2 k ohm. Internally generated spurious frequencies: Less than 0.25 μ V equivalent signal level. Crystal (clock) frequency: 1 MHz. Crystal aging rate: Approx. 10 ppm/yr. Ambient crystal stability: Approx. 10 ppm from ± 10 to $\pm 65^\circ$ C. Ambient operating temperature: 0° to $+40^\circ$ C. Ambient storage temperature: -55° to $+80^\circ$ C. Power source: 120/240 VAC, 50/60 Hz, 10 W. Dimensions: 3 $\frac{1}{2}$ " H x 10" W x 10" D.



51⁹⁵

NO MONEY DOWN

HP-23B Fixed Station Supply

Our popular fixed station power supply 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, AC power supply, 19 lbs., mailable . . . 51.95

HP-23B SPECIFICATIONS — Power requirements: 120/240 VAC, 50-60 Hz, 350 watts maximum. High voltage output: 820 VDC no load; 700 VDC @ 250 mA $\pm 10\%$. 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 $\pm 10\%$, (Low tap) 275 VDC, no load, 250 VDC @ 100 mA, $\pm 5\%$. Less than .05% AC ripple @ 150 mA, continuous duty to 175 mA. Fixed bias: -130 VDC $\pm 10\%$, no load; -100 VDC @ 20 mA. Filament voltage: 12.6 VAC @ 5.5 amps. Dimensions: 9" L x 4 $\frac{3}{4}$ " W x 6 $\frac{3}{4}$ " H.

HP-13B Mobile Supply

The solid-state circuit has been further refined for improved starting and power transistor protection. The bias voltage is now fixed and we've put heavier wires in the filament leads of the power cable. There's no better way for the ham who wants to get his station on the road.

Kit HP-13B, DC power supply, 8 lbs., mailable . . . 69.95

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. Duty cycle: Continuous up to 150 mA; 50% up to 300 mA. Low voltage output: (high tap) 310 VDC, no load; 300 VDC @ 150 mA. (low tap) 265 VDC, no load; 250 VDC @ 150 mA. AC ripple: Less than .05% @ 150 mA. Continuous duty cycle to 175 mA. Fixed bias: -130 VDC & 20 mA. Switching frequency: 1500 Hz (approx.). Ambient temperature: -10° to 122° F. Dimensions: 7 $\frac{3}{4}$ " W x 7 $\frac{1}{4}$ " L x 2 $\frac{3}{4}$ " D. All voltages referenced at 13 VDC.



69⁹⁵

NO MONEY DOWN

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit[®] Linears and station accessories



229⁹⁵

NO MONEY DOWN



369⁹⁵

NO MONEY DOWN

Heathkit 1 kW Linear Amplifier

The Heathkit SB-200 1 kW Amplifier puts your station in the "maxi" class for a minimum amount of money. Delivers 1200 W PEP SSB input, 1000 W CW. Built-in solid-state power supply with circuit breaker protection. Metering for SWR, grid current, plate current, relative power, plate voltage. ALC output. Shielded, fan-cooled amplifier compartment. Pre-tuned cathode input circuit for maximum efficiency and low distortion. The sturdy, yet lightweight construction of the SB-200 is achieved through the use of a heavy-gauge one-piece aluminum chassis that is partitioned for extra strength and isolation of components and circuitry. This clean, open layout makes assembly extra easy, too.

Kit SB-200, 50 lbs., mailable **229.95**

SB-200 SPECIFICATIONS — Band coverage: 80, 40, 20, 15 & 10 meters. Maximum power input: 1200 W P.E.P. SSB, 1000 W CW. Driving power required: 100 W. 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 W P.E.P. Output impedance: 50-75 ohm unbalanced; variable pi-output circuit. SWR not to exceed 2:1. Input impedance: 52 ohm unbalanced; broadband pre-tuned input circuit requires no tuning. Meter functions: 0-100 mA grid current, 0-100 mA plate current, 0-1000 mA plate current, 0-1000 relative power, 1:1-3:1 SWR, 1500-3000 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 requirements: 120 VAC @ 16 A (max.), 240 VAC @ 8 A (max.). Cabinet size: 6 $\frac{1}{2}$ " H x 14 $\frac{1}{2}$ " W x 13 $\frac{3}{8}$ " D.

Heathkit 2 kW Linear Amplifier

The SB-220 Linear Amplifier uses a pair of conservatively rated Eimac 3-500Z's in grounded grid circuitry to provide up to 2000 watts PEP SSB input. And it can be loaded to a full 1 kW input on both CW and RTTY. A broadband pre-tuned pi-input delivers maximum efficiency with low distortion over 80 thru 10 meters. Requires only 100 watts drive. Built-in solid-state power supply can be wired for either 120 or 240 VAC. Built-in circuit-breaker protection. Zener diode regulated operating bias reduces idling current for cooler running, extended tube life. A large quiet fan is another feature.

Kit SB-220, 70 lbs., mailable **369.95**

SB-220 SPECIFICATIONS — Band coverage: 80, 40, 20, 15 and 10 meters. Driving power: 100 W. Max. power input: SSB, 2000 W, P.E.P.; CW, 1000 W.; RTTY, 1000 W. Duty cycle: SSB, Continuous voice modulation. CW, Continuous (maximum key-down 10 minutes). RTTY, 50% (maximum transit 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 required: 120 VAC, 50/60 Hz at 20 amp. max. 240 VAC, 50/60 cycles, at 10 amp. max. Cabinet size: 8 $\frac{1}{4}$ " H x 14 $\frac{1}{2}$ " W x 14 $\frac{1}{2}$ " D.



Heathkit Station Speaker

Eight-ohm speaker in grey aluminum cabinet matches other Heathkit SB and HW gear. Audio response shaped from 300 to 3000 Hz for optimum voice reproduction. Enclosure has mounting for HP-23-series power supplies. Measures 6 $\frac{1}{2}$ " H x 10" W x 10 $\frac{1}{2}$ " D.

Kit SB-600, 7 lbs., mailable **19.95**



Heathkit Signal Monitor

Gives accurate display of transmitted AM, CW, SSB, RTTY signals. Shows signal envelope, AF and RF trapezoid patterns. Shows receiver IF envelope with IFs up to 6 MHz. Typically requires 0.5V IF signal for 1" display. Operates 160-6 meters, 15W-1kW. Not recommended for receivers with IFs above 6 MHz. Grey cabinet measures 6 $\frac{1}{2}$ " H x 10" W x 11 $\frac{1}{8}$ " D.

Kit SB-610, 14 lbs., mailable **89.95**



Heathkit Spectrum Analyzer

Offers 10 and 50 kHz sweep widths for single signal analysis. Variable width to 500 kHz for 455 kHz IFs. Has log and linear displays, operates with common receiver IFs up to 6 MHz. Grey aluminum cabinet matches SB series, measures 6 $\frac{1}{2}$ " H x 10" W x 10 $\frac{1}{2}$ " D.

Kit SB-620, 15 lbs., mailable **129.95**



Heathkit Station Console

Four control-monitor units in one. Has 24-hour clock with digital readout; SWR meter for proper matching; hybrid phone patch, and automatic resettable electronic 10-minute timer with red "Identify" light and buzzer. SB styled cabinet measures 6 $\frac{1}{2}$ " H x 10" W x 11 $\frac{1}{8}$ " D.

Kit SB-630, 10 lbs., mailable **89.95**

offer greater value thru kit-form savings



A) Heathkit VHF Wattmeter

The Heathkit HM-2102 VHF Wattmeter is an ideal accessory for your HW-202 2-Meter Transceiver and HA-202 2-Meter Amplifier or any 2-M rlg. Lets you test transmitter output in power ranges of 1 to 25 watts and 10 to 250 watts $\pm 10\%$ of full scale. 50 ohm nominal impedance permits placement in the transmission line permanently with little or no loss. Built-in SWR bridge lets you tune antennas for proper match, and has less than 10-watt sensitivity. The Heathkit HM-2102 gives you error-free tune-up capability at traditional Heathkit savings. Get one for your 2-meter rlg now.

Kit HM-2102, 4 lbs., available 29.95

HM-2102 SPECIFICATIONS — Frequency ranges: 50 MHz to 160 MHz. Wattmeter accuracy: $\pm 10\%$ of full-scale reading.* Power capability: To 250 W. SWR sensitivity: less than 10 W. Impedance: 50 ohms nominal. SWR bridge: Continuous to 250 W. Connectors: UHF type SO-239. Dimensions: 5¼" W, 5¼" H and 6½" D, assembled as one unit.
*Using a 50 Ω noninductive load.

B) Heathkit RF Load/Wattmeter

Features 50-ohm non-inductive load resistor; less than 1.2:1 SWR from 1.8 to 30 MHz; 0-200 and 0-1000 watt-meter range; $\pm 10\%$ full

scale accuracy; rated 175 watts continuous, 1 kW max.; high-temp. lamp and lamp test circuit.

Kit HM-2103, 6 lbs. 59.95

HM-2103 SPECIFICATIONS — Frequency Range: 1.8 to 30 MHz. Wattmeter Range: 0-200 and 0-1000. Wattmeter Accuracy: $\pm 10\%$ of full-scale reading. Power Rating: 175 watts continuous, 1000 watts maximum. Overload Indication: Thermal switch activated (requires 9 volt battery, NEDA #1604). SWR: Less than 1.2:1. Load Type: Noninductive. Load Impedance: 50 ohms nominal. Connectors: UHF type SO-239. Dimensions: 6" H x 5¾" W x 13¾" D.

C) Heathkit Wattmeter/SWR Bridge

Two switch-selected ranges: 10-200 and 100-2000 W...built-in SWR capability for tuneup, transmission line antenna matching. Negligible insertion loss in 50 ohm line. Remote detector permits placement of meter in any convenient location. (6 ft. of cable supplied.)

Kit HM-102, 4 lbs., available 29.95

HM-102 SPECIFICATIONS — Frequency range: 1.8 to 30 MHz. Wattmeter accuracy: $\pm 10\%$ of full-scale reading. Power capability: 10 to 2000 watts. Impedance: 50 ohm nominal. Connectors: UHF type SO-239. Dimensions: 5¼" H x 5¼" W x 6½" D.



D) Heathkit Coaxial Switch

Designed to switch one RF source to any one of several antennas or RF loads while grounding the unused outputs. Two can be used to switch up to four antennas/loads to four different units (transceivers, transmitters, receivers, etc.). Standing wave ratio to 250 MHz, 1.1:1 max. Power capability is 1000 W (2000W PEP). Bracket provided for mounting on equipment cabinets, desk or wall.

Kit HD-1234, 2 lbs., available 9.95

E) Heathkit Hybrid phone patch

Individual receiver-to-line & line-to-receiver gain controls; VU meter; 30 dB isolation for positive VOX. Matches 3-16 ohm speakers & hi-Z or 600 ohm inputs; VOX or PTT. 2¾" H x 9¼" W x 3¾" D.

Kit HD-15, 3 lbs., available 24.95

F) Heathkit 100 kHz crystal calibrator

Produces a signal every 100 kHz thru 54 MHz. Can be calibrated with trimmer against WWV. Requires 9V battery, not included.

Kit HD-20, 1 lb., available 14.95

G) Heathkit Relative Power Meter

Features 0.3V rms sensitivity at antenna; 100 kHz — 250 MHz frequency range; magnetic base. Requires no power... operates from radiated transmitter signal.

Kit PM-2, 2 lbs., available 12.95

H) Ham desk mike

High Impedance dynamic mike for SB-series gear. Ideal SSB response. Grip-to-talk switch w/lock. Wiring diagram & cables included.

HDP-21A, 4 lbs., available 29.95

I) "Antenna" Transmitter Dummy Load

Provides 50 ohm non-inductive load with SWR less than 1.5:1 for frequencies of 1.5 to 300 MHz. Coax fitting to transmitter line, & phone jack for relative power measurements. One gal. coolant oil capacity (oil not included) permits power up to 1 kw.

Kit HN-31, 3 lbs., available 10.95

HOW TO ORDER

- BY MAIL** — Complete the simple Heath order form, including the reverse side if you wish to use our Revolving Charge plan. Always use the same name whenever you order. Enclose check or money order to cover type of payment plan chosen. Include shipping charges only if item can be mailed Parcel Post or sent UPS (see rate information below). Do not include charges for REA or Motor Freight shipments. Fill out section 2 of order blank if you want order shipped to another address.
- BY TELEPHONE** — For kit or parts orders only... on Revolving Charge, COD, or commercial accounts call 816-983-7381 day, night, weekends or holidays for prompt order service and information on kit availability. For all other business... kit building assistance, product information, order checking, and if you'd like to place a COD order at the same time, call 816-983-3961 weekdays from 8 a.m. to 4:30 p.m. EST for proper routing.
- VISIT OUR FACTORY SALES/SHOWROOM**... located on Hill-top Rd. in St. Joseph, Mich. Open Mon.-Fri. 8:30 a.m. to 5 p.m. (Sat. 9 a.m. to 3 p.m.). See and hear Heathkit products in action... take your kit along... or arrange shipment to your home.

METHODS OF PAYMENT

- CASH** — Do not send currency or stamps. Send personal check or money order only.
- C.O.D.** — A 20% deposit is required on all COD orders by mail. Balance will be collected by carrier. Payment must be made in cash, money order or certified check. (They will not accept personal checks.) Parcel Post shipments cannot be made if balance is over \$200. No limit on UPS, Motor Freight or Express. Be sure to include "COD Fee" when figuring "Parcel Post" or "UPS" COD orders.
- HEATH REVOLVING CHARGE PLAN** — No money down. Up to 2 full years to pay. Two convenient payment plans. We figure postage for you... add it on to your account. See order blank for details and "ADD-ON" purchases.
- Net 30-Day Open Accounts** available to rated commercial firms. Company Purchase Order or letterhead over authorized signature acceptable.

NON-MAILABLE ITEMS

REA & MOTOR FREIGHT — Shipments exceeding Parcel Post or UPS limitations will be sent REA or Motor Freight. Check with local carriers for charges and best delivery service in your area. Do not enclose money for REA or Motor Freight... shipping charges will be collected by the carrier. When necessary we reserve the right to change routing instructions.

PREMIUM ROUTINGS — Upon your request, we can ship via Air Parcel Post, Parcel Post Special Handling, or Special Delivery, Air Express, Bus or Air Freight, if service is available to your area. Contact your local office for rates and delivery information.

IF YOU MOVE... please send in your old address and your new address... including Zip Code

IF YOU ARE RECEIVING DUPLICATE COPIES of Heathkit catalogs, please return the mailing labels of those copies you wish discontinued.

HOW TO FIGURE PARCEL POST & UPS CHARGES

Use the zone chart at right and the first 3 numbers of your zip code to determine your zone. Then refer to the Parcel Post or UPS rate charts at right for charges for each model per shipping weight given in price line. For example, if your Zip Code is 10036, use the first 3 numbers (100) and check the zone chart for your zone, which is 5. Parcel Post charge for a kit weighing 10 pounds is therefore \$1.90. Add insurance and COD fees, if desired.

ZONE CHART

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
010-000	5	282-276	4	387	5	479-488	2	610-619	3
070-089	4	279	5	388	4	490-491	1	620-623	4
080-089	5	280-283	5	389-397	5	492	2	624-628	3
		284-285	4			493-495	1	629-636	4
100-100	5	286-283	4	400-406	3	496-499	3	637-638	7
100	4	294-286	5	407-409	4			639-647	0
110-119	5	296-297	4	410-412	3	500-518	4	648-653	5
120-123	4	298-299	5	413-422	4	520-524	3	654-658	6
124-128	4					525	4	659-667	7
127-128	4	300-303	4	424-426	3	526-528	3	668-676	5
129	5	304	5	427-432	3	530-534	2	680-687	4
130-182	4	305-307	4	433-436	2	535-539	3	688-693	5
153	4	308-329	6	437-457	6	540	4	694-695	8
184-190	4	330-334	5	458	2	541-548	3	696-697	8
181	3	335-338	5	460-462	3	547-548	4	698-699	8
182-183	4	339	6	463-484	2	548	3	700	8
184-185	3	350-352	4	485-486	1	550-566	4	800-803	5
186-199	4	354	5	487-488	2	567	6	804-805	8
		355-359	5	470-472	3	570-572	4	806-807	5
200-232	4	360-361	5	473	2	573-588	5	808-810	6
233-237	5	362	4	474-475	3	590-597	6	820-822	5
238-254	4	363-369	5	476-477	4	598-599	7		

PARCEL POST RATES for MAILABLE ITEMS

Postal Regulations... limit parcel post shipments to 40 lbs. per package, all zones. EXCEPTION: Shipments up to 70 lbs. per package will still be accepted to APO addresses, and to APO numbers. Products listed as "mailable" that are over the Parcel Post & UPS weight limitations have been packed in multiple cartons.

APO and FPO Airlift Parcels... not over 30 lbs. and not over 60" length and girth combined can be sent "Airlift" for an additional \$1 fee; just figure regular surface rates, add \$1 for each kit 5 lbs. or over (but less than 30 lbs.) and mark "Airlift" on your order.

IMPORTANT

- Shipping weights listed for model numbers shipped in more than one carton have been adjusted to provide correct postage remittance based on Parcel Post chart at right.
- Figure the postage charges for each model number separately using the indicated shipping weight for that model.
- Then, total the individual charges determined and remit the full amount for Parcel Post.

C.O.D. Fees in Addition to Postage

Up to \$10.00	70 cents
\$10.01 to \$25.00	80 cents
\$25.01 to \$50.00	90 cents
\$50.01 to \$100.00	\$1.00
\$100.01 to \$200.00	\$1.10

Note: If C.O.D. shipment cannot be made in one package, we reserve the right to change routing. C.O.D. shipment cannot be made if balance is over \$200.00.

INSURED PARCEL POST (Add to Postage)

Liability:	Fee
\$0.01 to \$15	\$0.20
\$15.01 to \$50	.30
\$50.01 to \$100	.40
\$100.01 to \$150	.50
\$150.01 to \$200	.60

Liability for insured mail is limited to \$200.

Ship. Wt.	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
2 lbs.	\$0.72	\$0.75	\$0.83	\$0.82	\$1.02	\$1.12	\$1.21
3 lbs.	.78	.83	.82	1.04	1.16	1.32	1.45
4 lbs.	.84	.90	1.01	1.18	1.23	1.51	1.88
5 lbs.	.90	.96	1.10	1.28	1.49	1.71	1.93
6 lbs.	.96	1.05	1.18	1.40	1.64	1.80	2.17
7 lbs.	1.02	1.13	1.28	1.62	1.80	2.10	2.41
8 lbs.	1.08	1.20	1.37	1.64	1.85	2.28	2.65
9 lbs.	1.14	1.28	1.48	1.78	2.11	2.48	2.89
10 lbs.	1.20	1.35	1.58	1.88	2.26	2.68	3.13
11 lbs.	1.26	1.43	1.64	2.00	2.42	2.88	3.37
12 lbs.	1.32	1.50	1.73	2.12	2.57	3.07	3.61
13 lbs.	1.38	1.58	1.82	2.24	2.73	3.27	3.85
14 lbs.	1.44	1.65	1.81	2.38	2.88	3.46	4.08
15 lbs.	1.50	1.73	2.00	2.48	3.04	3.68	4.33
16 lbs.	1.56	1.80	2.09	2.60	3.19	3.85	4.57
17 lbs.	1.62	1.88	2.18	2.72	3.35	4.05	4.81
18 lbs.	1.68	1.95	2.27	2.84	3.50	4.24	5.06
19 lbs.	1.74	2.03	2.38	2.98	3.66	4.44	5.29
20 lbs.	1.80	2.10	2.45	3.08	3.81	4.63	5.53
21 lbs.	1.86	2.18	2.54	3.20	3.97	4.83	5.77
22 lbs.	1.92	2.28	2.63	3.32	4.12	5.02	6.01
23 lbs.	1.98	2.33	2.72	3.44	4.28	5.22	6.26
24 lbs.	2.04	2.40	2.81	3.56	4.43	5.41	6.49
25 lbs.	2.10	2.48	2.90	3.68	4.59	5.61	6.73
26 lbs.	2.16	2.58	2.99	3.80	4.74	5.80	6.97
27 lbs.	2.22	2.63	3.08	3.92	4.90	6.00	7.21
28 lbs.	2.28	2.70	3.17	4.04	5.05	6.19	7.45
29 lbs.	2.34	2.78	3.26	4.16	5.21	6.39	7.68
30 lbs.	2.40	2.85	3.35	4.28	5.38	6.58	7.93
31 lbs.	2.46	2.93	3.44	4.40	5.52	6.78	8.17
32 lbs.	2.52	3.00	3.53	4.52	5.67	6.97	8.41
33 lbs.	2.58	3.08	3.62	4.64	5.83	7.17	8.65
34 lbs.	2.64	3.15	3.71	4.76	5.98	7.36	8.89
35 lbs.	2.70	3.23	3.80	4.88	6.14	7.56	9.13
36 lbs.	2.76	3.30	3.89	5.00	6.29	7.75	9.37

Ship. Wt.	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
37 lbs.	\$2.82	\$3.38	\$3.88	\$5.12	\$6.45	\$7.95	\$9.61
38 lbs.	2.88	3.45	4.07	5.24	6.60	8.14	9.83
39 lbs.	2.94	3.53	4.16	5.36	6.78	8.34	10.08
40 lbs.	3.00	3.60	4.25	5.48	6.91	8.53	10.33
41 lbs.	3.06	3.68	4.34	5.60	7.07	8.73	10.57
42 lbs.	3.12	3.75	4.43	5.72	7.22	8.92	10.81
43 lbs.	3.18	3.83	4.52	5.84	7.38	9.12	11.05
44 lbs.	3.24	3.90	4.61	5.96	7.53	9.31	11.29
45 lbs.	3.30	3.98	4.70	6.08	7.69	9.51	11.53
46 lbs.	3.36	4.05	4.79	6.20	7.84	9.70	11.77
47 lbs.	3.42	4.13	4.88	6.32	8.00	9.90	12.01
48 lbs.	3.48	4.20	4.97	6.44	8.15	10.09	12.25
49 lbs.	3.54	4.28	5.06	6.56	8.31	10.29	12.49
50 lbs.	3.60	4.35	5.15	6.68	8.46	10.48	12.73
51 lbs.	3.66	4.43	5.24	6.80	8.62	10.68	12.97
52 lbs.	3.72	4.50	5.33	6.92	8.77	10.87	13.21
53 lbs.	3.78	4.58	5.42	7.04	8.93	11.07	13.45
54 lbs.	3.84	4.65	5.51	7.16	9.08	11.26	13.69
55 lbs.	3.90	4.73	5.60	7.28	9.24	11.46	13.93
56 lbs.	3.96	4.80	5.69	7.40	9.39	11.65	14.17
57 lbs.	4.02	4.88	5.78	7.52	9.55	11.85	14.41
58 lbs.	4.08	4.95	5.87	7.64	9.70	12.04	14.65
59 lbs.	4.14	5.03	5.96	7.76	9.86	12.24	14.89
60 lbs.	4.20	5.10	6.05	7.88	10.01	12.43	15.13
61 lbs.	4.26	5.18	6.14	8.00	10.17	12.63	15.37
62 lbs.	4.32	5.25	6.23	8.12	10.32	12.82	15.61
63 lbs.	4.38	5.33	6.32	8.24	10.48	13.02	15.85
64 lbs.	4.44	5.40	6.41	8.36	10.63	13.21	16.09
65 lbs.	4.50	5.48	6.50	8.48	10.79	13.41	16.33
66 lbs.	4.56	5.55	6.59	8.60	10.94	13.60	16.57
67 lbs.	4.62	5.63	6.68	8.72	11.10	13.80	16.81
68 lbs.	4.68	5.70	6.77	8.84	11.25	13.99	17.05
69 lbs.	4.74	5.78	6.86	8.96	11.41	14.19	17.29
70 lbs.	4.80	5.85	6.95	9.08	11.56	14.38	17.53

Note: These parcel post rates will be effective as of March 2, 1974 and are subject to change without notice.

ANY FRACTION OF A POUND OVER THE WEIGHT SHOWN TAKES THE NEXT HIGHER RATE

UNITED PARCEL SERVICE (UPS) RATES

Zones 2-6 only. For Zones 7-8, use Blue Label rates. NOTE: United Parcel Service is available from Heath to all states east of and immediately west of the Mississippi, plus North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Wyoming, Colorado and New Mexico. See UPS Blue Label (Air) Service to the West Coast only. UPS rates include insurance for up to \$100 value. Remit 25¢ for each additional \$100 value or fraction thereof.

REGULATIONS: Maximum weight per package, 50 lbs.; and 100 lbs. per shipment.

IMPORTANT

- Figure UPS charges for each model number separately using the indicated shipping weight for that model.
- Then total the individual charges figured and remit the full amount.
- Shipping weights listed for model numbers shipped in more than one carton have been adjusted to provide correct remittance based on rate chart at right.

C.O.D. FEES IN ADDITION TO REGULAR CHARGES For each C.O.D. delivery, 85 cents; for each address correction, 85 cents.

Weight Not To Exceed	RATES TO					BLUE LABEL AIR SERVICE CHARGES to Calif., Ore., Wash. only:
	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
1 lb.	\$0.85	\$0.87	\$0.88	\$0.82	\$0.85	\$.82
2 "	.88	.89	.89	.86	.74	1.10
3 "	.95	.71	.79	.88	.85	1.40
4 "	.70	.79	.88	.88	1.10	1.70
5 "	.78	.85	.88	1.18	1.35	2.10
6 "	.80	.82	1.07	1.22	1.40	2.42
7 "	.85	.88	1.17	1.34	1.56	2.74
8 "	.88	1.08	1.26	1.48	1.70	3.06
9 "	.88	1.13	1.30	1.50	1.80	3.36
10 "	1.00	1.20	1.45	1.70	2.00	3.70
11 "	1.06	1.27	1.56	1.82	2.15	4.02
12 "	1.18	1.34	1.64	1.84	2.30	4.34
13 "	1.15	1.41	1.74	2.00	2.48	4.66
14 "	1.20	1.48	1.83	2.10	2.60	4.98
15 "	1.28	1.54	1.93	2.30	2.78	5.30
16 "	1.30	1.82	2.02	2.42	2.90	5.62
17 "	1.35	1.90	2.13	2.54	3.06	5.94
18 "	1.40	1.78	2.21	2.66	3.20	6.26
19 "	1.45	1.83	2.31	2.78	3.38	6.58
20 "	1.50	1.90	2.40	2.90	3.50	6.90
21 "	1.55	1.97	2.50	3.02	3.68	7.22
22 "	1.60	2.04	2.59	3.14	3.80	7.54
23 "	1.68	2.11	2.69	3.26	3.98	7.86
24 "	1.70	2.18	2.79	3.38	4.18	8.18
25 "	1.75	2.25	2.88	3.50	4.38	8.50

Heathkit Catalogs for your friends...

Anyone interested in the satisfaction of doing things for themselves will enjoy the latest Heathkit Catalog — the world's largest electronic kit catalog. If you have friends you think would like to receive copies, simply jot down their names & addresses below, and we'll be happy to send them their own personal Heathkit catalogs.

Name _____

Address _____

City _____ State _____ Zip _____

Name _____

Address _____

City _____ State _____ Zip _____

Name _____

Address _____

City _____ State _____ Zip _____

Name _____

Address _____

City _____ State _____ Zip _____

NAME _____

ADDRESS _____

CITY & STATE _____ ZIP _____

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STAMP
HERE

HEATH COMPANY
BENTON HARBOR,
MICHIGAN 49022

NOW...
no purchase
necessary
to open
your Heath
Revolving
Charge Account



... see order form for details

Have you Enclosed Your Order,
with Check, Money Order,
or Your Account Number?

THANK YOU
FOR SHOPPING HEATH.



Enjoy your favorite Heathkit product
NOW — the easy way — by filling out and
mailing the Heath Revolving Charge
Account application on the back of the
order form. No purchase necessary. Once
your account is opened, a phone call or
letter will send your order on its way to
you — NO CASH REQUIRED.

HEATH REVOLVING CHARGE PLAN

ABOUT HEATH'S REVOLVING CHARGE PLANS

The "Cash Price" of merchandise on Heath's Revolving Charge Plans includes the cash price as listed on the page describing the merchandise, plus applicable sales tax, shipping charges, and less any advertised allowances. Regular or extended terms are the two plans available for your use. To use the extended plan, the balance must be at least \$400. The amount of your monthly installment can be determined from the chart below. The periodic rate for the **finance charge is 1 1/2 %** per month and is equal to an **annual percentage rate of 18%** before deducting payments and credits or adding purchases made during the current billing period. No down payment is required on new orders but one may be remitted if desired. **HOW TO OPEN AN ACCOUNT** Just fill out the credit application, sign the Revolving Charge agreement and mail to Heath with your order. **ADD-ON PURCHASES** List items you want on order blank, check the add-on box, and give your account number. Sign the Revolving Charge agreement, and send to us.

REVOLVING CHARGE AGREEMENT

TO: HEATH COMPANY, BENTON HARBOR, MICHIGAN 49022

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 % Rate]	[Annual % Rate]
ALL BALANCES	1 1/2 %	18%

The minimum **[Finance Charge]** assessed will be .50¢ on all small balances. If within 30 days from my billing date I pay the full outstanding balance shown on my monthly 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										EXTENDED REVOLVING CHARGE									
Charge up to	\$150	200	250	300	350	400	450	500	550	Charge up to	\$400	500	600	700	800	900	1,000	1,100	1,200
Pay Monthly	\$10	15	20	25	30	35	40	45	50	Pay Monthly	\$20	25	30	35	40	45	50	55	60

Add \$5 for every \$100, or a portion thereof over \$1,200.

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 the 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 of 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. NO FINANCE CHARGE IF PAID IN FULL IN 30 DAYS FROM CYCLE BILLING CLOSING DATE AS SHOWN ON STATEMENT.**

Date _____ Sign here _____ (Customer's Signature)

CREDIT APPLICATION

Check Revolving Charge Plan Desired
 Regular Extended

NAME _____
 (Please Print) (First Name) (Middle Initial) (Last Name)

ADDRESS _____

CITY _____ **STATE** _____ **ZIP CODE** _____

Number of Dependents _____ How Long at Present Address _____ No. of Rooms _____ **OWN** **RENT** **BOARD** Monthly Rent or Mortgage Payments \$ _____

Former Address _____ City _____ State _____ How Long _____

Phone No. _____ **AGE** _____ **MARRIED** **WIDDED** **SINGLE** **DIVORCED** Spouse's First Name _____

Employer _____ Address _____ City _____ State _____

How Long _____ Occupation _____ Social Security No. _____ Military Serial No. (If in service) _____ **EARNINGS \$** _____ Hr. Wkly.

Former Employer _____ How Long _____

Name of Spouse's Employer _____ Address of Spouse's Employer _____ **SPOUSE'S WEEKLY INCOME \$** _____

Other Income — Give Details _____ **TOTAL FAMILY INCOME \$** _____

Your Bank _____ Address _____ Type of Account _____

CREDIT REFERENCE: (Give 2 Merchants, Firms or Finance Companies with whom you do or have done business.)

First Credit Reference _____ Address _____ Present Balance \$ _____ Monthly Payment \$ _____

Second Credit Reference _____ Address _____ Present Balance \$ _____ Monthly Payment \$ _____

Nearest Relative _____ Address _____ Relationship _____
 (Do not list those with whom you are living) (If Military give permanent mailing address)



Heathkit[®] News & Views



President's letter

Dear Friends:

These are the days of short supply — of paper, parts, fuel, plastic — you name it, there's sure to be a shortage of it. Happily for kit builders, however, there's still no shortage of do-it-yourself energy. And what better way to sit out the energy crisis at home than by building that favorite Heathkit product you've been wanting, but just haven't gotten around to yet.

