



Test Instruments

HEATHKIT®



Shortwave



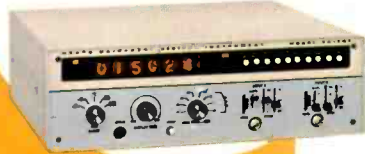
Solid-State Color TV



Model Radio Control



Marine Electronics



Laboratory Instruments



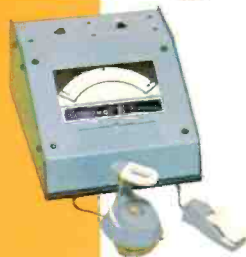
Trail Bikes



Amateur Radio



Electronic Organs



Photographic



Metal Locators

Over 300 different Kits
World's largest selection



Stereo /Hi-Fi



Home Entertainment

FACTORY MAIL ORDER
CATALOG 810 /71
HEATH COMPANY
a Schlumberger company



Welcome to the Excitement of Heathkit

The fact that you are opening this catalog tells a great deal about you. It tells that you are an individualist. That you use discretion both in what you buy and what you pay. Moreover, that you enjoy excitement and have a keen appreciation for accomplishment.

Since 1947 we've been providing exciting kits to people from every walk of life . . . from novices who have never held a soldering iron in their hand to expert design engineers. We know that you, regardless of your experience, can successfully build a kit at home with minimum effort and maximum savings and enjoyment. Our complete tech correspondence department is at your service — only a phone call or letter away — should a question arise.

If you are a first-time Heathkit builder you will find the adventure a truly rewarding one. You'll discover a new and exciting hobby . . . and pleasure that extends from the kit building experience itself to watching TV, listening to fine music, operating a ham rig, or playing an electronic organ, or fishing. And, you'll save up to 50% . . . while enjoying the traditionally superior quality and performance of Heathkit products.

If you are an old friend, you will be especially interested in products shown for the first time. Solid State Color TV's with an entirely new approach to serviceability — be sure to see the warranty on page 3. A new ham receiver, scopes and extension in the scientific instrument line.

If you would like additional technical information on any product, write for a free schematic specification sheet.

Whether you're new to the world of Heathkit or an old friend, I know you'll find your journey through these pages both a pleasant and rewarding adventure.

Sincerely,

D. W. NURSE
President

P.S. We will be happy to send your friends copies of this Heathkit catalog . . . just jot their names and addresses on the back of the order envelope.

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New Heathkit[®] Solid-State Modular Color TV!

Compare these features:

- Modular plug-in circuit board construction.
- MOSFET VHF tuner and 3-stage IF.
- Adjustable video peaking.
- Sound instantly, picture in seconds.
- Built-in Automatic Fine Tuning.
- Pushbutton channel advance.
- Tilt-out convergence and secondary controls.
- Hi-fi sound outputs—for amplifier.
- Virtually total self-service capability with built-in volt-ohm meter, dot generator, and comprehensive manual.
- Premium quality bonded-face etched glass picture tubes.
- Choice of 295" or 227" picture tube sizes.



Design and performance features add up to one-of-a-kind superiority

Over five years were spent in research and development to achieve the notably superior performance, improved convenience features, and ease of service now embodied in the new GR-270 and GR-370. They are premium quality receivers in the truest sense, and, we believe, the finest color TV's on today's market. Here's why . . .

EXCLUSIVE SOLID-STATE CIRCUITRY DESIGN . . . total of 45 transistors, 55 diodes, 2 silicon controlled rectifiers; 4 advanced Integrated Circuits containing another 46 transistors and 21 diodes; plus 2 tubes (picture and high voltage rectifier) combine to deliver performance and reliability unmatched by conventional tube sets.

EXCLUSIVE DESIGN SOLID-STATE VHF TUNER uses an MOS Field Effect Transistor for greater sensitivity, lower noise, and lower cross-modulation . . . gives you sharply superior color reception, especially under marginal conditions. Gold/Niobium contacts give better electrical connections and longer wear. Memory fine tuning, standard. Solid-state UHF tuner uses hot-carrier diode design for increased sensitivity.

3-STAGE SOLID-STATE IF has higher gain for better overall picture quality. Emitter-follower output prevents spurious signal radiation, and the entire factory-aligned assembly is completely shielded to prevent external interference.

AUTOMATIC FINE TUNING—standard on both sets. Just push a button and the assembled and aligned AFT module tunes in perfect picture and sound automatically . . . eliminates manual fine-tuning. Automatic between-channel defeat switch prevents tuner from locking in on stray signals between channels. AFT can be disabled for manual tuning.

VHF POWER TUNING . . . scan through all VHF and one preselected UHF channel at the push of a button.

BUILT-IN AUTOMATIC DEGAUSSING keeps colors pure. Manual degaussing coil can be left plugged into the chassis and turned on from the front panel . . . especially useful for degaussing after the set is moved some distance.

AUTOMATIC CHROMA CONTROL eliminates color variations under different signal conditions.

ADJUSTABLE NOISE LIMITING AND GATED AGC keeps pulse-type interference to a minimum, maintains signal strength at constant level.

HIGH RESOLUTION CIRCUITRY improves picture clarity and new adjustable video peaking lets you select the degree of sharpness and apparent resolution you desire.

"INSTANT-ON". A push of the power switch on the front panel brings

New Expedited 48-Hour No-Charge Warranty Service Plan for Solid-State TV Modules! Special service facilities have been established at the factory and all Heathkit Electronic Centers to expedite service and return of Solid-State TV circuit modules within two working days. During the 90-day warranty period, TV modules will be serviced or replaced with no charge for labor or parts. After the initial 90-day warranty period expires, TV modules will be serviced or replaced at a fixed charge of \$5.00 per module for labor and parts for a period of two years from date of original kit purchase.

your new solid-state set to life in seconds. Picture tube filaments are kept heated for instant operation, and extended tube life. "Instant-On" circuit can be defeated for normal on-off operation.

PREMIUM QUALITY COLOR PICTURE TUBES. Both the 227 sq. in. GR-270 and 295 sq. in. GR-370 use the new brighter bonded-face, etched glass picture tubes for crisper, sharper, more natural color. And the new RCA HiLite Matrix tube is a low cost option for the GR-370. See below.

ADJUSTABLE TONE CONTROL lets you choose the sound you prefer . . . from deep, rich bass to clean, pronounced highs.

HI-FI OUTPUT permits playing the audio from the set through your stereo or hi-fi for truly lifelike reproduction. Another Heath exclusive.

DESIGNED TO BE OWNER SERVICED. The new Heath solid-state color TV's are the only sets on the market that can be serviced by the owner. You actually can diagnose, trouble-shoot and maintain your own set.

BUILT-IN DOT GENERATOR AND TILT-OUT CONVERGENCE PANEL let you do the periodic dynamic convergence adjustments required of all color TV's for peak performance. Virtually eliminates technician service calls.

SNAP-OUT GLASS EPOXY CIRCUIT BOARDS WITH TRANSISTOR SOCKETS add strength and durability and permit fast, easy troubleshooting and transistor replacement. Makes each circuit a module.

BUILT-IN VOLT-OHM METER and comprehensive manual let you check circuits for proper operation and make necessary adjustments. The manual guides you every step in using this built-in capability. Absolutely no knowledge of electronics is required.

EASY, ENJOYABLE ASSEMBLY . . . the Heathkit way. The seven-section manual breaks every assembly down into simple step-by-step instructions. With Heath's famous fold-out pictorials and simple, straightforward design of the sets themselves, anyone can successfully complete the assembly.

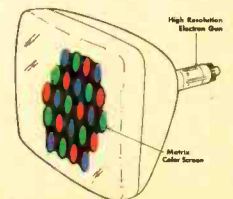
HEATHKIT SOLID-STATE MODULAR COLOR TV represents a significant step into the future . . . with color receiver design and performance features unmatched by any commercially available set at any price! Compare the specifications on the following page. Then order yours today.

Kit GR-270, all parts including chassis, 227" picture tube, face mask, UHF & VHF tuners, AFT & 6x9" speaker, 114 lbs. . . . \$489.95

Kit GR-370, all parts including chassis, 295" picture tube, face mask, UHF & VHF tuners, AFT & 6x9" speaker, 127 lbs. . . . \$559.95

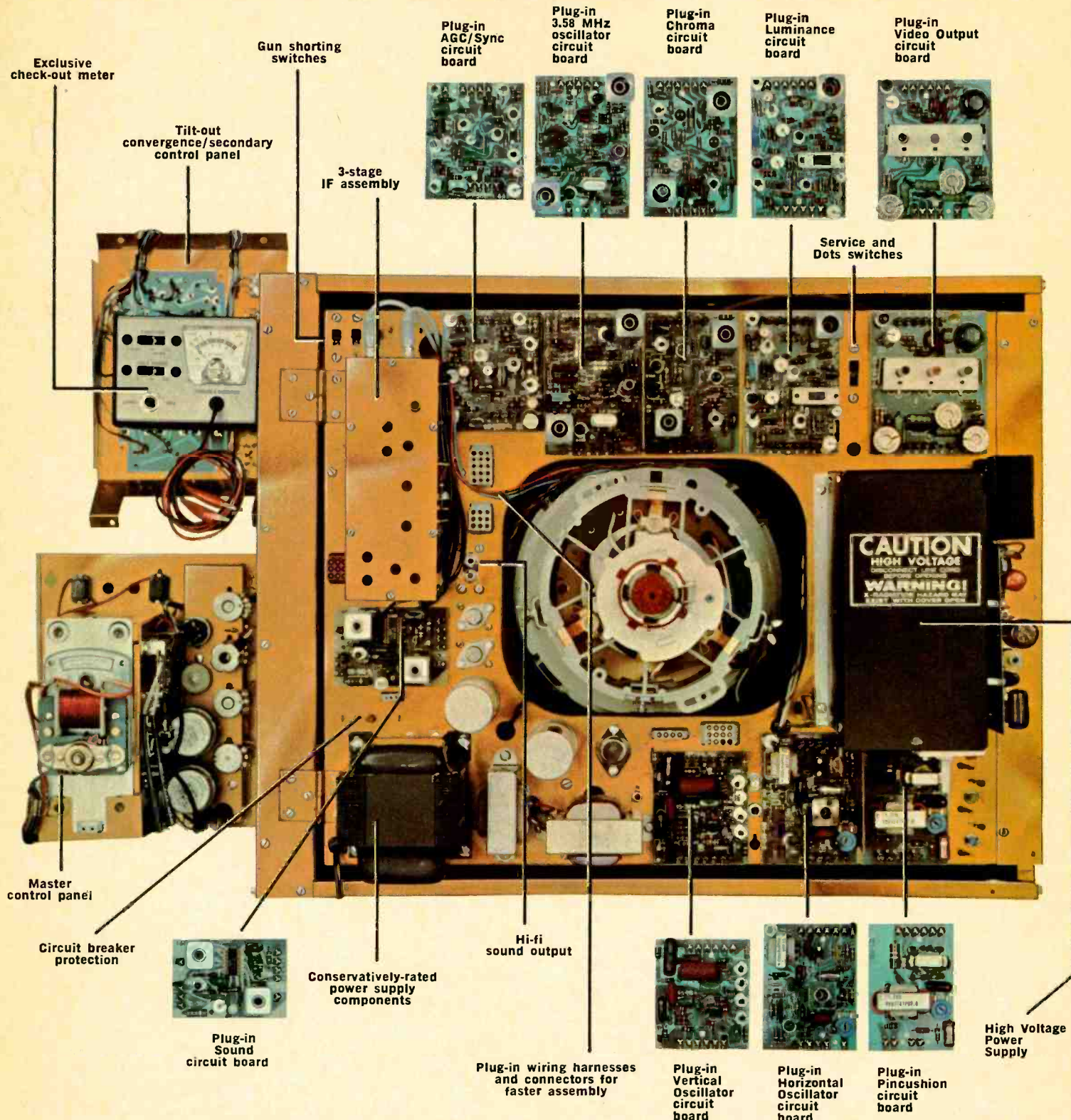
Kit GR-370MX, complete GR-370 with RCA matrix picture tube, 127 lbs. . . . \$569.95

Optional RCA Matrix Tube For Your New GR-370 . . . delivers an increase in resolution . . . makes pictures sharper. The Matrix screen around the phosphor dots eliminates reflected light, allows higher transmission glass for greater light output. Order your new GR-370 with the Matrix tube—see the difference.



Here's what makes the new Heathkit® Solid-State

Innovative engineering & modular design concepts



GR-270 AND GR-370 SPECIFICATIONS—Picture Tube Size: GR-370 Approximate Viewing Area: 295 Sq. In. GR-270 Approximate Viewing Area: 227 Sq. In. Deflection: Magnetic, 90 degrees. 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. 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. Hi-Fi output: Output impedance—1 k ohm. Frequency response— ± 1 dB 30 Hz to 10 kHz. Harmonic distortion—less than 1% at 1 kHz. Output voltage—0.3 V rms nominal. Audio output: Output impedance—4 ohm or 8 ohm. Output power—2 watts. Power requirements: 110 to 130 volts AC, 60 Hz, 240 watts. Net weight: GR-370, 114 lbs.; GR-270, 101 lbs.

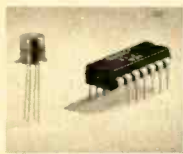


ADD EXTRA CONVENIENCE and versatility to your new GR-270 or GR-370 Solid-State Color TV with this new ultrasonic remote control kit. Lets you turn the set on and off, adjust volume, change VHF channels and adjust color and tint from the comfort of your chair. Assembles and installs complete in just a few hours and the built-in meter on the receiver makes final adjustment a matter of minutes. Kit GRA-70-6, 6 lbs. \$64.95

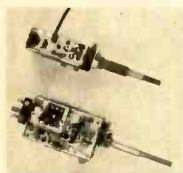
Open Your Heath Account — No Money Down Up To \$300 — Up To 18 Months To Pay — See Order Blank For Details.

Modular Chassis a better Color TV

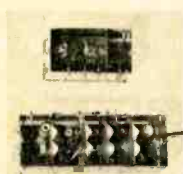
Advanced design



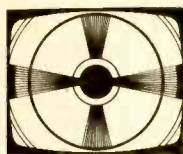
SOLID-STATE RELIABILITY. An exclusive Heath design with over 100 advanced solid-state devices to assure ultimate color quality & long term reliability.



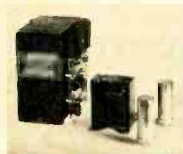
SOLID-STATE TUNERS. Exclusive FET VHF tuner gives increased sensitivity & interference rejection. Both tuners come factory assembled & aligned to assure top performance.



3-STAGE IF & BUILT-IN AFT. Perfectly tuned pictures by just pushing a button. And the assembled & aligned IF has higher gain for better pictures & is totally shielded to reduce interference.



AUTOMATIC HORIZONTAL & VERTICAL LINEARITY. Designed in & automatically adjusted with the height & horizontal controls . . . ends misadjustment and consequent poor proportioning.



7 SEPARATE POWER SUPPLIES. Factory assembled high voltage supply uses a fast-heating rectifier for quick warm-up. 4 solid-state supplies are electronically regulated for stable operation of critical circuits.

Simplified assembly



TRANSISTOR & IC SOCKETS & PLUG-IN WIRING HARNESSSES. Sockets mean easier assembly & protect delicate components from heat. New wiring harnesses eliminate time consuming chassis wiring.



MODULAR PLUG-IN CIRCUIT BOARDS snap in & out in seconds . . . permit easier assembly & initial set-up . . . make periodic adjustment & service fast & simple.



SPECIAL TOOLS SUPPLIED. We include 2 nut drivers, torque handle, open end/box wrench, nut starter & alignment wand . . . tools you'll need but may not have.



FAMOUS HEATHKIT MANUAL guides you expertly step-by-step with clear, plain English instructions and giant fold-out pictorials . . . you can't miss.



EXCLUSIVE CHECK-OUT METER. Upon kit completion you do exact tests & adjustment with the dot generator & meter. Also can be used to actually diagnose & track down faulty individual parts . . . a Heathkit exclusive.



Easier operation & service



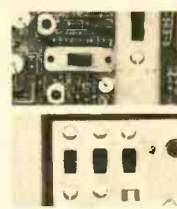
MASTER CONTROL PANEL . . . jet black on GR-370, black & silver on GR-270. Auxiliary controls are hidden behind the hinged door. A push of the power switch lights up the channel selectors.



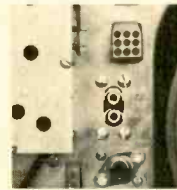
BUILT-IN POWER CHANNEL ADVANCE . . . standard on both new sets. Just push the button to quickly scan all VHF & one pre-selected UHF channels.



TILT-OUT CONVERGENCE & SECONDARY CONTROL PANEL keeps seldom-used controls handy but hidden. Height, AGC, Color Killer, Tone, Peaking, Dots & Convergence controls are available for instant adjustment anytime.



BUILT-IN DOT GENERATOR & GUN SHORTING SWITCHES. Flip the "Dots" switch to check & adjust convergence . . . turn picture tube guns on & off for purity, focus adjustments.



HI-FI SOUND OUTPUT on the chassis lets you play the sound thru your stereo or hi-fi system for incomparable sound reproduction.

Choose One Of These Handsome, Factory Assembled Cabinets

3 models for GR-370 chassis.

Luxurious Mediterranean Cabinet . . . factory assembled of fine furniture grade hardwoods and finished in a flawless Mediterranean pecan. Statuary bronze trim handle. 30³/₃₂" H x 47" W x 17³/₄" D. Assembled GRA-304-23, 85 lbs. . . . \$129.95



Deluxe Early American Cabinet . . . factory assembled of a special combination of hardwoods & veneers and finished in classic Salem Maple. 29¹/₃₂" H x 37¹/₄" W x 19³/₄" D. Assembled GRA-303-23, 67 lbs. . . . \$114.95



Contemporary Walnut Cabinet . . . factory assembled of fine veneers & solids with an oil-rubbed walnut finish. 29¹/₃₂" H x 35¹/₁₆" W x 19⁷/₈" D. Assembled GRA-301-23, 56 lbs. . . . \$74.95



3 models for GR-270 chassis.

Exciting Mediterranean Cabinet . . . assembled using fine furniture techniques and finished in stylish Mediterranean pecan. Accented with statuary bronze handle. 27³/₃₂" H x 41⁷/₈" W x 19³/₄" D. Assembled GRA-202-20, 70 lbs. . . . \$114.95



Contemporary Walnut Cabinet and Base Combination. Handsome walnut finished cabinet sits on a matching walnut base. Cabinet dimensions 20³/₃₂" H x 31¹/₄" W x 18⁵/₈" D. Base dimensions 7³/₄" H x 27³/₄" W x 18⁵/₈" D. Assembled GRA-203-20 Cabinet, 45 lbs. . . . \$49.95 GRS-203-6 above cab. w/matching base, 58 lbs. . . . \$59.95



Handy Roll-Around Cart and Cabinet Combination. Features the GRA-203-20 walnut cabinet plus a walnut-trimmed wheeled cart with storage shelf. Assembled GRA-203-20 Cabinet, 45 lbs. . . . \$49.95 GRA-204-20 Roll-Around Cart, 18 lbs. . . . \$19.95 GRS-203-5, Cart & Cabinet Combo, 58 lbs. . . . \$59.95



All items on these 2 pages shipped REA or mtr. frt. except GRA-70-6 mailable.

These Handsome Factory-Assembled Cabinets Fit Either "681" or "295" (New AC Interlock Provided)



Luxurious Mediterranean Cabinet . . . factory assembled of fine furniture grade hardwoods and finished in a flawless Mediterranean pecan. Statuary bronze trim handle. 30-1/32" H x 47" W x 17 3/4" D. Assembled GRA-304-23, 85 lbs. . . \$129.95



Deluxe Early American Cabinet . . . factory assembled of a special combination of hardwoods & veneers and finished in classic Salem Maple. 29-21/32" H x 37 1/4" W x 19 3/4" D. Assembled GRA-303-23, 67 lbs. . . \$114.95



Contemporary Styled Walnut Cabinet \$64.95 Factory assembled of fine veneers and solids with oil-rubbed walnut finish. GR-295 speaker and convergence panel mount behind tilt-out grille cloth on right side. Measures a slim 19" D x 31" H x 34 1/2" W. Assembled GRA-295-1, 56 lbs. . . Express or motor freight. \$64.95

Reception Is Simulated On All Sets Shown On These Pages

Control Your Heathkit Color TV The Easy Electronic Way With This Wireless Remote Control

You can add the comfort and convenience of full remote control to any rectangular tube Heathkit color TV, with these easy-to-build, easy-to-use remote control kits. All solid-state circuitry gives you armchair control of on-off, volume, color, tint and VHF channel selection. Available for models GR-681, GR-581, GR-481, GR-295, GR-227, GR-180 and GR-25 Heathkit color TV's.

- Kit GRA-681-6, use with Heathkit GR-681 Color TV, 9 lbs. \$64.95
- Kit GRA-295-6, use with Heathkit GR-295 & GR-25 Color TV's 9 lbs. \$69.95
- Kit GRA-227-6, use with Heathkit GR-581, GR-481, GR-227 & GR-180 Color TV's, 8 lbs. \$69.95



Heathkit® "681" and "295" Color TV's



NEW LOWER PRICES
Save \$30 on GR-681
GR-681 Now Only **\$469.95**
Save \$30 on GR-295
GR-295 Now Only **\$419.95**

Our Largest Screen Tube-Type Color TV's . . . Now Improved And At Lower Cost

Features Common To Both "681" & "295" Models
• Top quality American brand color tube with 295 sq. inch viewing area, and anti-glare safety glass • New improved phosphors for brighter, livelier colors • 24,000 volt regulated picture power • Automatic degaussing & mobile degaussing coil • Exclusive built-in servicing aids • Dynamic pincushioning correction circuit eliminates picture edge distortion • Extra B+ boost for improved picture definition • 3-stage video IF strip reduces interference, improves reception • Exclusive Heath "Magna-Shield" improves color purity • Gated Automatic Gain control (AGC) for steady, jitter-free pictures at all times • Automatic Color Control circuit reduces color fading • Deluxe VHF turret tuner with "memory" fine tuning and gold/niborium contacts • 2-speed transistor UHF tuner for both fast station selection and fine tuning individual channels • Two hi-fi sound outputs . . . a cathode follower for playing thru your hi-fi system and an 8 ohm output for connection to special contained-field 6" x 9" speaker • All critical circuits prebuilt & aligned • Two VHF antenna inputs . . . 300 ohm or 75 ohm • Circuit breaker protection • Optional wireless remote control can be added at any time • 2-year warranty on picture tube, 90 days on all other parts

Improved Circuitry In Both The "681" & "295" provide increased video frequency response . . . delivers clearer, crisper, more detailed pictures.

Exclusive Heath Self-Service Features in the "681" and "295" allow you to do the periodic maintenance required of all color TV's . . . without costly service calls. The built-in dot generator and tilt-out convergence panel let you check and adjust dynamic convergence in minutes for crisp, natural pictures. The famous Heath manual devotes many pages to this and

many more periodic adjustments . . . this feature alone can save you hundreds of dollars.

Exclusive Heath Design Features. Built-in automatic degaussing to assure pure colors always. Hi-Fi sound output allows playing TV sound thru your hi-fi or stereo for exceptional sound reproduction. The new brighter, etched face picture tube is standard on both sets, and the new RCA Matrix tube is a low cost option. An exclusive Heath Magna-Shield surrounds the entire picture tube to eliminate stray magnetic fields that ruin color purity. And Heath gives you the choice of installation . . . in one of the attractive assembled cabinets on this page . . . in a favorite old cabinet . . . in a wall or bookcase for a truly "custom" installation. Only Heathkit Color TV allows you to install wireless remote control at any time . . . now or later after purchase. These features add up to more value per dollar.

Additional Features Of The "681"
In addition to all the standard Heathkit Color TV features above, the GR-681 has factory-assembled Automatic Fine Tuning . . . just push a button for perfectly tuned pictures and sound on all VHF/UHF channels. Pushbutton channel advance is also standard.

Kit GR-681, all parts including chassis, tubes, mask, UHF & VHF tuners, AFT, cable-type remote control and 6" x 9" speaker, 135 lbs. only \$469.95

KIT GR-681MX, all parts with Matrix picture tube, 135 lbs. only \$479.95

Kit GR-295, all parts including chassis, tubes, mask, UHF & VHF tuners, and special extended-range 6" x 9" speaker, 131 lbs. (REA or motor frt.) . . \$419.95

Kit GR-295MX, as above except with new "Hi-Lite" Matrix picture tube, 131 lbs. \$429.95

GR-681 SPECIFICATIONS: Same as GR-295 below except with Automatic Fine Tuning on all VHF/UHF channels; pushbutton channel advance; bridge-type low voltage power supply.

GR-295 SPECIFICATIONS—Picture size: Rectangular viewing area approx. 295 sq. inches (23" diagonally, 20" horizontal, 16" vertical). **Tube Size:** 25" overall diagonal measurement. **Deflection:** Magnetic 90°. **Focus:** Electrostatic. **Convergence:** Magnetic & dynamic. **Antenna input impedance:** 300 ohm balanced, or 75 ohm unbalanced (VHF). **Picture IF carrier frequency:** 45.75 MHz. **Sound IF carrier frequency:** 41.25 MHz. **Color subcarrier:** 42.17 MHz. **Video IF bandpass:** 3.58 MHz. **Sound IF frequency:** 4.5 MHz. **Tuning range:** VHF channels 2-13, UHF channels 14-82. **Sound cathode follower:** Output impedance; 3 K. frequency response; ±1 dB, 50-15,000 Hz. Harmonic distortion, less than 1%. **Output voltage;** 2 v. **Audio output:** Output impedance, 8 ohms. **Output power,** 2 watts. **Frequency response,** ±2 dB, 50-10,000 Hz. Harmonic distortion, less than 3%. **Power requirements:** 110-130 v., 60 Hertz AC, 330 watts. **Chassis & Tube Dimensions Only:** 20 1/2" H x 25 1/2" W x 19 1/4" D. Control panel assembly: 6 1/2" W x 7 7/8" H x 7" D. Required installation clearances are given in spec sheet & manual.

**Factory Assembled Cabinets
For Your "581" Or "227"
(New AC Interlock Provided)**



**New
Lower Price
Save \$20
on "581" or "227"**



Contemporary Walnut Cabinet
Factory assembled of fine furniture grade hardwoods and finished in rich walnut. Measures 31 3/4" W x 29 3/4" H x 19 1/2" D.
Assembled GRA-227-1, 54 lbs. \$64.95



Contemporary Walnut Cabinet and Base Combination. Handsome walnut finished cabinet sits on a matching walnut base. Cabinet dimensions 20 3/4" H x 31 3/4" W x 18 5/8" D. Base dimensions 7 3/4" H x 27 3/4" W x 18 5/8" D. Assembled GRA-203-20 Cabinet, 45 lbs. . . \$49.95 GRS-203-6 above cab. w/matching base, 58 lbs. \$59.95



Handy Roll-Around Cart and Cabinet Combination. Features the GRA-203-20 walnut cabinet plus a walnut-trimmed wheeled cart with storage shelf. Assembled GRA-203-20 Cabinet, 45 lbs. . . \$49.95 GRA-204-20 Roll-Around Cart, 18 lbs. . . . \$19.95 GRS-203-5, Cart & Cabinet Combo, 58 lbs. . . \$59.95



Exciting Mediterranean Oak
Beautiful Mediterranean motif factory assembled and finished in luxurious oak. 40" W x 19 1/2" D x 29" H.
Assembled GRA-227-2, 70 lbs. \$109.95

**Now—The New, Improved GR-581 & GR-227 Have Sharper, Clearer Pictures . . .
Plus The New Brighter Picture Tube . . . All This And Lower Prices Too!**

Features Common To Both "581" & "227" Models

- Top quality American brand rectangular color tube with 227 sq. inch viewing area, and anti-glare safety glass • New improved phosphors for brilliant, livelier colors • 24,000 v. regulated picture power • Automatic degaussing & mobile degaussing coil • Exclusive built-in servicing aids • New improved low voltage power supply with more B+ for best operation • Dynamic top and bottom pincushioning correction circuit eliminates picture distortion • 3-stage video IF strip reduces interference, improves reception • Exclusive Heath "Magna-Shield" improves color purity • Gated Automatic Gain Control (AGC) for steady, jitter-free pictures at all times • Automatic Color Control circuit reduces color fading • Deluxe VHF turret tuner with "memory" fine tuning and gold/niborium contacts • 2-speed transistor UHF tuner • Two hi-fi sound outputs • Special limited-field 4" x 6" 8 ohm speaker • All critical circuits prebuilt & aligned • 300 ohm or 75 ohm VHF antenna inputs • Circuit breaker protection • New wireless remote control can be added to set at any time • 2-year warranty on picture tube 90 days on all other parts

The Best Is Now Better Than Ever . . . And Lower Cost Too! Both the Heathkit "581" and "227" have recently improved circuitry which provides increased video frequency bandwidth . . . gives you clearer, sharper, more detailed pictures. And lower prices from the picture tube manufacturers let us reduce prices on your Heathkit Color TV.