There are many Heathkit projects that can help you save energy at home and on the road — like our microwave oven that cuts electric bills as well as cooking time; a digital thermometer and weather station that can help you accurately tailor your home heating to the temperature indoors and out; a photo-electric lamp switch that never forgets to turn off a light even if you do; a CD ignition system and automotive tune-up instruments that can help keep your car running at its energy-saving best. You'll find them all — and more — in this month's issue of the Heathkit catalog.

Here's wishing you happy reading — and an early spring.

Sincerely,

D. W. Nurse
D. W. Nurse

Attention: U.S. Military Personnel in W. Germany:

All Heathkit products and catalogs are available at your nearest Audio Club.

HEATHKIT ELECTRONIC CENTERS (Sales and Service)

ARIZONA

Phoenix, 85017
2727 W. Indian School Rd.
Phone: 602-279-6247

CALIFORNIA

Anaheim, 92805
330 E. Ball Rd.
Phone: 714-776-9420
El Cerrito, 94530
6000 Potrero Ave.
Phone: 415-236-8870
Los Angeles, 90007
2309 S. Flower St.
Phone: 213-749-0261
Pomona, 91787
1555 Orange Grove Ave., N.
Phone: 714-623-3543
Redwood City, 94063
2001 Middlefield Rd.
Phone: 415-365-8155
San Diego (La Mesa, 92041)
8363 Center Dr.
Phone: 714-461-0110
Woodland Hills, 91364
22504 Ventura Blvd.
Phone: 213-883-0531

COLORADO

Denver, 80212
5940 W. 38th Ave.
Phone: 303-422-3408

CONNECTICUT

Hartford (Aven, 06001)
395 W. Main St. (Rte. 44)
Phone: 203-678-0323

FLORIDA

Miami (Hialeah, 33012)
4705 W. 16th Ave.
Phone: 305-823-2280
Tampa, 33614
4019 West Hillsborough Ave.
Phone: 813-886-2541

GEORGIA

Atlanta, 30305
5285 Roswell Rd.
Phone: 404-252-4341

ILLINOIS

Chicago, 60845
3462-86 W. Devon Ave.
Phone: 312-583-3920
Chicago (Downers Grove, 60515)
224 Ogden Ave.
Phone: 312-852-1304

INDIANA

Indianapolis, 46220
2112 E. 62nd St.
Phone: 317-257-4321

KANSAS

Kansas City (Mission, 66202)
5960 Lamar Ave.
Phone: 913-362-4486

KENTUCKY

Louisville, 40243
12401 Shelbyville Rd.
Phone: 502-245-7811

LOUISIANA

New Orleans (Kenner, 70062)
1900 Veterans Memorial Hwy.
Phone: 504-722-6321

MARYLAND

Baltimore, 21234
1713 E. Joppa Rd.
Phone: 301-661-4446

ROCKVILLE, 20852

5542 Nicholson Lane
Phone: 301-881-5420

MASSACHUSETTS

Boston (Wellesley, 02181)
165 Worcester Ave.
Phone: 617-237-1510

MICHIGAN

Detroit, 48219
18645 W. Eight Mile Rd.
Phone: 313-535-6480
E. Detroit, 48021
18149 E. Eight Mile Rd.
Phone: 313-772-0418

MINNESOTA

Minneapolis (Hopkins, 55343)
101 Shady Oak Rd.
Phone: 612-938-6371

MISSOURI

St. Louis, 63123
9296 Gravois Ave.
Phone: 314-638-5100

NEBRASKA

Omaha, 68134
9207 Maple St.
Phone: 402-391-2071

NEW JERSEY

Fair Lawn, 07410
35-07 Broadway (Rte. 4)
Phone: 201-791-6935

NEW YORK

Buffalo (Amherst, 14228)
3476 Sheridan Or.
Phone: 716-835-3090
Jericho, Long Island, 11753
15 Jericho Turnpike
Phone: 516-334-8181
New York, 10036
35 W. 45th St.
Phone: 212-765-4590
Rochester, 14626
1384 Long Pond Rd.
(Long Ridge Plaza)
Phone: 716-227-4750
White Plains
(North White Plains, 10603)
7 Reservoir Rd.
Phone: 914-761-7690

OHIO

Cincinnati (Woodlawn, 45215)
10133 Springfield Pike
Phone: 513-771-8850
Cleveland, 44129
5444 Pearl Rd.
Phone: 216-886-2590

COLUMBUS, 43229

2500 Morse Rd.
Phone: 614-475-7200

PENNSYLVANIA

Philadelphia, 19149
6318 Roosevelt Blvd.
Phone: 215-288-0180
Philadelphia (Frazer, 19355)
630 Lancaster Pike
Phone: 215-647-5555
Pittsburgh, 15239
3482 Wm. Penn Hwy.
Phone: 412-824-3564

RHODE ISLAND

Providence (Warwick, 02886)
558 Greenwich Ave.
Phone: 401-738-5150

TEXAS

Dallas, 75201
2715 Ross Ave.
Phone: 214-826-4053
Houston, 77027
3705 Westheimer
Phone: 713-623-2090

WASHINGTON

Seattle, 98121
2221 Third Ave.
Phone: 206-682-2172

WISCONSIN

Milwaukee, 53218
5215 Fond du Lac
Phone: 414-873-8250

ATTENTION HISTORY BUFFS:

Heath historians are interested in tracing the early beginnings of Heath Company advertising. If you have copies of any Heath Company advertising, literature, packaging, etc. dating back to 1938 or before, we would like to correspond with you. Please write Heath Company, Advertising Dept., Benton Harbor, Michigan 49022.

ATTENTION HW-202 OWNERS:

Circuitry changes have resulted in improved transmitter performance of HW-202 Transceivers shipped after Oct. 1, 1973. If your HW-202 was purchased prior to that date (with numbers 00316 through 02334 showing on the blue & white identification label), we'll be happy to send you — at no charge — the complete modification package, plus installation instructions. Simply drop us a note asking for part No. HWM-202-1, and include your name and return address.

Order a Heathkit Manual . . . your money back when you order the kit



If you've been wondering about a particular kit, but would like a chance to take a close look before you buy . . . just send for the manual. It costs only \$2 postpaid (except Color TV, Organs, EK and EF series which are \$5). Also, we give your money back on the manual when you buy the kit (see order form for complete details). Either way, Heathkit manuals are a bargain . . . many cost us more than this minimum charge.

What's in an evening?

2 EVENING KIT

You'll find the "... evening kit" symbol appearing with various kits throughout the catalog. Its purpose is to give you an approximate time that it may take you to assemble a particular kit.

However, since it is virtually impossible to establish an exact time for every kitbuilder, the symbol should be considered only as a guide. It may take you more time or less time to build a particular kit.

Even more important, we feel, is that you work at a pace you find enjoyable, and avoid the possibility of errors as a result of working too fast, or becoming tired.

Remember, building your Heathkit is not a race to meet the number of evenings we estimate. So relax . . . and enjoy yourself.

We won't let you fail!

Our company's success is tied directly to your success in building and using Heathkit products. Every kit we design is judged in the light of that philosophy before we offer it to you. If you have any problem before, during or after assembly — no matter how large or small — it will be resolved in the spirit of that philosophy to your satisfaction here at the Heath factory and at Heathkit Electronic Centers across the country. This is our pledge to you . . . "we won't let you fail."

Build in reliability and performance



**Kit, or
Assembled,
Tested,
Calibrated**

329⁹⁵
KIT

NO MONEY DOWN

475⁰⁰
ASSEMBLED

NO MONEY DOWN



399⁹⁵
NO MONEY DOWN

Solid-state 15 MHz scope

The IO-104 is a precise, solid-state lab or service bench oscilloscope. Vertical bandwidth of DC-15 MHz and sensitivity of 10 mV/cm with 12 calibrated vertical attenuator positions up to 50 V/cm accommodate a broad range of input signals. Input impedance is 1 megohm/40 pF and will accept up to 600 VDC. Any one of 22 time bases from 2 s/cm to 0.2 μ s/cm (X5 magnifier for max. sweep of 40 ns/cm) can be selected. The horizontal amplifier accepts external inputs from DC to 1 MHz with an input impedance of 1 megohm. Trigger controls include selection of either normal or automatic modes; switch-controlled AC-DC coupling; provision for external triggering signals. A built-in calibrator provides accurate frequency and amplitude signals.

Kit IO-104, 44 lbs., mailable **329.95**

Assembled SO-106A, wired version of the IO-104 in handsome black & white styling (not shown), 40 lbs., mailable **475.00**

IO-104 SPECIFICATIONS — Vertical — Input impedance: 1 M Ω shunted by 40 pF. Maximum input voltage: 600 volts DC. Sensitivity: 10 millivolts/cm. Frequency response: DC to 15 MHz, ± 3 dB with 4 cm deflection. Rise time: 24 ns. Attenuator: 12 positions in a 1, 2, 5 sequence. .01 volt/cm to 50 volts/cm $\pm 3\%$. Horizontal — Input impedance: ≈ 1 M Ω . Sensitivity: Less than .5 volt/cm. Frequency response: DC to 1 MHz, ± 3 dB. Attenuator: 2 position, X1 and X10. Time Base — Sweep: 22 steps in a 1, 2, 5 sequence, 2 s/cm to 2 μ s/cm, $\pm 5\%$. Horizontal expansion: X5 $\pm 5\%$. Trigger modes (switch selected): AUTO/NORMAL; + or —; AC/DC; INT/EXT. Trigger sensitivity — Internal: 1 cm display. External: 0.5 volt peak-to-peak. Calibrator — Signal Source: 4 MHz oscillator, crystal controlled $\pm 0.01\%$. Outputs (TTL square wave, peak-to-peak): Front panel: 1 kHz, 4 volt $\pm 5\%$. Internal: 1 kHz, 2.5 volts (approx.). 1 kHz, 5 volts (approx.). 10 kHz, 3 volts (approx.). 100 kHz, 3 volts (approx.). 1 MHz, 3 volts (approx.). 2 MHz, 3 volts (approx.). General — Input connections: Vertical: Coaxial, BNC. Horizontal: Banana jack. Trigger: Banana jack. CRT accelerating potential: 2800 volts DC, regulated. CRT type: 5ABP31, 6X10 cm viewing area; green, medium persistence phosphor. Retrace suppression: DC-coupled unblanking of the CRT. Graticules: Engraved, 6X10 cm, edge lighted. Power requirements: 110 to 130 VAC or 220 to 260 VAC, 50/60 Hz, 45 watts. Overall dimensions: 12 $\frac{3}{4}$ " H x 10 $\frac{3}{4}$ " W x 20" D. Dimensions include all protruding surfaces; knobs, handle, feet, etc. Net weight: 32 lbs. NOTE: Specifications measured at 25° C with 120 VAC line voltage.

Dual-trace 15 MHz scope

With the Heathkit IO-105 oscilloscope kit and less than seven evenings of your time you can build a versatile solid-state instrument for at least \$100 less than you would pay for a comparable wired unit.

You can display two separate input signals in Channel 1 or Channel 2 modes of operation. Direct comparison of both signals is possible in alternate and chopped modes. In the X-Y mode, both channels are displayed as a function of each other — channel 1 controlling the vertical (Y) axis and channel 2 controlling the horizontal (X) axis. Both input channels are precision balanced for 5° or less phase shift to 50 kHz. Switch selected AC or DC coupling lets you trigger the time base at a given point on the signal or at a preselected DC level. The 18-position time base switch in a 1, 2, 5 sequence provides sweep rates from 100 ms/cm to 0.2 μ s/cm. Full bandwidth is featured from 20 V/cm in a 1, 2, 5 sequence.

Kit IO-105, 40 lbs., mailable **399.95**

IO-105 SPECIFICATIONS — VERTICAL — Accuracy: $\pm 3\%$. Input impedance: 1 megohm shunted by 35 pF. Maximum input voltage: 600 VDC. Sensitivity: AC or DC, 0.05 V/cm. Frequency response: DC to 15 MHz, 3 dB with 4 cm deflection. Vertical windows: 2 minimum. Rise time: 24 ns. Overshoot: Less than 10%. Attenuator: 9 positions in a 1, 2, 5 sequence. 0.05 V/cm, $\pm 3\%$. Variable gain (uncalibrated) thru entire range. Vertical display in sweep mode: Channel 1, Channel 2, Channel 1 & 2 alternately; or Channel 2 chopped (50 kHz). HORIZONTAL — Time base: Triggered with 18 calibrated rates, 0.2 μ s/cm to 100 ms/cm in a 1, 2, 5 sequence, $\pm 3\%$. Continuously variable (uncalibrated) within the same range. Sweep magnifier: x5 (time base accuracy is $\pm 5\%$ when the magnifier is being used). External horizontal input: 750 mV/cm (uncalibrated & not adjustable). 100 K ohm minimum input impedance, DC to 100 kHz. X-Y MODE — Sensitivity: 0.05 V/cm to 20 V/cm, $\pm 3\%$. Frequency response: -3 dB @ 100 kHz (Channel 2). Phase shift between channels: $\pm 5^\circ$ or less from DC to 50 kHz within graticule limits. TRIGGERING — Delay: Approx. 600 ns. Auto: Zero crossing $\pm \frac{1}{2}$ cm of zero crossing. Norm: Within viewing area. Source: Channel 1, Channel 2, or Channels 1 & 2. Polarity: + or — slope. Couplings: AC or DC. Sensitivity: Internal, $\frac{1}{2}$ cm; external, 100 mV minimum, 7 V max. GENERAL — Blanking in: TTL compatible (Logic 0-blank). Gate out: 3.5 V minimum. Input connections: Vertical, BNC; horizontal, binding post; external trigger, binding post on $\frac{3}{4}$ " center with ground. CRT accelerating potential: 2200 VDC regulated. CRT type: 8X10 cm, rectangular, flat-face, D14-107GA. Retrace suppression: DC coupled unblanking of the CRT. Graticule: 8 cm x 10 cm grid, edge lighted. Power requirements: 105-125 or 210-250 VAC, 50/60 Hz, 60 W. Warm-up time: CRT heating time, approx. 30 seconds; for full calibration, approx. 15 min. Overall dimensions: 12 $\frac{3}{4}$ " H x 10 $\frac{3}{4}$ " W x 15" D. Note: Specification measured at 25° C with 120 VAC line voltage.



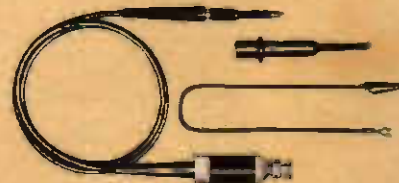
Low Capacitance Scope Probe Kit. Ideal for use with IO-102. Provides direct or x10 attenuated operation; trimmer capacitor gives proper match to scope. Wiring options for 3.3 or 1 megohm.

Kit PK-1, 1 lb., mailable **4.95**



Scope Demodulator Probe. For distortion checks & observation of RF & IF signal modulation. Functions as an AM detector, 30V rms. VDC max. Ideal for IO-102.

Kit 337-C, 1 lb., mailable **5.00**



High Frequency Compensated Scope Probe. Ideal for use with IO-103, IO-104 and IO-105 scopes. Features 10 megohm input impedance shunted by 11.5 pF; compensation for matching to any 1 megohm scope input shunted by 15-40 pF; DC-60 MHz bandwidth; x10 attenuation; 500 VAC & VDC voltage rating; BNC connector; combination spring-loaded outer hook connector and fine pointed inner tip probe; 3 $\frac{1}{2}$ ' lead length.

Assembled PKW-101, 1 lb., mailable **19.95**

with a top-value Heathkit[®] scope



229⁹⁵

NO MONEY DOWN



Kit, or
Assembled,
Tested,
Calibrated

119⁹⁵
KIT

NO MONEY DOWN

179⁹⁵
ASSEMBLED

NO MONEY DOWN

Solid-state 10 MHz triggered scope

Providing a big 6x10 cm screen with lighted graticule for easy, accurate measurement, the Heathkit IO-103 scope is the ideal tool for the service shop performing audio and TV maintenance. The IO-103 offers wide bandwidth and complete calibration. Response on the vertical channels in DC-10 MHz ± 3 dB, with less than 50 ns rise time. The calibrated attenuator switch has nine positions, with variable control. And sweep is adjustable in seven calibrated steps, from 100 ms/cm to 100 ns/cm, with variable control between. Horizontal expansion gives x2 magnification $\pm 5\%$ for a 50 ns/cm sweep rate. Select either normal or automatic mode for triggered sweep. Other individually controlled triggering options include "plus-or-minus" for selecting waveform slope: AC-DC which removes any DC component in the signal, or permits direct coupling for triggering by DC level changes or very low AC signals.

Kit IO-103, 36 lbs., mailable **229.95**

IO-103 SPECIFICATIONS - VERTICAL CHANNEL - Input impedance: 1 megohm shunted by 30 pF. Sensitivity: 50 mV/cm. Frequency response: DC to 10 MHz ± 3 dB @ 3 cm deflection. DC to 8 MHz ± 3 dB @ 6 cm deflection. Rise time: Less than 50 ns. Attenuator: 9-position, 0.05 to 20 V/cm (1, 2, 5 sequence). **HORIZONTAL CHANNEL** - Input impedance: 100 k ohms. Sensitivity: 0.25 V/cm (uncalibrated). Frequency response: DC to 500 kHz ± 3 dB. TIME BASE - Sweep: 7 steps, 100 ms to 100 ns/cm. Horizontal expansion: x2 $\pm 5\%$. Trigger Options (switch selected): Auto/Normal: +/- (plus or minus); AC/DC; INT/EXT. Sensitivity: Internal, 1 cm display. External 0.5 V peak-to-peak. **GENERAL** - CRT: 50EP1F, green, medium persistence phosphor. Graticule: 6x10 cm, edge lighted. Power supplies: All solid-state rectifiers, all amplifier supplies regulated. Power requirements: 120/240 VAC, 50/60 Hz, 35 W. Overall dimensions: 12 3/4" H x 9 1/4" W x 16 1/4" L. Dimensions include all protruding surfaces such as knobs, handle, feet, etc.

DC-5 MHz general purpose scope

If you're looking for a truly outstanding general purpose scope at a sensible price, you need look no farther than the IO-102. A wide band response of DC-5 MHz, fast 80 ns rise time, and a high 30 mV/cm input sensitivity make the Heathkit IO-102 scope a truly high performance, low cost instrument for a wide variety of applications. And for added convenience there's switch selected AC or DC coupling; frequency-compensated three-position attenuator to accommodate varying input levels; switch-selected grounding for zero reference line; FET high-impedance input circuit to minimize loading.

The recurrent, automatic sync-type sweep generator provides five sweep ranges, from 10 Hz to 500 kHz. A separate frequency vernier control permits selection of the desired sweep rate to give a stationary trace. And an external horizontal input allows the sweep signal to be applied by an external generator. The front panel internal-external switch and external sync connector provide a means for applying an external sync signal. A one volt peak-to-peak output provides a signal that can be used as a comparison to determine the value of an unknown voltage.

The type 50EP1 CRT used in the IO-102 provides a brilliant, easily-read trace, even in areas such as classrooms with high ambient light levels. The highly visible trace, coupled with the large 5" CRT make the IO-102 ideal for classroom demonstration purposes. A 6x10 cm ruled graticule makes trace amplitude easy to determine. And to provide additional convenience and versatility, the CRT bezel may be replaced by a standard scope camera mount.

Both horizontal and vertical amplifiers and sweep circuit are operated from zener-regulated power supplies. The transformer-operated power supply can be wired for either 120 or 240 VAC operation, and is fused for protection.

Kit IO-102, 31 lbs., mailable **119.95**

Assembled SO-107A, wired version
of the IO-102 in handsome black & white styling (not shown),
31 lbs., mailable **179.95**

IO-102 SPECIFICATIONS - VERTICAL CHANNEL - Sensitivity: 30 mV/cm, uncalibrated. Frequency Response: DC - 5 MHz, ± 3 dB. Rise Time: 80 ns. Input Impedance: 1 megohm shunted by 35 pF. Attenuator: 3-position, frequency compensated; x1, x10, x100. **HORIZONTAL CHANNEL** - Sensitivity: 0.1 V/cm. Frequency Response: 1 MHz ± 3 dB. Input Impedance: 1 megohm shunted by 50 pF. Sweep Generator Type: Recurrent, automatic sync. Range: 10 Hz - 500 kHz in five switch-selected steps, continuously variable between steps. **GENERAL** - Cathode Ray Tube: Type 50EP1, green medium persistence phosphor. Viewing area, 6x10 cm. Power Supplies: All solid-state rectifiers, regulated. Power requirements: 110-130 or 220/260 VAC, 50/60 Hz, 35 W. Overall Dimensions: 12 3/4" H x 9 1/4" W x 16 1/4" D, including knobs, handle, feet, etc. Net weight: 27 lbs.



Heathkit ID-101 Electronic Switch

Provides simultaneous visual display of two input signals on a single-beam oscilloscope by alternating from one input to the other at the internal square-wave generator frequencies offering the most favorable presentation on the scope - or a single A or B input trace. Has sync output on each channel permitting oscilloscope sweep to be locked to either input signal; DC coupling

for even greater versatility, and DC-5 MHz + 1 1/2 dB, -3 dB frequency response, 10-times the bandwidth of other similarly priced units.

Kit ID-101, 6 lbs., mailable **39.95**

ID-101 SPECIFICATIONS - Signal frequency response: DC-5 MHz + 1 1/2 dB, -3 dB. Signal gain: Greater than 10 times. Maximum input signal: 600 VDC or 600 VAC peak-to-peak. Input Impedance: 1 megohm, 50 pF. Maximum signal outputs 8 V peak-to-peak. Output loading: 1000 ohm minimum resistance. Hum and noise: (single channel only). Less than 40 mV peak-to-peak. Chopping rates: Approximately 100, 500, 1000 and 5000 Hz. Power requirements: 120/240 V, 50-60 Hz, 6 W. Dimensions: 4 1/4" H x 10 3/8" W x 5 3/4" D.

For capability and versatility on the job,

Kit, or
Assembled,
Tested,
Calibrated

Kit, or
Assembled,
Tested,
Calibrated



79⁹⁵

125⁰⁰

69⁹⁵

110⁰⁰

Kit
NO MONEY DOWN

Assembled
NO MONEY DOWN

Kit
NO MONEY DOWN

Assembled
NO MONEY DOWN

Regulated Low Voltage Power Supply

One of the finest low voltage supplies Heath has ever offered. Regulated DC voltages are selected in 5 volt increments on the 10 position Coarse Voltage Range switch with exact values made possible by the Fine Voltage control. Output current limiting is also selected in 4 fixed ranges by the Coarse Current switch and the Fine Current control is used for exact, vernier adjustments.

Kit IP-27, 16 lbs., mailable **79.95**

Assembled SP-27A, wired version of the IP-27 in handsome black & white styling (not shown), 15 lbs., mailable **125.00**

IP-27 SPECIFICATIONS — Input: 120/240 VAC, 50/60 Hz; 135 W at full load (50 V, 1.5A). Output: 0.5-50 VDC; 1.5 amps max. DC. Load regulation: ± 15 mV, can be adjusted for no change. Line regulation: For a 10% change in line voltage, less than .05 change. Ripple & noise: Less than 250 μ V. Transient response: Less than 25 μ sec. Output impedance: Less than .075 ohms from DC to 10 kHz, less than .3 ohms 10 kHz & up. Overload protection: Current limiter & relay. Meter: $3\frac{1}{2}$ " 1 mA, 50 ohm. Current ranges: 50 mA, 150 mA, 500 mA, 1.5 A. Voltage ranges: 5V, 15V, 50V. Front panel controls: On/Off Coarse

voltage switch, Fine voltage adjust, Current range switch, Current limit adjust, Meter rocker switch, Reset Standby toggle switch, Output terminals: (3), plus (+), minus (-), chassis ground. Dimensions: $5\frac{1}{2}$ " H x $13\frac{1}{4}$ " W x 9" D.

Variable 0-400 VDC Regulated Supply

Hundreds of uses for experimenters, servicemen, physics and chemistry labs.

Kit IP-17, 21 lbs., mailable **69.95**

Assembled SP-17A, wired version of the IP-17 in handsome black & white styling (not shown), 21 lbs., mailable **110.00**

IP-17 SPECIFICATIONS — Output: 0-400 V regulated DC at 0-100 mA continuous, 125 mA intermittent, 0 to -100 VDC at 1 mA variable bias voltage, 6.3 VAC at 4 amps, 12.6 V at 2 amps. (25 VA max. AC load), filament voltage. Regulation: Output variation less than 1% from no load to full load. Output variation less than 1% for a ± 10 V change at 117 VAC input. Ripple: Less than 10 millivolts RMS, ripple, jitter and noise. Output impedance: Less than 10 ohms, DC to 1 MHz. Meters: Voltmeter 0-400 V or 0-150 V; Milliammeter 0-150 mA. Power requirements: 120/240 VAC, 50/60 Hz, 150 W max. Dimensions: $5\frac{1}{2}$ " H x $13\frac{1}{4}$ " W x 11" D.



Solid-State 1-15 VDC Regulated Supply

Versatile supply for solid-state applications.

Kit IP-18, 5 lbs., mailable **21.95**

IP-18 SPECIFICATIONS—Voltage output: 1-15 VDC, continuously adjustable. Load regulations: Less than 50 mV variation from no load to full load. Line regulation: Less than 50 mV change in output voltage for a 10% change in line voltage. 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 requirements: 120/240 VAC, 50/60 Hz, 15 W at full load. Dimensions: $4\frac{3}{4}$ " H x $5\frac{1}{2}$ " W x $5\frac{3}{4}$ " D. Programming: AC or DC, 5000 ohm input resistance.



Solid-State 1-30 VDC Regulated Supply

Ideal low-voltage source for transistor work.

Kit IP-28, 9 lbs., mailable **49.95**

IP-28 SPECIFICATIONS—Voltage output: 2 ranges: 1-10 and 1-30 VDC, continuously adjustable. Load regulation: Less than 50 mV variation from no load to full load (at front panel terminals) without remote sensing. Less than 20 mV variation from no load to full load at front or rear panel terminals when using remote sensing. Line regulation: Less than 25 mV variation in output voltage for 10% change in line voltage. Ripple & noise: Less than 5 mV. Current output: 1A maximum continuous load (0.75A max. continuous load below 5 V). Current limiting: 2 ranges: 10-100 mA & 10 mA-1A, continuously adjustable. Transient response: 25 μ s. Output impedance: 0.3 ohms or less to 100 kHz. Meter accuracy: 3% of full scale. Meter ranges: One switch determines voltage or current reading. 2 voltage ranges: 0-10 V, 0-30 V, 2 current ranges: 0-100 mA, 0-1A. External programming: AC or DC programming. 5000 ohm load on DC. Power requirements: 120/240 VAC, 50/60 Hz, 50 W, at full load. Dimensions: $6\frac{1}{2}$ " H x $10\frac{3}{4}$ " W x $4\frac{3}{4}$ " D. overall.



6 & 12 VDC Variable Battery Eliminator

Doubles as a battery charger.

Kit IP-12, 18 lbs., mailable **62.95**

IP-12 SPECIFICATIONS—Continuously variable output: 6 V range: unfiltered, 10 amp continuous, 15 amp maximum; filtered, 5 amp continuous, less than .3% ripple. 12 V range: unfiltered, 5 amp continuous, 7.5 amp maximum; filtered, 5 amp continuous, less than .3% ripple. Power requirements: 120 VAC, 50/60 Hz at 200 W. Dimensions: $8\frac{1}{2}$ " H x 13" W x 7" D.

use test instruments from Heath

Heathkit IM-1202 2½-Digit Multimeter

- 2½-digit Cold Cathode Readout Tubes — eliminate ambiguous readings
- Convenient Front-panel Polarity Switch — for positive and negative DC values.

State-of-the-art digital circuitry and readout, rugged portability and versatility... at unbelievable kit-form savings. The Heathkit IM-1202 Digital Multimeter has 1% accuracy on DC volt ranges, 1½% on AC volts and AC-DC current, 2% on ohms. With its low price, ease of assembly and simplicity of operation, this multimeter is the obvious choice for every ham and every electronics hobbyist.

The IM-1202 accurately measures voltages from 10 mV to 1000 V on DC in either polarity, 10 mV to 700 V rms on AC, 10 µA to 2 A on AC or DC current, and 1 ohm to 2 megohms on resistance. On DC functions, a handy front-panel polarity switch eliminates the need to switch leads. Diodes can be measured for forward and reverse current flow at the snap of a switch. Four overlapping ranges on each of the AC, +DC and -DC volts and current, and five ranges for resistance make operation even easier. There are lighted indicators for overrange, positive and negative DC voltages and current. And the decimal is placed correctly with range selection.

The bright 2½-digit display ends the parallax and interpolation errors common to conventional analog meters. Resolution is 10 mV, 10 µA and 1 ohm. The all solid-state design utilizes IC circuitry for clear, non-blinking display; dependable ramp analog-to-digital converter with the readout updated every 16 msec; overload protection on all ranges. Other features are a three-wire cord and dual primary power transformer (no batteries needed), isolated floating ground and completely enclosed heavy-gage aluminum case for safe, rugged use. For your convenience, the IM-1202 includes a neat carrying handle, tinted viewing window and universal banana jacks.

We've kept this kit simple to build (3 or 4 evenings) and simple to service. Most circuitry mounts on two fiberglass circuit boards which are almost totally exposed when the case is removed. And the exclusive Heath built-in lifetime calibration standards are all you need for those initial and periodic adjustments.

- Kit IM-1202, 6 lbs., mailable 79.95
 Assembled SM-600, wired version of the IM-1202 in handsome black & white styling (not shown), 6 lbs., mailable 120.00



IM-1202 SPECIFICATIONS — Functions: ±DC volts, ±DC current, AC volts, AC current, ohms. Ranges: (full scale): DC volts 2, 20, 200, 1,000V. DC current: 2, 20, 200, 2,000 mA. AC volts: 2, 20, 200, 700V rms (25 Hz to 10 kHz). AC currents 2, 20, 200, 2,000 mA rms (25 Hz to 10 kHz). Ohms: 200, 2k, 20k, 200k, 2,000k ohms. Maximum input without damage: 3 A into AC or DC mA, and ohms (fuse protected). 700 VAC rms into volts (except 2V range — 140 VAC rms). 1000 VDC into volts (except 2V range — 200 VDC). Resolution: (Lowest Range) Volts: 10 mV. Current 10µA. Ohms: 1 ohm. Display: Two & one half digit numeric. Rated accuracy carried to 25% overrange. Accuracy (Full Scale ±1 digit): 1% DCV (1000 V max.), 1½% ACV (700V max.), AC & DC current, 2% ohms. Input Impedance: 1 megohm on all voltage ranges. 2V drop maximum on current ranges. Sample Rate: Approximately 60 per second. Power Requirements: 120/240 VAC, 50/60 Hz, 8 watts. Dimensions (overall): 7¾" H, 5¾" W x 3½" D.

Heathkit IM-102 3½-Digit Multimeter



229.95
NO MONEY DOWN

The IM-102 accurately measures AC/DC voltages and currents and resistance without switching probes for polarity. Dual slope integrator converts analog to digital, and pre-assembled precision DC calibrator simplifies assembly and periodic adjustment. Cold cathode readout and memory circuit assure non-blinking operation. Includes detachable line cord (no batteries needed), banana jack connectors complete with test leads.