Better Than Ever Picture Tube. It's the big news in color TV . . . improved phosphors for more light and contrast. And Heath buys the premium etched-face tube that cuts glare. It's on all 581 & 227 sets.

Heathkit Exclusive—Add Wireless Remote Control Anytime! Like all Heath Color TV's, the "581" and "227" models are designed so that you can add the pleasure and convenience of wireless remote control at any time . . . even after you've been enjoying your set for some time.

Heathkit Exclusive—Choice Of Installation. Your new "581" or "227" will install three different ways . . . put it in a wall or build it into a bookcase for a really "custom" looking installation . . . in a favorite old B&W cabinet . . . or in any of the three handsome, factory assembled Heath cabinets.

Heathkit Exclusive—Built-In Self-Servicing Capability. Only Heath Color TV is designed to be serviced by its owner . . . a feature that can add up to sizable savings. The readily accessible convergence control panel & built-in

dot generator give you fast, easy dynamic convergence anytime you decide it's necessary . . . lets you do this periodic adjustment required of all color TV's. The famous Heath manual gives detailed information so you can keep your set in peak operating condition always.

The "581" & "227" Have These Advanced Performance Features . . . an improved low voltage power supply providing more B+ for better operation . . . automatic degaussing that demagnetizes your set every time it's turned on from a cold start . . . the exclusive Heath Magna-Shield that surrounds the entire set and eliminates stray magnetic fields that ruin color purity . . . Gated Automatic Gain Control and an automatic color control circuit that reduce color fading and insure steady, jitter-free pictures . . . 300 ohm & 75 ohm VHF antenna inputs . . . two hi-fi sound outputs for listening thru the built-in 4x6" speaker or thru your hi-fi system . . . plus preassembled, prealigned VHF & UHF tuners, 3-stage IF assembly and high voltage power supply for fast, easy assembly.

New "581" Includes Automatic Fine Tuning

In addition to all the standard Heathkit Color TV features mentioned above, the new "581" also includes Integrated Circuit AFT that eliminates manual fine tuning on all VHF/UHF channels. And it comes factory assembled & tested for even easier assembly.

Kit GR-581, all parts including chassis, tubes, mask, UHF & VHF tuners, AFT & special 4x6" speaker, 114 lbs. (REA or Motor Frt.) . . . only **\$399.95**
Kit GR-227, all parts including chassis, tubes, mask, UHF & VHF tuners and special 4x6" speaker, 114 lbs. (REA or Motor Frt.) . . . only **\$359.95**
Kit GRA-227-6, wireless remote control, 8 lbs. **\$69.95**

GR-581 SPECIFICATIONS—Same as GR-227 below except with Automatic Fine Tuning on all VHF/UHF channels.
GR-227 SPECIFICATIONS—Picture size: Approx. 227 sq. in. rectangular. Deflection: Magnetic 90°. Focus: Electrostatic. Convergence: Magnetic & dynamic. Antenna input impedance: 300 ohm balanced, 75 ohm unbalanced VHF. Picture IF carrier frequency: 45.75 meg Hz. Sound IF carrier frequency: 41.25 meg Hz. Color subcarrier frequency: 42.17 meg Hz. Video IF bandpass frequency: 3.58 meg Hz. Sound IF frequency: 4.5 meg Hz. Tuning range: VHF channels—2-13 & UHF—14-83. Tube & diode complement: 27 tubes, 15 diodes, 2 transistors. Sound cathode follower: Output impedance 3k ohms, frequency response ±1 dB, 50-15,000 Hz. Harmonic distortion less than 1%, output voltage 2V. Audio output: Output impedance—8 ohms; output power—2 watts; frequency response—±2 dB, 50-10,000 Hz; harmonic distortion—less than 3%. Power requirements: 110-130 V., 60 Hz AC 330 watts. Chassis & Tube Dimensions Only: 19 1/4" H x 27 3/4" W x 18" D. Required installation clearances are given in spec sheet & manual.

All Kits On These 2 Pages Shipped REA or Motor Frt. Except Remote Control Kits Mailable



Now
As Low As
\$299⁹⁵



**Factory-Assembled Cabinets
For Your New "481" or "180"
(New AC Interlock Provided)**



**Table Model TV Cabinet & Cart
Buy Together & Save \$4.95!**
Handsome walnut-grained vinyl-clad wood cabinet . . . measures only 18 3/4" H x 27 3/4" W x 19 1/2" D with rubber feet.
GRA-180-3, cabinet only, 36 lbs. \$27.50
Roll around cart has walnut-finished woods with "pale brass" accents.
GRA-180-4, cart only, 22 lbs. \$19.95
GRS-180-5, cart & cabinet combo, 58 lbs. \$42.50



**Reception Is Simulated
On All Sets Shown**

Contemporary Walnut Cabinet
Has a beautiful oil-rubbed walnut finish. Measures a compact 18 3/4" D x 28 3/4" W x 29" H.
Assembled GRA-180-1, 41 lbs.
(REA or motor freight) \$54.95



Deluxe Early American Cabinet
Factory assembled with a special combination of veneers and solids, finished in popular Salem Maple. GR-180 speaker mounts on right side of 1-piece face mask. Measures 18 3/4" D x 28 3/4" W x 31 3/4" H.
Assembled GRA-180-2, 48 lbs.
(REA or motor frt.) \$94.95



Simulated TV Reception

Heathkit® Color TV Now Costs Less

**Now—New, Improved Heathkit GR-481 & GR-180 . . . Have Sharper,
More Detailed Pictures . . . Plus New Brighter Picture Tube . . . And Cost \$30 Less**

Features Common To Both "481" & "180" Models

- Top quality American brand 180 sq. inch rectangular color tube with anti-glare safety glass • Rare earth phosphors plus smaller dot size for brighter, livelier color and better picture definition • 24,000 volt regulated picture power • Automatic degaussing • Exclusive Heath Magna-Shield covers entire tube to assure color purity at all times • Built-in servicing facilities to adjust and maintain set at peak performance • Automatic color control circuit to reduce color fading • Gated automatic gain control (AGC) for steady, flutter-free pictures • Extra B+ boost for improved picture definition • 2-speed transistor UHF tuner • Deluxe VHF turret tuner with "memory" fine tuning and gold/niborium contacts • 3-stage IF strip reduces interference, improves reception • Hi-fi sound output • Circuit breaker protection • Vertical swing-out chassis for easier servicing & installation in Heath cabinets • All critical circuits pre-wired and tested • New wireless remote control can be added at any time—a Heathkit exclusive • 2-year warranty on picture tube, 90 days on all other parts • Tubes alone list over \$245

Your Best Buy In Color TV Now Costs Even Less. Both the "481" & "180" have the same high performance features as the "295" (see page 6) except for the 180 sq. in. rectangular picture tube. New lower prices from picture tube manufacturers let us offer even greater savings on your Heathkit Color TV.

New Improved Circuitry. The "481" & "180" have recent circuit improvements that provide increased video frequency bandwidth . . . deliver clearer, sharper, more detailed pictures.

High Performance Color Picture Tube At No Extra Cost. The same quality, etched-face tube—only smaller—as on the larger Heath sets. You'll like the improved color, higher contrast and low glare.

Exclusive Heathkit Self-Servicing Features . . . the built-in dot generator plus full color pictures & instructions in the manual let you do the set-up, convergence and periodic touch-up when required.

Add Wireless Remote Control Anytime . . . only the unique Heathkit design lets you add wireless remote control at any time after purchase.

Three-Way Installation . . . install your new "481" or "180" in a wall or bookcase . . . in a favorite old B&W cabinet . . . or choose any of the smartly styled, factory assembled Heath cabinets on this page.

Advanced Features Insure Peak Performance. Like all Heath Color TV's, the "481" & "180" include the exclusive Heath Magna-Shield that surrounds the picture tube to keep out stray magnetic fields that ruin color purity . . . automatic degaussing everytime you turn your set on from a cold start . . . hi-fi sound output . . . two VHF antenna inputs . . . and much more.

Easy Assembly. All critical circuits come factory assembled & aligned.

Additional features of the Heathkit "481"

The new Heathkit "481" includes all of the standard features mentioned above plus Automatic Fine Tuning on all 82 UHF and VHF channels for perfect pictures always without having to manually fine tune each time you change channels . . . the state-of-the-art AFT module, using advanced Integrated Circuits, does it all. And the AFT module is factory assembled and aligned for even easier assembly.

Whichever model you choose . . . the "180" or "481", you can congratulate yourself on knowing a truly remarkable value. Order yours today.

Kit GR-481, all parts including chassis, tubes, mask, UHF & VHF tuners, AFT & special 4x6" speaker, 102 lbs. (REA or Motor Frt.) . . . only \$329.95

Kit GR-180, all parts including chassis, tubes, mask, UHF & VHF tuners and special 4x6" speaker, 102 lbs. (REA or Motor Frt.) . . . only \$299.95

Kit GRA-227-6, Wireless remote control, 8 lbs. \$69.95

GR-481 SPECIFICATIONS—Same as GR-180 below except with Automatic Fine Tuning on all VHF/UHF channels and full wave bridge power supply.

GR-180 SPECIFICATIONS—Picture size: Rectangular viewing area approx. 180 sq. inches (18" diagonally, 16" horizontally, 12" vertically). Tube Size: 19" overall diagonal measurement. Deflection: Magnetic 90°. Focus: Electrostatic. Convergence: Magnetic and Dynamic. Antenna Input Impedance: 300 ohm balanced, 75 ohm unbalanced VHF. Picture IF carrier frequency: 45.75 Meg. Hz. Sound IF carrier frequency: 41.25 Meg. Hz. Color subcarrier frequency: 42.17 Meg. Hz. Video IF bandpass frequency: 3.58 Meg. Hz. Sound IF Frequency: 4.5 Meg. Hz. Tuning range: VHF channels 2-13 & UHF channels 14-83. Tube & Diode Complement: 27 tubes, 15 diodes, 2 transistors. Sound cathode follower: Output impedance 3K ohm, frequency response ±1 dB, 50-15,000 Hz. Harmonic distortion less than 1%, output voltage 2V. Audio output: Output impedance—8 ohm; Output power—2 watts; Frequency response—±2 dB, 50-10,000 Hz. Harmonic distortion—less than 3%. Power requirements: 110-130 V. . . 60 Hz AC, 330 watts. Chassis & Tube Dimensions Only: 17 1/2" H x 25 3/4" W x 17 1/2" D. Required installation clearances are given in spec sheet & manual.

Open Your Heath Account—No Money Down Up To \$300—Up To 18 Months To Pay—See Order Blank For Details



Take It To The Beach . . . or use it poolside so you won't miss the ball game.



Use It In A Playroom, rec room, child's room, bedroom, kitchen . . . any room in the house. Runs on any 117 v. AC outlet.



Take It Fishing . . . use on any boat. Runs off boat's 12 v. battery or on optional GRA-104-1 rechargeable battery pack.



Take It Camping . . . its light weight and compact size totes easily, makes it ideal for trailers.



Use It On The Patio, or in the backyard. Or take it on a picnic . . . any family outing.



GR-104A
\$124.95
(less battery pack)



Deluxe Solid-State Portable B&W TV

Runs On House Current, 12 V. DC Or Optional Battery Pack For Play Anywhere Operation . . . Solid-State Performance . . . 12 Hour Assembly!

- 74 sq. inch (picture diagonal 12") 110° shell bond picture tube
- 36 transistor, 26 diode circuitry including new integrated sound circuit that replaces 39 component parts • Plays anywhere . . . runs on household 117 v. AC, any 12 v. battery or accessory rechargeable battery pack • Instant "On" AC operation • Covers all channels, 2 through 83 • UHF dual speed tuning • VHF "memory" fine tuning—no need to fine tune when switching channels
- 3-stage IF for maximum gain with controlled bandwidth • Gated automatic gain control for steady, jitter-free pictures • Transformer regulated power supply • Circuit breaker protection • One-piece, swing-out chassis for easy assembly and servicing
- Rugged high-impact, designer styled plastic cabinet with carrying handle • Pressembled and aligned tuners assure peak performance, speed construction . . . takes only 12 hours • Front panel-mounted speaker • 1-year warranty on picture tube, 90 days on all other parts

PORTABLE A-GO-GO! That's the versatile, easy-to-carry GR-104. With its optional battery pack it goes where you go . . . beach, picnic, camping, fishing . . . to bring you all your favorite TV shows. If you're a boat owner, run it off the boat's 12 v. battery for at-sea TV. Or plug it into any household 117 v. AC outlet for 82 channels of crisp black & white TV pictures in the kitchen, bedroom, playroom, workshop, basement . . . any room in the house.