- Kit IM-102, 9 lbs., mailable 229.95

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 2V, 10 megohm on all other ranges. Accuracy: ±0.2% ±1 digit with furnished DC calibrator, ±0.1% ±1 digit with lab calibration. Overload protection: 350V on 200 mV and 2V, 1000V on other ranges. Overrange capability: 20% minimum (subject to overload protection limits).

Resolution: 100 µV. Full scale step response: 2 sec. to rated accuracy. Input bias current: 10nA maximum at reference conditions. Temperature influence: ±0.005%/°C., ±1 digit /°C. Normal mode rejection: 35dB minimum @ 60 Hz. Common mode rejection: 80dB minimum with 1k unbalance @ 60 Hz. OHMMETER — 6 ranges: 200 ohm with 1mA test current, 2k with 100µA, 20k with 10µA, 200k with 10µA, 2M with 1µA, 20M with 100nA. Accuracy: With DC calibrator, ±0.5% ±1 digit on 200, 2k, 20k, 200 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 20. Overload protection: 250 V RMS. Resolution: 0.1 ohm (200 ohm range). Full scale step response: 2 sec. on ohm and k ohm ranges, 10 sec. at 10 megohms to rated accuracy. Temperature influence: ±0.05% @ 0°C. Overrange capability: 20% minimum. AC VOLTMETER (Average responding, RMS calibrated) — 5 ranges: 20mV, 2V, 20V, 200V, 1000V. Input Impedance: 1 megohm @ 150 pF. Overload protection: 250 RMS on 200mV and 2V, 500 V on higher ranges. 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 40kHz-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, ±0.3% ±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. Resolution: 100 nanoamperes (200µA range). Overload protection: 3 A, any range, by fuse and clamp diodes. AC AMMETER (40kHz-10kHz) — 5 ranges: 200µA, 2mA, 20mA, 2A. Voltage drop: 0.2 V (nominal). Accuracy: With DC calibrator, ±1.5% ±1 digit on 200µA, ±0.7% ±1 digit on 2mA and 20mA; ±0.8% ±1 digit on 200mA; ±1% ±1 digit on 2A. Resolution: 100 nanoamperes. Overload protection: 3A, any range, by fuse and clamp diodes. GENERAL — Display: Maximum count, 1999. Overrange indication, automatic beyond 1999. Polarity indication, automatic "+", "0", or "-". Reading rate, 5 per sec., non-blink (200 millisecond integration time). Numeric display by side-viewing neon glow tubes with integral decimal points. Power requirement: 120 or 240 VAC, 50Hz/60Hz, 8 W nominal. Operating temperature: 10°C-40°C. Reference: 25°C. ±1°C. Size: 3" H x 7" W x 7.9" D.

High voltage probe for IM-102 Multimeter

Ideal for measuring extremely high (up to 30,000 V) DC. Has multiplication factor of 100 on DC ranges of any 10 megohm input meter, provides useful 1000 megohm input for measuring voltages as low as 1 V in high-impedance circuits. Has 1% resistor.

- Kit ID-1041, 2 lbs., mailable 6.95

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit® VOMs and VTVMs for shop or home-



79⁹⁵
NO MONEY DOWN

Portable VOM with FET input

This is the tool you've been waiting for. 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 allow you to read from 1 ohm to 100 megohms, conventional or low voltage modes. Decibel ranges from -40 to +62 dB. DC null scale with better than 1 mV resolution.

Kit IM-104, 4 lbs., available **79.95**

IM-104 SPECIFICATIONS — DC VOLTMETER — 9 ranges: 0-1, 0.3, 1, 3, 10, 30, 100, 300, 1000V. Input resistance: 10 megohm. Accuracy: $\pm 2\%$ 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 factors 1 to 3.162 (10 dB) per step. Input resistance: 10 megohm. Input capacity: 100 pF typical. Accuracy: $\pm 3\%$ of full scale (meter in horizontal position; 60 Hz sine wave). Response: Average value of 1/2 sine wave. Scale calibrated to indicate rms. Frequency response: 20 Hz to 20 kHz $\pm 3\%$; 20 Hz to 50 kHz $\pm 5\%$ on 0.1 to 30 V. 20 Hz to 10 kHz $\pm 3\%$; 20 Hz to 20 kHz $\pm 5\%$ on 100 and 300 V. 20 Hz to 1.0 kHz $\pm 3\%$; 20 Hz to 2.5 kHz $\pm 5\%$ on 1000 V. DC MILLIAMMETER — 6 ranges: 0-0.01, .1, 1, 10, 100, 1000 mA. Voltage drop (approx. full scale): 0.100 V on 0.01 to 10, 0.150 V on 100, 0.350 V on 1000. Insertion resistance: Voltage drop divided by full-scale current. Accuracy: $\pm 2\%$ on 0.01 to 100, $\pm 3\%$ on 1000. (Meter in horizontal position.) AC MILLIAMMETER — 6 ranges: 0-0.01, 0.1, 1, 10, 100, 1000 mA. Voltage drop (approx. at full scale): 0.100 V on 0.01 to 1, 0.150 V on 10, 0.350 on 1000 V. Insertion resistance: Voltage drop divided by full-scale. Accuracy: $\pm 3\%$ on 0.01 to 100, $\pm 4\%$ on 1000. (Meter in horizontal position; 60 Hz sine waves). Response: Average value of 1/2 sine wave (DC current must be negligible). Scale calibrated to include rms. Frequency response: 20 Hz to 5 kHz $\pm 3\%$ on 0.01, 20 Hz to 20 kHz $\pm 3\%$ on 0.1, 20 Hz to 50 kHz $\pm 3\%$ on 1 to 1000. OHMMETER — 7 ranges. Rx1 (10 ohm center scale), Rx10, Rx100, Rx1K, Rx10K, Rx100K, Rx1M. Accuracy: $\pm 3\%$ on x10 to x1M. Test voltage (nominal): 1.55 V 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 to +22, +10 to +32, +20 to +42, +30 to +52, +40 to +62. Accuracy: ± 3 dB @ -20 dB to ± 0.3 dB @ +2B. Voltage dividers: 1% precision metal-film resistors. Meter: 4 1/2", 100 μ A, 95°, ruggedized, taut-band movement. 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. Amplifier circuit: Dual FET source followers driving operational amp. Front panel switches: 24-position, continuous rotation RANGE switch (including battery check position BATT and OFF). 4-position push-button switch for AC, ohm LV, -DC/ohm, +DC/ohm. Meter temperature coefficient: Maximum of $\pm 0.2\%$ or $\pm 0.2^\circ$ or arc per $^\circ$ C over range of 15 to 35 $^\circ$ C. Operating temperature: 0 to 50 $^\circ$ C. Storage temperature (less batteries): -40 to +80 $^\circ$ C. Batteries (not supplied): 1 1.5 V O-cell (NEDA #13), 4 1.5 V AA-cell (NEA #15). Dimensions: 6.95" H x 4.95" W x 2.25" D.



A)

A) General purpose VOM

Gives you a low-friction, taut-band meter with diode & fuse protected movement.

Kit IM-105, 3 lbs., available **47.95**

IM-105 SPECIFICATIONS — DC VOLTAGE RANGES — 0.25, 2.5, 10, 50, 250, 500, 1000 & 5000 V full scale. Accuracy: $\pm 3\%$ of full scale. Input resistance: 20,000 ohms/V full scale. AC VOLTAGE RANGES — 2.5, 10, 50, 250 & 500 V full scale. Accuracy: $\pm 4\%$ of full scale. Input resistance: 5000 ohms/V. Input capacity: Less than 20 pF. Frequency response: 2.5, 10, and 50 V ranges: $\pm 5\%$; 10 Hz to 100 kHz; 250, 500 V ranges: $\pm 5\%$; 10 Hz. DC CURRENT RANGES — 0.05, 1.0, 10, 100, 500 mA & 10 A full scale. Accuracy: $\pm 3\%$ of full scale. Voltage drop: Approximately 0.25 V at full scale. RESISTANCE RANGES — x1 (20 center scale), x10, x100, x1k, x10k. Accuracies ± 3 degrees of arc. Source voltage: x1 through x1k ranges: 1.5 V x 10k range: 15 V. DECIBEL RANGES: (0 db = 1 mV in 600 ohms): -10 to +56 dB. GENERAL — Voltage dividers: -1% metal film resistors on most ranges. Meter: 4 1/2", 50 μ A, ruggedized, taut-band movement. Meter protection: Combined fuse and diode overload protection. Meter temperature coefficient: 15 to 35 $^\circ$ C, $\pm 1\%$ (or 0.1 degree of arc) per degree C. Operating temperature range: 0-55 $^\circ$ C. Batteries (not supplied): One 1.5 V "O" cell (NEA #13). One 15V (NEA #208). Dimensions: 7" H x 5" W x 2 1/4" D. Test Leads: Supplied.

B) Solid-state VOM

Combines the precision of a vacuum tube voltmeter and the portability of a volt-ohmmeter.



B)



C)

Kit IM-16, 10 lbs., available **52.50**

IM-16 SPECIFICATIONS — DC VOLTMETER — 8 Ranges: 0.5, 1.5, 5, 15, 50, 150, 500, 1500 V. Input resistance: 11 megohms on all ranges. Accuracy: $\pm 3\%$ of full scale. AC VOLTMETER — 8 Ranges: 0.5, 1.5, 5, 15, 50, 150, 500, 1500 V. Input resistance: 1 megohm. Accuracy: $\pm 5\%$ of full scale. OHMMETER — 7 Ranges: x1 (10 ohm center scale), x10, x100, x1k, x10k, x1 megohm. INPUT — Probe with shielded cable: AC-ohms/DC switch in probe. (Single plug for probe & common connections). POWER SUPPLIES — Amplifier circuit: Power line, 120/240 VAC, 50/60 Hz. Battery, 9 V NEA 1602 or equivalent. Ohms circuit: Battery, 1.5 V (one "C" cell), Meter: 6", 100 μ A (100° movement). Dimensions: 5 1/2" H x 16 1/2" W x 7 1/4" D.

C) Deluxe solid state high-impedance VOM

Ideal for solid-state circuit analysis. Extra low current and voltage ranges.

Kit IM-25, 11 lbs., available **85.00**

IM-25 SPECIFICATIONS — DC VOLTMETER — 9 Ranges: 0.15, .5, 1.5, 5, 15, 50, 150, 500, 1500 V full scale. Input resistance: 11 megohms on all ranges. Accuracy: $\pm 3\%$ of full scale. DC MILLIAMMETER — 11 Ranges: 0-.015, .05, .15, .5, 1.5, 5, 15, 50, 150, 500, 1500 mA full scale. Input resistance: 0.10 ohm (1500 mA). Accuracy: $\pm 4\%$ of full scale. AC VOLTMETER — 9 Ranges: 0-.15, .5, 1.5, 5, 15, 50, 150, 500, 1500 V full scale. Input resistance: 10 megohm shunted by 175 pF (measured at probe tip). Accuracy: $\pm 5\%$ of full scale. Frequency response: ± 2 dB, 10 Hz to 100 kHz. AC MILLIAMMETER — 11 Ranges: 0.015, .05, .15, .5, 1.5, 5, 15, 50, 150, 500, 1500 mA full scale. Input resistance: 0.1 ohm (1500 mA) to 10 k ohm (.015 mA). Accuracy: $\pm 5\%$ of full scale. OHMMETER — 7 Ranges: 10 ohm center scale x1, x10, x100, x1k, x10k, x100k, x1 meg. Terminal voltage 70 mV (not sufficient to cause diode junction conduction). Probe: Combined AC-OHMS-DC switching probe. Meter: 6", 200 μ A 100° movement. Power supplies: Battery operation; "C" cells. Line operation; Transformer operated 1/2 wave circuit, operable on either 120/240 VAC, 50/60 Hz. Dimensions: 5 1/2" H x 13 1/2" W x 6 1/4" D.

at traditional kit-form savings

**Kit, or
Assembled.
Tested.
Calibrated**



- 11 megohm input resistance
- Single test probe for all measurements

29⁹⁵ Kit
NO MONEY DOWN

55⁹⁵ Assembled
NO MONEY DOWN



Top-value Heathkit IM-18 VTVM

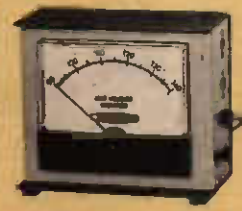
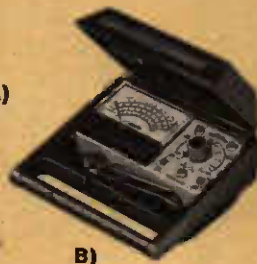
For decades, Heathkit VTVMs have been prized by owners for their convenient size, practical meter ranges, single test probe, and low cost. The IM-18 possesses all of these traditional Heathkit values, plus impressive features of its own: a single probe for all measurements—seven AC, seven DC, and seven Ohms ranges; precision 4½" 200 μA meter; 1% precision divider network resistors; ±1 dB 25 Hz to 1 MHz frequency response; rms & p-p AC voltage measurements; 120/240 VAC wiring options.

Kit IM-18, 5 lbs., mailable 29.95
Assembled SM-20A, wired version of the IM-18 in handsome black & white styling (not shown), 6 lbs., mailable 55.95

IM-18 SPECIFICATIONS—Meter scales: DC & AC (rms): 0-1.5, 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). Tubes: 12AU7, 6AL5. Battery requirements: 1.5 V, size "C" cell (not supplied). Power requirements: 120/240 VAC, 50/60 Hz, 10 W. Dimensions: 7¾" H x 4¾" W x 4¼" D.



**Kit, or
Assembled.
Tested.
Calibrated**



**Kit, or
Assembled.
Tested.
Calibrated**

A) Service bench VTVM

A deluxe service bench version of the popular Heathkit IM-18.
Kit IM-28, 7 lbs., mailable 39.95
Assembled SM-21A, wired version of the IM-28 in handsome black & white styling (not shown), 7 lbs., mailable 59.95

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 (.353 of peak-to-peak). Frequency Response (5 V range): ±1 dB 25 Hz to 1 MHz (600 ohm source, referred to 60 Hz). Circuit: Halfwave voltage doubler, using twin diode. Accuracy: 5% of full scale. Input Resistance & Capacitance: 1 megohm shunted by 40 pF measured at input terminals (200 pF at probe tip). OHM-METER—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. Probe: Combined AC-OHMS-DC switching probe, single jack input for probe and ground connections. Dividers: 1% precision type. Battery: 1½ V, "C" cell. Power Requirements: 120/240 VAC, 50-60 Hz, 10 W. Dimensions: 5" H x 12¼" W x 4¾" D.

B) Heathkit IM-17 portable VOM

All solid-state with FET Input. Features include portable battery operation, zero and ohms adjust controls, accessory probe jack, DC polarity reversing switch, three built-in test leads, easy 3-5 hour assembly. Not recommended for use in RF fields.
Kit IM-17, 4 lbs., mailable 22.50

IM-17 SPECIFICATIONS—DC VOLTMETER—Four ranges: 0-1, 10, 100, 1000 V full scale. Input resistance: 11 meg. on all ranges. Accuracy: ±3% of full scale. AC VOLTMETER—Four ranges: 0-1, 10, 100, 1000 V full scale. Input resistance: 1 meg. on all ranges.



Etched Circuit RF Probe with 11 meg input; for RF measurements from 1000 Hz to over 100 MHz; 1000 VDC max. at tip; 90 V rms RF max.
Kit PK-3, 1 lb., mailable 5.00
Assembled PKW-3, 1 lb., mailable 7.00

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. Amplifier circuit: 8.4 V mercury cell (NEDA #1611), batteries not supplied. GENERAL—Meter: 4½", 200 μA, 100° movement. Dimensions: 5¾" H x 9¾" W x 9" D.

C) Heathkit line voltage monitor

The ideal accessory for labs, shops, hams & CBer's, hobbyists. When calibrated from a source of known accuracy, the IM-103 has an accuracy of ±2%. The large, expanded scale meter lets you know at a glance what your power line voltage is...without having to use a separate AC voltmeter...without having to depend on utility company estimates.
Kit IM-103, 3 lbs., mailable 16.95

IM-103 SPECIFICATIONS—Voltage range: 90 VAC (rms)—140 VAC (rms). Voltage accuracy (sine wave): ±2% when calibrated with a known line voltage. Power requirements: 90-140 VAC, 50-60 Hz, 4.2 W. Dimensions: 5¾" H x 6¼" W x 3" D.

D) Laboratory AC VTVM

Kit IM-38, 5 lbs., mailable 41.95
Assembled SM-22A, wired version of the IM-38 in handsome black & white styling (not shown), 6 lbs., mailable 59.95

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 dB, 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 requirements: 120/250 VAC, 50/60 Hz, 10 W. Dimensions: 7¾" H x 4¾" W x 4¼" D.



30 KV DC Probe x 100 on DC range of 11 meg. input; 1100 megohm input for hi Z circuits. 2% resistors.
Kit 336, 1 lb., mailable 6.50
Assembled 336W, 1 lb., mailable 7.95

charg-a-kit—No money down on any kit—up to 2 years to pay—see page 42 for details.

Get performance you can count on

Heathkit IB-1103 Counter reads to 180 MHz with phase-locked frequency multiplier



Pushbutton selection permits multiplication by 1 (direct), 10, 100 or 1000. An input frequency of up to 10 kHz can be measured down to 0.001 Hz. A temperature compensated crystal oscillator (TCXO) generates the time base, and three push-buttons provide 1 millisecond, 100 millisecond and 1 second gate times. The Heathkit IB-1103 has an input sensitivity of 50 mV to 120 MHz and 100 mV to 180 MHz. A rear panel switch permits by-passing the internal oscillator to allow use of any external time base up to 3 volts. In addition to the cold-cathode display tubes, the readout circuitry provides range lamps for MHz, kHz and Hz, plus Gate, Over-range, and unlocked indicators.

Kit IB-1103, 12 lbs., available \$379.95

IB-1103 SPECIFICATIONS - FREQUENCY MEASUREMENTS - Range: 1 Hz to 180 MHz. Gate time: 1 msec., 100 msec, or 1 sec. Accuracy: ± 1 count \pm time base stability. Readout: MHz, kHz, or Hz with positioned decimal. **SIGNAL INPUT -** Maximum sensitivity: 50 mV to 120 MHz, 100 mV to 180 MHz. Coupling: AC and DC (two separate inputs). 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° to 40° C. Line voltage 0.5 ppm with $\pm 10\%$ voltage change. Frequency trimming: Accuracy ± 1 ppm. Range ± 10 ppm. Sample rate: Approx. 500 msec. (time between two openings of counting gate). **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 10kHz. Accuracy: x10: ± 1 count \pm time base accuracy. x100: ± 1 count \pm time base accuracy. x1000: At less than 500 Hz, ± 1 count \pm time base stability. At greater than 500 Hz, ± 2 counts \pm time base stability. To remain locked: Frequency rate of change must not exceed 10 Hz. Lock time after step frequency change: x10 & x100: 5 sec. for frequencies less than 500 Hz; 3 sec. for frequencies greater than 500 Hz. x1000: 1.5 sec. for frequencies less than 500 Hz; 1 sec. for frequencies greater than 500 Hz. Lock indicator: Front panel lamp; "Off" = locked, "On" = unlocked. **EXTERNAL TIME BASE INPUT -** Frequency: 1 MHz with stability greater than 10^{-5} . Input impedance: 1000 ohms. Maximum Input: 3 V rms. **GENERAL -** Display: 8 1/2 digits plus overrange, gate, MHz, kHz, Hz and unlocked lamps. Operating temperature range: Operating 10°C to 40°C. Power requirements: 120/240 VAC, 50/60 Hz, 40 W when not using frequency multiplier, 45 W when using frequency multiplier. Connectors: 3 BNC's. Input (AC & DC) on front panel; external clock on rear panel. Dimensions: 3 3/4" H x 8 5/8" W x 9 1/4" D.



An extender circuit board is provided to allow easy access to the input, time base or frequency multiplier circuit boards for in-circuit servicing.

379⁹⁵
NO MONEY DOWN

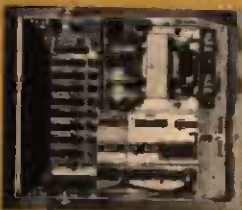
IB-1102 Counter reads to over 120 MHz in 8 digits



The Heathkit IB-1102 Counter is one of the most versatile, easy-to-use frequency counter we've ever offered. It has an overrange lamp, gate lamp, and two range indicator lamps for an easy-to-read display. Overall accuracy is assured by the use of the temperature compensated "clock." The high-impedance (FET) input circuit presents minimum loading to the circuit under test. And an automatic triggering level feature offers simple "hands-off" operation. The IB-1102 features a sensitivity of 50 mV to 120 MHz. It will accept inputs up to 120 V rms without damage to the instrument. The time base crystal oscillator is temperature compensated and offers ± 1 ppm stability from +10° to +40°C with an aging rate of less than ± 1 ppm/yr. The full eight-digit cold-cathode readout lets you read frequencies with the best possible resolution (down to 1 Hz) without bothering to switch the time base.

Kit IB-1102, 12 lbs., available \$299.95

IB-1102 SPECIFICATIONS - FREQUENCY MEASUREMENTS - Range: 1 Hz to 120 MHz. Gate time: 1 msec. or 1 sec. Accuracy: ± 1 count \pm 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 $\pm 10\%$ 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 $> 10^{-5}$. Input impedance: 1000 Ω . 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 requirements: 120/220 VAC, 50/60 Hz, 30 W. Connectors: Two BNC's. Input on front panel; external clock on rear panel. Cabinet dimensions: 8 5/8" W x 3 3/8" H x 9 1/4" D.



All ICs are mounted on plug-in connectors, and three of the four fiberglass circuit boards plug into the chassis for ease of construction and service. The counter can be wired for either 120 or 240 VAC operation.

299⁹⁵
NO MONEY DOWN

with Heathkit® frequency counters

5-digit counter measures 1 Hz to 100 MHz

- 1 Hz to 100 MHz capability
- Wide-range input without adjustment

The Heathkit IB-1101 Counter has an exclusive Heath-designed input circuit that will accept input levels from less than 50 mV to 140 V rms, depending on frequency, without damage to the instrument. The full five-digit readout can be expanded to eight-digit capability by a simple method using the over-range circuitry. To make accurate readout and operation even easier digits are positioned automatically with respect to decimal point, and MHz, kHz, over-range and gating conditions are shown as illuminated legends on the front panel. The one megohm input impedance and low input capacitance minimize the possibility of circuit loading. The all solid-state circuitry and cold cathode readout tubes mean instant operation whenever the counter is turned on.

Count storage circuitry provides a non-blinking or count-up readout changing only if the count varies. The time-base crystal is custom designed for rigid stability, with accuracy better than ± 3 ppm from 17° to 32°C.

Kit IB-1101, 8 lbs., mailable **229.95**

IB-1101 SPECIFICATIONS — Frequency range: 1 Hz to over 100 MHz. Accuracy: ± 1 digit \pm time base stability. Sensitivity: 50 mV rms, to 50 MHz, 100 mV rms, 50 MHz to 100 MHz. Gate time: 1 ms or 1 sec., with auto. reset. Input impedance: 1 megohm, shunted by less than 15 pF. Maximum input voltage: 140 V rms at 400 Hz decreasing to 3 V rms @ 100 MHz. Maximum dc input 200 V. External standard input: 1 MHz, 2.5 V rms to 6.5 V rms, sine or square wave, approx. 2.5 k ohms, 70 pF. Time base (after 30 min. warmup): 1 MHz. Time base stability (after 30 min. warmup): Better than ± 3 PPM between 17° C

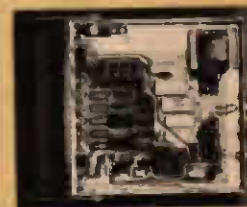


229⁹⁵

NO MONEY DOWN

and 32° C. Better than 1 PPM/month after 30 days operation. Better than ± 20 PPM between 0° C and 40° C. Front panel indications: 5 10-numeral cold-cathode tubes, 4 neon lamps for overrange, gate, MHz and kHz. Rear panel: Input sensitivity control, time base osc. adjust, BNC external standard input (1 MHz), TP level terminal, removable 3-wire line cord. Front panel: Power off/on switch, range MHz/kHz switch, BNC input connector. Power requirements: 120/240 VAC, 50/60 Hz, 15 W. Dimensions: 3 $\frac{3}{8}$ " H x 8 $\frac{1}{4}$ " W x 9" D.

You can build your IB-1101 in approximately 10 hours. All components mount neatly on one double-sided fiberglass board.



IB-1100 Counter resolves 1 Hz with 100 mV sensitivity

The Heathkit IB-1100 Counter puts a 1 Hz to over 30 MHz counter in everybody's price range. Switch the kHz/MHz switch to MHz and you read to the nearest kHz. Put it in the kHz position and read down to the last Hz. The lighter Overrange indicator makes misreading virtually impossible. The custom-designed time-base circuitry assures rigid stability, accuracy better than ± 3 ppm from 22° to 37°C. A diode-protected J-FET gives improved triggering over inputs from 100 mV rms to 150 V rms — and also never needs adjusting. Input impedance is 1 megohm, shunted by 20 pF, to minimize loading.

Kit IB-1100, 6 lbs., mailable **169.95**

IB-1100 SPECIFICATIONS — Frequency range: 1 Hz to over 30 MHz. Accuracy: ± 1 digit \pm time base stability. Sensitivity (after 30 minute warmup): 100 mV rms typical, 200 mV rms max. Gate time: 1 msec. or 1 sec.; with automatic reset. Input impedance: 1 megohm shunted by less than 20 pF. Max. Input voltage: 150 V rms to 100 kHz. Derate 48 V per decade above 100 kHz. (Maximum dc input 200 V). Time base frequency: 1 MHz. Time base stability: (After 30-min. warmup): Less than ± 3 ppm between 22°C and 37°C. Less than 1 ppm/month after 30 days operation. Less than ± 20 ppm between 10° and 40°C. Front panel indications: Five 10-numeral, cold-cathode tubes, plus neon lamp for Overrange. Rear panel: Time Base Osc adjustment, TP Level control, TP Output terminal. Ambient temp. range: Storage -55°C to +80°C. Operating 10°C to 40°C. Power requirements: 120/240 VAC, 50/60 Hz, 15 W. Dimensions: 3 $\frac{3}{8}$ " H x 7 $\frac{1}{4}$ " W x 8 $\frac{7}{8}$ " D.



169⁹⁵
NO MONEY DOWN

Heathkit IB-102 Frequency Scaler

The IB-102 will divide input frequencies from 2 MHz to 175 MHz with the scaled output fed to any compatible frequency counter with a 1 megohm input. Front panel switch-selection of 10:1 or 100:1 scaling ratios... resolution down to 10 Hz, with a counter having a 1 second time base. For use with frequencies within the range of the counter being used, a 1:1 switch position provides straight-thru counting without scaling.

Not for use with the Heathkit IB-1102.

Kit IB-102, 8 lbs., mailable **89.95**

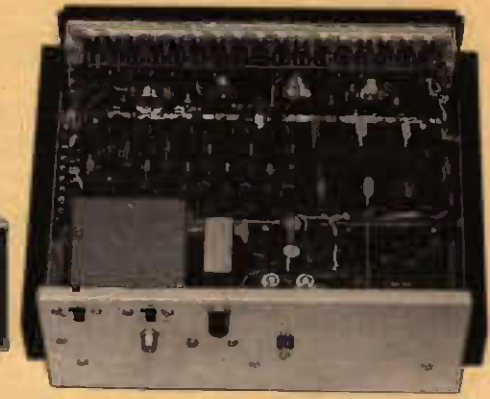
IB-102 SPECIFICATIONS — Frequency Range: 2 MHz to 175 MHz. Resolution: Counter with 1 millisecond time base — divide by 10=10 kHz; divide by 100=100 kHz. Counter with 1 second time base — divide by 10=10 Hz; divide by 100=100 Hz. Meter: Green area indicates adequate signal level. INPUT — Sensitivity: 50 mV, 2 MHz to 100 MHz, 125 mV, 100 MHz to 175 MHz. Impedance: Divide by 1, same as frequency counter. Divide by 10 and 100, 50 ohms. Amplitude (maximum): 3 volts RMS. OUTPUT — Amplitude (minimum): 1 volt across 1 megohm and 20 pF load. Rise Time: 20 nanosecs. Fall Time: 10 nanosecs; Offset from Ground: Adjustable from zero to ± 500 millivolts. GENERAL — Power Requirements: 110-130 or 220-260 VAC, 50/60 Hz, 5 watts. Ambient Temperature Range: Storage, -55 degrees C to 80 degrees C. Operation, 10 degrees C to 40 degrees C. Dimensions: 8 $\frac{1}{4}$ " W x 3 $\frac{3}{8}$ " H x 9" D (not including handle).



89⁹⁵
NO MONEY DOWN

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

There's a kit or assembled Heathkit test



139⁹⁵ Kit
NO MONEY DOWN

199⁰⁰ Assembled
NO MONEY DOWN

Heathkit Post-marker/Sweep Generator

You can complete any alignment job quickly and successfully with a scope, a VTVM and the IG-57A. That's all you need to align virtually any B&W or color receiver on the market. You can check the overall receiver frequency response from the antenna terminals through the tuner, IF strip, video detector, to the color bandpass amplifier outputs. New circuitry provides sweep-modulated picture carriers — not only at 45.75 MHz for the tuner mixer input, but also 67.25 MHz for the antenna terminal output. The exclusive Heathkit external attenuator enables you to set bandwidth accurately in seconds and eliminates guessing at important 6 dB amplitudes. There are 15 crystal-controlled markers — four for color bandpass, one for FM IF, eight for TV IF frequencies from 39.75 to 47.25 MHz — plus markers for channels 4 & 10 picture and sound carriers. Now you accurately locate picture and sound carriers, 6 dB points and trap locations. Three Sweep Oscillators in stable Colpitts circuits produce five ranges using harmonics for color bandpass, FM IF, Video IF bandpass, VHF channels 4 & 10. Just the right size for the job, the IG-57A measures only 13 3/4" W x 5 1/2" H x 12" D — doesn't waste valuable bench space. The front panel controls are easy to read, easy to use. It utilizes quick-

disconnect BNC connectors and comes complete with four coaxial cables, four test leads and a demodulation probe.

Kit IG-57A, 15 lbs., mailable 139.95

Assembled SG-57A, wired version of the IG-57A in handsome black & white styling (not shown), 16 lbs., mailable 199.00

IG-57A SPECIFICATIONS — Marker frequencies: 100 kHz. Marker frequencies, crystal-controlled: 3.08, 3.58, 4.08, and 4.50 MHz $\pm 0.1\%$. 10.7, 39.75, 41.25, 42.17, 42.50, 42.75, 45.00, 45.75, 47.25, 67.25 and 193.25 MHz $\pm 0.05\%$. 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. Type of marker: Birdie. Controls: Bias controls; Marker/Trace — dual concentric; Sweep Width/Sweep Center — dual concentric; Marker Out — concentric with Sweep Range switch; and Phase. Switches: Rocker type — separate switch for each of the above listed frequencies; Blanking, On/Off; Trace Reverse; Modulation On/Off. Sweep frequency ranges and output voltage: LO Band — 2.5 to 5.5 MHz ± 1 dB at 0.5 volts RMS (min.) fundamentals, and 10.7 MHz on harmonics. IF Band — 38 to 49 MHz ± 1 dB, at 0.5 volts RMS (min.) fundamentals. RF band — 64 to 72 MHz ± 1 dB at 0.5 volts RMS (min.) fundamentals and 192 to 198 MHz on harmonics. Attenuator: Total of 70 dB of attenuation in seven steps — 1 dB, 3 dB, 6 dB, 10 dB, 10 dB, 20 dB and 20 dB. Power requirements: 120 V, 60 Hz AC at 4.5 watts.

Heathkit Stereo Generator

The Heathkit IG-37 FM Stereo Generator has all the signals you need for quick alignment of FM/FM Stereo equipment. There's an audio or composite stereo signal for multiplex adapter adjustments... an RF carrier modulated by these signals for tuner and receiver adjustments... a "phase test" function for accurate adjustment of sub-carrier transformers... a variable-level crystal-controlled 19 kHz (± 2 Hz) pilot signal to check the lock-in range of stereo receivers... and built-in sweep and marker signals for overall RF and IF alignment. Carrier signal is adjustable up to 2 MHz above or below its normal frequency to permit alignment on a clear portion of the FM band.

New front panel and controls are "human engineered" and "technician proven" for maximum utility. Select either right or left channel signals or the special "phase test" from the front panel — no balancing required for equal right and left channel modulation level. Provides switch-selected frequencies, either direct or modulated RF, of 400 Hz, 1000 Hz, 5000 Hz, 19 kHz, and one of two special SCA (subscription service) frequencies (65 kHz or 67 kHz), to provide a versatile system for aligning even the most advanced-design tuners. Complete with leads.

Kit IG-37, 12 lbs., mailable 79.95



79⁹⁵
NO MONEY DOWN

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 ranges: 60 dB in 20 dB steps. Crystal-controlled markers: 10.7, 90.95, 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; 19 kHz (± 2 Hz); 38 kHz & SCA (65 or 67 kHz). Distortion: (At 400, 1000, & 5000 Hz) Less than 5%. Power requirements: 120/240 VAC, 50/60 Hz, 35 W. Dimensions: 5 1/2" H x 13 1/2" W x 9" D.

instrument for almost every service need



124⁹⁵
NO MONEY DOWN

Heathkit Vectorscope/Color Generator

A good tech knows his instruments inside and out — and we make it easy with the IO-101. You build it on your own bench and the manual is full of circuit descriptions, schematics and theory of operation data. You mount the solid-state circuitry on two boards, wire-up the controls and our exclusive 3-in. flat-face CRT. Ten ICs, comprising 15 J-K flip-flops and eight gates, and the crystal-controlled clock in the divider chain eliminate extensive final adjustment while increasing overall accuracy and stability.

The vector pattern indicates the ten color bars generated, amplified and demodulated by the color receiver circuitry — accurately represents the chroma signal fed to the CRT guns. Shows at a glance missing or weak colors — proper adjustment of burst phase transformer, reactance coil, oscillator coil and bandpass transformer. Color demodulation angle can also be checked.

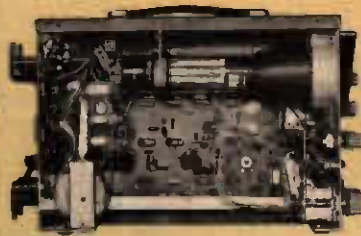
A grid cathode switch on the rear panel enables all vector patterns to be displayed regardless of how the CRT is driven. There are front panel controls for tuning channels 2 through 6; selecting plus or minus going video signals, sync output, and 4.5 MHz crystal-controlled sound carrier.

Other features include shielded leads for fast connection of RF signal to antenna terminals or video signals to video circuits; gun shorting switches; lead-piercing grid jacks, and two 500 watt grounded AC receptacles for test gear or TV.

Kit IO-101, 12 lbs., mailable **124.95**

IO-101 SPECIFICATIONS — PATTERNS — Purity: Produces a snow-free raster for purity adjustments. **Dots:** 9x9 produces a display of 110 small dots. 3x3 produces a display of nine dots for convergence adjustments. **Crosshatch:** 9x9 produces a display of 11 vertical and 10 horizontal lines. 3x3 produces a display of three vertical and three horizontal lines for convergence and linearity adjustments. **Horizontal Lines:** 9x9 produces a display of 10 horizontal lines. 3x3 produces a display of three horizontal lines for vertical linearity and pin-cushion adjustments. **Vertical Lines:** 9x9 produces 11 vertical lines. 3x3 produces a display of 3 vertical lines for horizontal linearity and convergence adjustments. **Color Bars:** 9x9 produces a display of ten standard color bars. 3x3 produces a display of three 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 for color gun level adjustments. **OUTPUT SIGNALS — Video:** Greater than ±1 volt peak-to-peak composite signal for composite signal injection beyond the video detector. **RF:** Variable to approximately 25,000 μV output, channels 2 through 6, for composite signal injection into the TV receiver antenna input terminals. **Sync:** Greater than 3.5 volts peak-to-peak signal for servicing sync circuits without video, or sets having separate video and sync demodulator phase adjustments. **GENERAL — Power Requirements:** 105-125 or 210-250 VAC, 50/60 Hz, 20 Watts. **Cabinet 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.



The IO-101 produces 12 patterns plus a clear raster for purity adjustments. All patterns are available at the turn of a knob, either in the familiar 9x9 or the exclusive Heath 3x3 display.

Heath Color Bar/Pattern Generator

Reliable solid-state circuitry with 10 ICs assembles quickly and easily on two roomy boards. Has 12 patterns plus raster; dots, cross hatch, vertical and horizontal bars and shading bars in either the familiar 9x9 display or the exclusive Heath 3x3.

Kit IG-28, 8 lbs., mailable **79.95**

Assembled SG-28A, wired version of the IG-28 in handsome black & white styling (not shown), 10 lbs., mailable **114.95**

IG-28 SPECIFICATIONS — Output signals: Video — Greater than ±1 V peak-to-peak composite signal for composite signal injection behind the video detector. **RF —** Variable to 50,000 μV output, channels 2 through 6, for composite signal injection into the receiver antenna input terminals. **Sync —** Greater than 3.5 V peak-to-peak signal for servicing sync circuits without video, or sets having separate video and sync demodulators. **Control Grids (3) —** Individual red, blue, and green control grid signals for viewing chroma signal demodulator phase adjustments. **Power supply:** Transformer operated, full-wave zener diode regulated. **Input —** 120/240 VAC, 50/60 Hz. **Output —** 3.6 VDC, 500 mA, zener diode regulated. **Dimensions — overall:** 5½" H x 13½" W x 8" D.



Kit or Assembled, Tested, Calibrated

Heathkit TV Vector Monitor

The IO-1128 uses our exclusive 3-in. flat-face tube and associated circuitry from the Heathkit Vectorscope mounted in a separate cabinet. Designed for use with the IG-28 Color Bar & Dot Generator or similar unit, the IO-1128 displays "rainbow" (offset carrier) color bar patterns. Helps you perform fine tuning, static and dynamic convergence, purity, 3.58 oscillator, reactance coil, phase detector transformer, demodulator angle check, and chroma bandpass adjustments. Indicates all color bars generated, amplified and demodulated by the color TV.



Kit IO-1128, 10 lbs., mailable **49.95**

IO-1128 SPECIFICATIONS — Switches: Power on-off, red gun, blue gun, green gun on front panel. **Chroma switch** on rear panel. **Controls:** Intensity, horizontal position, vertical position, focus (screwdriver adjust), astigmatism (screwdriver adjust), Graticule with radial patterns. **For use with all colorbar generators which produce vertical color bars (offset carrier).** **Cathode ray tube:** 3RPIA, flat-faced CRT (green trace on white background). **Power requirements:** 120/240 VAC, 50/60 Hz, 10 W. **Dimensions:** 6½" H x 5¾" W x 12¼" D.

Heathkit[®] generators for lab or shop

Heathkit Sine-Square Wave Generator

The Heathkit IG-18 generator provides 1 Hz to 100 kHz sine wave output at 5% accuracy, with less than 0.1% distortion from 10 Hz to 20 kHz. Square wave output is from 5 Hz to 100 kHz, less than 50 ns rise time. Both outputs are floating and available simultaneously. Switch-selected internal/external load.

Kit IG-18, 12 lbs., mailable **69.95**

Assembled SG-18A, wired version of the IG-18 in handsome black & white styling (not shown), 10 lbs., mailable **99.50**

IG-18 PARTIAL SPECIFICATIONS - GENERAL: Frequency selection: 0-100 switch (steps 10), 0-10 switch (steps of 1), 0-1 control (vernier) & multiplier switch (x1, 10, 100, 1000). **SINE WAVE OUTPUT:** Output voltage: 8 ranges, 0.003 to 10 Vrms (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: $\pm 10\%$ of full scale with proper load termination. **SQUARE WAVE OUTPUT:** Output voltage (peak-to-peak): .1, 1, 10 V into 2000 ohm load or higher. Output impedance: .1 V and 1 V ranges: 52 ohm; 10 range: up to 220 ohm.



Kit, or Assembled, Tested, Calibrated

69⁹⁵ KIT
NO MONEY DOWN

99⁵⁰ ASSEMBLED
NO MONEY DOWN

Heathkit Audio Intermodulation Analyzer

Combines AC VTVM, wattmeter and IM analyzer in one. Has built-in high and low signal sources for IM tests, load resistors for 4, 8, 16 & 600 ohms. 120/240 VAC, 50/60 Hz, 20 W. Measures 8 1/2" H x 13" W x 7" D.

Kit IM-48, 13 lbs., mailable **69.95**



69⁹⁵
NO MONEY DOWN

Heathkit Harmonic Distortion Meter

Measures harmonic distortion as low as 1% full-scale reading from 20-20,000 Hz. Measures noise down to -60 dBm. Meter calibrated in volts rms, % distortion and dB. Requires audio generator such as the IG-72 (below) for alignment, 120/240 VAC, 50/60 Hz, 30 W. 3 1/2" H x 13" W x 7" D.

Kit IM-58, 13 lbs., mailable **67.50**



67⁵⁰
NO MONEY DOWN

Heathkit Low Distortion Audio Generator

Produces near-perfect waveform with less than 0.1% distortion from 20-20,000 Hz. Switch selects frequencies from 10 Hz to 100 kHz, meter monitors output in volts and dB to within $\pm 5\%$ from 10 Hz to 100 kHz. 120/240 VAC, 50/60 Hz, 40 W. 6 1/2" H x 9 1/2" W x 5" D.

Kit IG-72, 8 lbs., mailable **49.95**

Assembled SG-72A, wired version of the IG-72 in handsome black & white styling (not shown), 9 lbs., mailable **74.95**



Kit, or Assembled, Tested, Calibrated

49⁹⁵ KIT
NO MONEY DOWN

74⁹⁵ ASSEMBLED
NO MONEY DOWN

Heathkit Precision RF Generator

Adjustable to $\pm 3\%$ frequency calibration accuracy from 100 kHz to 30 MHz with RF output voltage adjustable from 5 to 100,000 μ V in five attenuated steps, with 10:1 variable attenuation. RF output can be modulated from 0-50% with 5% accuracy: 120/240 VAC, 50/60 Hz. 8 1/2" H x 13" W x 7" D.

Kit IG-42, 15 lbs., mailable **69.95**



32⁹⁵
NO MONEY DOWN



69⁹⁵
NO MONEY DOWN

Heathkit General Purpose RF Generator

Covers 100 kHz to 200 MHz in 6 bands with 2% tuning accuracy. Large accurately calibrated dial scales. Factory wired and aligned coil and band-switch assembly. Modulated or unmodulated RF output. 400 Hz signal modulation and 400 Hz audio output for audio tests. 9 1/2" H x 6 1/2" W x 5" D. 120 VAC, 50/60 Hz.

Kit IG-102, 6 lbs., mailable **32.95**

Instruments for easier solid-state servicing



89⁹⁵

NO MONEY DOWN

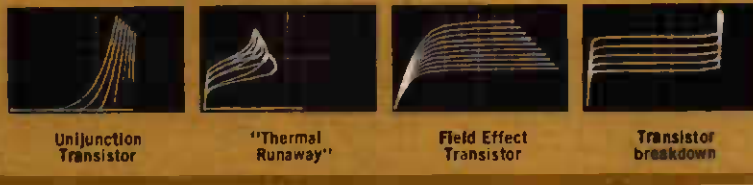
Heathkit Semiconductor Curve Tracer permits display of operating parameters

The Heathkit IT-1121 Semiconductor Curve Tracer is a versatile instrument that can be used by hobbyists, TV servicemen — anyone who works with electronic circuits. When connected to an oscilloscope it accurately displays operating parameters of virtually all types of semiconductors such as bipolar transistors, diodes, SCRs, triacs, FETs, etc. The IT-1121 can be used to select devices for specific applications or for sorting, inspecting, and testing. Extra leads are included for tests of large devices or for in-circuit tests.

The IT-1121 is extremely useful for identifying parameters of unknown semi-conductors. It's a great educational aid, too. The Curve Tracer permits display of fundamental operating parameters and the extensive manual tells how to Interpret each display. Any scope with horizontal sensitivity of 0.5 V/div. and vertical sensitivity of 1 V/div. can be used with the IT-1121. Connecting to the scope is easy with the cables supplied, and a calibration switch enables fast and accurate scope calibration. All major controls are stepped in a 1, 2, 5 sequence for maximum parameter resolution.

Kit IT-1121, 11 lbs., mailable 89.95

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. $\pm 3\%$. Sweep Current Sampling: .5, 1, 2, 5, 10, 20, 50, 100 and 200 mA/div. $\pm 3\%$. Sweep Dissipation Resistors 0, 10, 50, 100, 500, 1000, 5000, 10 k, 50 k, 100 k, 500 k, 1 M $\pm 10\%$. Step Currents Available: .002, .005, .01, .02, .05, .1, .2, 2, 5, and 10 mA/step, $\pm 3\%$, ± 250 nA offset current max. Step Voltages Available: .05, .1, .2, .5, and 1 volt/step, $\pm 3\%$, ± 5 mV maximum offset voltage. Polarity Available: PNP and NPN (P Channel — N Channel). Calibration Source: 9 volts $\pm 2\%$ in 1 volt steps. Oscilloscope Requirements: Vertical sensitivity of 1 volt/cm. Horizontal sensitivity of 0.5 volt/cm. Bandwidth to 20 kHz or greater. (DC-coupled oscilloscope is recommended). Operating Temperature Range: 10°C to 40°C. Temperature variation, referenced at 25°C, will have a maximum effect of $\pm 1\%$ on all other specifications. Power Requirements: 110 to 130 or 220 to 260 VAC. Dimensions: 4 1/2" H x 11 1/4" W x 10" D.



Unijunction Transistor

"Thermal Runaway"

Field Effect Transistor

Transistor breakdown



49⁹⁵

NO MONEY DOWN

Heathkit In-Circuit FET/Transistor Tester

The Heathkit IT-121 In-Circuit FET/Transistor Tester is designed for quick, accurate tests of conventional (bipolar) transistors, diodes, FETs, SCRs, triacs, and unijunction transistors. Gain (DC Beta), transconductance (GM), and leakage values are read directly on the large easy-to-read meter.

Devices can easily be tested either in-circuit using color-coded test leads supplied, or out-of-circuit using the built-in transistor and FET sockets. Single circuit board design makes the IT-121 an enjoyable two-evening project to assemble and the high performance at low cost makes it a top value service and design tool.

Kit IT-121, 6 lbs., mailable 49.95

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 μ mhos. Leakage measurements: Five ranges, 0 to 100 μ A, 0 to 1 mA, 0 to 10 mA, 0 to 100 mA, 0 to 1 A. Out-of-circuit accuracy: $\pm 5\%$ for DC beta and leakage. In-circuit accuracy: indicates good or bad transistor, FET, diode, SCR or triac. Diode tests: Tests for forward conduction and blocking. Unijunction transistor test: Measures V_{eb} , R_{bb} , and emitter current (out-of-circuit). Power requirements: Two 1 1/2 V cells, (alkaline for best performance). Dimensions: 5" H x 9 1/8" W x 8 1/8" D.

Heathkit 12-speed 10" Chart Recorder

- Push-button selection of 12 chart speeds

The Heathkit IR-18M recorder will measure and record any phenomena that varies with time and can be converted to the proper DC voltage level. It features 12 different chart speeds, from 5 sec/in. to 200 min/in. Two input ranges permit accurate voltage measurements on 1 mV and 10 mV full scale.

Kit IR-18M, 15 lbs., mailable 149.95

IRA-18-1, 3 rolls chart paper, (140 ft./roll), 5 lbs., mailable 9.95

IR-18M SPECIFICATIONS — Chart paper: Grid width, 10". Length, 140 ft. roll. Markings, 0-100 right to left. Chart speed: 12 speeds, pushbutton selected, 5, 10, 20, 50, 100, 200 sec./inch and 5, 10, 20, 50, 100, 200 min./inch. Chart span: Two fixed ranges; 1 mV full scale. Pen: Standard cartridge-type fountain pen. Balancing time: Approximately 0.1 sec./inch, 1 second full scale (10"). Input circuit: Self-balancing potentiometer. Input resistance: Essentially infinite at null. Line frequency rejection: (input shorted), 130 dB in common mode. Floating input: +100 VDC maximum with respect to ground. Overall error: Less than 1% of full scale. Maximum recommended source resistance: 100 k ohms. Reference source: Zener regulated supply. Power requirements: 120/240 VAC, 60 Hz, 14 W or 120/240 VAC, 50 Hz, 16 W. Fuse: $\frac{1}{2}$ amp slow-blow (120 VAC). Dimensions: 6" H x 15" W x 9 $\frac{1}{2}$ " D.



149⁹⁵
NO MONEY DOWN

A) Low cost Tube Checker

The IT-17 saves valuable time by eliminating doubt and guesswork as to tube quality before further circuit investigations are made. Tubes are quickly tested for quality on the basis of total emission, for shorts, leakage, open elements, and filament continuity.

Kit IT-17, 12 lbs., mailable 72.50

IT-17 SPECIFICATIONS — Tests: Emission, short, leakage, open element, filament continuity. 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: 6.3, 1.4, 2, 2.35, 2.5, 3.15, 4.2, 4.7, 5, 6.3, 7.5, 9.45, 12.6, 19.8, 25, 32, 50, 70, 110 VAC. Element test voltages: 30, 100, 250 VAC. Power requirements: 120 VAC, 50/60 Hz. Dimensions: 8 $\frac{1}{2}$ " H x 13" W x 5 $\frac{1}{2}$ " D.

electrical measurements involving resistors are made. Range is 1 ohm to 999,999 ohms in 1-ohm steps. All resistors used have $\frac{1}{2}$ % accuracy.

Kit IN-17, 4 lbs., mailable . . . 29.95

SPECIFICATIONS — Range: 1 ohm to 999,999 ohms in 1 ohm steps. Resistors: Precision $\frac{1}{2}$ % accuracy, 1 W. Minimum DC resistance: .25 ohms or less at terminals with all switches at zero. Dimensions: 5" H x 7 $\frac{1}{2}$ " W x 6 $\frac{1}{2}$ " D.

D) Decade Capacitance Box

Three convenient range switches select any capacitance from 100 pF to 0.111 μ F in 100 pF steps. Ideal for use with the IN-17 Decade Resistance Box in solving resistance and capacitance networks where a large range of values is necessary.

Kit IN-27, 3 lbs., mailable . . . 19.95

SPECIFICATIONS — Range: 100 pF to 0.111 μ F increments of 100 pF. Voltage rating: 350 VDC continuous; 500 VDC intermittent; 100 VDC instantaneous test. Accuracy of incremental capacity: \pm %. Stray capacitance: 10 to 15 pF at terminals. Dimensions: 4" H x 7 $\frac{1}{8}$ " W x 5" D.

E) Resistor Substitution Box

Provides switch selection of any one of 36 EIA standard 10% 1-watt resistors, from 15 ohms to 10 megohms. Hi/Lo switch. Case is 5 $\frac{1}{2}$ " H x 3 $\frac{1}{8}$ " W x 3" D.

Kit IN-37, 2 lbs., mailable . . . 7.95

F) Capacitor Substitution Box

Select any of 18 EIA standard capacitors from 100 pF to .22 μ F. All rated at 600 V except three lowest and two highest values, 500 & 400 V respectively. 5 $\frac{1}{2}$ " H x 3 $\frac{1}{8}$ " W x 3" D.

Kit IN-47, 2 lbs., mailable . . . 7.50

B) Heathkit Impedance Bridge

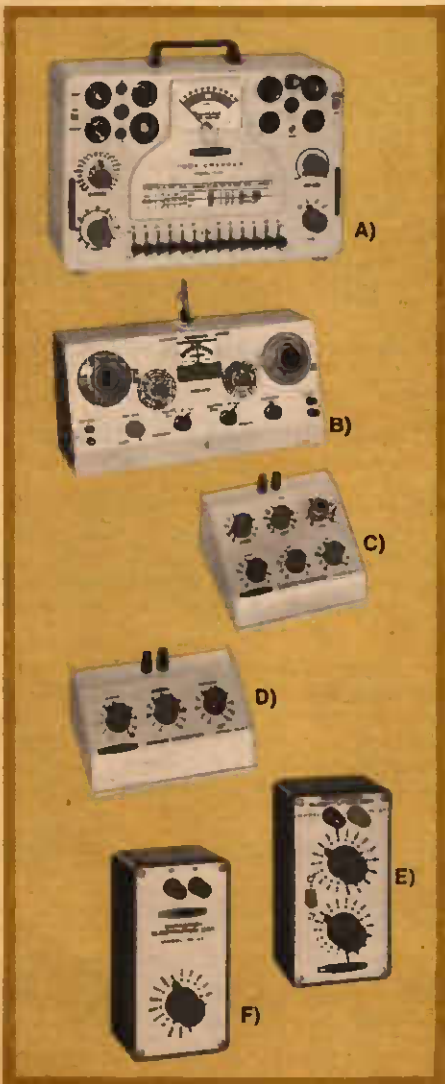
Four separate bridge circuits measure resistance, capacitance, low & high Q inductance. Built-in generator and amplifier. $\frac{1}{2}$ % resistors & silver-mica capacitors for higher accuracy. 50/60 Hz operation. Requires headphones or scope for alignment.

Kit IB-28, 11 lbs., mailable . . 89.95

IB-28 SPECIFICATIONS — Circuit: 4-arm impedance bridge. DC Measurements: Built-in power supply. Binding posts provided for external supply. Meter: 100-0-100 micro-ampere meter. AC Measurements: Built-in 1000 Hz generator. Terminals on panel for external generator at other frequencies. Detector: Vacuum tube detector and amplifier, using built-in meter. Terminals provided for external detector. Resistance: 0.1 ohm to 10 megohm. Capacitance: 100 pF to 100 μ F. Inductance: 0.1 mH to 100 H. Dissipation Factor: (D) 0.002 to 1. Storage Factor: (Q) 0.1 to 1000. Accuracy: $\frac{1}{2}$ % decade resistors used. Tube Complement: (2) 1U4, (2) 1L4. Power Supply: Transformer and silicon rectifier. Power Requirements: 105-125 V. or 210-250 V., 50/60 cycles, 10 watts. Dimensions: 8" H x 17" W x 6" D.

C) Decade Resistance Box

The IN-17 was designed as an accurate laboratory-type instrument for use wherever



the fun-to-build, low cost way to equip your bench



Direct-reading Heathkit Capacitor Checker

- Direct reading scales — no involved calculations
- Low bridge voltage for safe testing of miniature electrolytics
- Measures capacitance from 10 pF to 1000 μ F & resistance from 5 ohms to 50 megohms

Fast, efficient and accurate, the Heathkit IT-28 Capacitor Checker gives you the capability for complete analysis of all capacitor types on direct-reading scales. A low bridge voltage is provided for safe testing of miniature electrolytics. Capacitance can be measured from 10 pF to 1000 μ F, resistance from 5 ohms to 50 megohms and 16 leakage testing voltages are provided. Precision resistors and capacitors in the bridge circuit provide high accuracy and stability.

Terminals are provided to allow use of an external standard, if desired, when making L, C or R measurements. An external audio generator may also be used for checking components at frequencies up to 10 kHz.

The assembly manual includes operating procedures and a complete circuit description including schematic diagrams to explain the various circuit functions.

Kit IT-28, 7 lbs., mailable **39.95**

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 μ F, .001 μ F to .5 μ F, .1 μ F, to 50 μ F, 20 μ F to 1000 μ F. External standard (comparison bridge; maximum ratio 25:1). Resistance ranges: 5 ohm to 5000 ohm, 500 to 500 k ohm, 50 k ohm to 50 megohms. Inductance check: External standard only. Power requirements: 120/240 VAC 50/60 Hz, 30 W. Dimensions: 9 $\frac{1}{2}$ " H x 6 $\frac{1}{2}$ " W x 5" D.

A) Lab Transistor Checker

Checks transistors up to 15 amps and diodes up to 1.5 amps. Tests shorts, DC gain (Beta 0-200 & 200-400), leakage (Icbo, Iceo), diode forward and reverse current under simulated operating conditions. Four lever switches permit eight different tests and measurements, which result in a comparative quality figure rather than the simple good-bad test made by many other transistor testers. Seven 1.5 V "D" batteries (not included) provide power. 5 $\frac{1}{2}$ " H x 10 $\frac{1}{4}$ " W x 10 $\frac{1}{4}$ " D.

Kit IM-36, 9 lbs., mailable **67.50**

B) Transistor/Diode Checker

The IT-27 was designed to provide a compact, battery-powered, portable checker for testing transistors and diodes. Checks high & low power transistors both NPN & PNP, for shorts, leakage, opens, and current gain. Checks forward and reverse current on diodes. Also serves as continuity checker. Uses two 1.5 V "C" cells (not supplied). 3 $\frac{1}{8}$ " H x 3 $\frac{1}{8}$ " W x 3 $\frac{3}{4}$ " D.

Kit IT-27, 2 lbs., mailable **6.95**

C) In-circuit Transistor & Diode Tester

Checks transistors and diodes in or out of circuit. Measures transistor gain (DC Beta) out of circuit, range 2-100, 20-1000. Measures leakage out of circuit, range 0-5000 μ A. Tests diodes for opens and shorts and identifies unknown leads. Matches and identifies NPN and PNP transistors. Battery-powered circuit can't harm transistors or diodes. Not for use with high power or switching transistors.

Kit IT-18, 4 lbs., mailable **25.95**

IT-18 SPECIFICATIONS — D. C. Beta: x1 range — 2 to 100, x10 range — 20 to 1000. Out-of-circuit accuracy: \pm 5%. In-circuit accuracy: Indicates good or bad (accuracy depends upon circuit being tested); I_{ceo} (out-of-circuit only) — 0-5000 μ A; I_{sbo} (out-of-circuit only) 0-5000 μ A diodes; forward or reverse current — 0-5000 μ A. Power: One standard "D" cell (not supplied). Dimensions: 4 $\frac{1}{2}$ " H x 8 $\frac{1}{2}$ " W x 7 $\frac{1}{4}$ " D (including handle).

D) Heathkit Visual-aural Signal Tracer

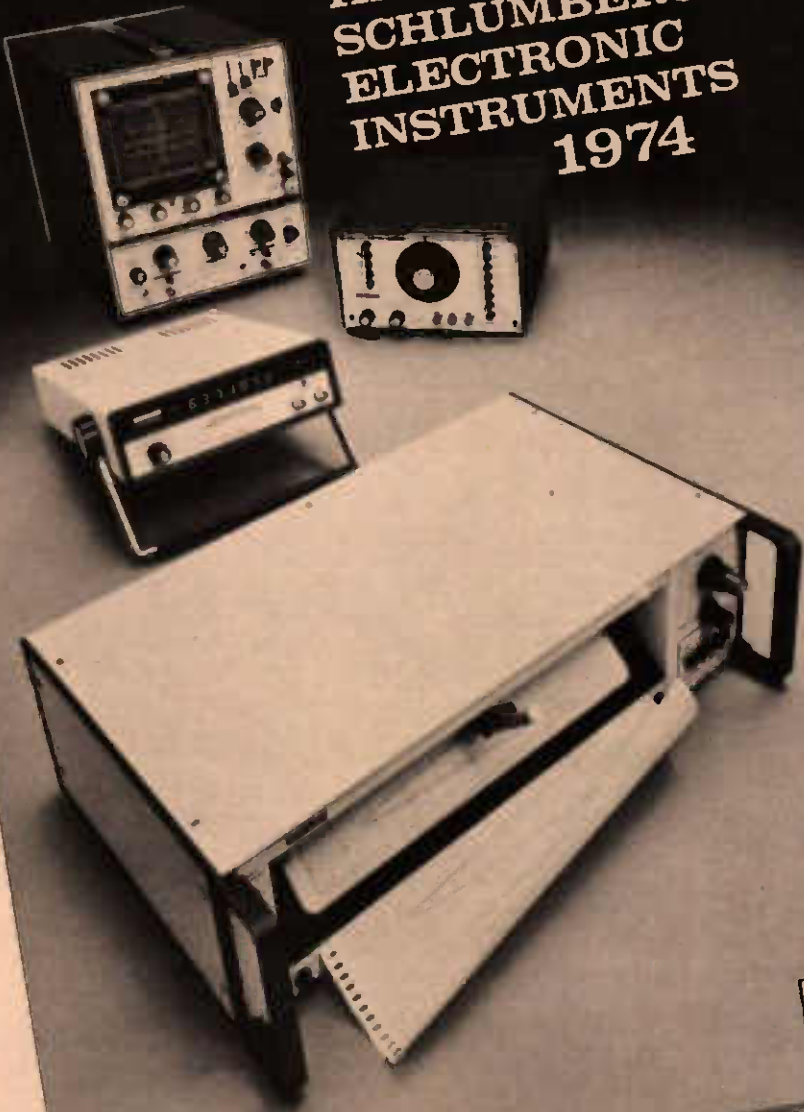
With the versatile IT-12, you can trace RF, IF and audio signals, locate noisy or intermittent components. A built-in 3 $\frac{1}{2}$ " speaker is provided for sound and an eye tube indicator permits visual observation of the output level. Has audio/RF probe with switch, doubles as test amp or speaker. Can be wired for 120/240 VAC, 50/60 Hz, 25 W. 7 $\frac{1}{2}$ " H x 4 $\frac{1}{2}$ " W x 4" D.

Kit IT-12, 6 lbs., mailable **25.95**



FREE

HEATH/ SCHLUMBERGER ELECTRONIC INSTRUMENTS 1974



The new Heath/Schlumberger assembled instruments catalog is here...and the price is right! Thirty-two pages of high performance, low cost equipment for design, service and educational applications...all factory-assembled and calibrated...all covered by our one-year parts and labor warranty...and all available at low, direct-to-you mail order prices. Check out the wide selection:

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- Generators
- TV alignment equipment
- Strip chart recorders
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Heathkit® 3-Channel R/C System converts to 4

Heathkit GDA-1057 3-Channel R/C System

- Available at special system prices, compatible with all Heathkit Servos
- Available on all R/C frequencies

The Heathkit GDA-1057 3-Channel System, quickly and economically becomes 4 channels with the addition of an optional conversion kit. Order 3 now, add the fourth later. It's a system designed to grow as your plans do.