FEATURES SPACE-AGE INTEGRATED CIRCUIT . . . contains 39 TV parts, yet is only the size of a tiny transistor . . . reduces heat, consumes less power, improves performance and makes assembly easier. A 110° shell bond picture tube features a short 20mm neck that requires less deflection power. Also boasts an automatic gain control for rock-steady pictures; front panel speaker for direct sound; 3 video IF

amplifiers with superior gain and controlled bandwidth; deluxe VHF "memory" tuner; 2-speed UHF tuner for either fast channel selection or fine tuning each station; transformer and regulated power supply for drift-free power regardless of source; lighted channel indicators; circuit breaker protection; and complete controls (see specifications).

FROM PARTS TO PORTABLE PROGRAMS IN AROUND 12 HOURS. You just wire two circuit boards, connect a wiring harness and mount the parts . . . finish in 12-15 hours. Includes a built-in telescopic whip antenna for VHF, plus an 8" UHF loop that attaches to terminals on the back panel. Also has input for 300 ohm balanced antenna, plus a handsome blue-gray plastic cabinet with pearl mask.

Kit GR-104A, portable TV for 117 v. AC and 12 v. DC operation, 27 lbs. . . . no money dn **\$124.95**
Kit GRA-104-1, rechargeable battery pack and Outdoor Sun shield, 9 lbs. . . . no money down **\$39.95**
GRA-104-2, Outdoor Sun shield only, 1 lb. **\$1.95**

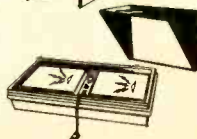
GR-104A SPECIFICATIONS: Picture Size: 74 sq. in. viewing area, picture diagonal 12". Deflection: Magnetic, 110 degrees, 20 mm neck. Focus: Electrostatic. Antenna Input Impedance: 300 ohm balanced. Tuning Range: VHF TV Channels 2 thru 13, UHF TV Channels 14 thru 83. Picture IF Carrier: 45.75 MHz. Sound 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 coarse tuning; UHF fine tuning, VHF channel selector, VHF fine tuning. OFF/On volume, brightness, contrast, vertical hold, horizontal hold. Controls (rear panel): Vertical linearity, Vertical height, Low voltage adjust, AGC. Transistor & Diode Complement: 36 transistors 26 diodes, 1 picture tube. Power Requirement: 110-130 volts AC @ 0.35 amperes, 40 watts; 12 volts DC @ 1.7 amperes, 20 watts. Overall Size: 11 1/2" H, 15 3/4" W, 9-5/16" D. Net weight: 20 lbs.



Hinged, One-Piece Chassis swings out for easy servicing . . . helps speed kit assembly.

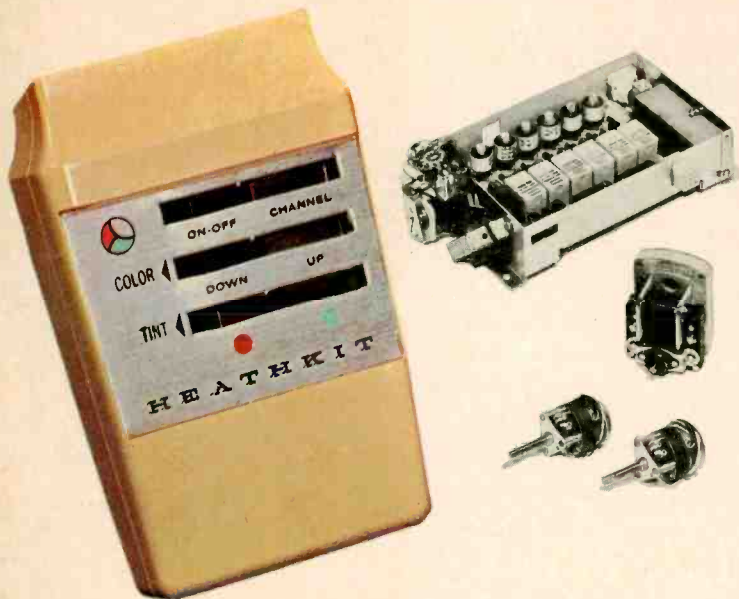


Space-Age Integrated Sound Circuit . . . contains 12 transistors, 12 diodes, and 15 resistors . . . replaces sound I.F., detector, and preamp.



Rechargeable Battery Pack Base Mount Plus Sun Shield. Combination rechargeable batteries and charging circuit for play-anywhere operation. Batteries automatically recharge when plugged into any 120 v. AC outlet, & GR-104 turned off. Sun shield hood fits over screen mask for best outdoor viewing. Kit GRA-104-1, 9 lbs. . . . no money down **\$39.95**

All kits on these two pages shipped REA or Mtr. Frt. except GR-104A and its accessories, and remote controls



**Add The Convenience
Of Wireless Remote Control
To Any Rectangular Tube Heathkit Color TV**

Now from the comfort of your easy chair, you can turn your Heathkit Color TV set on and off, change volume, adjust color and tint, and change VHF channels by sonic control . . . no cables cluttering the room. Three models: the GRA-70-6 for use with the new Heathkit Solid-State GR-270 and GR-370 models; the GRA-295-6, for use with Heathkit model GR-295 and GR-25 Color TV's; and the GRA-227-6, for use with Heathkit Color TV models GR-581, GR-481, GR-227 and GR-180.

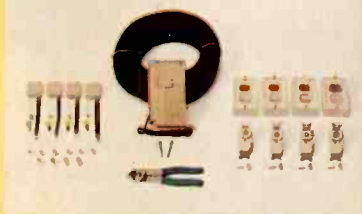
The Remote Receiver is easy to build . . . on one uncluttered circuit board. An Integrated Circuit is used which consists of 15 Resistors, 10 Transistors, and one Diode. A meter is also built into the receiver for adjustment ease. Installation is also easy . . . you merely mount the motors and the receiver, and connect them together with a plug-in type harness.

The Remote Transmitter is electronic (no cables) and is powered by a small conventional 9 v. battery such as used in small transistor radios. The different functions are obtained by simply pushing the proper rocker type knob which operates a set of switches on the transmitter circuit. The transmitter is housed in a small, smartly styled, Beige plastic case . . . feather-light, and fits comfortably in your hand for easy push-button operation. Battery not supplied.

SPECIFICATIONS—Switch functions: On-Off Volume, VHF Channel Selector, Color Up—Color Down, Tint Green, Tint Red. Channel frequencies: On-Off Volume—40 kHz. VHF Channel Selector—38 kHz. Color Down—44 kHz. Color Up—42 kHz. Tint Red—36 kHz. Tint Green—34 kHz. Power requirements: Transmitter: 100 milliwatts @ 9 volts, supplied by a N.E.D.A. type #1604 battery (not supplied). Receiver: 1.5 watts (idling) @ 120 VAC. Color: Beige (transmitter case). Meter: Receiver adjustment. Transmitter dimensions: 4 1/4" x 3 3/4" x 1 1/4". Weight: Transmitter: 8 oz. Total shipping wt. 9 lbs.

- Kit GRA-70-6, 9 lbs., for use with Heathkit solid-state GR-370 and GR-270 model Color TV's \$64.95
- Kit GRA-295-6, 9 lbs., for use with Heathkit model GR-295 and GR-25 Color TV's \$69.95
- Kit GRA-227-6, 9 lbs., for use with Heathkit model GR-581, GR-481, GR-227 and GR-180 Color TV's \$69.95

**4-Way Coaxial
Distribution Kit
. . . Gives You
TV or FM In
4 Rooms At Once**



Now enjoy color and B&W TV or FM stereo anywhere in your house, with this Heathkit Distribution System. The heart of the system is the Jerrold TAC-4 distribution amplifier which takes a single coaxial input from any all-channel antenna (such as the GD-239,-128 or -138), amplifies all signals & feeds four coaxial outlets anywhere in the house. Each line terminates at a surface mounted outlet box or mount them flush in standard electrical boxes if desired. The kit has everything you need for a complete installation—200 ft. of color coaxial cable, connectors & crimping tool and four matching transformers/frequency splitters to provide the necessary impedance match and UHF/VHF separation at the rear of the set. Put unequalled color TV & FM reception throughout your house. Order your distribution system now.

GD-248, 14 lbs. \$89.95

**Reception Proven Coaxial Cable For Color TV . . .
Designed Specifically For 82 Channel Reception**

Coax cable is a necessity for really superb, distortion-free color TV, and it can be run through pipes, near electrical lines, etc., without causing color-killing distortion. Will last ten to fifteen years under the most adverse conditions too.

- GD-228, 50' coax. w/connectors installed, 3 lbs. \$7.95
- GD-238, 75' coax. w/ connectors installed, 4 lbs. \$9.95
- GD-328, 100' coax. w/connectors installed, 5 lbs. \$11.95



**75-300 Ohm Matching Transformer/Frequency
Splitter**

Matches one all-channel 75-ohm coaxial download to 300 ohm VHF and UHF inputs on TV set. Provides excellent isolation between outputs and has low loss. Comes with extra coax connector, cable clamp, mounting hardware and instructions for mounting in rear of set.

GD-298, 1 lb. \$4.95

**TV
Accessories**



**Cornell-Dubilier AR-33
Pushbutton Antenna Rotator**

The solid-state control can be operated either by dial or set-and-forget pushbuttons at a touch of a switch. Locate any of five pre-selected TV or FM stations quickly with pushbutton operation. ±1° accuracy and heavy duty rotor design. Complete instructions included. (5-wire power cable not supplied.)

GDP-258, 16 lbs., no money dn. \$49.95

High Quality Alliance Tenna-Rotor

Rotates 360° in either direction and is instantly reversible, thanks to magnetic braking action. Sealed against moisture and lubricated for life. Uses standard 115 V 60 Hz house current. (5-wire power cable not supplied.)

GDP-214, 11 lbs. \$29.95

**Strong, Safe
Antenna
Roof Mount Kit**

The perfect solution to the problem of where to put your new TV antenna. Mount it quickly and easily on your roof with this complete kit. Includes all necessary hardware: two 5' masts, mast base, 50 foot of 300 ohm transmission line, 50 foot of strong guy wire and all necessary standoffs, screw eyes and wire clamps.

GD-218, 9 lbs. Shipped REA or Mtr. Frt. . . . \$6.95

**75 Ohm Mixer-Splitter
To Operate Two Sets**



Operates two sets from one coax download, or combines two 75 ohm antennas into one lead. Provides 12 dB isolation and has low loss. Complete instructions and hardware included for indoor surface mounting.

GD-318, 1 lb. \$7.95

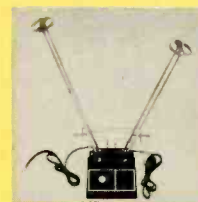
**Chimney Mount Your
Antenna Efficiently
With This Complete Kit**



Nothing extra to buy—you get everything you need to do a first rate job of chimney mounting your new antenna. Kit includes two 5' masts, "Z" chimney mount, 50 foot of 300 ohm transmission line, five 3 1/2" and two clip-type standoffs, two 10 foot steel straps and complete instructions.

GD-208, 10 lbs. Shipped REA or Mtr. Frt. . . \$7.95

Premium 82-Channel Jerrold-Designed Antenna



A nationwide favorite because of its quality design, outstanding performance and low price. Ideal where an outdoor antenna would be difficult or impossible to install. And the 12 position selector switch provides optimum tuning on all channels. Twin folded dipoles provide real station-pulling and are tarnish resistant.

GD-198, 3 lbs. \$10.95

**All Channel Coupler
With FM Tap**



Coupling network for taking an FM signal off a coax line ahead of distribution system or TV set connection. 2.25 dB insertion loss and 12 dB isolation. Includes hardware and instructions.

GD-308, 1 lb. \$10.95

Double your fun.

Learn TV-Radio while you build your Heathkit Color Set or Black and White Set.



Included in your Master Course in Color TV Servicing:

Heathkit GR-295 Color Receiver

For details on this receiver, please refer to page where this unit is pictured and described. Furniture cabinet not included. (Simulated TV reception)



Included in your Master Course in TV and Radio Servicing:

Heathkit GR-104A Black & White Receiver

For details on this receiver, please refer to page where this unit is pictured and described. (Simulated TV reception)



Heathkit VOM IM-17.

For details, please refer to page where this unit is pictured and described.



Up to 31 training kits

With both of these NTS programs, in addition to the TV receiver, you will also build an AM-SW radio, a Solid-State radio, and test instruments you'll enjoy using for a lifetime — the Heath VOM IM-17 and the NTS Electronic Tube Tester.

Approved for veterans

If you have been in service since 1955, or are still in service, check special box in the enrollment coupon.

In the Master Course in TV and Radio Servicing, you will also build the NTS Signal Generator. These kits are developed by NTS especially for training purposes. They make learning TV-Radio a snap. And, they come to you without extra costs — you pay shipping charges only on the color picture tube.

National Technical Schools

is an accredited member of:
National Association of Trade & Technical Schools,
National Home Study Council.

NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

Dept. HKD, 4000 South Figueroa Street, Los Angeles, California 90037

SEE OTHER SIDE
FOR MORE
COURSE INFORMATION

NTS ENROLLMENT APPLICATION

Gentlemen: Please enroll me in the course checked. I will make my payments to National Technical Schools as indicated in Payment Plan which I have chosen. I understand I am entitled to complete instruction, all materials and services of this course, as I progress with my studies. I understand I will receive all privileges extended to me as a member of the NTS Student Body. I may advance as fast as my time will permit within the limit of my payment plan. I will be allowed up to 4 years to complete my course should I need that much time.

Enclose your down payment or full payment with your enrollment. Send remittance by money order or check payable to National Technical Schools, Dept. HKD, 4000 South Figueroa, Los Angeles 90037. Send currency registered mail only . . . for your protection.

This agreement is subject to regulations respecting Trade Schools in force in state or province in which the student lives. Students in Canada and foreign countries assume payment of custom duties and any difference in exchange rates.

CHECK COURSE AND PAYMENT PLAN, BELOW:

- MASTER COURSE IN COLOR TV SERVICING.
COMPLETE HEATHKIT GR-295 COLOR TV SET AND OTHER EQUIPMENT DESCRIBED ABOVE WITH THIS COURSE.
- PLAN A \$15.00 down \$20.00 per mo. Total: \$795.00
B \$15.00 down \$30.00 per mo. Total: \$777.00
C \$759.00 Cash (Save \$36.00)
- MASTER COURSE IN TV AND RADIO SERVICING.
COMPLETE HEATHKIT GR-104A BLACK & WHITE TV SET AND OTHER EQUIPMENT DESCRIBED ABOVE WITH THIS COURSE.
- PLAN A \$10.00 down \$10.00 per mo. Total: \$389.00
B \$25.00 down \$15.00 per mo. Total: \$374.00
C \$34.00 down \$25.00 per mo. Total: \$359.00
D \$345.00 Cash (Save \$44.00)
- COLOR TELEVISION SERVICING FOR QUALIFIED TECHNICIANS.
COMPLETE HEATHKIT GR-295 COLOR TV SET AND VOM IM-17 WITH THIS COURSE.
- PLAN A \$45.00 down \$45.00 per mo. Total: \$740.00
B \$708.00 cash (Save \$32.00)

FILL
IN
OTHER
SIDE

BOTH MASTER COURSES INCLUDE ALL THIS:

● **MORE THAN 90 LESSONS**, covering TV-Radio servicing, Color and B&W principles, advanced color and B&W servicing, and Stereo Sound Systems.

● **PLUS UP TO 31 KIT MANUALS**, a Tube Manual, Electronics Dictionary, 7 Shop Manuals, Pix Display Trouble-Shooting Guide, 27 Job Sheets.

BOTH NTS MASTER COURSES are designed to give you all the background you'll ever need to install and maintain home entertainment equipment. You'll learn to service your own set. Save money on costly service calls, too. You get all this, plus training in stereo and stereo multiplex sound systems.

You need no electronics experience at all. Lessons are easy to understand and fully illustrated. First you'll be introduced to basic electronic principles — the fundamental scientific laws that apply to television, radio and electronics. Then, at your own pace, you'll learn not only the "how" of assembling your kits, but also the "why" — what makes them work. You'll develop a thorough understanding of home entertainment electronics.

All kits are carefully integrated with lesson materials so that you learn by doing. Your progress is checked by men who are both instructors and service technicians. They help you every step of the way, providing added assistance, if you need it.

YOU WILL LEARN basic principles about the theory of television, the principle of scanning, and how the television camera converts the televised scene into a picture signal. We introduce you to various sections of the TV receiver and point out the similarities and differences between TV and

radio receivers. Section by section, you learn to test each part of the entire TV receiver. You cover low voltage power supply, picture tube troubles and rejuvenation, installation and repair of television antennas.

In both courses, you receive specialized training in color television. You learn about light, color, color mixing, hues, brightness and saturation. You're introduced to the color camera — how it works. The color killer circuit and color balance adjustment are included, as well as adder and out-pur circuits and chrominance channel. Color TV servicing lessons begin with a complete receiver analysis and alignment study. You receive a valuable service reference guide listing the symptoms, probable causes, and circuit locations of common troubles encountered in color television receivers.

Hi-fi, stereo, recorders, microphones, speakers and speaker enclosures are also covered in both courses — at no additional cost.

NTS, established in 1905, is one of the oldest and largest home study schools in the world. Well over 100,000 men have graduated to go on to careers as technical specialists in various fields.

Our **COLOR TV SERVICING FOR QUALIFIED TECHNICIANS COURSE** is an advanced course for technicians who have had prior radio training and experience. Covers B&W and Color TV Servicing.

● **17 TRAINING KITS**

You build and keep the Heath GR-295 and Heath VOM IM-17.

● **OVER 50 LESSONS AND 19 KIT MANUALS**

CONSUMER CREDIT INFORMATION

To assist you in understanding the difference between the paid-in-full upon enrollment tuition fee and the time-payment tuition fee, National Technical Schools has prepared this chart. This information is presented in accordance with guidelines established under federal law.

HOW TO USE THE CHART: After you have selected the course in which you wish to enroll, and have decided upon the payment plan you will follow, find your tuition cost under Column A. This is the total amount you will pay for the course you have chosen. The cash price, listed in Column B, is the total cost if you prefer to pay in full for the course at the time of your enrollment. By subtracting the down payment (Column C), for your selected course and

plan, from the cash price, the difference is the amount financed which is shown in Column D. The amount of the financing charge is listed in Column E. This finance charge, expressed as an annual percentage rate based upon the amount being financed, is shown in Column F. The total number of monthly payments to be made is listed in Columns G and H. All students have the right to pay in advance the unpaid balance of their tuition and obtain a partial refund of the time-payment charge.

Upon receipt of your enrollment form and payment, we will send you a student I.D. card, and other important information which will assist you in your studies. You will also receive a copy of your enrollment form for your records.

COURSE TITLE	Pay this amount Time Payment Tuition Price A	Cash Price B	Down Payment C	Amount Financed D	Finance Charge E	Annual Percentage Rate F	Amount and Number of Monthly Payments G	Plus Final Payment H
Master Course in Color TV Servicing	\$795	\$759	\$15	\$744	\$36	2¾%	39 @ \$20 ea.	\$ —
	\$777	\$759	\$15	\$744	\$18	2¼%	25 @ \$30 ea.	\$12
Master Course in TV and Radio Servicing	\$389	\$345	\$10	\$335	\$44	7¾%	37 @ \$10 ea.	\$ 9
	\$374	\$345	\$25	\$320	\$29	8½%	23 @ \$15 ea.	\$ 4
	\$359	\$345	\$34	\$311	\$14	7¾%	13 @ \$25 ea.	\$ —
Color Television Servicing for Qualified Technicians	\$740	\$708	\$45	\$663	\$32	6¾%	15 @ \$45 ea.	\$20

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NAME (Please write your name plainly)

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DATE

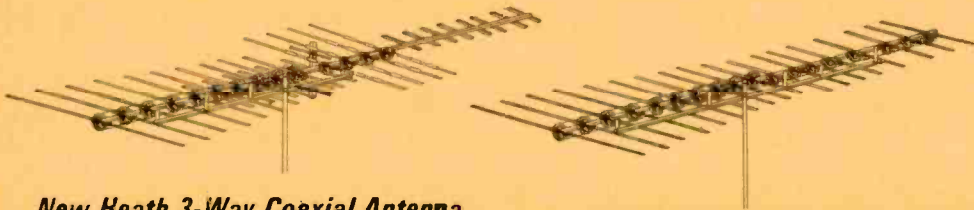
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ADDRESS ALL CORRESPONDENCE TO DEPT. HKD, NATIONAL TECHNICAL SCHOOLS, 4000 S. Figueroa Street, Los Angeles, Calif. 90037.

Viewing With These Heathkit® TV Accessories



New Heath 3-Way Coaxial Antenna For Deep Fringe Reception

- 55 elements for exceptional reception on all TV & FM channels • Very high front to back ratio for rejection of unwanted signals • High efficiency • Weather-resistant • Extra high gain • Easy assembly

The new GD-239 is designed by Jerrold to Heath's rigid specifications and delivers truly exceptional VHF/UHF/FM reception in very deep fringe areas... up to 180 miles depending on conditions. The very high front-to-back ratio means excellent directivity and unwanted signal rejection, and exceptionally flat response virtually eliminates signal fading and color distortion. Has the high gain you need for good reception in outlying areas. Heavy-duty Jerrold construction and weather-resistant coating assure many years of dependable use. Comes complete with a 300 to 75 ohm transformer at the antenna and a matching transformer/frequency splitter. For top performance, 75 ohm coax cable is a must.

GD-239, 18 lbs. (less mast & coaxial cable).....\$49.95

GD-239 SPECIFICATIONS—Elements: Active—12; Passive—43. Front-To-Back Ratio: 19. Usable Distance: (Mileage over flat terrain with best reception conditions.) VHF—180 mi.; UHF—100 mi. Matching Transformer: Included. Length: 176". Width: 102". Turning Radius: 107".

New Heath VHF/FM Coaxial Antenna For Deep Fringe Areas

- Outstanding VHF/FM reception from 31 elements • Excellent rejection of unwanted signals • High gain and directivity • Rugged construction • Fast, simple assembly

With the many TV specials, sporting events & top entertainment now on the air, fringe area TV viewers will want this new Jerrold-designed VHF/FM antenna for maximum reception. Delivers remarkable TV & FM reception up to 200 miles away under ideal conditions, thanks to the 31 elements. High gain, excellent directivity and flat response across the VHF/FM band all add up to make this antenna a great value. Rugged square boom construction and a weather-resistant finish mean long, trouble-free life too. 300 to 75 ohm matching transformer included at the antenna, as 75 ohm coaxial cable is highly recommended for best results.

GD-229, 18 lbs. (less mast & coaxial cable).....\$39.95

GD-229 SPECIFICATIONS—Elements: Active—10; Passive—21. Front-To-Back Ratio: 20. Usable Distance: (over flat terrain with best reception conditions), 200 mi. Length: 202". Width: 102". Turning Radius: 107".



Heath VHF/UHF/FM Coaxial Antenna For Fringe & Near-Fringe Areas

- 33 elements for peak performance • Flat response across the entire TV/FM band • High gain • Excellent front-to-back ratio • Superior efficiency • Rugged construction

Excellent UHF/VHF/FM reception up to 150 miles with this Jerrold-designed log-periodic antenna. High directivity, virtually flat response and high gain make this antenna the ideal choice for outlying areas. Antenna-mounted matching transformer and matching transformer/frequency splitter included. Coax cable recommended.

GD-128, 15 lbs. (less mast & coaxial cable).....\$34.95

GD-128 SPECIFICATIONS—Elements: Active—10; Passive—23. Front-To-Back Ratio: 18. Usable Distance: (Mileage over flat terrain with best reception conditions) VHF—150 mi.; UHF—80 mi. Matching Transformer: Included. Length: 120". Width: 102". Turning Radius: 80".

New Heath Coaxial High Gain VHF/FM Fringe Antenna

- High gain for excellent fringe area VHF/FM Reception • 23 elements • Very directional • High front-to-back ratio for rejection of unwanted signals • Weather resistant

An excellent antenna choice for fringe & near-fringe areas that will deliver remarkable results up to 180 miles, depending on conditions. Heavy-duty, weather-resistant Jerrold construction and easy assembly. A 300 to 75 ohm matching transformer is included to take advantage of the superior results of coaxial cable installation.

GD-219, 15 lbs. (less mast & coaxial cable).....\$29.95

GD-219 SPECIFICATIONS—Elements: Active—10; Passive—13. Front-To-Back Ratio: 20. Usable Distance: 180 mi. (over flat terrain with best reception conditions). Length: 142". Width: 102". Turning Radius: 88".



Heath City-Suburban Antenna Receives UHF/VHF/FM

- 17 elements give reception up to 100 miles away under ideal conditions • High directivity eliminates reception-destroying reflected signals • Flat response for sharp color fidelity & excellent stereo FM • 75 ohm coaxial cable recommended

GD-138, 10 lbs. (less mast & coaxial cable).....\$24.95

GD-138 SPECIFICATIONS—Elements: Active—10; Passive—7. Front-To-Back Ratio: 17. Usable Distance: (Mileage over flat terrain with best reception conditions.) VHF—100 mi.; UHF—60 mi. Matching Transformer and frequency-splitter: Included. Length: 111". Width: 102". Turning Radius: 79".

Heath VHF/FM Coaxial Antenna For City-Suburban Areas

- Excellent VHF/FM antenna for areas where signal level is low • Receives up to 150 miles away depending on conditions • High gain & good directivity • Flat response • Rugged, weather resistant construction • 75 ohm coaxial cable installation recommended

GD-158, 14 lbs. (less mast & coaxial cable).....\$26.95

GD-158 SPECIFICATIONS—Elements: Active—8; Passive—9. Front-To-Back Ratio: 19. Usable Distance: (over flat terrain with best reception conditions) 150 mi. Length: 120". Width: 102". Turning Radius: 79".

NEW! Spaulding "Strato-Towers" To Mount Your Heath TV Antenna

24 ft.* Model GDP-249

\$44⁶⁵

32 ft.* Model GDP-259

\$58⁰⁰

40 ft.* Model GDP-269

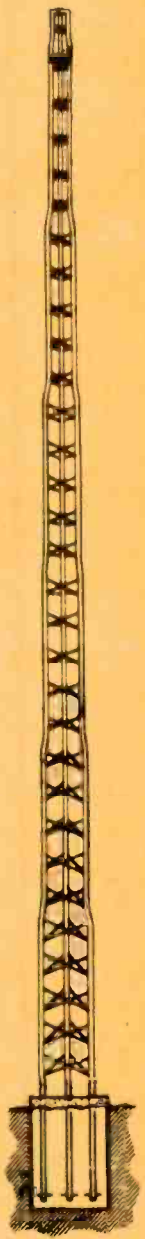
\$75⁹⁵

48 ft.* Model GDP-279

\$95⁷⁰

*Height does not include 8 ft. mast.

- Complete tower package with 4' concrete base stubs, mast kit assembly, rotor plate, 8 ft. mast and all hardware • Self-supporting—no guy wires needed • All galvanized steel riveted construction • Accepts any standard rotor • "X" brace design gives greater strength—braces riveted in center as well as ends • Beaded channel leg design reduces danger of twisting • All towers shipped freight collect from Frankfort, Indiana in nested 8 foot sections



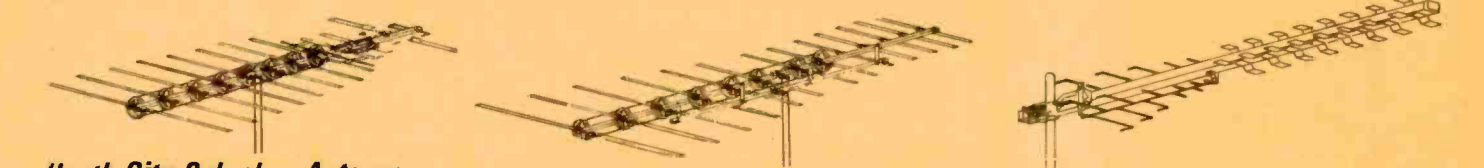
Now you can mount your new Heath TV antenna at a height that will assure improved reception... on a new "Strato-Tower" from Spaulding, the world's largest manufacturer of quality TV towers. Four different heights are offered... from 24 to 48 feet... and each is a complete package including tower, 4' concrete base stubs, mast kit assembly, 8 ft. mast and hardware. For maximum performance, put your antenna on a new Spaulding tower.