The Heathkit GDA-1057 system uses the flight proven circuitry found in the popular Heathkit GD-19. The GDA-1057-1 3-Channel Transmitter comes with a 2-axis stick assembly. Add the GDA-1057-4 conversion and you put 3 channels on the stick with the fourth controlled by a thumb tab. The GDA-1057-1 Transmitter is available on all R/C frequencies, and is housed in a slender new case for positive one-hand action during launch or engine adjustment. Other top-flight features include all nickel-cadmium battery packs with external charging unit, vinyl-covered front panel, adjustable hand-strap, telescoping whip antenna, and relative power output meter that doubles as a battery-charging indicator. The compact GDA-1057-2 3-Channel Receiver has a molded nylon case and connector block for servos and receiver battery pack. It's compatible with all Heathkit servos, and the GDA-1057-4 conversion kit converts it to 4-channels also.

SPECIAL SYSTEM PRICE #1 — Order 3-Channel Transmitter, Receiver, Receiver Battery, two GDA-19-4 Standard Servos 139.95

SPECIAL SYSTEM PRICE #2 — Order same system as above, substituting GDA-405-44 Miniature Servos 149.95

SPECIAL SYSTEM PRICE #3 — Order same system as above, substituting GDA-505-44 Sub-miniature Servos 149.95

SPECIFY FREQUENCY WHEN ORDERING

Kit GDA-1057-1, 3-channel transmitter, 4 lbs., mailable 74.95

Kit GDA-1057-4, 4-channel conversion pack for both transmitter and receiver, 1 lb., mailable 19.95

Kit GDA-1057-2, 3-channel receiver, 1 lb., mailable 34.95

Kit GDA-405-3, receiver battery, 1 lb., mailable 9.95

Kit GDA-19-4, standard servo, 1 lb., mailable 19.95

Kit GDA-405-44, miniature servo, 1 lb., mailable 24.95

Kit GDA-505-44, sub-miniature servo, 1 lb., mailable 24.95

GDA-1057-1 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 9.5V, 500 mA hours, nickel-cadmium battery. Rechargeable simultaneously with receiver battery at 50 mA from external charger. Frequencies available: 27 MHz (11 meters) — 26.995, 27.045, 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 3¼" W x 2¼" D.

GDA-1057-2 SPECIFICATIONS — RECEIVER — RF Carrier Frequency: One frequency, crystal-controlled on 27 MHz, 53 MHz or 72 MHz. Operating temperature: 0°-160° F. Power supply: 4.8V; Battery Pack GDA-405-3. Dimensions: 1½" H x 1¾" W x 2¼" D. Net receiver weight: 2.5 oz. Servo channels: 3 (4 with option). **GENERAL** — Complete airborne system weight: with 2 GDA-505-44 servos: 8.8 ozs.



3-Channel System with 4th channel option installed

3-Channel System



Improved Heathkit Servo Simulator

Improved version of the popular GD-206. The new GD-1053 Servo Simulator replaces transmitter and receiver for making adjustments on all Heathkit servos and a wide variety of others. Operates servos from 120 VAC line or optional internal battery. When plugged in, also serves as charger for receiver and glo-plug batteries. New long-life indicator bulb shows battery condition. Includes adaptor cable for new Heathkit GD-405-series servos.

GD-1053, 3 lbs., mailable 19.95

Kit GDA-19-3, optional battery pack, 1 lb., mailable 9.95



Heathkit Thumb® Tach for super tuning

The Heathkit GD-69 Thumb® Tach is the compact, convenient R/C accessory designed to measure model engine rpm on two ranges: 0-5,000 and 0-25,000. Checks engine rpm quickly and easily without touching or being physically connected to the engine. Ideal for needle valve adjustments, selection of glow plugs, gears and props — permits peaking engine for rpm changes you can't hear.

Kit GD-69, 2 lbs., mailable 19.95

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit 8-channel and "full-house" R/C Systems



GDA-405-S



GDA-405-D



Heathkit 8-Channel R/C Systems give you single or dual-stick control

The Heathkit GD-405 series transmitters put eight independent channels in a package no larger than most 4-channel units. An exclusive Heath-designed IC encoder in the transmitters and 8-channel decoder IC in the receiver keep the size and weight to a minimum — while substantially increasing reliability.

The GDA-405-S Single-Stick Transmitter provides one-hand simultaneous control of three independent channels. The stick utilizes a gimbal coupling to actuate two functions, while the third is controlled by the return-to-center knob at the top of the stick.

The GDA-405-D Dual-Stick Transmitter provides two-hand control of four independent channels. A friction adjust permits removing the spring from one function at each stick to retain the control in any desired position. And both transmitters have positive trim adjust tabs for neutralizing channel action without affecting stick position. A relative power meter monitors radiated signal.

Secondary controls common to both 8-channel transmitters include: A two-position switch that's perfect for landing gear; finger adjust tabs for auxiliary functions. Each transmitter is equipped with two coin-switch selected adjacent channels (except when 75.640 is specified). Trainer jacks accommodate the Heathkit Trainer Link. Internal circuitry and an external jack let you charge both the transmitter battery and the receiver battery pack simultaneously. Eight range controls, one for each channel, provide a method of adjusting servo travel for a given amount of transmitter control movement.

The GDA-405-2 super lightweight receiver, weighing in at a mere 2.5 ounces, has its own on-off switch, features an external two-channel frequency switch, plus a newly designed internal connector block to take the wasted space and time out of servo and battery hookups.

- Kit GDA-405-S, single stick transmitter only, 4 lbs., mailable 139.95
- Kit GDA-405-D, dual stick transmitter only, 5 lbs., mailable 119.95
- Kit GDA-405-2, receiver only, 1 lb., mailable 54.95
- Kit GDA-405-3, receiver battery pack only, 1 lb., mailable 9.95
- GDA-405-44, one new miniature servo, 1 lb., mailable 24.95
- GDA-505-44, one new sub-miniature servo, 1 lb., mailable 24.95

GDA-405-S & GDA-405-D SPECIFICATIONS — TRANSMITTER — RF carrier frequency: Crystal controlled on 27 MHz, 53 MHz, and 72 MHz. Frequency stability: Within $\pm 0.005\%$ on 27

MHz band. Within $\pm 0.002\%$ on 53 and 72 MHz bands. Temperature range: 0 to 160 degrees F. RF output circuit: PI network. RF input power: 500 mW Min. Modulation: On-Off carrier keying. Approx. current drain: 100 mA on all bands. Controls: Eight channels, four with trim. On-Off switch. Frequency selector switch. Trainer push button. Power Supply: Internal 9.6V 500 mA nickel-cadmium battery. Rechargeable simultaneously with receiver battery at 35 to 400 mA from 120 volt power line. Dimensions: 7" H x 7" W x 2" D. Net weight: w/battery, 2 3/4 lbs.

GDA-405-2 SPECIFICATIONS — RECEIVER — Local oscillator operating frequency: Crystal controlled on 27 MHz, 53 MHz and 72 MHz. Frequency stability: .003% on 53 and 72 MHz bands. Temperature range: 0 to +160 degrees F. Sensitivity: 5 μ V or better. Selectivity: 6 dB down at \pm kHz; 30 dB down at ± 9 kHz. Current Drain: 10 mA. Intermediate frequency: 453 kHz. Power supply: 4.8 V Battery Pack GDA-405-3. Controls: ON-OFF switch. Frequency selector switch. Dimensions: 1 1/2" H x 1 3/4" W x 2 1/4" D. Net weight: 2.5 ozs.

GDA-405-3 SPECIFICATIONS — RECEIVER BATTERY — Type: Nickel-cadmium. Rechargeable simultaneous with the transmitter batteries at 35 to 40 mA from 120 V power line. Voltage: +2.4 V and +4.8 V outputs. Current rating: 500 mA hours. Dimensions: 1 1/4" H x 1 1/4" W x 2 3/4" D. Net weight: 3.8 oz.

FREQUENCY COMBINATIONS AVAILABLE — Adjacent channels: 27 MHz: 26.995/27.045, 27.095/27.145, 27.145/27.195. 53 MHz: 53.1/53.2, 53.3/53.4, 53.4/53.5. 72 MHz: 72.08/72.24, 72.18/72.32, 72.40/72.96. Available only as single channel: 75.640.

Order a complete system

SAVE 34⁷⁰

Systems include: 8-Channel Transmitter (select either GDA-405-S Single Stick or GDA-405-D Dual Stick), Receiver (specify GDA-405-2), Battery Pack (GDA-405-3), 4 Servos (GDA-405-44, GDA-505-44, or any combination equalling 4).

Complete Single Stick System 269.95

Complete Dual Stick System 249.95

Both system prices represent a \$34.70 savings as against ordering components individually. And both systems include all batteries, a retail value worth up to \$39.

Trainer Link accessory



Six-foot coiled cord connects two GDA-405 Transmitters for in-flight instruction. Automatically makes one unit "master" with override capability... the other a "slave."

GDA-405-6, 1 lb., mailable ... 7.95

put you in the air on a kit-form budget

SAVE \$5⁰⁰

\$5 off on Heathkit GDA-19-42 Subminiature Servos (identical to GDA-505-44 servo, below — except 4-wire instead of 3). Limited quantity... while they last...

only 19⁹⁵

Build your own Heathkit "full house" system

Why not move up to that "full house" system you have always wanted? This build-it-yourself Heathkit System makes it easy. And in quality and performance it's comparable to R/C systems costing up to \$100 more. The GD-19 dual-stick system utilizes GDA-19-4 servos to give you a low 16.6 oz. flight weight. The slim-line transmitter has factory-assembled high output RF stage, Kraft sticks for precise control, built-in charging circuit that charges both transmitter and receiver batteries with one cord. Also includes Heathkit miniature receiver with three ceramic IF filters for increased selectivity & reliability without bothersome alignment, double tuned front end, RF amplifier and dual AGC for interference-free reception, and high impact nylon case. Four servos and nickel cadmium batteries for both transmitters & receiver complete the package. See frequencies below.

System Kit GD-19, with standard servos, specify frequency desired. 10 lbs., mailable 199.95

Kit GDA-19-1, transmitter, battery, charging cord, specify frequency; 6 lbs., mailable 86.50

Kit GDA-19-2, receiver only, specify frequency; 1 lb., mailable 49.95

Kit GDA-19-3, receiver battery pack only; 1 lb., mailable 9.95

Kit GDA-19-4, one standard servo only; (see below), 1 lb., mailable 19.95

GDA-19-1 SPECIFICATIONS — TRANSMITTER — RF Carrier frequency: 1 channel, crystal controlled on 27, 53 or 72 MHz. Frequency stability: $\pm 0.05\%$ on 27 MHz, $\pm 0.02\%$ on 53 and 72 MHz. Temperature: 0° to $+160^\circ\text{F}$. RF Output Circuit: Pi-network. Modulations: On-off carrier keying. Approximate current drain: 100 mA. Controls: 5 channels; 4 with trim, on-off switch. Power supply: Internal 9.6 volt nickel-cadmium battery. Rechargeable simultaneously with receiver battery at 35 to 40 mA from 120V. Dimensions: $6\frac{3}{8}"$ H x $6\frac{3}{4}"$ W x $2\frac{1}{2}"$ D. Net Weight: 2 $\frac{3}{4}$ lbs. with battery.

GDA-19-2 SPECIFICATIONS — RECEIVER — Frequency: 1 channel, crystal controlled on 27, 53 or 72 MHz. Frequency stability: $.003\%$ on 27 MHz, $.002\%$ on 53 and 72 MHz. Temperature range: 0° to $+160^\circ\text{F}$. Sensitivity: 5 μV or better. Selectivity: 6 dB at ± 4.0 kHz, 30 dB at ± 9.0 kHz. Approximate current drain: 6 mA. Intermediate frequency: 453 kHz. Power supply: Heath GDA-19-3 battery pack. Controls: On-Off switch. Dimensions: $\frac{3}{2}"$ H x 2" W x $2\frac{1}{2}"$ D. Net receiver weight: 2.3 oz.

GDA-19-3 SPECIFICATIONS — RECEIVER BATTERY — Type: Nickel-cadmium. Rechargeable. Voltage: +2.4 and +4.8 V outputs. Dimensions: $\frac{5}{8}"$ H x $2\frac{1}{4}"$ W x $2\frac{3}{4}"$ D. Net weight: 3.9 oz. Frequencies Available: 27 MHz (11 meters) — 26,995, 27,045, 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, 72,960, & 75,640. (NOTE: An amateur radio operator's license is required for 6 meter operations. Class C Citizen's Band license required for 27 and 72 MHz.)

Save . . . on quality Heathkit Servos

A) Heathkit Sub-Miniature Servo. Use with GD-405, -57 and -19 systems (-57 and -19 users request free modification kit GDM-1957 and #432-104 when ordering).

Kit GDA-505-44, 1 lb., mailable 24.95

GDA-505-44 SPECIFICATIONS — Input signal: Pulse, 1-2 msec. wide; 4 V P-P. Thrust: 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 nominal; no load current, 80 mA. Mechanical outputs: 1 large rotary arm, 1 small rotary arm, 1 offset rotary arm, 1 rotary wheel. Position accuracy: 1.0%. Dimensions: $1\frac{1}{2}"$ H x $\frac{3}{4}"$ W x $1\frac{1}{2}"$ L (length includes mounting ears, height includes the outputs). Net weight: 1.25 oz.

B) Heathkit Miniature Servo. Use with GD-405, -57 and -19 systems (-57 and -19 users request free modification kit GOM-1957 connectors when ordering).

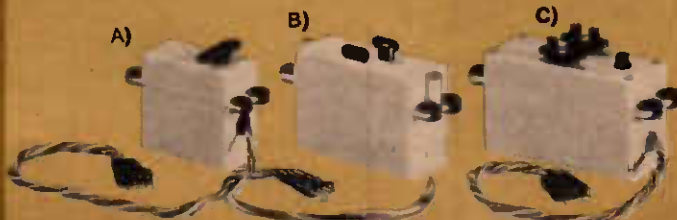
Kit GDA-405-44, 1 lb., mailable 24.95

GDA-405-44 SPECIFICATIONS — Input signal: Pulse 1-2 msec. wide, 4 V P-P. Thrusts: 4 lbs. min. at racks and rotor. Travel time: 0.5 sec. Linear output travel: $\frac{1}{2}"$ end to end. Rotary output travel: 90° rotation. Temperature range: 0° - 160°F . Power requirements: Battery — 4.8 VDC. Idle current — 15 mA. Stall current — 450 mA; no load current, 80 mA. Gear train backlash: Less than .002". Mechanical output: 1 rotary arm; 1 rotary wheel; 2 linear racks. Position accuracy: 1.0%. Dimensions: $1\frac{1}{2}"$ H x $\frac{7}{8}"$ W x $2\frac{1}{2}"$ L (length includes mounting ears; height includes outputs). Net weight: 1.75 oz.

C) Heathkit Standard Servo. (for use with Heathkit GD-57 & GD-19 systems only).

Kit GDA-19-4, 1 lb., mailable 19.95

GDA-19-4 SPECIFICATIONS — SERVO — Thrust: 3 lbs., minimum. Transit time for $\frac{5}{8}"$ travel: 0.7 sec. Linear output travel: $\frac{5}{8}"$ end-to-end, $\frac{1}{2}"$ nominal. Rotary output travels 0 to $+100^\circ$. Mechanical output: 1 — rotary arm, 1 — rotary wheel, 2 — linear arms. Dimensions: $1\frac{3}{4}"$ H x $\frac{1}{2}"$ W x $1\frac{1}{2}"$ L (length includes mounting ears; height includes arms. Net weight: 2.5 oz.



charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit® entertainment - handcrafted by you



44⁹⁵
GR-17



29⁹⁵
GR-24



19⁹⁵
GR-151B



24⁹⁵
GR-28



39⁹⁵
GR-48

Heathkit AM/FM Solid-State Portable

Hear the best of both FM and AM worlds in a battery-powered portable that plugs in, too, with the optional converter/charger below. Three tuned AM transformers and amplified AGC offer clean, stable AM listening. On the FM side, a collapsible 34" whip antenna, three IF stages and an amazing 5 μ V sensitivity combine to give you sharp, accurate FM reception over great distances. And the AFC keeps your favorite FM station locked in for enjoyable, drift-free listening. The portable won't eat its own weight in batteries every week, either. It runs 200-300 hours on six "D" cells (not supplied) that last even longer with the optional charger/converter. The handsome rich brown simulated leather case featuring slide rule tuning dial, tone control, built-in external earphone jack and earphone measures 6 $\frac{3}{4}$ " H x 8 $\frac{3}{4}$ " W x 4" D.

Kit GR-17, 6 lbs., mailable **44.95**
GRA-43-1, converter/charger, 1 lb., mailable **3.95**

GR-17 SPECIFICATIONS - AM SECTION - Tuning Range: 535 kHz-1620 kHz. IF: 455 kHz. Sensitivity: 200 μ V per meter for 20 dB signal-to-noise ratio. **FM SECTION -** Tuning Range: 88-108 MHz. IF: 10.7 MHz. Sensitivity: Better than 5 μ V for 30 dB quieting. Audio Output: 350 mV. Size: 6 $\frac{3}{4}$ " H x 8 $\frac{3}{4}$ " W x 4" D.

Heathkit Solid-state AM Portable

Six-transistor circuit, tuned RF stage and double-tuned IF stage offer excellent sensitivity and selectivity. Push-pull audio output stage produces clean sound - even when batteries are low. Operates on six long-lasting "D" cells (not included). Handsome brown simulated leather case, chrome-finished frame, anodized aluminum grille, 7" H x 8 $\frac{3}{4}$ " W x 3 $\frac{3}{4}$ " D.

Kit GR-24, 5 lbs., mailable **29.95**

Heathkit Beginner's AM Portable

The ideal kit for first-time builders. Heathkit manual, supplementary theory of radio, clearly marked circuit board give the novice a rewarding introduction to electronics. Receiver has 4"x6" speakers, pre-aligned coil and IF transformer, built-in antenna. Tan simulated leather case measures 6 $\frac{1}{2}$ " H x 8" W x 3" D.

Kit GR-151B, 5 lbs., mailable **19.95**

Heathkit Solid-state AM Radio

Seven-transistor, 3-diode circuit assures top performance, long life. Automatic gain control keeps volume constant. Full wave transformer power supply eliminates annoying line hum. Styled in handsome gold and brown with matching grille cloth supplied... or design your own to match drapes or carpet. Measures 5 $\frac{1}{4}$ " H x 10" W x 4 $\frac{1}{8}$ " D.

Kit GR-28, 5 lbs., mailable **24.95**

Heathkit Solid-state AM/FM Radio

AFC for drift-free tuning... AGC on AM keeps volume constant. Built-in AM and FM antennas for better reception. Back-lit dial for easy reading in the dark. Avocado green cabinet with matching grille cloth or design your own grille. 5 $\frac{1}{4}$ " H x 10" W x 4 $\frac{1}{8}$ " D.

Kit GR-48, 5 lbs., mailable **39.95**

Heath cabinets come assembled, ready to use

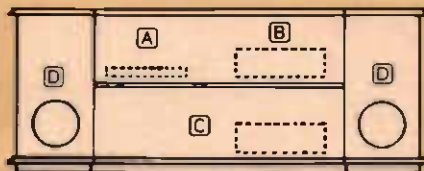


A) One-piece Mediterranean credenza . . . 195.00

One-piece 5½-ft. Mediterranean credenza, crafted in hickory veneers and solid oak trim, finished in oiled pecan. Adjustable shelf (A&B) for stereo receiver, cartridge or cassette deck, or separate tuner and amplifier. Below (C) is room for turntable and record storage. Ducted-port, reflex design speaker enclosures (D) have pre-cut 12-in. openings. Changer drawer on ball bearing slides available.

AE-101, credenza, 167 lbs., Express/Frt. 195.00

AEA-101-1, changer drawer, 16 lbs., mailable 31.50



CABINET OVERALL: 267/8" H x 66" W x 19¼" D. **SHELF COMPARTMENT:** (A&B) overall, 357/8" W x 17½" D (shelf 15" D); adjustable shelf height: 5½", 6½", 7½", 8½". **LOWER COMPARTMENT:** (C): 357/8" W x 17½" D x 12¼" H min. (with shelf at 8½"). **SPEAKER CABINET VOLUME:** (D): 2.3 cu. ft. (12" cut out). **CHANGER BASE:** 5½" H x 18½" W x 14" D.

B) 3-piece contemporary group . . . 298.00

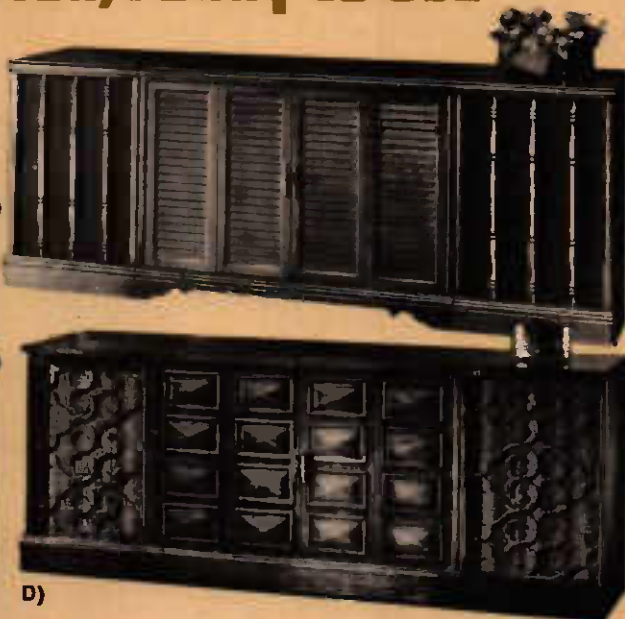
Walnut finish on solids and veneers. Top lifts to expose changer compartment, bifold doors hide components. Decorative statuary bronze handles. Matching speaker cabinet. Ducted-port reflex design accommodates 8-in. or 12-in. speakers (installation instructions included), measures 28¾" H x 18" W x 19" D. Order two for stereo.



AE-37, equipment cabinet, 108 lbs., Express/Frt. 150.00

AEA-37-1, speaker cabinet, 70 lbs., Express/Frt. (each) 74.00

CABINET OVERALL: 28¾" H x 40" W x 19" D. **CHANGER COMPARTMENT:** 19" W x 16½" D, mounting board is uncut and can be adjusted in height. **RECORD-TAPE RECORDER COMPARTMENTS:** 15¾" H x 19" W x 16½" D. **SHELF COMPARTMENT:** 24¾" H x 19" W x 16½" D, with two adjustable shelves.



C) 3-piece Early American group . . . 325.00

Salem-Maple on solids and veneers, with louvered doors. Lift-top changer compartment, bi-fold front doors swing away to reveal components. Statuary bronze handles. Ducted-port reflex installation for 8-in. or 12-in. speakers. Speaker cabinet measures 28¾" H x 18" W x 19" D. Order two for stereo.

AE-47, equipment cabinet, 104 lbs., Express/Frt. 165.00

AEA-47-2, speaker cabinet, 67 lbs., Express/Frt. (each) . . 80.00



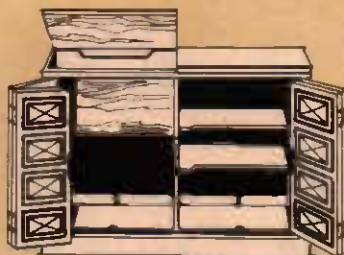
CABINET OVERALL: 28¾" H x 40" W x 19" D. **CHANGER COMPARTMENTS:** 19" W x 16" D, mounting board is uncut and can be adjusted in height. **RECORD-TAPE RECORDER COMPARTMENT:** 15¾" H x 19" W x 16" D. **SHELF COMPARTMENT:** 24¾" H x 19" W x 16" D, with two adjustable shelves.

D) 3-piece Mediterranean group . . . 365.00

Selected solids and veneers with a dramatic pecan finish. Bi-fold doors. Statuary bronze handles. Top raises to reveal changer compartment, doors open to components. Adjustable shelves. Matching ducted-port speaker cabinets accept 8-in. or 12-in. speakers (installation instructions included), measures 28¾" H x 17¾" W x 18¾" D. Order a pair for stereo.

AE-57, equipment cabinet, 109 lbs., Express/Frt. 175.00

AEA-57-1, speaker cabinet, 64 lbs., Express/Frt. (each) . . 95.00



CABINET OVERALL: 28¾" H x 40" W x 19¾" D. **CHANGER COMPARTMENT:** 19" W x 16" D, mounting board is uncut and can be adjusted in height. **RECORD-TAPE RECORDER COMPARTMENT:** 15¾" H x 19" W x 16" D. **SHELF COMPARTMENT:** 23¾" H x 19" W x 16" D, with two adjustable shelves.

Save An Extra 5% By Ordering A System

Here's How. . . (1) order a stereo or 4-channel amplifier and stereo program source (tuner, turntable, tape deck) plus a pair of speaker systems; (2) a stereo or 4-channel receiver and a pair of speaker systems; (3) a stereo compact plus a pair of speaker systems. Order the complete system at the same time, and subtract 5% from the to-

tal price. (Discount does not apply to automotive stereo components).

Other audio items related to the basic system and ordered at the same time (such as turntables, GD-28 tape player, cabinets, additional speakers or speaker systems, AC-17 headphone control, antenna) also qualify for the 5% discount.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

A) Heathkit 2-way acoustic suspension speaker system on a budget... just 34.95

The AS-1042 combines a high compliance, long throw 8" woofer with a 3½" shallow cone/dome tweeter to produce a flat frequency response from 40 to 18,000 Hz. The woofer has a hefty 8.5-oz. magnet and is capable of useable bass response down below 30 Hz. The tweeter uses a 1.3-oz magnet and a high frequency shaping circuit to maintain flat acoustic output. A high-frequency level control on the back panel tailors the "highs" to your listening room. The AS-1042 can be powered by as little as 10 watts, yet can handle up to 50 watts. Impedance is 8 ohms nominal, 6 ohms minimum. The mechanical and capacitive crossover system operates at 1500 Hz, and total system resonance is 65 Hz. Cabinet and grille board come fully assembled and finished. The cabinet is covered with easy-to-care-for walnut toned vinyl. Measures 19" H x 10" W x 8¼" D.

Kit AS-1042, 27 lbs., mailable 34.95

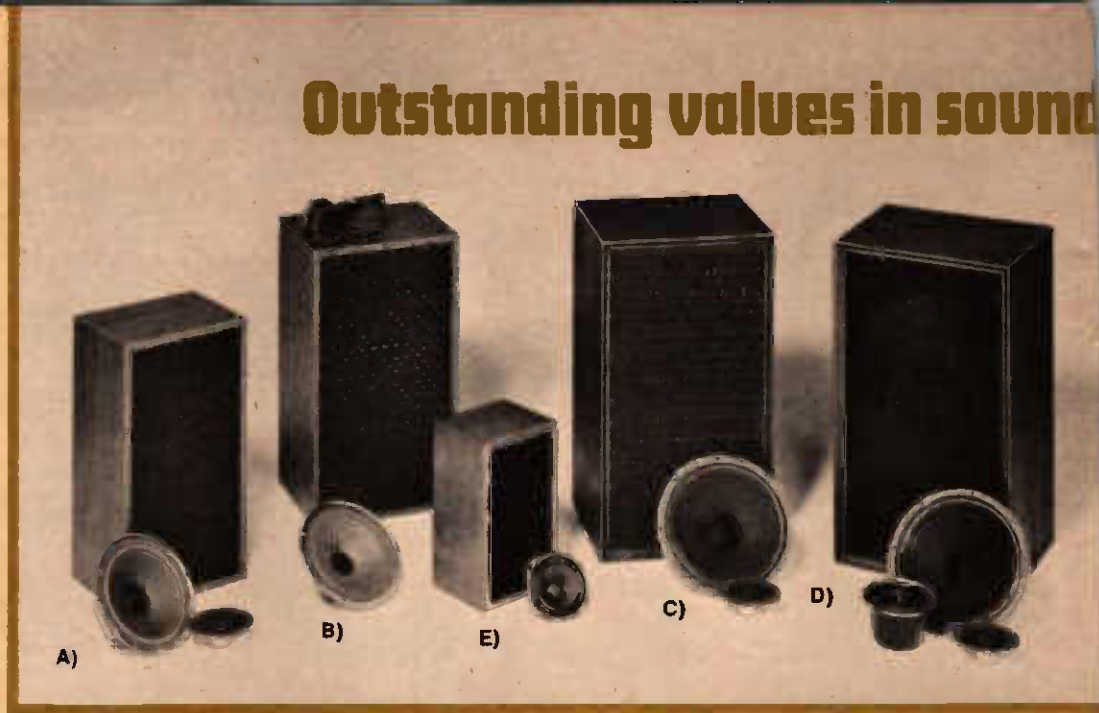
B) Heathkit 2-way ultra-efficient speaker system takes only 5 watts to drive... 44.95

We've designed this highly efficient bookshelf system to bring out the best in low power amplifiers. Just five watts is enough to drive the new Heathkit AS-1039 at a booming volume. The system uses an 8-in. woofer in vented bass-reflex enclosure and an exponential rectangular horn tweeter with its own level control knob mounted on the back panel. Magnets are 10 ounces for the woofer and 1.47 ounces on the tweeter. Frequency response is 70 to 15,000 Hz with crossover at 3,500 Hz. The AS-1039 has a nominal impedance of 8 ohms, and can handle up to 25 watts of music power.

The one-piece cabinet with removable grille cloth board provides a solid vibration-free housing while also simplifying kit building. You simply build and install the crossover circuit then front-mount both speakers. The grille-cloth board is snugly held in place with zip-strip fasteners. All cabinetry comes fully assembled and finished. The enclosure is clad in a rich-looking walnut toned vinyl, while the grille cloth is done in a dark green, brown and gold tweed. Measures 21½" H x 12" W x 10½" D. Order two for stereo. You can build them both in an evening.

Kit AS-1039, 36 lbs., mailable 44.95

Outstanding values in sound



C) Heathkit 2-way acoustic suspension speaker system... 64.95

Takes 100 watts in stride with outstanding response spanning 30 Hz to 18 kHz, with extremely low distortion below 50 Hz. Has a 10" acoustic suspension woofer and 3½" cone/dome tweeter in sealed infinite baffle cabinet filled with sound absorbing material; high frequency level control. Requires 10W to drive. Impedance is 8 ohms. Assembled one-piece cabinet measures 24" H x 13½" W x 11½" D. Buy two...and enjoy stereo the same night.

Kit AS-105U, unfinished, 52 lbs., Express/Frt. 64.95
Kit AS-105W, walnut finish, 52 lbs., Express/Frt. . . 69.95

D) Heathkit 3-way acoustic suspension speaker system... 89.95

Easily handles up to 100 watts music material with response extending smoothly from 30 Hz to 18 kHz. Has 10" acoustic suspension woofer in sealed infinite baffle enclosure filled with sound absorbing material; high compliance 4½" midrange in sealed & acoustically lined sub-enclosure; ring damped closed back 3½" cone/dome tweeter; individual high & mid-frequency controls. Requires 10 watts to drive. Impedance, 8 ohms. Assembled walnut veneer one-piece cabinet measures 24" H x 13½" W x 11½" D.

Kit AS-104, 54 lbs., Express/Frt. 89.95



Three-Way High Compliance Speaker... 12" unitary speaker with woofer, compression mid-range and a horn-loaded compression super tweeter; 80-watts peak power capability; 600 and 4000 Hz crossovers; mid & high frequency level control; 1-year guarantee.

Model AS-27, 15 lbs., mailable 79.50
Pair (AS-27-2), 33 lbs., mailable 152.00

AS-27 SPECIFICATIONS — Impedance: 8 ohms. Frequency response: 20-20,000 Hz. Cone resonance: 30 Hz. Magnet weights: 1 lb., 6.4 oz., 4.6 oz. Voice coil sizes: 1½" and 1".

Two-Way High Compliance Speaker... 12" high-compliance woofer with re-entrant horn tweeter. High frequency level control. 1-yr. guarantee.

Model AS-183, 15 lbs., mailable 54.95
Pair (AS-183-2), 39 lbs., mailable 105.00

AS-183 SPECIFICATIONS — Impedance: 8 ohms. Power ratings: 30 watts. Frequency response: 20-15,000 Hz. Cone resonance: 25 Hz. Magnet weights: 1¾ lbs., 4.65 oz. Voice coil sizes: 1½" and 1".



Three-Way High Compliance Speaker... 12" high-compliance woofer with mid-range cone; special Heath-designed tweeter. 1¾-lb. ceramic magnet. High frequency level control. 1-yr. guarantee.

Model AS-173, 14 lbs., mailable 44.95

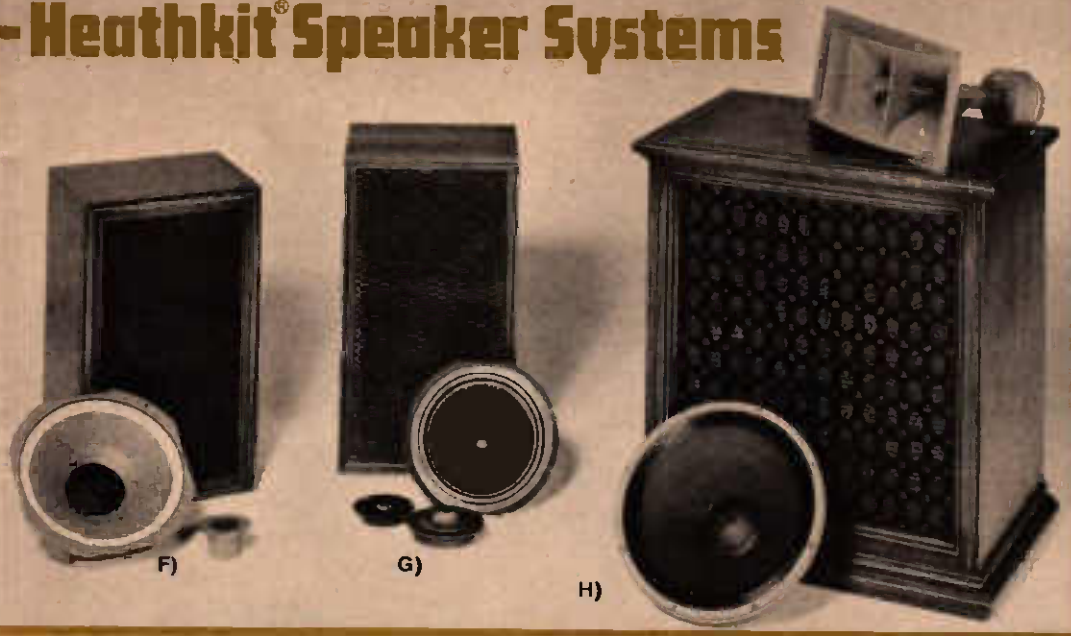
Pair (AS-173-2), 37 lbs., mailable 85.00
AS-173 SPECIFICATIONS — Impedance: 8 ohms. Power rating: 25 watts. Frequency response: 35-15,000 Hz. Cone resonance: 40 Hz. Voice coil sizes: 1½" and 1".

12" Three-Way Coaxial Speaker... Handles up to 20 W. True coaxial design with woofer, mid-range cone and special design horn tweeter. Electrical & mechanical crossovers. High frequency level control. 1-yr. guarantee.

Model AS-163 12 lbs., mailable 34.95

Pair (AS-163-2), 32 lbs., mailable 66.00
AS-163 SPECIFICATIONS — Impedance: 8 ohms. Frequency response: 40-15,000 Hz. Cone resonance: 60 Hz. Magnet weights: 13 oz., 1 oz. Voice coil sizes: 1½" and 1".

-Heathkit® Speaker Systems



G) Heathkit®/AR acoustic suspension speaker system ... 189.95

Using three Acoustic Research AR-3a drivers in a sealed acoustic suspension enclosure, the AS-103A delivers what many audio experts consider the ultimate in clean, natural response and extremely low distortion. Virtually flat response from 30 Hz to 20,000 Hz is assured from the highly praised AR speakers and acoustic suspension design. The 12" woofer provides crisp, clean bass down to 30 Hz with exceptionally low distortion. The special hemispherical dome midrange and tweeter, combined with a precisely-engineered crossover network, deliver the natural transparent sound typical of all AR systems. Separate output level controls on the rear of the cabinet for both midrange and tweeter allow you to "custom tailor" the sound to your acoustic environment. The luxurious preassembled oiled walnut cabinet provides a suitably rich enclosure for this extraordinary speaker. Order a pair of AS-103As for your stereo system now!

Kit AS-103A, 64 lbs., Express/Frt. 189.95

AS-103 SPECIFICATIONS — Power requirements: 25 W rms recommended minimum per channel. Impedance: 4 ohms nominal (2.75 ohms minimum at 1000 Hz). Frequency range: 20 Hz to 20,000 Hz. Crossover frequencies: 575 Hz and 5000 Hz. Speaker complement: One 12" acoustic suspension low-frequency driver (woofer); 3.3 lb. magnet. One 1 1/2" hemispherical dome mid-frequency driver, 1.75 lb. magnet. One 3/4" hemispherical dome high-frequency driver (tweeter); 10 oz. magnet. Enclosure: Acoustic suspension type. Finish: Oiled walnut. Dimensions: 25" H x 14" W x 11 3/4" D.

E) Heathkit mini acoustic suspension speaker system ... 19.95

Excellent wide-range response—small enclosure. The AS-106 single-speaker system is perfect for that apartment-size 4 to 20-watt amplifier. Features a 4 1/2-in. high-compliance cloth-suspension speaker with long throw voice coil, sealed acoustic suspension cabinet with fiber-glass sound-damping material. Useful frequency response extends from 70 Hz to 16kHz. Cabinet is 1/2-in. particle board with rich walnut veneer. Order a pair for stereo, and build both in an evening.

Kit AS-106, 10 lbs., mailable 19.95

AS-106 SPECIFICATIONS — Speaker: 4 1/2" full range, 2.5-oz. Alnico magnet. Impedance: 8 ohms. Recommended minimum amplifier power: 4 W rms. Enclosure: Sealed infinite baffle. Dimensions: 12" H x 7" W x 6" D.

F) Heathkit®/JBL 2-way speaker system ... 189.95

Heath design know-how and JBL speakers combined in the classic bookshelf cabinet for a system that will do justice to your top-of-the-line components. The 14-in. woofer uses an inert, self-damping cone suspension and massive 1 1/2-lb. magnet for clear, full bass down to 40 Hz. JBL 2-in. direct radiator produces sharp, lifelike highs. Factory assembled and finished cabinet. System assembles in one or two hours.

Kit AS-48, 57 lbs., mailable 189.95

AS-48 SPECIFICATIONS — Speakers: 14" woofer, 4" voice coil, 1 1/2 lb. magnet assembly; 2" piston-type direct radiator tweeter. 1.25 lb. magnet assembly. Frequency range: 40-20,000 Hz. Crossover: LC-type, 2000 Hz. Power rating: 50 W program material. Impedance: 8 ohms. Control: Three-position high frequency level control. Cabinet: Damped reflex, tube-ported. Oak veneer and furniture grade hardwoods, pecan finish. Dimensions: 14" H x 23 1/2" W x 12" D.

H) The Heathkit®/Altec-Lansing speaker system ... 269.95

The AS-101 drives with as little as 10 watts, yet handles up to 50 watts program material. A bass reflex design incorporating a high compliance 15-in. woofer and sectoral horn, it reproduces from 35 to 22,000 Hz with uncompromising fidelity. Woofer has a 10 1/2-lb. magnet assembly, 3-in. edge-wound copper ribbon voice coil and structurally reinforced cast aluminum frame. The sectoral horn with matching driver, an Altec-Lansing hallmark, uses a 13-oz. magnet, 1 3/4-in. voice coil and provides controlled dispersion for uniform mid & high frequency coverage. Impedance is 8 ohms.

A two-way crossover network, compatible with bi-amplification, delivers all frequencies below 800 Hz to the massive woofer, and all above to the horn driver. High frequency level control allows balancing horn and woofer output to your taste and room acoustics. Mount the front panel & speakers in the attractive cabinet, wire the crossover network and it's all together! Beautiful factory-assembled Mediterranean cabinet with pecan veneers, hardwood trim, gold and black grille cloth measures 29 3/4" H x 27 3/4" W x 19 3/8" D.

Kit AS-101, 128 lbs., Express/Frt. 269.95



12" Two-Way Coaxial Speaker ... Separate woofer & tweeter with capacitive crossover for up to 15 W. High frequency level control. 1-yr. guarantee.

Model AS-153, 10 lbs., mailable 24.95
Pair (AS-153-2), 28 lbs., mailable . . . 46.00

AS-152 SPECIFICATIONS — Impedance: 8 ohms. Frequency response: 50-15,000 Hz. Cone resonance: 60 Hz. Magnet weights: 10 oz., 1.47 oz. Voice coil sizes: 1" and 3/4".



8" Dual Cone Speaker...Only 3 1/2" deep — ideal for in-wall mounting or where space is tight. 50-12,000 Hz response. Handles up to 12 watts. 1-yr. guarantee. Ideal for playroom or den system.

Model AS-123, 5 lbs., mailable 11.95
Pair (AS-123-2), 15 lbs., mailable . . 22.00

AS-123 SPECIFICATIONS — Impedance: 8 ohms. Cone resonance: 70 Hz. Magnet weight: 10 oz. Voice coil size: 1".



8" Two-Way Coaxial Speaker...50-14,000 Hz response from separate woofer & tweeter. Handles up to 12 W. Separate high frequency level control. 1-yr. guarantee.

Model AS-133, 6 lbs., mailable 19.95
Pair (AS-133-2), 18 lbs., mailable . . 38.00

AS-133 SPECIFICATIONS — Impedance: 8 ohms. Cone resonance: 70 Hz. Magnet weights: 10 oz., 0.68 oz. Voice coil sizes: 1" and 3/4".



Headphone control unit
 Takes two sets of headphones. Dual concentric level control. 20' cable.
Kit AC-17, 3 lbs., mailable 8.50

Your audio system deserves the finest-

From the stable of Dual thoroughbreds

A) The Dual 1229

Standard bearer for the Dual family. Features built-in illuminated strobe; tracking angle selector that shifts tonearm base down for single play, up for multiple discs; tracking as low as 0.25 gram with pressure dial calibrated in 1/10ths from 0.2 through 1.5 grams; manual or automatic play at 78, 45 and 33 1/2 rpm; anti-skating calibrations for spherical and elliptical styli; damped cueing system; full 12-in. diameter 7-lb. platter; synchronous/continuous-pole motor; 6% pitch adjustment. Select cartridge from list next page. 14 1/4" W x 12" D x 5" above motor board, 3" below.

ADP-200, includes turntable, WB-19 walnut base and DC-9 dust cover, 44 lbs., mailable . . . **224.95**

ADA-39-2, 45 rpm spindle (Dual AS-12), 1 lb., mailable 5.95

B) The Dual 1218

Gives three-speed manual or automatic play. Has separate anti-skating scales for conical and elliptical styli; tracking angle selector in cartridge housing; 6% pitch control; 10 1/2" diameter 4-lb. one-piece platter. Will track as low as 0.5 gram. Choose cartridge next page. Measures 13" W x 10 1/4" D x 5" above motor board, 2 1/2" below.

ADP-190, includes turntable, WB-12 walnut base and DC-4 dust cover, 39 lbs., mailable . . . **163.40**

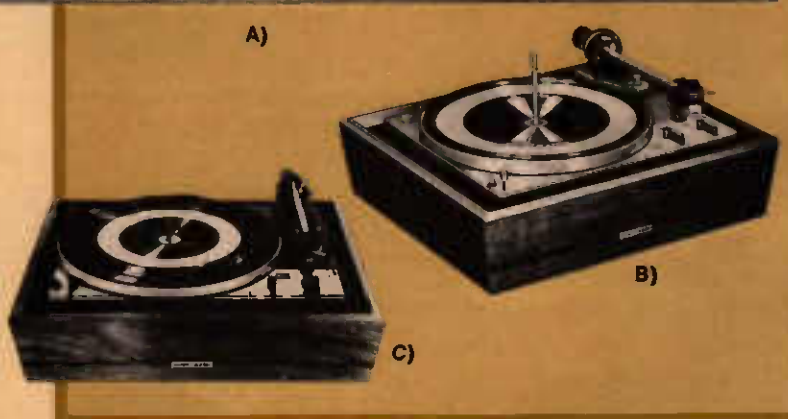
ADA-39-2, 45 rpm spindle (Dual AS-12), 1 lb., mailable 5.95

C) The Dual 1216

They call it "Dual's best buy" and we agree. Offers 33 1/2, 45 and 78 rpm automatic or manual play with 6% pitch control on all speeds; anti-skating system identical to Dual 1229 and 1218; 10 1/2" diameter 4-lb. platter; hi-torque motor; direct-dial setting for tracking pressure as low as 0.75 gram. Choose cartridge next page. 13" W x 10 1/4" D x 5" above motor board, 2 1/2" below.

ADP-170, includes turntable, WB-12 walnut base and DC-4 dust cover, 34 lbs., mailable . . . **159.95**

ADA-39-2, 45 rpm spindle (Dual AS-12), 1 lb., mailable 5.95



From the famed Garrard lineup. . .

A) Garrard Zero 100C

Dual pivoting tone arm for zero tracking error; cartridge overhang adjustment; magnetic anti-skating system; 3% pitch control; illuminated stroboscope; patented Synchro-Lab motor; separate control for automatic and manual play of 33 1/2, 45 and 78 rpm discs. Plus the new Zero 100C includes a built-in record counter to monitor stylus life, and a new cueing control that's damped in both up and down directions. Measures 15 1/2" W x 14 1/2" D x 4 1/2" above motor board, 2 1/2" below. Select cartridge from table next page.

ACP-1084, includes turntable, WB-2 walnut base and D-2 dust cover, 39 lbs., mailable . . . **215.30**

B) Garrard Zero 92

The new zero 92 has cartridge overhang adjustments; sliding weight stylus force setting; lever type sliding weight anti-skating adjustment; patented Synchro Lab motor; kinetically matched turntable; 2-point record support, and refined cueing control with dampening in both directions. Includes interchangeable spindles for single or multiple play. Plays single or stacked discs at 33 1/2, 45 and 78 rpm. Measures 15 1/2" W x 14 1/2" D x 4 3/8" above motor board, 2 1/8" below. Choose cartridge from table next page.

ACP-1074, includes turntable, WB-2 walnut base and D-2 dust cover, 39 lbs., mailable . . . **165.95**

C) Garrard 82

Retains many of the features from the Zero-100 and new Zero-92. For example, it has 15° vertical tracking adjustment, the identical cartridge clip with overhanging adjustment, and sliding weights, instead of springs, for stylus force and anti-skating. The newly designed low mass extruded aluminum tone arm has full provisions for dynamic counterbalancing and damped cueing in both ascent and descent modes. The new Garrard 82 gives full automatic or manual play at 33 1/2, 45 and 78 rpm. Select cartridge from table next page. Measures 15 1/2" W x 14 1/2" D x 4 3/8" above motor board, 2 1/8" below.

ACP-1064, includes turntable, WB-2 walnut base and D-2 dust cover, 37 lbs., mailable . . . **124.85**



ACCESSORIES FOR YOUR GARRARD TURNTABLE
ADA-47-1, molded base (Garrard B2), 3 lbs., mailable 6.50
ADA-100-2, 45 rpm spindle (Garrard LRS-100),
 1 lb., mailable **3.80**

Heath-approved turntables & cartridges

The Thorens TD-160C

Thorens 2-speed Integrated Transcription Turntable — Our engineers all agreed the TD-160C was a lot of turntable for the money. So we're proud to be able to add it to the Heathkit Catalog. Thorens uses a belt-drive system that eliminates the mechanical vibration common to turntables using an idler-wheel drive. Other features include a 16-pole synchronous motor, unique magnetic anti-skating system, front panel cueing control and rubber turntable mat designed to reduce resonances. Accepts single discs only, 33½ and 45 rpm. Includes walnut base and hinged dust cover. 7¾" H x 17" W x 13½" D (with base and dust cover). Choose cartridge from table below.

ACP-1099, turntable, base and cover, 26 lbs.,
 mailable 200.00



Save up to 42.50 on cartridges when ordered with a Garrard, Thorens or Dual turntable



New Shure V-15 Type III features newly designed cartridge/stylus structure resulting in lighter mass, wider dynamic response and a flatter frequency response curve. For use with any turntable capable of tracking at ¼ to 1¼ grams. Order with the Garrard Zero 100 (ACP-1084), Dual 1229 (ADP-200) or Thorens TD-160C (ACP-1099) only, pay just \$30.

Model AD-1059, 1 lb., mailable 72.50

Shure, M91ED, only \$5 with Garrard, Dual or Thorens turntable order.
 Model ADP-1062, 1 lb., mailable 49.95

Shure M93E, only 1¢ with Garrard, Dual or Thorens turntable order.
 Model AD-58R, 1 lb., mailable 39.95

Empire 999SE/X, only \$5 with Garrard, Dual or Thorens turntable order.
 Model AD-121, 1 lb., mailable 49.95

Empire 999E/X, only 1¢ with Garrard, Dual or Thorens turntable order.
 Model AD-126, 1 lb., mailable 39.95

MODEL	FREQUENCY RESPONSE	OUTPUT	SEPARATION	ELLIPTICAL STYLUS	TRACKING
Shure V-15 Type III	10-25,000 Hz	3.5 mV	28 dB	0.2 x 0.7	¾ to 1¼ gr.
Shure M91ED	20-20,000 Hz	5.0 mV	25 dB	0.2 x 0.7	¾ to 1½ gr.
Shure M93E	20-20,000 Hz	6.2 mV	25 dB	0.4 x 0.7	1½ to 3 gr.
Empire 999SE/X	8-32,000 Hz	8.0 mV	35 dB	0.2 x 0.7	½ to 1½ gr.
Empire 999E/X	10-30,000 Hz	8.0 mV	35 dB	0.3 x 0.7	¾ to 2 gr.

Heath/BSR Changers include base, dust cover and cartridge in one price

A) Heath/BSR AD-1145 — The new AD-1145 heads up three great new turntables carrying the Heathkit/BSR hallmark. The 1145 features a 3½-lb. heavy-cast machined platter, vernier counter-balance adjustment, synchronous motor, micrometer stylus pressure control, viscous damped cueing, dual-range anti-skate control, slide-in cartridge head, pop filter and interchangeable automatic and manual spindles. Plus, there's a built-in stereo muting switch for complete silence during the change cycle. Handles 7-in., 10-in. or 12-in. discs at 33, 45 and 78 rpm. Includes Shure M93E magnetic cartridge with elliptical diamond stylus, and all connecting cables. Measures 7¼" H x 15¼" W x 14½" D.

AD-1145, 18 lbs., mailable 84.95

AD-1037, optional 45 rpm spindle, 1 lb., mailable 1.95

B) Heath/BSR AD-1135 — A high-performance turntable at a modest price, the AD-1135 offers many of the same features found in the AD-1145. It has manual, semi-automatic or automatic capability; high torque synchronous motor; viscous damped cueing; aluminum low-mass tone arm; dual range anti-skate control; micrometer stylus adjustment; slide-in cartridge holder. Includes base, dust cover, Shure M75ECS cartridge with elliptical stylus and cables. Measures 7¼" H x 15¼" W x 14½" D including base and dust cover.

AD-1135, 15 lbs., mailable 69.95

AD-1037, optional 45 rpm spindle, 1 lb., mailable 1.95

C) Heath/BSR AD-1125 — An excellent choice for rounding out any budget-minded component system. The AD-1125 features manual, semi-automatic or automatic modes; four-pole induction motor; aluminum counterweighted tone arm; slide-in cartridge holder; cue/pause control; stylus force control. Includes base, dust cover, Shure M75ECS cartridge with elliptical stylus and cables. Measures 7¼" H x 15¼" W x 14½" D including base and dust cover.

AD-1125, 14 lbs., mailable 54.95

AD-1037, optional 45 rpm spindle, 1 lb., mailable 1.95



charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heath-quality tape recording equipment to

9 EVENING KIT

249⁹⁵
NO MONEY DOWN

Heathkit Cassette Deck with Dolby® circuit

The Heathkit AD-1530 Deluxe Cassette Tape Deck combines a preassembled top-quality domestic-make tape transport, the famous Dolby Noise Reduction System, to produce a superb cassette tape deck in easy-to-assemble kit form. The famous-make tape transport comes to you preassembled, ready to wire into the kit, and features PLAY, STOP, FAST-FORWARD, REWIND and EJECT controls. All controls are interlocked, so it's impossible for you to accidentally press the wrong control and break a tape. An automatic shutoff returns the transport to STOP when tape ends in PLAY or RECORD mode. "Piano"-keys give you fingertip control of PLAY, RECORD, and STOP functions. Levers control FAST-FORWARD, REWIND and EJECT functions, STEREO or MONO input: Dolby ON/OFF; tape-type REGULAR (Iron oxide) or CrO₂ (chromium dioxide).

Other features are individual bias adjust controls for regular and CrO₂ tape; individual record level controls with separate VU meters; large three-digit resettable counter for reliable indexing of selections within a tape; input selector switch for either microphone or high-level source input (any low impedance microphone with standard ¼" phone jack can be used). Modular plug-in circuit board design is employed in the amplifier and Dolby circuits of the AD-1530, simplifying kit construction and any servicing. Built-in test circuitry and free test cassette aid in initial kit check-out and adjustment. A blank 60 minute cassette is also included with the kit.



Kit includes special test cassette for initial check-out and adjustment. Plus 60-minute blank cassette.



Optional cardloid electret condenser microphone features 80-13,000 Hz response, on-off switch, 18-ft. cable, 2-conductor phone plug, mike stand adaptor, handsome leather-grain vinyl case. Order a pair for stereo recording.

AD-1530 SPECIFICATIONS: Frequency Response: Regular (iron oxide) tape; ±3 dB from 40 Hz to 12 kHz typical. CrO₂ (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 Additional Noise Reduction as Follows; -10 dB @ 4000 Hz and up. -9 dB @ 2400 Hz. -6 dB @ 1200 Hz. -3 dB @ 600 Hz. Wow and Flutters Less than 0.25% RMS. Inputs: Microphone: Lo-Z, 0.2 mV to 10 mV. Auxiliary: Hi-Z, 50 mV to 10V. Bias Oscillator Frequency: Approximately 100 kHz. Tape Speed: 1½ in/s or 4.76 cm/s. Fast Forward/Rewind Time: Approximately 45 sec. for C-60 cassette. Solid State Devices: 37 transistors and 2 JFET's. Output: Greater than 0.5 volts from low impedance source. Dimensions: 5½" H x 9½" D x 14" W. Power Requirements: 120 volts, 60 Hz, 15 W.

- Kit AD-1530, 20 lbs., mailable 249.95
 ADA-1530-1, dust cover, 1 lb., mailable 4.95
 ADP-1034, Electret Condenser Microphone & case, 2 lbs., mailable 39.95

TEAC 3340S Four-channel Three-head Tape Deck

Teac calls it the ultimate quadraphonic tape deck for the home recordist who wants to go creative. First the 3340S gives you discrete four channel record and playback capability. Then there's Simul-Sync — an exclusive Teac feature that permits recording of four discrete but fully synchronized channels on each track of a four-track tape. This technique makes possible synchronized overdubbing, professional mix-down, special effects tapes, etc. Other features include: 4 output controls, 4 mike input controls, 4 line input controls. Four VU meters. Four tape/source monitor switches. Front and rear stereo headphone jacks. Two channel, four-channel play switch. Separate bias, equalization switches for tape optimization. Selector switches for record mode for each channel. Plus, the 3340S accepts a variety of mix-down panels, sound-on-sound and echo adapter. Separate Simul-Sync switches for each channel, 10" reel capacity.

ATP-1082, 72 lbs., Express/Frt. 999.50



SUPPLIED ACCESSORIES — Empty 10½" reel. Reel adaptor, input-output connection cord. Lubricating oil. AC power cord. Splicing tape. 117 V. AC fuse. Head cleaning stick. Silicone cloth. Rubber feet. Reel height adjusting sheet. **SPECIFICATIONS** — 3 heads: Erase, Record, Play. Recording system: 4-track, 4-channel and 2-channel stereo (with Simul-Sync). Tape speed: 15, 7½ ips (±0.5%). Reel size: 10½" max. 3 motors: 1 dual speed hysteresis synchronous capstan, 2 eddy current induction reel. Rewind/Fast-Forward time: 140 Sec./1800". Wow and flutter: 0.04% at 15 ips, 0.06% at 7½ ips. Frequency response (Hz): 25-24k (±3 dB, 30-20k) at 15 ips, 25-22k (±3 dB, 30-18k) at 7½ ips. Signal-to-noise ratio: 55 dB. Level indicators: Four VU Meters (one for each channel). Harmonic distortion: 1% at 1 kHz normal operating level. Stereo channel separation: 50 dB at 1 kHz. Microphone input impedance: 600 ohms. Microphone input sensitivity: -72 dB (0.25 mV). Line input impedance: 50k ohms. Input sensitivity: 0.1V. Stereo headphone jacks output impedance: 8 ohms. Line output impedance: 10k ohms. Output levels 0.775 V. Power requirements: 117 V. AC, 60 Hz, 138 W. Dimensions (WHD): 17½" x 20½" x 8¾".

match your performance and budget needs



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NO MONEY DOWN

Heathkit AD-110 Cassette Deck

Full-function record and playback of both stereo and mono tape. The Heathkit AD-110 features solid-state circuitry with internally adjustable bias to accommodate the new "wide spectrum" chromium dioxide cassettes; two-transistor regulated DC motor for stable tape speed with minimum "wow" and "flutter". Six pushbuttons control all tape transport functions. Separate level controls and meters for "high level" input from less than 100 mV to 10V. Transport mechanism is preassembled and aligned for easier assembly. Blank 60-minute cassette included with kit.

Kit AD-110, 12 lbs., mailable 129.95

ADA-110-1, two matched stereo microphones, 2 lbs., mailable .. 19.95

AD-110 SPECIFICATIONS — Frequency response (record-play): ± 3 dB from 30 Hz to 12 kHz typical. Inputs: Aux. 70 mV to 10 V, Mike 0.2-6 mV. Hum and noise: -45 dB. Bias and erase frequency: 110 kHz. Wow and flutter: Less than .25% WRMS record and playback. Motor: Solid-state regulated DC. Speed: 1 7/8 ips. Fast forward-rewind time: Less than 120 sec. for C-60 cassette. Tape: C-30, C-60, C-90 cassettes. Control: Power switch, record level (left and right channel), record, rewind, stop-eject, play, fast forward, pause. Transistor complement: 13 transistors and 1 IC. Output: Greater than 1/2 volt from low impedance amplifier stage. Finish: Black with walnut end panels. Dimensions (overall): 3 1/4" H x 13 3/4" L x 11" D. Power: 120/240 VAC, 50-60 Hz, 7 watts.



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NO MONEY DOWN

Heathkit 8-Track Stereo Cartridge Player

Plays back pre-recorded 8-track stereo tape cartridges through your present music system. A metal tape splice switches the playhead from one track to the next automatically. Or you can select the track you want to hear by just pushing the convenient slide switch... a pilot lamp indicates at a glance which track is playing. The tape player mechanism by Motorola® is pre-assembled and adjusted to make your kit building an easy two evening project. 40-Minute Stereo Cartridge included with your new GD-28. Features 16 Instrumentals by world famous Capitol Records recording artists. A \$7.95 value!

Kit GD-28, 10 lbs., mailable 59.95

GD-28 SPECIFICATIONS — Cartridge: 8-track stereo. Tape speed: 3 3/4" per second. Output (each channel): 300 mV at Standard Reference Level. Harmonic distortion: Less than 3%. Separation: Greater than 30 dB at 1 kHz. Frequency response: ± 6 dB, 50 Hz to 10 kHz. Wow & flutter: Less than 0.3%. Hum & noise: Better than -40 dB. Motor: 117 VAC synchronous. Power requirements: 105-125 VAC, 60 Hz, 45 watts (momentary). Cabinet: Simulated walnut grained vinyl clad wood. Dimensions: 10 3/4" W x 4 1/2" H x 8 1/4" D.



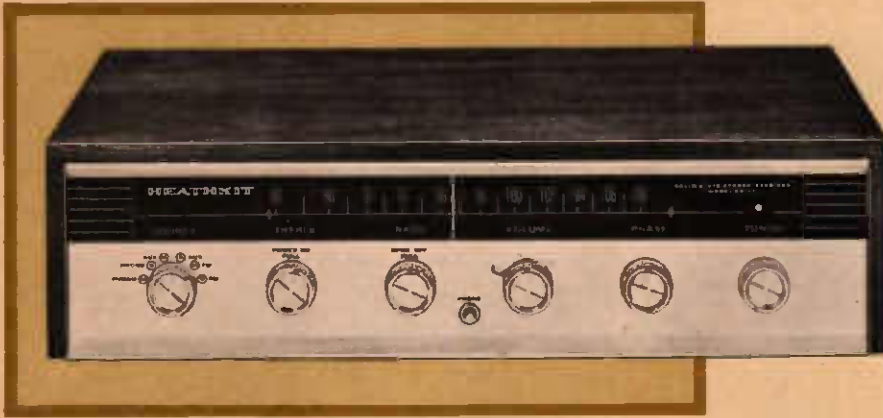
TEAC 2300S Three-head Stereo Deck

We're proud to be able to offer our customers Teac's most economical reel-to-reel tape deck. While the price may be quite low, this unit has a brilliance and clarity found only on top-of-the-line equipment. And for the amateur recording engineer, it's loaded with features. There's total push-button transport control with logic circuitry. Dual, professional VU meters. Separate bias, equalization switches for using high energy or standard tape. Three motors for improved tape stability. Three heads for better frequency response. Mike/Line mixing or other blending of signals from two sources. Total remote control capability. Pause control with indicator light. Tape/source monitor switch. Operates vertically or horizontally. Walnut side panels included.

ATP-1072, 51 lbs., Express/Frt. 429.50

SUPPLIED ACCESSORIES — Empty reel. Input-output connection cord. Lubricating oil. 117 V. AC fuse. Head cleaning sticks. Silicone cloth. Rubber feet. AC power cord. Splicing tape. **SPECIFICATIONS** — 3 Heads: Play, Erase, Record. Recording system: 4-track 2-channel stereo. Tape speed: 7 1/2 ips, 3 3/4 ips, ($\pm 0.5\%$). Reel size: 7" max. Motors: 1 dual speed hysteresis synchronous capstan, 2 eddy current induction reel. Rewind and fast-forward time: 140 sec./1,800'. Wow and flutter: 0.08% (7 1/2 ips), 0.10% (3 3/4 ips). Frequency response: (Hz): 25-24k (± 3 dB, 30-20k at 7 1/2 ips), 25-16k (± 3 dB, 30-13k at 3 3/4 ips). Signal-to-noise ratio: 58 dB. Level indicators: Two VU meters (one for each channel). Harmonic distortion: 1% at 1 kHz normal operating level. Crosstalk: 60 dB at 1 kHz. Stereo channel separation: 50 dB at 1 kHz. Microphone input impedance: 600 ohms. Input sensitivity: -72 dB (0.25 mV). Line input impedance: 100k ohms. Input sensitivity: 0.1V. Stereo headphone jack output impedance: 8 ohms. Line output impedance: 10k ohms. Output levels: 0.3 V. Power requirement: 117 V. AC, 60 Hz, 95 W. Dimensions 17 3/4" x 15 3/4" x 8 3/4".