GDP-249, 73 lbs., 24' tower pkg.....\$44.65

GDP-259, 101 lbs., 32' tower pkg.....\$58.00

GDP-269, 139 lbs., 40' tower pkg.....\$75.95

GDP-279, 181 lbs., 48' tower pkg.....\$95.70



Heath UHF Antenna For City-Suburban Locations

- High gain, 19 element antenna for reception out to 60 miles under ideal conditions • Broad-band periodic design by Jerrold • May be easily combined with any VHF antenna • 75 ohm coaxial cable recommended for installation

GD-188, 4 lbs. (less mast & coaxial cable).....\$9.95

GD-188 SPECIFICATIONS—Elements: Active—11; Passive—8. Front-To-Back Ratio: 19. Usable Distance: 60 mi. (over flat terrain with best reception conditions). Length: 46". Width: 8". Turning Radius: 44".

The Incomparable Heathkit® AR-15...

The Finest Stereo Receiver

You Can Buy—Anywhere!

Advanced Features!

• 69 silicon transistors, 43 diodes, 2 IC's • 150 Watts dynamic music power • Stereo threshold control for automatic switching to stereo and mono • Automatic noise-operated FM squelch circuit • Adjustable Phase Control • Automatic stereo indicator light • Stereo only switch silences all mono broadcasts when you wish to hear stereo only • Magnetic phono inputs with 98 dB dynamic range • Two stereo headphone jacks • Built-in test circuit VOM for circuit checkout during and after kit assembly • Capacitor coupling to speaker terminals for speaker protection • Loudness switch to compensate for low and high frequencies when listening at low power levels • External antenna connectors . . . 300 ohm and 75 ohm for FM, plus a built-in rod antenna for AM • Simple circuit board construction • Heavy die-cast, chrome-plated panel and machined anodized aluminum knobs • Choice of installation, wall, custom cabinet or Heath walnut wrap-around cabinet with vented top

World's Most Sophisticated Features From The Audio Industry's Most Experienced Solid-State Engineering Staff. Like Integrated Circuits and crystal filters in the IF amplifier section. The two IC's provide hard limiting, excellent temperature stability and rugged reliability. Each IC is no larger than a transistor, yet each contains 10 transistors, 11 resistors and 7 diodes. The crystal filters are another Heath first in high fidelity and replace the usual transformers. These filters provide an ideally shaped bandpass with almost vertical skirts and offer a degree of adjacent channel selectivity impossible with conventional IF transformers. And since there are no coils, there are no alignment or adjustment worries—ever.

Sensitive FM Tuner . . . Designed For Top Performance.

The special-design field effect transistor (FET) FM tuner consists of a cascode 2-stage FET RF amplifier and an FET mixer for high overload capability, excellent cross modulation and image rejection. The completely shielded tuner has a 4-gang variable capacitor and 6 tuned circuits for a selectivity of 70 dB even under the most adverse conditions. IHF sensitivity is 1.8 uv or better and harmonic and intermodulation distortion are both 0.5% or less.

Powerful 150-Watt Amplifier Section.

The amazing 150 watts music power (100 watts RMS) amplifier floats along effortlessly, but when you need it, the AR-15 is right there to deliver, without clipping, without harsh annoying distortion. The unusual performance of the amplifier comes from 4 conservatively rated, individually heat-sinked and protected output transistors powered by a giant power transformer and filter capacitor.

Positive Circuit Protection. You don't have to worry about damage from overloads or short circuits of any duration thanks to the 4 current-limiting Zener diodes and 2 temperature-sensitive circuit breakers that protect the driver and output transistors. A special Hi-Temp indicator shows when the thermal breakers have opened.

Other Features Include all-silicon transistor circuitry, stereo only switch, loudness switch for full response listening even at low levels, two calibrated tuning meters (signal strength & center-tune), noise-operated squelch to hush between-station noise before you hear it, stereo threshold control, adjustable phase control for best stereo, plus many more advanced features. Start enjoying the finest listening with the AR-15. (Kit not recommended for beginners.)

But Don't Take Our Word For It. Read what every leading audio and electronics magazine, every major testing organization and some of the thousands of owners have to say about the AR-15—they all agree its tops in the stereo receiver field . . . in advanced design concepts, in superior performance. Ten different patents have been applied for on just this one Heathkit product—proof of its advanced design.

READ WHAT AUDIO CRITICS AND OWNERS SAY:

Popular Electronics, Jan. '68: "There is no doubt in your reviewer's mind that the AR-15 is a remarkable musical instrument. If you are harboring any suspicion that, after all, a kit is still a kit, be assured that kit building has reached an apogee with the AR-15."

High Fidelity, Dec. '67: "The AR-15 has been engineered on an all-out, no-compromise basis." "The performance data measured on the kit-built AR-15 at CBS Labs turned out to equal or surpass Heath's specifications for the set."

Electronics World, May '67: "Heath implies strongly that the AR-15 represents a new high in advanced performance and circuit concepts. After testing and living with the AR-15 for a while, we must concur." "We found the AR-15 easy to operate and easy on the ears. Its enormous reserves of clean power make for effortless listening at any level and the FM tuner brought in more listenable broadcasts . . . than we had realized existed in our area."

Hi-Fi/Stereo Review, May '67: "The most impressive part of the AR-15 is its FM tuner. This is the most sensitive FM tuner we have ever tested, and it has by far the best limiting characteristic." "Several people have commented to us that for the price of the AR-15 kit they could buy a very good manufactured receiver. So they could, but not one that would match the superb overall performance of the Heath AR-15."

Modern Hi-Fi & Stereo Guide, 1968: "I cannot recall being so impressed by a receiver . . . it can form the heart of the finest stereo system."

Popular Science, Dec. '67: "Top-notch stereo receiver" . . . "it's FM tuner ranks with the hottest available" . . . "it's hard to imagine any other amplifier, at any price, could produce significantly better sound."

Audio Magazine, May 1967: "The entire unit performs considerably better than the published specifications."

Popular Mechanics, Nov. '67: ". . . Heathkit's top-of-the-line AR-15 is an audio Rolls Royce . . ."

Kit AR-15, (less cabinet), 34 lbs. \$349.95
Assembled ARW-15, (less cabinet), 34 lbs. \$540.00
Assembled AE-16, optional walnut cabinet, 10 lbs. \$24.95

AR-15 SPECIFICATIONS—Recommended System Mates: All speakers & speaker systems, all changers & turntables. **AMPLIFIER—Music Power (Each Channel):** 8 ohms, 75 watts*; 4 ohms, 50 watts; 16 ohms, 45 watts. **Continuous Power:** 8 ohms, 50 watts*; 4 ohms, 45 watts; 16 ohms, 35 watts. **Power Bandwidth For 0.5% T.H.D.:** 6 Hz to 30 kHz*. **Frequency Response (1 watt):** ±1 dB, 8 to 40 kHz. **Harmonic Distortion:** 0.5% from 20 Hz to 20 kHz at 50 watts rms, 0.2% at 1000 Hz at 1 watt. **Intermodulation Distortion:** 0.5% at 50 watts, 60 & 6,000 Hz mixed 4:1, 0.2% at 1 watt. **Damping Factor:** 45. **Input Sensitivity:** Phono: 2.2 mv (Overload 155 mv). Tape, Aux., and Tape Mon., 200 mv (Overload 4.5 V) **Hum & Noise:** Phono [10 mv ref.], —60 dB. Tape & Aux. [200 mv ref.], —65 dB. **Channel Separation:** Phono, 45 dB. Tape & Aux., 55 dB. **Output Impedance (each channel):** 4 to 16 ohms. **Tape Output Impedance:** 120 ohms. **Input Impedance:** Phono, 51 k ohms (RIAA Equalized). Aux, Tape & Tape Mon., 100 k ohm. **Tape Output:** 0.17 volt output with 0.2 volt input. **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 Microvolts*. **Selectivity:** 70 dB*. **Image Rejection:** 90 dB*. **Capture Ratio:** 1.5 dB*. **AM Suppression:** 50 dB*. **Harmonic Distortion:** 0.5%. **Intermodulation Distortion:** 0.5%*. **Hum & Noise:** —65 dB*. **Spurious Rejection:** —100 dB*. **FM SECTION—(Stereophonic)—Channel Separation:** 40 dB at mid-frequencies. **Frequency Response:** ±1 dB from 20 to 15,000 Hz. **Harmonic Distortion:** 1% at 1000 Hz with 100% modulation. **19 kHz And 38 kHz Suppression:** 55 dB. **SCA Suppression:** 50 dB. **AM SECTION—Tuning Range:** 535 to 1620 kHz. **AM Antenna:** Built-in rod. Connections for external ant. and grd. **Sensitivity:** External antenna, 12 uV at 1000 kHz for 10 dB S+N/N. **Selectivity:** 20 dB at 10 kHz. **Image Rejection:** 60 dB at 600 kHz*. 40 dB at 1400 kHz*. **IF Rejection:** 70 dB*. **Harmonic Distortion:** 1.5%. **Hum & Noise:** —45 dB*. **GENERAL—AC Outlet Sockets:** One switched (350 watts max.), two unswitched (350 watts max.). **Power Requirements:** 105-125 or 210-250 volts 50/60 Hz AC 240 watts at full output. **Dimensions:** Overall—16 1/2" W x 4 3/4" H x 14 1/2" D.
*Rated IHF (Institute Of High Fidelity) Standards

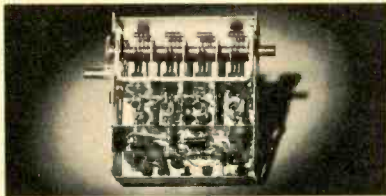


Kit AR-15
\$349⁹⁵
 (less cabinet)

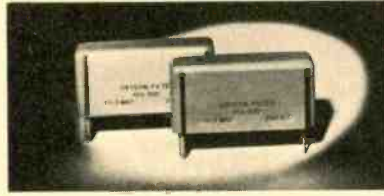
Wired ARW-15
\$540⁰⁰
 (less cabinet)

"Black Magic" Panel Lighting

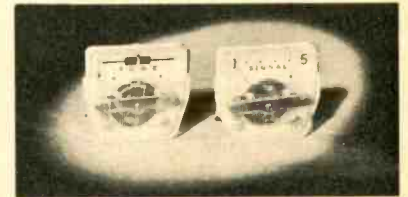
Even when not in use, the Heathkit AR-15 remains quietly unobtrusive . . . its rich midnight face unmarred by any dial or scale markings. And when you're ready for the ultimate in stereo listening, a simple touch of the power switch brings the AR-15 to life—the "Black Magic" panel lights up with an extended sliderule dial for easy tuning, and immediate identification of all controls. The "Black Magic" is in the unique tinted acrylic "dual-panel" design.



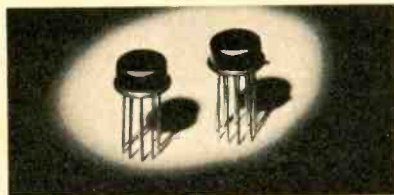
Field Effect Transistor (FET) Tuner . . . completely assembled & shielded. A cascade 2-stage FET RF amplifier and an FET mixer provide high overload capability, excellent cross modulation and image rejection.



Crystal Filters . . . replace the usual transformers in the IF amplifier, providing an ideally shaped IF bandpass which offers adjacent channel selectivity not possible with conventional IF transformers.



Two Calibrated d'Arsonval Tuning Meters. A signal strength indicator tells you when you receive the strongest signal & a special "Center-Tune" meter puts you on exact station frequency.



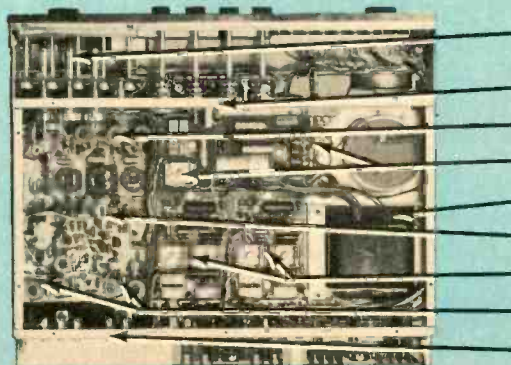
Integrated Circuits. Two in the IF amplifier for hard limiting, temperature stability and reliability. Each is only the size of a tiny transistor, yet contains 28 actual parts . . . 10 transistors, 11 resistors and 7 diodes.



150 Watts Dynamic Music Power. 4 conservatively rated, individually heat-sinked & protected output transistors provide 75 watts per channel, 50 watts continuous.



Positive Circuit Protection. 4 Zener diodes and 2 thermal circuit breakers protect driver and output transistors from overloads & shorts. Special Hi-Temp indicator shows opened thermal breakers.

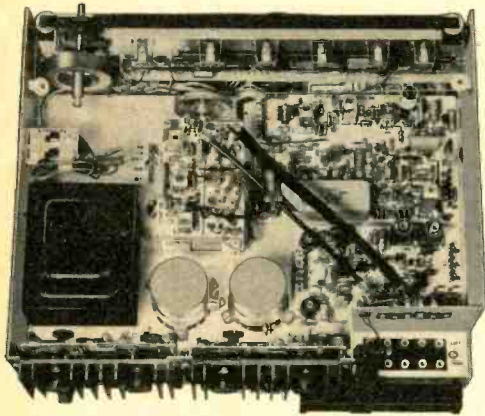


- All-Silicon Transistor Circuitry** . . . for maximum reliability, superior stability.
- Front Panel Input Level Controls** . . . up front for convenient adjusting — protected from accidental setting changes by an attractive hinged door.
- Tone-Flat Switch** . . . bypasses tone control circuitry for completely flat response.
- Super SCA Filter** . . . removes SCA and noise frequencies above 57 kHz for clean, quiet listening.
- Electronic Filter Circuit** . . . provides power supply with exceptionally low ripple and excellent regulation.
- Massive Power Supply** . . . for low heat and superior regulation — electrostatic and magnetic shielding for lowest hum and noise.
- Noise-Operated Squelch** . . . a step ahead of the normal circuitry to hush between-station noise *before* you hear it.
- Transformerless Design** . . . direct coupling between driver and output stages for lowest phase shift and distortion.
- Filtered Left & Right Channels** . . . for direct "beat-free" stereo recording . . . a low cost way to build your own music library.
- Recessed Inputs & Outputs** . . . no protruding array of leads to waste valuable space — fits flush against any wall or surface.