Heathkit® values in budget-priced components



Heathkit AR-14 30-Watt FM Stereo Receiver... only **99⁹⁵** less cabinet

Two preamplifiers and two power amps deliver a hard-driving 30 watts of music power at ± 1 dB from 15 to 50,000 Hz. The sensitive FM tuner pulls in stations far and wide. Advanced transformerless output circuit provides pure sound, uncolored by reactive circuits. A six-position source switch selects tuner, tape, or records — stereo or mono. Has dual concentric volume control; a tandem treble control with push-pull power switch, and tandem bass control with push-pull

speaker on-off switch for listening with headphones. There's also a front-panel headphone jack for private listening; automatic stereo indicator light; and filtered outputs for beat-free stereo taping.

- Kit AR-14, less cabinet, 18 lbs., mailable **99.95**
- AE-55, walnut veneer cabinet, 7 lbs., mailable **12.95**
- AE-65, beige metal cabinet, 6 lbs., mailable... **3.95**

AR-14 SPECIFICATIONS — AMPLIFIER — Continuous power output: 10 W each channel — 20 W total. Music power output (IHF): 15 W per channel. Speaker output impedance: 4 through 16 ohm. Tape output impedance: 3.5 K ohm. Damping factor: 50. Hum and noise: Phono —60 dB; Auxiliary: —63 dB. Frequency response: 12 to 60,000 Hz ± 1 dB; 6 to 100,000 Hz ± 3 dB. Power response: 15 to 50,000 Hz ± 1 dB; 7 to 90,000 Hz ± 3 dB. Input sensitivity: Phono: 4.5 mV; auxiliary: 300 mV. Input Impedance: Phono: 47 k ohm; Auxiliary: 180 k ohm. Channel separation: 45 dB or better. Total harmonic distortion (at rated output): 0.5% or less @ 1000 Hz; 1% or less @ 20 & 20,000 Hz. Intermodulation distortion (at rated output): Less than 1% (60 & 60,000 Hz, 4:1). Phono equalization: RIAA. FM: Tuning range: 88-108 MHz. Antenna: Balanced input for external 300 ohm antenna. Intermediate frequency: 10.7 MHz. Sensitivity (IHF): 5 μ V. Hum & noise (IHF): —50 dB. Audio frequency response (IHF): 0 to —3 dB from 20 to 15,000 Hz. Harmonic distortion (IHF): 1% or less. Image ratio (IHF): —45 dB. Capture ratio (IHF): 3 dB. AFC correction: 150 kHz per volt. AM suppression (IHF): —35 dB. IF Rejection (IHF): —80 dB. FM STEREO — Separation: 30 dB @ 1 kHz. **GENERAL —** Front panel: 6-position Source Switch; Monophono; Stereo Phono; Mono Auxiliary; Stereo Auxiliary; Mono FM; Stereo FM; Volume Control; Bass Control; Treble Control; Phone Jack. Rear panel: Fused AC Power Socket; switched and unswitched. Speaker Terminal Blocks: one left & one right. Left & right input sockets; phono & aux. Tape output sockets; left & right right channel. Power requirement: 120/240 V, 50/60 Hz; 32 W idling; 65 W full output; (No load on AC power sockets). Dimensions: Overall: 3 $\frac{3}{4}$ " H x 15 $\frac{1}{4}$ " W x 12" D. Mounting position: Horizontal or Vertical, Cutout required 15" x 3 $\frac{1}{2}$ "; Depth required from front of mounting surface 11 $\frac{1}{2}$ ".

Heathkit FM Stereo Tuner **49⁹⁵** less cabinet



Four-stage IF provides 5 μ V sensitivity, less than 1% distortion. Has fly-wheel tuning, mono-stereo

switch, and stereo phase control for maximum separation. Features AFC for drift-free reception; stereo light; pre-aligned and assembled tuner for fast, simple kit building.

- Kit AJ-14, less cabinet, 6 lbs., mailable **49.95**
 - AE-25, walnut veneer cabinet, 5 lbs., mailable **9.95**
 - AE-35, beige metal cabinet, 4 lbs., mailable **3.95**
- AJ-14 SPECIFICATIONS: Same as tuner section of AR-14. (3" H x 12" W x 9 $\frac{3}{4}$ " D)

Heathkit 30-Watt Stereo Amplifier **59⁹⁵** less cabinet



Easy-to-build high performance solid-state amplifier with enough power to drive any efficient

4-16 ohm speaker system. Provides 15 to 50,000 Hz ± 1 dB response at a full 15 watts of IHF music power per channel with less than 0.5% harmonic distortion. Six-position source control handles turntable, tuner or tape-deck — stereo or mono.

- Kit AA-14, less cabinet, 11 lbs., mailable **59.95**
 - AE-25, walnut veneer cabinet, 5 lbs., mailable **9.95**
 - AE-35, beige metal cabinet, 4 lbs., mailable **3.95**
- AA-14 SPECIFICATIONS: Same as amplifier section of AR-14. (3" H x 12" x 10 $\frac{1}{4}$ " D)



179⁹⁵ NO MONEY DOWN

AR-17 14-Watt FM Stereo Receiver

28-transistor, 7-diode circuit delivers 14 watts music power. Response of 25 to 35,000 Hz ± 1 dB at full power with less than 1% distortion. Selector for magnetic phono, tuner, aux., stereo or phono. Assembled FM front end. 3" H x 12" W x 10 $\frac{3}{4}$ " D.

- Kit AR-17, less cabinet, 9 lbs., mailable **72.95**
- AE-35 beige metal cabinet, 4 lbs., mailable **3.95**
- AE-25, walnut veneer cabinet, 5 lbs., mailable **9.95**



AA-18 4-Watt Mono Amplifier

Drives any 4-16 ohm high efficiency speaker with power to spare. Excellent frequency response and low distortion. Inputs for ceramic phono cartridges, mono AM or FM tuners or tape recorders. Front panel headphone jack.

- Kit AA-18, 4 lbs., mailable **19.95**

AA-18 SPECIFICATIONS — Dynamic power output: 4 watts.* Continuous power output: 3.25 watts.* Harmonic distortion: Less than 1.5% from 40 Hz to 60 kHz at 4 watts output. Less than 0.7% from 20 Hz to 60 kHz at 1 watt output. Intermodulation distortion: Less than 4% with 4 watts output using 60 Hz and 6 kHz mixed 4:1. Power requirements: 120/240 VAC, 50/60 Hz, 5 watts maximum. Cabinet size: 2 $\frac{1}{2}$ " H x 7 $\frac{1}{8}$ " W x 5 $\frac{1}{8}$ " D. *Rated IHF (Institute of High Fidelity) Standards.



Stereo "separates" from the famed AR-15 & AR-29

9 EVENING KIT



199⁹⁵
less cabinet
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9 EVENING KIT



189⁹⁵
less cabinet
NO MONEY DOWN

7 EVENING KIT



179⁹⁵
less cabinet
NO MONEY DOWN

8 EVENING KIT



159⁹⁵
less cabinet
NO MONEY DOWN

Heathkit AJ-15 FM Stereo Tuner

Tuner section of the renowned AR-15. All solid-state design uses circuit-board wiring harness construction with ICs equivalent to eight conventional IF stages. Field Effect transistors (FET) for excellent sensitivity and selectivity; 2 crystal filters for optimum IF bandpass shape; 2 calibrated tuning meters; automatic noise-operated FM squelch; stereo threshold control; stereo only switch; 2 headphone jacks.

Kit AJ-15 (less cabinet), 18 lbs., mailable **199.95**
AE-18 walnut cabinet, 8 lbs., mailable **19.95**

AJ-15 SPECIFICATIONS — TUNER SECTION — Tuning Range: 88-108 MHz. Frequency response: ± 1 dB, 20-15 kHz. Sensitivity: 1.8 μ V*. Selectivity: 70 dB*. Image rejection: 90 dB*. IF rejection: 90 dB*. Capture ratio: 1.5 dB*. AM suppression: 50 dB*. Harmonic distortion: 0.5% or less*. Intermodulation: 0.5% or less*. Hum & Noise: 65 dB*. Spurious rejection: 100 dB*. **STEREOPHONIC SECTION —** Channel separation: 40 dB or greater at midfrequencies; 30 dB at 50 Hz; 25 dB at 10 kHz; 20 dB at 15 kHz. Frequency responses ± 1 dB 20-15 kHz. Harmonic distortion: 1% at 1000 Hz with 100% modulation. 19 kHz and 38 kHz suppression: 55 dB or greater. SCA suppression: 50 dB. **AUDIO SECTION —** Output voltage: Tape & fixed, 1.5 V rms nominal (with 100% modulation). Output Impedance: Tape & fixed, Approx. 9000 ohms. Phono & variable: 100 ohms. **GENERAL —** AC outlet socket: Unswitched; 350 W max. Power requirements: 120/240 VAC, 50-60 Hz, 0.25 W. Dimensions: 4 $\frac{3}{4}$ " H x 16 $\frac{7}{8}$ " W x 12 $\frac{1}{2}$ " D.

*Rated IHF (Institute of High Fidelity Standards).

Heathkit AA-15 Stereo Amplifier

Amplifier section of the famed Heathkit AR-15. Gives 150 watts of dynamic music power. Features include individual input level controls for each channel of all inputs; outstanding response; less than 0.5% harmonic and IM distortion at 50-watts continuous output; main and remote stereo speaker switches and connections; two headphone jacks; tone-flat switch; loudness switch; tape monitor switch.

Kit AA-15 (less cabinet), 37 lbs., mailable **189.95**
AE-18 walnut cabinet, 8 lbs., mailable **19.95**

AA-15 SPECIFICATIONS — Music power (each channel): 8 ohms, 75 W*; 4 ohms, 50 W; 16 ohms, 45 W. Continuous power: 8 ohms, 50 W*; 45 W; 16 ohms, 35 W. Power bandwidth for 0.5% THD: 6 Hz to 30 kHz*. Frequency response: (1 W): ± 1 dB, 8 to 40 kHz. Harmonic distortion: 0.5% at 50 W. Damping factor: 45. Input sensitivity: Phono 2.2 mV, Tape, Aux., and Tape Mon., 200 mV. Hum & noise: Phono, -60 dB; Tape & Aux., -65 dB. Channel separation: Phono, 45 dB; Tape & Aux., 55 dB. Tape output impedance: 120 ohms. Input Impedance: Phono 51 k ohms, Aux., Tape & Tape Mon. 100 k ohms. Tape output: 0.17 volt output with 0.2 volt input. **GENERAL: AC outlet sockets: 3 on rear panel — 1 switched (350 W max.), 2 unswitched (350 W max.).** Power requirements: 120/240 VAC, 50-60 Hz, 240 W @ full output. Dimensions: 4 $\frac{3}{4}$ " H x 16 $\frac{7}{8}$ " W x 12 $\frac{1}{2}$ " D.

*Rated IHF (Institute of High Fidelity Standards).

Heathkit AJ-29 Stereo Tuner

For clean, sensitive FM-stereo reception the pre-assembled, factory-aligned FM tuner boasts 1.8 μ V sensitivity and a computer-designed nine-pole L-C filter in the IF strip gives ideally shaped bandpass with greater than 70 dB selectivity, superior separation and eliminates IF alignment forever. The blend function attenuates any on-station FM hiss or high-frequency noise at the push of a button...and the mute function attenuates between-station noise on FM without affecting sensitivity of the tuner. And the AJ-29 has truly remarkable AM reception too. The built-in AM rod antenna swivels to allow orientation for best reception.

Kit AJ-29, 19 lbs., mailable **179.95**
AE-19 cabinet, 9 lbs., mailable **19.95**

Same outstanding performance specifications as the tuner section of the AR-29. (5 $\frac{1}{8}$ " H x 16 $\frac{3}{4}$ " W x 14 $\frac{1}{2}$ " D)

Heathkit AA-29 Stereo Amplifier

Few amplifiers that can match the Heathkit AA-29...100 watts music power, 70 watts continuous. That's more than enough to drive the most inefficient system — and there are outputs for two stereo speaker systems. A massive, fully-regulated and filtered power supply, four conservatively heat slinked output transistors and excellent intermodulation and harmonic distortion specifications add up to superlative sound fidelity. Positive circuit protection is provided by a dissipation-limiting circuit that protects the outputs from damage, even with a short circuit condition. Input level controls for both channels of all inputs including tape monitor allow adjustments of levels so volume remains constant when switching sources.

Kit AA-29, 27 lbs., mailable **159.95**
AE-19 cabinet, 9 lbs., mailable **19.95**

The same pace-setting performance specs found in the amplifier section of the AR-29 plus an additional "auxiliary" input and an extra tuner input. (5 $\frac{1}{8}$ " H x 16 $\frac{3}{4}$ " W x 14 $\frac{1}{2}$ " D).

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Meet the value-minded "1214" Receiver family



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NO MONEY DOWN

AR-1214 SPECIFICATIONS — FM SECTION (Monophonic) — Frequency response: ± 1 dB, 20 to 15,000 Hz. Sensitivity: $2 \mu\text{V}$. * Volume sensitivity: Below measurable level. * Selectivity: 60 dB. * Image rejection: 50 dB. * IF rejection: 75 dB. * Capture ratio: 2 dB. * AM suppression: 50 dB. * Harmonic distortion: 0.5%. * Intermodulation distortion: 0.5%. * Hum and noise: 65 dB. * Spurious rejection: 70 dB. * **FM SECTION (Stereo-Phonic) —** Channel separation: 40 dB typical, 35 dB minimum. Frequency response: ± 1 dB from 20 to 15,000 Hz. Harmonic distortion: 1% @ 1000 Hz with 100% modulation, 19 kHz and 38 kHz suppression: 55 dB. SCA suppression: 55 dB. **AM SECTION —** Sensitivity: 100 μV per meter. * Selectivity: 40 dB (alternate channel). AM antenna: Built-in rod type (adjustable). Image rejection: 60 dB. * IF rejection: 50 dB. * Harmonic distortion: Less than 2%. Hum and noise: 35 dB. * **Amplifier —** Dynamic power output per channel: 25 W (8 ohm load). * 30 W (4 ohm load), 14 W (10 ohm load). Continuous power per channel: 15 W (8 ohm load), 20 W (4 ohm load), 10 W (16 ohm load). Power bandwidth for constant 0.5% total harmonic distortion: 5 Hz to 30 kHz. Frequency response (1 W level): ± 1 dB, 7 Hz to 100 kHz, ± 3 dB, 5 Hz to 150 kHz. Harmonic distortion: Less than 0.5% from 20 Hz to 20 kHz @ 15 W output. Less than 0.25% @ 100 Hz with 1 W output. Intermodulation distortion: Less than 0.5% with 15 W output. Less than 0.2% @ 1 W output. Damping factor: Greater than 50. Input sensitivity: Phono: 2 mV (Overload 75 mV). Tape: 190 mV (Overload 2.5 V). Hum and noise: Phono —65 dB. Channel separation: 55 dB Phono & Tape. Tape output: 0.4 V input. **GENERAL —** AC outlet sockets: 2 (350 W max.), 1 switched, 1 unswitched. Power requirements: 120/240 VAC, 50-60 Hz. Dimensions: $3\frac{3}{4}$ " H x 17" W x 13" D. * Rated IHF (Institute of High Fidelity) Standards ** Record Industry of America

Heathkit AR-1214, 50-Watt Stereo Receiver

Compare the styling, the performance, the features with any — you'll find the AR-1214 is the value winner! The amplifier section produces a clean 25 watts IHF, 15 watts RMS, per channel into 8 ohms. Two integrated circuits and two ceramic filters in the IF give this receiver a selectivity greater than 60 dB and superior amplifying/limiting characteristics. The phase lock multiplex demodulator gives 40 dB typical channel separation at less than 0.5% distortion. The pre-assembled FM tuning unit provides $2 \mu\text{V}$ sensitivity and a 2 dB capture ratio. The phono preamp section also uses integrated circuitry and has its own level controls so turntable volume can be set to coincide with tuner levels. Most circuitry mounts neatly on just three printed boards. Advanced features include: Black Magic panel lighting; fly-wheel tuning; stereo indicator light; headphone jack; speaker on/off button. And there are complete tape monitor facilities.

Kit AR-1214, 18 lbs., mailable **169.95**



Top, bottom and side panels are removable for total access to circuitry or for custom mounting.



Preassembled tuning unit mounts with room to spare on IF board.

5 EVENING KIT



89⁹⁵
NO MONEY DOWN

Heathkit AA-1214 50-Watt Stereo Amplifier

Here's a great piece of audio gear for the seasoned music lover who's a novice kit builder, but likes to save money. The AA-1214 produces 15 watts RMS, 25 watts IHF, per channel into 8 ohms. That's sufficient to drive all but the most inefficient speaker systems with volume to spare. And there are inputs for phono, tape, tuner and auxiliary source. Plus a tape monitor jack that makes the "1214" an ideal low cost amp for 4-channel use. A headphone jack and level control for phono input round out the "top-of-the-line" extras on this sensational little amplifier. Pushbuttons select program source, mono or stereo mode, and provide on-off control of speaker systems and power. Master controls actuate bass, treble, balance and volume. The new AA-1214 has all the power and performance most music lovers will ever want, and the "stackable" bookcase styling makes it as pleasing to the eye as it is to the ear. Order now — it's easy to build and easy on the budget.

Kit AA-1214, 13 lbs., mailable **89.95**

AA-1214 SPECIFICATIONS — GENERAL — AC outlet sockets: 2, one switched, 1 unswitched, 350 W max. Power requirements: 120/240 VAC, 50/60 Hz, 100 W at full output with no load on accessory outlets. Dimensions: $3\frac{3}{4}$ " H x $12\frac{3}{4}$ " W x 12" D. Other specifications same as Amplifier Section of AR-1214.

5 EVENING KIT



89⁹⁵
NO MONEY DOWN

Heathkit AJ-1214 AM/FM Stereo Tuner

The beginner kit builder will find the AJ-1214 especially delightful to assemble and enjoy...with handsome "1214" styling in an even smaller cabinet. The AJ-1214 has single-knob flywheel tuning for AM and FM, pushbutton mode controls, stereo-broadcast light, adjustable AM antenna and inputs for 75 or 300 ohm external FM antenna. And what's inside stands out even more. The solid-state circuitry utilizes 13 transistors, six diodes and three integrated circuits. The pre-assembled and aligned FM tuning unit uses an RF field effect transistor to achieve a $2 \mu\text{V}$ sensitivity with low cross modulation and minimal overload on strong signal stations. The FM IF includes two ICs and two ceramic filters for selectivity greater than 60 dB, superior amplifying/limiting characteristics, overall compactness and dependability. A phase-lock multiplex demodulator contributes to the 40 dB typical channel separation at less than 0.5% distortion. A great kit for the beginner, goes together simply in three evenings. Big performance at little cost.

Kit AJ-1214, 11 lbs., mailable **89.95**

AJ-1214 SPECIFICATIONS — AM Output: 0.6 V nominal. FM output: 1 V nominal. Power requirements: 120-240 VAC, 50/60 Hz, 10 W. Dimensions: Overall, $3\frac{3}{4}$ " H x $12\frac{3}{4}$ " W x 13" D. All other specifications same as Tuner Section of AR-1214 Receiver.

Outstanding values in medium-power stereo



10 EVENING KIT

239⁹⁵
less cabinet
NO MONEY DOWN

11 EVENING KIT

299⁹⁵
less cabinet
NO MONEY DOWN

Heathkit AR-1302 60-watt Stereo Receiver ... performance and value that compare with the best

- *Proof positive that medium price can buy maximum performance in an AM/FM Stereo Receiver*

Modular design makes the AR-1302 a simple yet fascinating kitbuilding experience. 57 transistors, 35 diodes and three integrated circuits mount on eight-printed circuit boards, all of which plug into chassis connectors. Chassis-mounted parts are held to a minimum, a three-cable assembly makes point-to-point wiring fast and trouble-free. The FM IF section uses two ICs and two ceramic filters to achieve truly outstanding sound reproduction. Sensitivity is 1.9 μ V, selectivity 60 dB, capture ratio 1.8 dB, harmonic distortion 0.5% or less, IM distortion 0.25% or less, channel separation 40 dB at midfrequencies. There's pushbutton selection of tone-flat contour, loudness control, muting of between station noise, blending of any on-station FM hiss, stereo speaker system 1 and system 2 (or use the extra connection for center channel sound — it can be switched from stereo to mono). One knob tunes AM and FM with ball bearing inertia smoothness. Linear motion controls for volume, bass, treble, and balance. Individually adjustable controls for each input including tape monitor. Two tuning meters, center and signal level. Other features: direct coupled outputs; dissipation limiting circuitry; massive power supply; assembled and aligned FM tuner; built-in test circuitry (no other instruments needed); "black magic" panel lighting.

Kit AR-1302, less cabinet, 32 lbs., mailable 239.95
AE-19, oiled pecan cabinet, 9 lbs., mailable 19.95

AR-1302 SPECIFICATIONS — AMPLIFIER — Music Power (Each channel): 8 ohms, 30 W*, 4 ohms, 20 W; 16 ohms, 17 W. Continuous power: 8 ohms, 20 W*; 4 ohms, 20 W; 16 ohms, 15 W. Power bandwidth for 0.25% T.H.D.: 5 Hz to 30 kHz*. Harmonic distortion: 0.25% from 5 Hz to 20 kHz at 20 rms. Intermodulation distortion: 0.25% at 20 W, 60 and 6,000 Hz marked, 4:1. Channel separation: Phono, 50 dB, Tape & Aux., 55 dB. Output impedance (each channel): 4 to 16 ohms. **FM SECTION (Monophonic) —** Tuning range: 88 to 108 MHz. Antenna: Balanced for external 300 ohm antenna. Unbalanced 75 ohm. Frequency response: ± 1 dB, 20 to 15,000 Hz. Sensitivity: 1.9 μ V*. Selectivity: 60 dB*. Capture ratio: 1.8 dB*. AM Suppression: 45 dB*. Spurious Rejection: -90 dB*. **FM SECTION (Stereo-Phonic) —** Channel Separation: 40 dB at mid-frequencies. Frequency Response: ± 1 dB from 20 to 15,000 Hz. Harmonic distortion: 0.5% at 1000 Hz with 100% modulation, 19 kHz and 38 kHz Suppression: 50 dB*. **AM SECTION —** Tuning Range: 535 to 1620 kHz. Antenna: Adjustable rod. Sensitivity: Rod Antenna, 300 μ V/M*. Selectivity: 25 dB at 10 kHz. Image rejection: 60 dB at 600 kHz*, 60 dB at 1400 kHz*. **GENERAL —** AC Outlet Sockets: One switched, one unswitched (350 W max. each). Power requirements: 120/240 VAC 50/60 Hz. Dimensions: Overall — 5 1/8" H x 16 3/4" W x 14 1/2" D.

* Rated IHF (Institute of High Fidelity) Standards.

Enjoy truly superior stereo listening with the Heathkit AR-29 100-watt AM-FM Receiver

- *A medium-priced, superior stereo receiver that's in a class by itself*

The AR-29 has become a benchmark for designers of uncompromising home audio components. Spec for spec few receivers can match it — and those that do usually cost far more than the AR-29. Unquestionably the hours you invest in this kit pay off with fine stereo performance.

And there's no mystery in assembling the sophisticated solid-state circuitry. Most components mount on eight circuit boards, seven of which plug in. Three cable assemblies with color-coded wires connect to six-pin connectors. The remaining chassis wiring and soldering are as simple as following the check-by-step Instructions. Components include 65 transistors, 42 diodes, four ICs, preassembled and aligned FET tuner, computer designed LC filter. And you get ball-bearing tuning, mute and blend control on FM, linear master controls, individually adjustable level controls.

Kit AR-29, less cabinet, 34 lbs., mailable 299.95
AE-19, oiled pecan cabinet, 9 lbs., mailable 19.95

AR-29 SPECIFICATIONS — AMPLIFIER — Music power (Each Channel): 8 ohms, 50 W*; 4 ohms, 65 W; 16 ohms, 30 W. Continuous Power: 8 ohms, 35 W*; 4 ohms, 35 W; 16 ohms, 25 W. Power Bandwidth For 0.25% T.H.D.: 5 Hz to 30 kHz*. Frequency Response (1 W): -1 dB, 7 Hz to 60 kHz. Harmonic Distortion: 0.25% from 20 Hz to 20 kHz at 35 W rms, 0.1% at 1000 Hz at 1 W. Intermodulation Distortion: 0.2% at 35 W, 60 and 6,000 Hz mixed 4:1. 0.1% at 1 W. Damping Factor: 50. Input Sensitivity: Phono: 2.2 mV (Overload 155 mV). Tape, Aux. and Tape Mon., 180 mV (Overload 10 V). Hum and Noise: Phono (10 mV ref.), -65 dB. Tape & Aux. (0.25 V ref.), -75 dB. Channel Separation: Phono, 50 dB. Tape & Aux., 60 dB. Output Impedance: (each channel): 4 to 16 ohms. Tape Output Impedance: 50 ohms. Input Impedance: Phono, 49 k ohm (RIAA Equalized). Aux., Tape & Mon., 100 k ohm. Tape Output: 1 V with 0.2 V input. FM, 3.8 V with 100% modulation. **FM SECTION — (Monophonic) —** Tuning Range: 88 to 108 MHz. Antenna: Balanced for external 300 ohm antenna. Unbalanced 75 ohm. Frequency Response: ± 1 dB, 20 to 15,000 Hz. Sensitivity: 1.8 μ V*. Selectivity: 70 dB*. Image Rejection: 90 dB*. Capture Ratio: 1.5 dB*. AM Suppression: 50 dB*. Harmonic Distortion: 0.5%*. Intermodulation Distortion: 0.4%*. Hum & Noise: -60 dB. Spurious Rejection: -90 dB. **FM SECTION — (Stereo-Phonic) —** Channel Separation: 45 dB at mid-frequencies. Frequency Response: ± 1 dB from 20 to 15,000 Hz. Harmonic Distortion: 0.5% at 1000 Hz with 100% modulation, 19 kHz and 38 kHz Suppression: 55 dB. SCA Suppression: 55 dB. **AM SECTION —** Tuning Range: 535 to 1620 kHz. AM Antenna: Adjustable rod. Connections for external ant. grd. Sensitivity: External antenna, 20 μ V 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*. IF Rejection: 50 dB*. Harmonic Distortion: 2%*. Hum & Noise: -35 dB*. **GENERAL —** AC Outlet Sockets: One switched (350 W max.), one unswitched (350 W max.). Power Requirements: 120/240 VAC 50/60 Hz 240 watts at full output. Dimensions: Overall — 5 1/8" H x 16 3/4" W x 14 1/2" D.

* Rated IHF (Institute of High Fidelity) Standards.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

The world famous Heathkit AR-1500



379⁹⁵
less cabinet
NO MONEY DOWN

16 EVENING KIT

The Heathkit AR-1500 . . . the stereo receiver the experts recognize as superior

- 180 watts IHF — 90 watts per channel into 8 ohms (60 watts RMS)
- Better than 90 dB FM selectivity — AM performance approaching FM quality
- Built-in multipath monitoring capability — with the new Heathkit AD-1013 Audio-Scope

This is the receiver for the audiophile who wants to own or give the best there is. Yet this fine audio component can be built by anyone capable of assembling the simplest electronics kit. Julian Hirsch of STEREO REVIEW put it this way:

"With their well-known thoroughness, Heath has left little to the builder's imagination, and has assumed no electronic training or knowledge on his part. The separate packaging of all parts for each circuit board subassembly is a major boon... Virtually all the circuit boards plug into sockets, which are hinged so that boards can be swung out for testing or servicing without shutting off the receiver. An 'extender' cable permits any part of the receiver to be operated in the clear — even the entire power-transistor and heat-sink assembly! The 245-page manual has extensive test charts that show all voltage and resistance measurements in key circuits as they should appear on the receiver's built-in test meter..."

Conservatively rated, the AR-1500 puts out 180 watts, 90 per channel, into 8 ohms, with less than 0.2% intermod distortion, less than 0.25% harmonic distortion. Two computer-designed five-pole LC filters and the Improved 4-gang 6-tuned front end combine for an FM selectivity better than 90 dB, 1.8 uV sensitivity. And here are some things the specs won't show you. There are outputs for two separate speaker systems, two sets of headphones, biampification, and monitoring of FM with an oscilloscope, such as the Heathkit Audio-Scope on the facing page. Standard inputs — all with individual level controls. Elec-

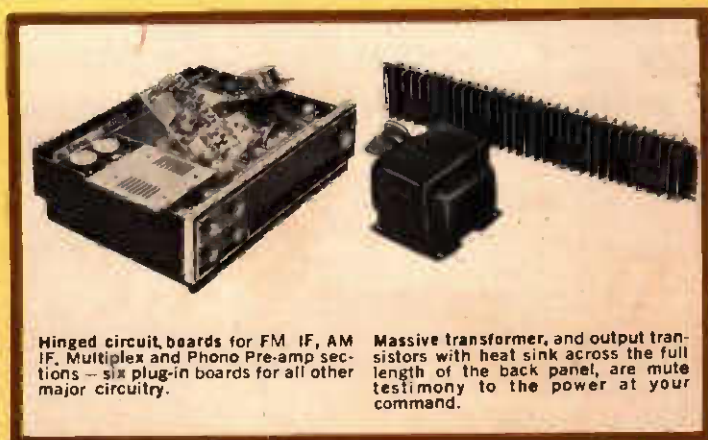
tronically monitored overload circuitry. There are even two dual-gate MOSFETS, one J-FET and a 12-pole LC filter in the AM section for super sound there! The AR-1500 is simply the best receiver we have ever offered. And at the low kit-form price, it's an incredible value for the audiophile who demands excellence. Build it, listen to it, and you'll believe it. And if you can't believe your ears, order the style-matched AD-1013 Audio-Scope on the opposite page — and get visual proof of performance.

Kit AR-1500, less cabinet, 53 lbs., mailable **379.95**
ARA-1500-1, walnut cabinet, 8 lbs., mailable **24.95**

AR-1500 SPECIFICATIONS — TUNER — FM SECTION (Monophonic): Tuning Range: 88 to 108 MHz. Intermediate Frequency (IF): 10.7 MHz. Frequency Response: ± 1 dB, 20 to 15,000 Hz. Antenna: Balanced input for external 300 ohm antenna. 75 ohm antenna input may be used between either FM antenna terminal and ground. Sensitivity: 1.8 uV. * Volume Sensitivity: Below measurable level. 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 and Noise: 60 dB. * Spurious Rejection: 100 dB. * **FM SECTION (Stereophonic):** Channel Separation: 40 dB or greater at midfrequencies; 35 dB at 50 Hz; 25 dB at 10 kHz; 20 dB at 15 kHz. Frequency Response: ± 1 dB from 20 to 15,000 Hz. 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 SECTION:** Tuning Range: 535 to 1620 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: 50 uV with external input, 300 uV per meter with radiated input. Selectivity: 20 dB at 10 kHz; 60 dB at 20 kHz. AM Antenna: Built-in rod type; connections for external antenna and ground on rear chassis apron. Image Rejection: 70 dB at 600 kHz; 50 dB at 1400 kHz. IF Rejection: 70 dB at 1000 kHz. Harmonic Distortion: Less than 2%. * Hum and Noise: 40 dB. * **AMPLIFIER — Dynamic Power Output per Channel (Music Power Rating):** 90 watts (8 ohm load)*; 120 watts (4 ohm load)*; 50 watts (16 ohm load). Continuous Power Output per Channel: 60 watts (8 ohm load)*; 100 watts (4 ohm load); 40 watts (16 ohm load). Power Bandwidth for Constant 25% Total Harmonic Distortion: Less than 8 Hz to greater than 30 kHz. * Frequency Response (1 watt level): -1 dB, 7 Hz to 80 kHz; -3 dB, less than 5 Hz to 120 kHz. Harmonic Distortion: Less than 0.25% from 20 Hz to 20 kHz at 60 watts output; less than 0.1% at 1000 Hz with 1 watt output. Intermodulation Distortion: Less than 0.1% with 60 watts output, using 60 and 6,000 Hz mixed 4:1; less than 0.1% at 1 watt output. Damping Factor: Greater than 60. Input Sensitivity: Phono, 1.8 millivolts; Tape, 140 millivolts; Aux, 140 millivolts; Tape Mon, 140 millivolts. Input Overload: Phono, 145 millivolts; Tape, greater than 10 volts; Aux, greater than 10 volts; Tape Mon, greater than 10 volts. Hum & Noise: Phono (10 millivolt reference), -63 dB. Tape and Aux (0.25 volt reference), -75 dB. Volume control in minimum position, -90 dB referred to rated output. Channel Separation: Phono, 55 dB; Tape and Aux, 55 dB or greater. Output Impedance (each channel): 4 ohm through 16 ohms. Tape Output Impedance: Approximately 50 ohms. Input Impedance: Phono, 49 k ohm (RIAA** Equalized); Aux, Tape, and Tape Mon, 100 k ohms. Tape Output: Tape or Aux inputs, 1 volt output with 0.2 volt input. **GENERAL — Accessory AC Outlet Sockets:** Two. One switched and one unswitched (240 watts maximum). Power Requirements: 120 or 240 volts 50/60 Hz AC. 40 watts idling (zero output) and 356 watts at full output with no load on accessory outlets. Dimensions: Overall — 18 1/2" W x 5 3/4" H x 13 7/8" D.

*Rated IHF (Institute of High Fidelity) Standards.

**Rated RIAA (Record Industry Association of America).



Hinged circuit boards for FM IF, AM IF, Multiplex and Phono Pre-amp sections — six plug-in boards for all other major circuitry.

Massive transformer, and output transistors with heat sink across the full length of the back panel, are mute testimony to the power at your command.

Heathkit® Audio Scope monitors FM performance



9 EVENING KIT

199⁹⁵
less cabinet
NO MONEY DOWN

Heathkit AD-1013, 4-Channel Audio Scope

The AD-1013 represents another Heathkit "first"... a top quality professional audio oscilloscope capable of visually monitoring the performance of all two- and four-channel stereo systems — cabinet-matched to the famed Heathkit AR-1500 Stereo Receiver on the facing page, but styled to enhance the appearance of other contemporary component systems — and at a kit-form savings of hundreds of dollars!

The AD-1013 is a sophisticated solid-state instrument especially designed for use with any 2-channel or 4-channel stereo system to provide visual checking and monitoring of such parameters as channel separation, phasing, relative signal strengths, multipath reception, center-tuning of receivers and tuners, etc.

Triggered sweep, another Heathkit exclusive Plus-Value, assures you of a stable, jitter-free signal trace with no fiddling around with knobs. Inputs are provided on the rear panel of the Audio-Scope for Left-Front, Left-Back, Right-Front, Right-Back, and Multipath. Any of these inputs can be switched and observed on the cathode ray tube, independently or in combination. In addition, a front panel input is provided for observing any external source, permitting you to use the AD-1013 as a conventional oscilloscope for checking out malfunctions in various stages of your tape equipment, receiver, amplifier, tuner, turntable, etc.

Lighted function indicators at the edge of the CRT screen on the front panel show you at a glance what function is being displayed on the screen, so you don't have to constantly refer to the function switch itself during operation. A built-in independent 20 Hz to 20 kHz low distortion audio oscillator provides a convenient means of setting up and checking your 4-channel or 2-channel stereo system. Front panel controls are provided for frequency selection of the audio oscillator as well as controlling the amplitude of the generated signal. Outputs from the audio oscillator are located on both front and rear panels. Output voltage will not vary with frequency change.

Other convenient front-panel controls include a Sweep Variable con-

rol providing a continuous adjustment of the sweep time between the rates indicated on the range switch; Sweep Range Switch, selects the range to display the desired number of cycles on the oscilloscope screen; Function Switch, selects the modes of operation for the Audio-Scope; Vertical Position control, varies vertical position of the display; Vertical Gain control, adjusts vertical size of the trace; Horizontal Position control; Horizontal Gain control; Display Focus control, adjusts sharpness of the display; Display Intensity control, varies the brightness of displays.

You'll find the new Heathkit Audio-Scope an extremely satisfying kit to build. Most of the solid-state components mount on a single large circuit board in a wide-open arrangement. Point-to-point wiring is held to a minimum. In short, you'll find as much enjoyment in assembling this kit as you'll have checking out and displaying the performance of your own audio system or those of friends.

Kit AD-1013, less cabinet, 19 lbs., mailable **199.95**

ARA-1500-1, walnut cabinet, 8 lbs., mailable **24.95**

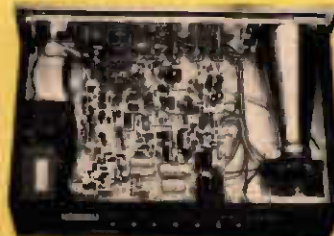
ATTENTION AR-15 AND AJ-15 OWNERS: in less than an evening you can add multipath provision to your equipment. The ARA-15-1 Adaptor Kit makes your AR-15 or AJ-15 compatible with the AD-1013 above, or any DC-coupled oscilloscope, for observing multipath conditions which may be limiting the quality of your FM reception.

Kit ARA-15-1, 1 lb., mailable **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. Audio Oscillator Output: Range: 20 Hz to 20 kHz. Voltage Level: 2 mV to 3 volts (rms) (variable). Output Variation: .25 dB 20 Hz to 20 kHz. 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, 50/60 Hz, 15 watts with no accessory load. AC Outlet (on rear panel): Unswitched. Dimensions (overall): 5 1/4" H x 18 1/2" W x 13 1/2" D.



Inputs are provided on the rear panel of the Audio-Scope for Left-Front, Left-Back, Right-Front, Right-Back, and Multipath. Any of these inputs can be switched and observed on the cathode ray screen, independently or in combination.



A satisfying kit-building experience — most solid-state components mount on a single large circuit board in the spacious cabinet. Point-to-point wiring is held to a minimum for easier kit assembly and self-service.

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Heathkit components make the most of



Heathkit AJ-1510 Computer Tuner™

Only tuner of its kind, the AJ-1510 makes exclusive use of computer technology—encompassing digital logic, scalars, dividers, decoders, programmers, counters and registers—a technology never before available to the general consumer.

A state-of-the-art digital frequency synthesizer employing phase-lock-loop techniques does the station tuning—with channel frequency accuracy better than 0.005%. An inductorless digital frequency discriminator of the pulse counting (averaging) type follows two fixed-tuned five-pole LC IF filters thus eliminating all IF and discriminator adjustments while achieving distortion levels of 0.1%. The preassembled varactor FM RF tuning unit (front end) uses field-effect transistors to provide high sensitivity (less than 1.8 μ V) and low cross modulation with no overload on strong signal local stations. The familiar, mechanically gauged variable capacitor has been replaced by varicaps (voltage variable capacitance diodes) to provide complete electronic tunability. Computer-keyboard tuning is a Heath exclusive. Now you can simply program the station's assigned frequency with a light touch of the keys. Four softly glowing numerals show you the channel frequency—exactly! A touch of

a button and the frequency synthesizer starts counting down from 107.9 MHz, with the readout displaying every available FM frequency through 88.1 MHz, stopping at each station with a listenable signal, or stopping only at stereo stations if you prefer. Depress the by-pass button and the Tuner resumes scanning. Up to three computer-type punch cards, programmed by you for your favorite stations, can be inserted in the Tuner. Selector buttons marked A, B, C give you instant access to any of these pre-programmed stations. Extra cards are supplied with the kit so you'll have one for each of your preferred FM frequencies. Secondary controls include AGC and noise squelch level adjusts. Both can be independently set to cut out or by-pass those stations with a signal quality unacceptable to the listener. The squelch circuitry can be circumvented by simply pushing the squelch defeat button. Other secondary controls include variable "sweep speed," a switch for selecting mono, stereo or blend listening modes, and a light test button for checking the numeric readout indicators. Still another hidden switch controls the dual-function front-panel meter. The meter shows relative signal strength and, at the flip of the switch, becomes a multipath indicator for optimum antenna alignment. Also, outputs are provided for visually monitoring multipath signals with an oscilloscope.

Heathkit 4-Channel, 200-Watt Amplifier

The AA-2010 decodes all matrix encoded material and enhances recorded stereo material and stereo FM broadcasts by reproducing the "hidden presence" in 2-channel programming and reproducing it through 2 rear speakers for realistic 4-channel effect. A flip of the "mode" switch, and your AA-2010 handles discrete 4-channel material such as 8-track tape, and CD-4 as processed through an external demodulator. Four conservatively rated amplifiers produce 260 watts IHF into 4 ohms (4x65), 200 watts into 8 ohms (4x50), 120 watts into 16 ohms (4x30). The individual amplifier sections are controlled in pairs, giving you two complete and independent stereo systems. Duplicate control clusters provide front and rear bass, treble, balance and volume, as well as phono, tape, tuner, aux., tape monitor, hi filter and loudness. A master mode switch selects mono, stereo, matrixed 4-channel or discrete 4-channel. Pushbuttons activate speaker pairs in any combination of up to eight speakers—or, two complete 4-channel systems. Twenty input level controls—for all inputs and tape monitor—can be adjusted beneath the chassis. And there are separate rear panel jacks to permit biamping, separate filters, equalizers, etc. Four VU meters monitor the outputs. 3-range meter switch sets meter levels.

Kit AA-2010, 36 lbs., less cabinet, mailable 359.95

AAA-2004-1, pecan cabinet, 7 lbs., mailable 24.95

AA-2010 SPECIFICATIONS—Dynamic power output per channel: 50 W (8 ohm load), 65 W (4 ohm), 30 W (16 ohm). Continuous power output per channel: 35 W (8 ohm load)*, 35 W (4 ohm), 25 W (16 ohm). Power bandwidth for constant 0.25% total harmonic distortion: Less than 5 Hz greater than 45 kHz.* Frequency response (1 W level): -1 dB, 7 Hz to 50 kHz, -3 dB, 4 Hz to 90 kHz. Harmonic distortion: Less than 0.25% from 20 Hz to 20 kHz @ 35 W output. Less than 0.1% @ 1000 Hz with 1 W output. Intermodulation distortion: Less than 0.2% with 35 W output, using 60 and 7,000 Hz mixed 4:1. Less than 0.1% @ 1 W output. Damping factor: Greater than 50. Input sensitivity: Phono: 2.2 mV. Tuner, Aux, Tape, Tape Mon: 180 mV. Input Overload: Phono: 155 mV. Tuner, Aux, Tape, Tape Mon: Greater than 10 V. Tape output: 1.4 V output with 0.2 V input. Num and noise: Phono (10 mV reference): -65 dB. Tuner, Aux, Tape, Tape Mon. (0.25 V reference): -75 dB. Volume control in minimum position: -90 dB referred to rated output. Channel separation: Phono: 50 dB. Tuner, Aux, Tape, Tape Mon: 55 dB or better. Hi filter: -3dB @ 9 kHz, -14 dB @ 20 kHz. Recommended speaker impedance (each channel): 4 through 16 ohm. Tape output impedance: Approx. 50 ohm. Input impedance: Phono: 49 k ohm (RIAA equalized). Tuner, Aux, Tape and Tape Mon: 100 k ohm. Dimensions: 6½" H x 18½" W x 13¾" D.

*Rated IHF (Institute of High Fidelity) Standards.

Kit AJ-1510, Tuner less cabinet,
23 lbs., mailable 539.95

AJA-1510-1, Pecan cabinet, 8 lbs., mailable 24.95

AJ-1510 SPECIFICATIONS—MONOPHONIC—Exact tuning range: 88.1 to 107.9 MHz. Tuning: Digitally synthesized. Intermediate frequency: 10.7 MHz. Antenna: 75 or 300 ohm. Frequency response: Discriminator: 10-60,000 Hz, \pm 0.5 dB. Audio: 20-15,000 Hz, \pm 1 dB. Sensitivity: Less than 1.8 μ V. Selectivity (alternate channel):* Greater than 95 dB. Capture ratio:* Less than 1.5 dB. Harmonic distortion:* Less than 0.3%. Intermodulation distortion:* Less than 0.1%. Image rejection: Greater than 90 dB. IF rejection:* Greater than 95 dB. Spurious rejection:* Greater than 90 dB. Signal-to-noise* ratio (100% mod.): Greater than 65 dB. AM suppression:* Greater than 60 dB. Channel frequency accuracy: Better than .005%. STEREO PHONIC—Channel separation: 1,000 Hz, 40 dB; 80 Hz, 25 dB; 10 kHz, 25 dB; 15 kHz, 20 dB. Harmonic distortion* (100% mod.): 0.35%. Frequency response: (\pm 1 dB): 20 to 15,000 Hz. 19 kHz and 38 kHz suppression: Greater than 60 dB. SCA suppression: Greater than 60 dB. AUDIO OUTPUT—Audio output level: (fixed): 1.2 V rms nominal (with 100% mod.). Output impedance (fixed): Approx. 4,700 ohms. GENERAL—Power requirements: 120/240 VAC, 50/60 Hz, 50 W. AC outlet socket: Unswitched, 350 W Max. Dimensions: 6" H x 16¾" W x 14¾" D.

*IHF

all available stereo & 4-channel sound

Heathkit 4-Channel AM-FM Receiver

- 25 Watts Music Power per channel for room-filling 4-channel sound
- Built-in matrix decoder, optimized for SQ, also handles other matrix-encoded material

Build one of the most outstanding audio values available and surround yourself with 4-channel sound.

The conservatively-rated four-section amplifier delivers a clean 25 watts IHF, 15 watts continuous, per channel into 8 ohms. The FM receiver section boasts two integrated circuits and two ceramic filters in the IF to produce a selectivity greater than 60 dB, with superior amplifying/limiting characteristics. A phase lock multiplex demodulator offers 40 dB typical channel separation at less than 0.5% distortion. The preassembled FM tuner provides 2 μ V sensitivity and a 2 dB capture ratio.

A versatile rear panel phono socket arrangement provides inputs for Phono, Tape, Auxiliary—plus outputs for "Tape Out." Two sets of auxiliary inputs are provided: one set of two inputs for stereo material; the other set of four inputs for four-channel material such as discrete 4-channel tape or outputs from an external CD-4 demodulator. This makes it possible for you to connect two complete systems to your auxiliary inputs at the same time, and switch to either one you desire from the front panel.

Convenient front panel controls include a single flywheel tuning knob for tuning FM or AM stations with easy, gliding action. Four level controls give you precise level adjustment of each of the four channels. Once these are set, the volume can be controlled by the single "master" volume control.

Attractive chrome pushbutton switches give you fingertip control of on-off, speakers, and all modes of operation. Two front panel headphone jacks are provided for private listening. Also featured are stereo indicator light, Black Magic panel lighting, and slim low-profile cabinet with black leather-grain vinyl-clad metal top and attractive walnut veneer end panels — included in the price of the kit.

Kit AR-2020, 31 lbs., mailable 249.95

AR-2020 SPECIFICATIONS — FM SECTION (Monophonic) — Tuning Range: 88 to 108 MHz. Intermediate Frequency (IF): 10.7 MHz. Frequency Response: ± 1 dB, 20 to 15,000 Hz. Sensitivity: 2 μ V. Selectivity: 60 dB. Image Rejection: 50 dB. IF Rejection: 75 dB. Capture Ratio: 2 dB. AM Suppression: 50 dB. Harmonic Distortion: .5%. Intermodulation Distortion: .5%. Hum and Noise: 60 dB. Spurious Rejection: 70 dB. FM SECTION (Stereophonic) — Channel Separation: 40 dB typical. Frequency Response: ± 1 dB from 20 to 15,000 Hz. Harmonic Distortion: .75% at 1000 Hz with 100% modulation. 19 kHz and 38 kHz Suppression: 60 dB. SCA Suppression: 55 dB typical. AM SECTION — Tuning Range: 535 to 1620 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: 100 μ V per meter. Selectivity: 40 dB (alternate channel). Image Rejection: 75 dB at 600 kHz. 70 dB at 1400 kHz. IF Rejection: 70 dB. Harmonic Distortion: 2%. Hum and Noise: 35 dB. AMPLIFIER — Dynamic Power Output per Channel (Music Power Rating): 25 watts (8 Ω load), 30 watts (4 Ω load), 14 watts (16 Ω load). Continuous Power Output per channel: 15 watts (8 Ω load), 20 watts (4 Ω load), 10 watts (16 Ω load). Power Bandwidth for Constant .5% Total Harmonic Distortion: 5 Hz to 30 kHz. Frequency Response (1 watt level): ± 1 dB, 7 Hz to 50 kHz. ± 3 dB, 5 Hz to 70 kHz. Harmonic Distortion: Less than .5% from 20 Hz to 20 kHz at 15 watts output. Less than .25% at 1000 Hz with 1 watt output. Intermodulation Distortion: Less than .5% with 15 watts output, using 60 and 6000 Hz mixed 4:1. Less than .25% at 1 watt output. Damping Factor: Greater than 30. Input Sensitivity: Phono: 2.2 millivolts. Tape: 200 millivolts. Input Overload: Phono: Greater than 5 volts with level control. Tape: Greater than 2.5 volts. Hum and Noise: Phono (10 millivolt reference) —60 dB. Tape (200 millivolt reference) —70 dB. Volume control in minimum position —85 dB referred to rated output. Channel Separation: Phono: 40 dB. Tape: 45 dB. Output Impedance: 4 Ω , 8 Ω , or 16 Ω . Tape Output Impedance: Approximately 50 Ω . Input Impedance: Phono: 49 k Ω (RIAA* equalized). Tape: 100 Ω . Tape Monitor: 100 Ω . Tape Output: .4 volt output with .2 volt input. GENERAL — AC Outlet Sockets: Two. One switched (350 watts maximum) and one unswitched (350 watts maximum). Power Requirements: 120 or 240 volts 50/60 Hz AC. Dimensions: 5" H x 20" W x 14" D.

* Rated IHF (Institute of High Fidelity) Standards



Heathkit 4-Channel Amplifier

The AA-2005 has a built-in matrix decoder optimized for SQ that will also handle other matrix-encoded material. You can use it as a monophonic amplifier, as a stereo amplifier, as four individual amplifiers, or as a discrete 4-channel amplifier for playing back 8-track, 4-channel tape, and CD-4 material after it has been processed by an external demodulator. Front-panel pushbuttons select on-off, up to four speakers, mono, stereo, matrix 4-channel, discrete 4-channel, tuner, auxiliary, tape, and phono. Four level controls (one for each channel) also are located on the front panel for adjustment of individual channel levels. Once these level controls are set, the "master" volume control on the front panel gives you complete control of the entire system's volume level. In addition, two front panel headphone jacks let you listen privately without disturbing others. On the rear panel, you'll find phono sockets for phono, tape, auxiliary and tuner inputs, as well as tape outputs. Two AC sockets are also provided, one switched and one unswitched, for powering other system components. Terminal connections accommodate up to four speakers.

The wide open circuit layout of the AA-2005, combined with solid state modular plug-in circuit boards, make the unit a kitbuilder's delight, providing even the beginner with a thoroughly delightful and rewarding project.

Kit AA-2005, 28 lbs., mailable 179.95

AA-2005 SPECIFICATIONS — Dynamic Power Output per Channel (Music Power Rating): 25 watts (8 Ω load), 30 watts (4 Ω load), 14 watts (16 Ω load). Continuous Power Output per Channel: 15 watts (8 Ω load), 20 watts (4 Ω load), 10 watts (16 Ω load). Power Bandwidth for Constant .5% Total Harmonic Distortion: 5 Hz to 30 kHz. Frequency Response (1 watt level): ± 1 dB 7 Hz to 50 kHz. ± 3 dB 5 Hz to 70 kHz. Harmonic Distortion: Less than .5% from 20 Hz to 20 kHz at 15 watts output. Less than .25% at 1000 Hz with 1 watt output. Intermodulation Distortion: Less than .5% with 15 watts output, using 60 and 6000 Hz mixed 4:1. Less than .25% at 1 watt output. Damping Factor: Greater than 30. Input Sensitivity: Phono: 2.2 millivolts. Tuner, Aux., Tape: 200 millivolts. Input Overload: Phono: Greater than 5 volts with level control tuner, aux., Tape: Greater than 3 volts. Hum and Noise: Phono (10 millivolt reference) —60 dB. Tuner, aux., Tape (200 millivolt reference) —70 dB. Channel Separation: Phono: 40 dB. Tape: 45 dB. Output Impedance: 4 Ω , 8 Ω , or 16 Ω . Tape Output Impedance: Approximately 50 Ω . Input Impedance: Phono: 49 k Ω (RIAA* equalized). Tuner, Aux., Tape: 100 k Ω . Tape Output: .4 volt output with .2 volt input. GENERAL — AC Outlet Sockets: Two. One switched (350 watts maximum) and one unswitched (350 watts maximum). Power Requirements: 120 or 240 volts 50/60 Hz AC. Dimensions: 4 7/8" high x 19 3/4" wide x 12" deep.

* Rated IHF (Institute of High Fidelity) Standards

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

Build more life into your parties with



CONTEMPORARY
995⁰⁰
NO MONEY DOWN

MEDITERRANEAN
1045⁰⁰
NO MONEY DOWN

The new Heathkit/Thomas Spinet puts a whole orchestra at your fingertips

Here it is — the Heathkit/Thomas Spinet you've been waiting for! The organ blessed with a wealth of tonal resources — from the rich, mellow bass sounds, to the brassy and woodwinds that literally cry with WAH WAH! Bring on the optional TOA-60-1 "Rhythm Section" (next page) that thinks like a musical computer — automatically selects from eight pre-programmed percussion rhythm patterns. Push a PRE-SET button and add beautiful lower keyboard Piano, Guitar, Banjo or Harpsichord, playing along with the pre-programmed rhythm patterns. Now you're playing a Piano or Harpsichord duet — a "Soul group" with Guitar and Accordion — or whatever strikes your mood. Call in FANCY FOOT, an automatic "bass fiddler" that gives you alternating bass pedal notes to fit into the rhythm pattern of your choice. You can literally create a different combo every day of the year. Add it up — the automatic rhythm; percussion voices on both keyboards; spacious stereo music; magnificent Split Tremulants — and you see why this is one of the world's most popular organs. And now it's available to you in money-saving kit form.

The TO-1260 is a completely solid-state spinet home organ featuring two 44-note overhanging keyboards with tilted keys for easier playing, and a 13-note Radial Arc pedal keyboard constructed to correspond to the natural swing of your foot as it moves from one pedal to another. Behind the magnificent stereo sound are two powerful 35-watt RMS solid-state amplifiers and two specially designed wide-range 12-inch extra heavy duty speakers. Also featured is a new convenient accessory panel for quick, easy installation of cassette recording equipment, and earphones for silent practicing — as well as provision for connecting an external tone cabinet. The luxurious cabinets, created by a foremost furniture designer, are available in your choice of Contemporary or Spanish Mediterranean styles, handcrafted of furniture-grade hardwoods and exquisitely finished in hand-rubbed walnut. (Distressed antique in the Mediterranean). Both cabinet models come to you completely assembled and finished, ready for installation of the electronics. For a kitbuilding experience that will capture the entire family's interest, and for musical enjoy-

ment you can pass on to future generations...order your TO-1260 now!

Kit TO-1260M, Mediterranean, 203 lbs., Exp./Frt. **1045.00**
Kit TO-1260W, Contemporary, 203 lbs., Exp./Frt. **995.00**
Kit TOA-60-1, Rhythm Section, 5 lbs., mailable . . . **249.95**

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. COLOR-GLO—On/Off with Pilot Light. Expression Pedal. 44" wide, 23½" deep, 37½" Wide. Dimensions: 37½" H x 44" W x 23½" D.

SPECIAL ORGAN WARRANTY

The tone generators of the Heathkit/Thomas organs on these pages are warranted for a period of five (5) years from the date of purchase.



Accessory panel has in/out tape jacks for listening to pre-recorded cassette organ lessons, or recording your own organ music. Earphone plugs shut off main speaker so you can practice without disturbing others around you.



Kit-form "boss" amp

Gives you 120 watts of EIA music power, 240 watts peak. Has harmonic modifier for that "fuzzy" sound; brightness switch; tremolo variable in both rate and depth; separate bass and treble boost; dual spring-type variable reverb; dual foot switch for tremolo and reverb; 3 separate channels with 2 inputs for each. Matching speaker system features two 12-in. woofers and special horn driver. Measures 25¾" W x 14½" D x 38" H. Includes 20' cable.

Kit TA-17, amplifier only,
40 lbs., Exp./Frt. **179.95**

Kit TA-17-1, one speaker system,
112 lbs., Exp./Frt. **129.95**



The 25-watt guitar amp

All solid-state design delivers solid 25 watts EIA music power, 60 watts peak. Has 2 dual-input channels; double spring variable reverb and tremolo with variable rate and depth; 2 foot switches for reverb & tremolo; 2 heavy-duty 12" speakers. Sturdy black vinyl covered ¾" wood cabinet measures 28" W x 9" O x 19¾" H.

Kit TA-16, 48 lbs.,
Exp./Frt. **124.95**

a Heathkit/Thomas Electronic Organ



17 EVENING KIT

549⁹⁵
NO MONEY DOWN

Build this Heathkit/Thomas Spinet and know real pride of accomplishment

This great sounding, great looking organ has two 44-note keyboards with tilted and overhanging non-yellowing keys for easier playing. The exclusive Thomas Color-Glo system lights up the lettered keys, and color coded chords so you can start playing the first time you sit down. A "Quick-Play" organ course with a wide variety of sheet music is included with your kit. The 13-note radial arc pedal keyboard is constructed to correspond to the natural swing of your foot as it moves from one pedal to another. And the 25-watt RMS amplifier drives a wide range 12-in. speaker capable of producing the total audible range of an entire orchestra.

Controls include an Expression Pedal, Variable Pedal Volume, Variable Manual Balance; switch tabs for Vibrato, and a new Light Vibrato that gives true orchestral effects. Plus there's a new accessory front panel on the keyboard with earphone and cassette recorder jacks and an AC power receptacle. Plug in the earphones and the main speaker shuts off so you can practice anytime without disturbing the rest of the family. The In-Out tape jack lets you take advantage of the many available organ lesson programs pre-recorded on cassettes. All you need is a conventional cassette deck and you can play the lessons through the organ, and record your own organ selections on blank cassettes. The handy external power socket, controlled by the organ Power switch, can be used for your cassette recorder, music rack lamp or any other accessory equipment.

The authentic instrumental voices give you literally hundreds of orchestral combinations. On the upper keyboard are Flute 16', 8' and 4'; Trumpet 8'; Oboe 8', and Violin 8'. While on the lower keyboard you have Horn 8'; Diapason 8'; Melodia 8', and Cello 8'. The pedal keyboard provides a Flute 16'-8' combination. Finally, the Heathkit/

Thomas Spinet is beautiful furniture. The cabinet and bench are hand-crafted from selected walnut veneers in a Scandia finish, with solid hardwoods used at all points that require strength and rigidity. And, unlike other electronic organ kits, the cabinet is shipped to you fully finished and assembled. You install the electronics. Overall dimensions are: 44" H x 43½" W x 25" D.

Kit TO-1160, 233 lbs., Exp./Frt. 549.95

Kit TOA-60-1, Rhythm Section, 5 lbs., mailable . . . 249.95

Heathkit Thomas "Rhythm Section"



Designed especially for the TO-1260 and TO-1160 Organs. Pre-programmed effects give you an endless variety of rhythmic accompaniment: chord-pedal alterations, pre-programmed bass patterns, a choice of Piano, Guitar, Banjo or Harpsichord, a complete drum section, and a choice of eight different rhythms from Waltz — to Rhumba. Preset Accompaniment Voices and preset Drum Patterns provide you with a total rhythm instrument of amazing versatility. Don't fail to include this remarkable accessory with your TO-1260 or TO-1160 order.

Kit TOA-60-1, 5 lbs., mailable 249.95

TOA-60-1 SPECIFICATIONS — PRE-PROGRAMMED RHYTHM PATTERNS: Waltz, Fox Trot, Rock, Soul, Polka, Samba, Bossa Nova, Rhumba. **Controls:** Drums (On/Off), Variable Slide — Tempo, Variable Slide — Volume. **RHYTHM VOICES:** Add Cymbal, Snare/Tom Tom Selector. **FANCY FOOT:** (Alternating bass pedal) notes that fit into rhythm pattern chosen — automatic when foot pedal is held. **Control:** syncopated and Alternating Bass. **PRE-SET ACCOMPANIMENT — Voices:** Piano (Pre-Set), Guitar (Pre-Set), Harpsichord (Pre-Set). **Controls:** ACC Pre-Sets (On/Off), Variable Slide — Volume.



"Fuzzy" sound-maker

Add the fuzzy effect to your sound with the Heathkit Distortion Booster. Just plug in between your guitar and amplifier. Housed in a convenient foot-switch — push the switch to add the distortion — push again to play it straight. Tone and distortion degree controls. Runs on penlite cell (not supplied).

Kit TA-28, 4 lbs., mailable 17.95



Electronic metronome

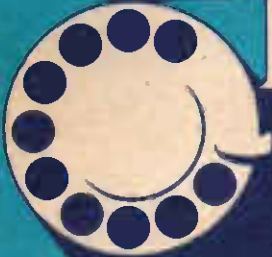
An indispensable tool in any musicmaker's kit. Inexpensive enough for any student's use — yet accurate enough for the professional musician. Adjustable tempos from 40 to 210 beats per minute. Adjustable volume control. Chart relates tempos in various time signatures to beats per minute. Easy one evening assembly. Requires two 9V batteries (not supplied).

Kit TD-17, 2 lbs., mailable 9.95

charg-a-kit — No money down on any kit — up to 2 years to pay — see page 42 for details.

800/253-7261 (toll free)

dial-a-kit



Just pick up the phone any time of the day, any day of the week, dial the toll-free number above, and your kit order will be sent on its way to you. If you have a Heath Revolving Charge Account, that's all there is to it; your purchase & shipping charges will be reflected on your next monthly statement. (Opening a Heath Revolving Charge Account is as easy as filling out the application on page 42.) If you are not yet a Charg-a-kit customer, your order can be sent C.O.D. via the best available shipping method. Due to phone traffic generated by dial-a-kit toll-free service, you can understand that we must restrict calls to kit ordering only, and will be unable to transfer calls to other departments. For parts ordering & other service-related calls, please follow the directions given under the "How to Order" section on page 40 of this flyer.

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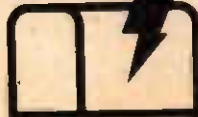
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