SAVE
5%
 order a system
 see page 29

The Heathkit® AR-29 100-Watt

The World's Finest Medium Power Stereo Receiver . . . Designed In The Tradition Of The Famous Heathkit AR-15 . . . Advanced Field Effect Transistor And Integrated Circuit Design . . . Modular Plug-In Circuit Boards . . . Exciting New Styling Concepts



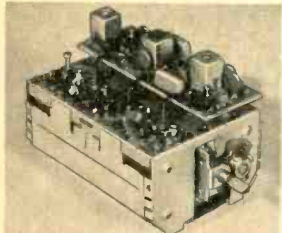
SAVE
5%
order a system
see page 29

- All solid-state design . . . 65 silicon transistors, 42 diodes & 4 IC's containing another 124 transistors and 40 diodes.
- Assembled, aligned FET tuning unit . . . hypersensitive, free from overload.
- Computer designed L-C filter . . . a new advance in circuitry; fix-tuned, sealed factory assembled unit never needs alignment, gives steep flat-topped bandpass for highest selectivity.
- Ball-bearing flywheel tuning . . . just spin across the dial to your favorite station.
- Plug-in circuit boards . . . a first in kits . . . easy to build modular design.
- Built-in test circuit . . . test probes and meters combine to give you in-progress checks and service capability anytime.
- Massive power supply . . . loafs along at 100 watts . . . protected.
- Integrated Circuits . . . compress most of the elaborate IF and multiplex circuitry into 4 tiny solid-state devices.
- Recessed inputs & outputs . . . the cabinet fits flat against a wall.
- External AM & FM antenna inputs for your option.
- Transformerless outputs . . . for lowest distortion and phase shift characteristics.
- Linear Action Controls . . . just push left or right to the setting you desire for Volume, Bass, Treble, and Balance.
- Directional AM Rod Antenna . . . maximum signal for your favorite station.



"Black Magic" Panel Lighting

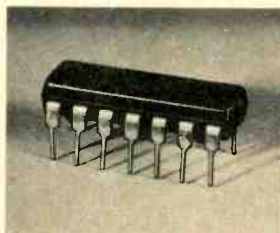
When not in use, the new AR-29 remains quietly distinctive . . . its impressive midnight black and chrome face reveals no dial or scale marking. A gentle press of the pushbutton power switch and the dial and scale markings appear. The "black magic" is in the unique dual tinted acrylic panel design.



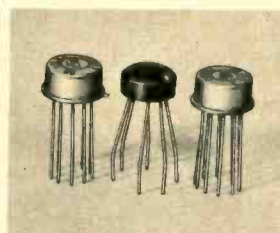
Field Effect Solid-State FM Tuner . . . preassembled & aligned, delivers high sensitivity, low cross modulation & no overloading. AM RF board atop.



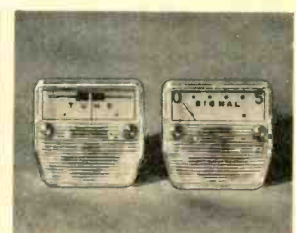
Computer Designed L-C Filter . . . gives IF alternate channel selectivity of more than 70 dB, optimum separation & minimum distortion. A first in kits from Heath.



Integrated Circuit Multiplex . . . this single tiny IC contains 31 transistors, 30 resistors & 10 diodes . . . performs four different functions.



Three Integrated Circuits in FM IF amplifier for hard limiting, temperature stability and increased reliability. Contain a total of 25 transistors, 14 diodes, and 24 resistors.



Two Calibrated Tuning Meters. Signal Strength meter indicates strongest signal . . . "Center Tune" puts you exactly on station frequency.

AM-FM-FM Stereo Receiver . . . \$285.00

The New Heathkit AR-29 . . . 100 Watts Music Power Output . . . Remarkable FM Performance . . . High Fidelity AM Reception . . . Built-In Self-Servicing Capability . . . An Extraordinary Musical Instrument

- All solid-state circuitry with 65 transistors, 42 diodes and 4 Integrated Circuits • 100 watts music power output at 8 ohms • 7-60,000 Hz frequency response • Less than 0.25% Harmonic & 0.2% IM Distortion at full power output • Transformerless, Direct-coupled outputs with dissipation-limiting circuitry for output protection • AM-FM/FM-Stereo Tuner features ball-bearing inertia flywheel tuning • Advanced L-C Filter for greater than 70 dB selectivity and elimination of IF alignment forever • Preassembled, factory-aligned FET FM Tuner for better than 1.8 uV sensitivity • Mute Control attenuates between-station noise on FM • Blend Control attenuates on-Stereo station noise on FM • SCA Filter • Linear Motion controls for Volume, Balance, Bass & Treble • Individually adjustable level controls for each channel of each input including tape monitor permits switching sources without annoying volume changes • Switches for 2 Separate Stereo speaker systems • Center speaker capability • Two front panel tuning meters for exact station selection • Stereo indicator light • Front panel stereo headphone jack • Swivel AM rod antenna for best signal pickup • 300 & 75 ohm FM antenna inputs • Tone Flat switch disables Bass & Treble controls for perfectly "flat" response • Massive, electronically regulated power supply • New Heath modular plug-in circuit board design speeds assembly, aids servicing • Circuit board-wiring harness construction for fast, enjoyable kit building

Another Design Leader. The new Heathkit AR-29 reflects a heritage of solid-state engineering experience that could only come from the designers of the world famous Heathkit AR-15. The result of a two year project to produce the finest medium-power stereo receiver ever conceived, the introduction of the AR-29 marks another milestone in receiver design.

New Performance Standards For Stereo Amplifiers. The AR-29 houses what is undeniably one of the finest stereo amplifiers in any receiver. It delivers a full 100 watts of IHF music power, 70 watts continuous . . . enough to drive even the most inefficient speakers. A massive, fully regulated and filtered power supply, 4 individually heat-sinked output transistors and the best IM and Harmonic Distortion specifications in the industry combine to give the cleanest, most life-like sound you'll ever hear.

Short-Circuit Protection . . . a dissipation-limiting circuit protects the outputs from damage, even with a short circuit condition.

Input Level Controls . . . for both channels of all inputs including tape monitor allow adjustment of levels so volume remains constant when switching sources.

Clean, Sensitive FM-Stereo Reception. The preassembled, prealigned FM tuner has 1.8 uV sensitivity for real station pulling power, using FET design for superior overload characteristics. A tiny integrated Circuit performs four different functions in the Multiplex section to assure excellent stereo performance. Three IC's in the IF section provide superior AM rejection capability, hard limiting, temperature stability and greater reliability.

New Computer Designed 9-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. High "Q" toroid design gives better performance than ever possible with transformer type multi-stage IF's or single crystals. An exclusive in kits from Heath.

New "Blend" Function . . . attenuates any on-station FM hiss and high frequency noise at the push of a button.

New "Mute" Function . . . attenuates between-station noise on FM without affecting sensitivity of the tuner . . . just touch a button.

AM That Sounds Like FM. Three Field Effect Transistors in the AM RF circuits provide superior sensitivity with large signal handling capability for really remarkable AM reception. And the built-in AM rod antenna swivels so you can orient it for best reception.

New Modular Plug-in Circuit Boards . . . make assembly faster, easier, more enjoyable. And they snap out in seconds for faster service. Another first in kit design from Heath.

Exclusive Built-In Test Circuitry . . . means you not only assemble, test and align your new AR-29 a section at a time, but you can also service it if it's ever necessary—all without external test equipment. Test probes and meter are furnished at all times . . . just flip a switch to use. The manual includes comprehensive instructions on the use of this built-in capability.

Versatile Installation. The new Heathkit AR-29 can be installed a number of ways. Put it in a wall or equipment cabinet. Design and build your own cabinet. Or order the completely assembled AE-19 cabinet, finished in rich oiled pecan . . . measures only 17-11/16" W x 13 1/8" D x 6 3/8" H with feet.

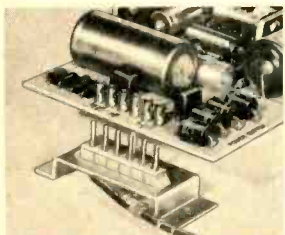
Compare The New Heathkit AR-29 against anything in its power class . . . and be convinced that it is, indeed, the world's finest medium power receiver. Order yours now.

Kit AR-29 (less cabinet), 33 lbs. **\$285.00**
Assembled AE-19, cabinet, 10 lbs. **\$19.95**

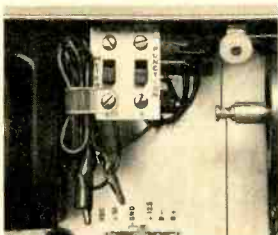
AR-29 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems • all changers & turntables.

AMPLIFIER SECTION: Dynamic Power Output Per Channel (Music Power Rating): 50 watts, 8 ohms*; 65 watts, 4 ohms; 30 watts, 16 ohms. **Continuous Power Output Per Channel:** 35 watts, 8 ohms*; 35 watts, 4 ohms; 25 watts, 16 ohms. **Power Bandwidth For Constant 0.25% Total Harmonic Distortion:** Less than 5 Hz to greater than 30 kHz. **Frequency Response (1 Watt Level):** —1 dB, 7 Hz to 60 kHz; —3 dB, 4 Hz to 100 kHz. **Harmonic Distortion:** Less than .25% from 20 Hz to 20 kHz @ 35 watts output; less than 0.1% @ 1000 Hz with 1 watt output. **Intermodulation Distortion:** Less than 0.2% with 35 watts output using 60 & 6000 Hz mixed 4:1. Less than 0.1% with 1 watt output. **Output Damping Factor:** Greater than 50. **Input Sensitivity:** Phono, 2.2 millivolts (overload 155 mV); Tape, 180 millivolts (greater than 10 V); Aux., 180 millivolts (greater than 10 V); Tape Mon., 180 millivolts (greater than 10 V). **Hum And Noise:** Phono, 10 millivolt reference: —65 dB. Tape and Aux., 0.25 volt reference: —75 dB. Minimum Volume: —90 dB. **Channel Separation:** Phono, 50 dB or better; Tape and Aux., 60 dB or better. **Recommended Speaker Impedance:** 4 ohm through 16 ohm. **Tape Output Impedance:** Approximately 50 ohm. **Input Impedance:** Phono, 49 K*. Aux., Tape, and Tape Mon., 100 K. **Tape Output:** 1 volt output with 0.2 volt input. **TUNER (FM Section—Monophonic):** Tuning Range: 88 to 108 MHz. **Intermediate Frequency (IF):** 10.7 MHz. **Frequency Response:** ±1 dB, 20-15,000 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 or less*. **Volume Sensitivity:** Below measurable level*. **Selectivity:** Greater than 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 Distortion:** 0.4% or less*. **Hum And Noise:** Greater than 60 dB*. **Spurious Rejection:** Greater than 90 dB*. **FM SECTION—Stereo: Channel Separation:** 40 dB min. at mid-frequencies; 30 dB min. at 50 Hz; 25 dB min. at 10 kHz; 20 dB min. at 15 kHz. **Frequency Response:** ±1 dB, 20-15,000 Hz. **Harmonic Distortion:** 0.5% or less at 1000 Hz with 100% modulation. **19 kHz and 38 kHz Suppression:** 55 dB. **SCA Suppression:** 55 dB typical. **AM SECTION: Tuning Range:** 535 to 1620 kHz. **Intermediate Frequency:** 455 kHz. **Sensitivity:** Using external input, 30 uV at 600 kHz*, 20 uV at 1400 kHz*. Using rod antenna, 200 uV/meter at 600 kHz*, 300 uV/meter at 1400 kHz*. **Selectivity:** Greater than 40 dB alternate channel. **AM Antenna:** Adjustable built-in rod type. Connections for external antenna and ground on rear. **Image Rejection:** 60 dB @ 600 kHz*, 45 dB @ 1400 kHz*. **IF Rejection:** 50 dB*. **Harmonic Distortion:** Less than 2%*. **Hum And Noise:** 35 dB. **CONTROLS AND SWITCHES: Front Panel:** AM-FM TUNING: 535 to 1620 kHz & 88 to 108 MHz. SOURCE PUSH BUTTON SWITCHES: AM, FM, Phono, Tape, and Aux. VOLUME CONTROL: Dual linear motion (slider). BASS CONTROL: Dual linear motion (slider) for 18 dB boost & 10 dB cut at 20 Hz. TREBLE CONTROL: Dual linear motion (slider) for 14 dB boost and 16 dB cut at 20 kHz. BALANCE CONTROL: Dual linear motion (slider) which balances the right and left channel amplifiers for equal effective sound output from both speaker systems. NOTE: The following are push-button switches—in position being on: TONE FLAT switch; SPEAKER SWITCH 1 AND 2; POWER SWITCH; MODE SWITCH; TAPE MONITOR SWITCH; BLEND SWITCH; LOUDNESS SWITCH; MUTE SWITCH. **Bottom Plate:** LEVEL CONTROLS: L and R (left and right channel) controls for Phono, AM, FM, Tape, Auxiliary and Tape Monitor. **Rear Panel:** CENTER CHANNEL SWITCH. OTHER CONTROLS AND SWITCHES: SEPARATION ADJUST CONTROL; 19 kHz and 38 kHz SWITCH. Normal Adjust positions; METER AND FUNCTION SWITCH, Norm/V (volts) and R (Resistance) positions; CENTER AND DEVIATION CONTROLS. **GENERAL: AC Outlet Sockets:** Two located on rear panel for power accessory equipment. One switched (350 watts max.) and one unswitched (350 watts max.). **Power Requirements:** 105-125 or 210-250 volts, 50/60 Hz AC; 34 watts idling (zero output) and 160 watts at full output with no load on accessory outlets. **Dimensions:** Overall—16 3/4" W x 5 1/8" H x 14 1/2" D. **Mounting:** AE-19 cabinet or custom mounting. **Net Weight:** 26.5 lbs.

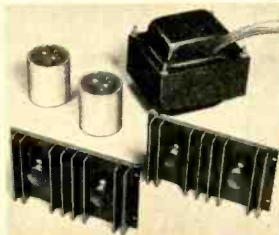
*Rated IHF (Institute of High Fidelity) Standards.
 **RIAA (Record Industry Association of America).



Plug-In Fiberglass Circuit Boards . . . mean quicker, more enjoyable assembly with less chance for error, easier servicing, and strong long life.



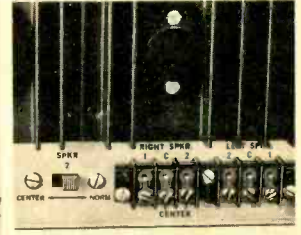
Built-In Test Circuitry for fast, precise initial set-up and servicing without external test equipment.



100 Watts Dynamic Music Power from massive regulated power supply and 4 heat-sinked transistors. Dissipation limiting circuitry protects it even with short circuits.



Built-In Adjustable AM Rod Antenna swivels so you can position it or best reception under all conditions.



Switch Select Two Stereo Speaker Systems . . . both can be used simultaneously for stereo sound in two different locations . . . or you can switch in a "Center Channel" speaker for fill-in sound.



The New Heathkit AR-19 . . . Advanced Field Effect Transistor & Integrated Circuit Design For Superb AM-FM-FM Stereo Performance In The Tradition Of The Famous Heathkit AR-15 . . . 60 Watts Music Power Output . . . The Ideal Power Level For All Medium & High Efficiency Speaker Systems

- Advanced solid-state circuitry with 57 transistors, 35 diodes and 5 Integrated Circuits • 60 Watts music power output at 8 ohms • Less than 0.25% Harmonic & IM Distortion at any power level • Frequency response from 6 to 35,000 Hz • Direct-coupled, transformerless outputs for lowest distortion and phase shift • Dissipation-limiting circuitry protects outputs from damage even with a short circuit • AM-FM-FM Stereo Tuner features ball-bearing inertia flywheel tuning for smooth, accurate station selection • Pre-assembled, factory aligned FM IF Circuit board speeds assembly and eliminates IF alignment • 35 dB selectivity • Assembled, aligned FET FM Tuner delivers 2.0 uV sensitivity to give you more listenable stations • Multiplex IC Circuit provides inherent SCA rejection • Pushbutton Mute Control attenuates between-station FM noise • Blend control attenuates on-station FM noise with a push of a button • Tone-Flat pushbutton disables Bass & Treble controls for perfectly "flat" response • New Linear Motion controls for Volume, Balance, Bass & Treble • Individually adjustable level controls for each input including Tape Monitor eliminate annoying volume changes when switching sources • Switches for two separate stereo speaker systems for stereo sound in two different locations • Center channel speaker capability • Two front panel tuning meters give exact station selection • Stereo indicator light • Front panel stereo headphone jack • 300 & 75 ohm FM antenna inputs • High fidelity AM reception • Built-in AM rod antenna swivels for best reception • Massive power supply includes section of electronically regulated power • New Heath modular plug-in circuit board design speeds assembly, aids servicing • Circuit board-wiring harness construction for easy, enjoyable 25 hour assembly

Another Audio Landmark. From the engineers who designed the AR-15 and the recently introduced AR-29, comes the most extraordinary 60 watt AM-FM-FM Stereo Receiver ever conceived . . . the new Heathkit AR-19—with all the value and design sophistication the audio world has come to expect from the leader.

The Ideal Power Level For Most Audio Systems. Many of today's fine speaker systems are medium and high efficiency, so it's only natural that someone should design a receiver suitable in all respects for these systems. Heath did. The AR-19 delivers a solid 60 watts IHF music power, 40 watts continuous . . . enough to drive any medium or high efficiency speaker system to truly awesome sound levels. A giant power supply furnishes power to four heat-sinked output transistors and electronically regulated power to all receiver and pre-amplifier stages.

Pace Setting Performance Standards For Stereo Amplifiers. The frequency response curve of the new AR-19 is a straight line from 6 Hz to 35,000 Hz and Harmonic & IM Distortion are the lowest for any receiver in this power class—less than 0.25% at any power output level. An extremely wide dynamic range for all inputs virtually eliminates the problem of overloading the amplifier on strong signal inputs. The end result of these extraordinary specifications is naturally pure, undistorted sound at any power level. The highs are crisp without ringing or breakup . . . the lows are solid, clean-cut, without doubling or distortion.

Total Output Protection. Dissipation-limiting circuitry for the output transistors protects them from damage, even under a short circuit condition.

Complete Input Level Controls . . . allow you to adjust input levels for all sources, including tape monitor, so volume remains constant when switching sources.

Superb FM Stereo Listening. Press the pushbutton power switch to bring the AR-19 to life and tune slowly across the FM band. The ball-bearing

inertia flywheel makes tuning smooth and solid, without annoying looseness. Check the two front panel tuning meters that put you exactly on frequency with the strongest signal. You'll marvel at the number of listenable stereo stations you never heard before. The secret is in the factory assembled and aligned tuner, with Field Effect Transistors in the "front end" for superior overload characteristics and 2.0 uV sensitivity to pull in stations from far and near with equal clarity and ease. The assembled & aligned FM IF circuit board incorporates four Intergrated Circuits to provide superior AM rejection, hard limiting, greater temperature stability and extra reliability. The four stage circuit delivers 35 dB selectivity to separate those closely spaced stations.

New "Mute" Function . . . allows you to attenuate between-station noise on FM without affecting tuner sensitivity . . . just touch a button.

New "Blend" Function . . . just push the handy button to attenuate any annoying on-station FM hiss and high frequency noise.

Pushbutton Tone-Flat Control . . . disables the Bass & Treble controls for perfectly "flat" response across the entire audio spectrum.

High Fidelity AM Reception. Four tuned circuits in the AM section assure sharp selectivity, high sensitivity and excellent audio response. And the built-in AM rod antenna swivels in two planes so you can orient it for best reception.

Switch-Selection Of Two Separate Stereo Speaker Systems. With the new AR-19, you can enjoy its beautiful stereo sound in two places at once. Just connect a second speaker system to the handy terminals on the rear panel and flip the convenient switch to the Normal position. Or you can install a center channel speaker system for "fill-in" sound.

New Modular Plug-In Circuit Board Design. All eight circuit boards in the new AR-19 snap in & out in seconds for faster, easier assembly and quick service. Another first in kits from the leader.

Exclusive Built-In Test Circuitry . . . lets you not only assemble, test and align your new AR-19 a section at a time, but also service it completely . . . right down to individual parts such as transistors, capacitors, etc. And you do it yourself, *without any external test equipment required.* The test probes and circuitry are built-in and you use the front panel meter to give indications on the condition of the particular circuit board or part you're testing. The manual devotes many pages to the use of this built-in, exclusive Heathkit capability.

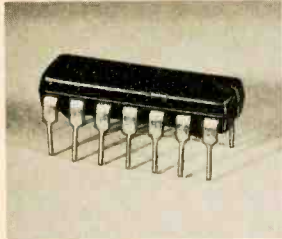
Versatile Installation. The new Heathkit AR-19 can be installed a number of different ways. Design and build your own cabinet . . . custom-mount it in a wall, bookcase or equipment cabinet . . . or order the completely assembled AE-19 cabinet, finished in rich oiled pecan. No matter how you install it, the new AR-19 will look as sharp as it sounds thanks to its stylish new design, "Black Magic" panel lighting, and heavy chrome plated die cast front panel.

The New Heathkit AR-19 AM-FM-FM Stereo Receiver . . . the ideal power level . . . hot AM & FM performance . . . extremely flexible controls, inputs & outputs . . . a thoroughly engineered design from the world leader in stereo equipment. Make the new Heathkit AR-19 the heart of your stereo system now.

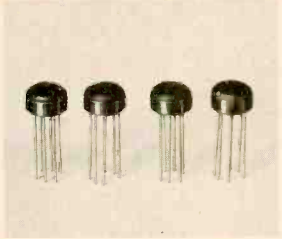
Kit AR-19, 29 lbs. \$225.00
Assembled AE-19, cabinet, 10 lbs. \$19.95

60-Watt AM-FM-FM Stereo Receiver . . . \$225.00

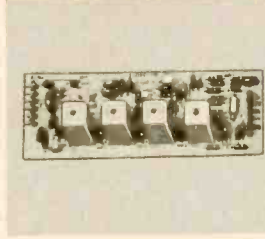
Compare These Important Heathkit Design Features



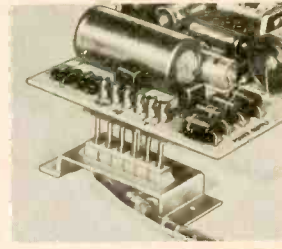
Integrated Circuit Multiplex . . . four different functions, compressed into this tiny IC—contains 31 transistors, 30 resistors and 10 diodes.



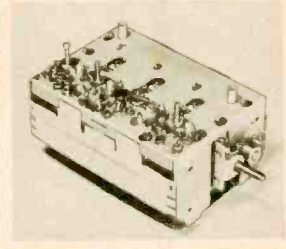
Four IC's in the FM IF for superior limiting, greater temperature stability and increased reliability . . . contains a total of 20 transistors, and 8 resistors.



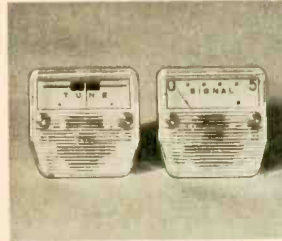
Factory Assembled, Aligned FM IF Circuit Board for faster assembly, optimum performance and elimination of IF alignment.



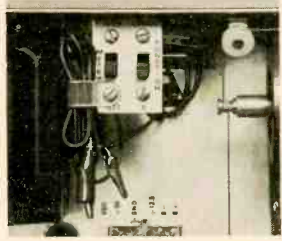
Plug-in Fiberglass Circuit Boards . . . for faster, more enjoyable assembly with less chance of error, easier servicing and long, trouble-free life.



Field Effect Solid-State FM Tuner . . . factory assembled and aligned, gives high sensitivity, low cross modulation and freedom from overloading.



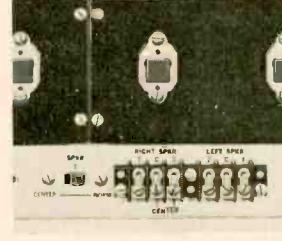
Two Calibrated Tuning Meters . . . "Center Tune" puts you on exact station frequency . . . Signal Strength meter indicates strongest signal.



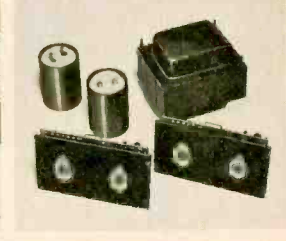
Built-In Test Circuitry for fast, exact initial set-up and complete servicing facilities anytime without external test equipment.



Built-In Adjustable AM Rod Antenna swivels so you can position it for best signal pickup under all conditions.



Switch Select Two Stereo Speaker Systems . . . both can be used at once for stereo in two locations . . . or connect a "Center Channel" speaker for fill-in sound.



60 Watts Dynamic Music Power from a giant power supply and 4 heat-sinked transistors. Outputs are protected even under a short circuit condition.

The New Heathkit AR-19 Features Modular Plug-In Circuit Boards For Extra Reliability, Faster Assembly & Easier Service . . . Another Kit Exclusive From Heath!



Black Magic Panel Lighting . . . the distinctive black & chrome face reveals no dial or scale markings when the AR-19 is not in use. Push the power switch & the dial and scale markings appear. The unique dual tinted acrylic panel design does it.

Control Preamp Board



AM IF Board



Preassembled, Aligned FM IF Board



FM Multiplex Board



Right Channel Output Board



Power Supply Board



Left Channel Output Board



Input Preamp Board

AR-19 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems all changers & turntables. **FM SECTION (Monophonic):** Tuning range: 88 to 108 MHz. Antenna: Balanced input for external 300 ohm antenna. 75 ohm antenna input may be used between either FM antenna terminal and ground. Intermediate frequency (IF): 10.7 MHz. Frequency response: ± 1 dB, 20 to 15,000 Hz. Sensitivity: 2.0 Microvolts*. Volume sensitivity: Below measurable level. Selectivity: 35 dB*. Image rejection: 90 dB*. IF Rejection: 90 dB*. Capture ratio: 2.5 dB*. AM Suppression: 50 dB*. Harmonic distortion: 1% or less*. Intermodulation distortion: 0.5% or less*. Hum and noise: —65 dB*. Spurious rejection: —90 dB*. **FM SECTION (Stereo):** Channel separation: 35 dB at midfrequencies (1000 Hz), 30 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: 1.5% or less at 1000 Hz with 100% modulation. 19 Hz and 38 kHz. Suppression: 50 dB or greater. SCA Suppression: 50 dB. **AM SECTION:** Tuning range: 535 to 1620 kHz. Intermediate frequency (IF): 455 kHz. Antenna: Rod type [adjustable]. Sensitivity: 130 microvolts/meter for 10 dB signal to noise, at 1000 kHz, using a radiating loop. Selectivity: 25 dB at 10 kHz*. Image rejection: 60 dB at 600 kHz; 60 dB at 1400 kHz. 1F Rejection: 60 dB at 1000 kHz. Harmonic distortion: Less than 2% with a 5 millivolt input signal, 400 Hz, 90% modulation*. Hum and noise: —40 dB*. **AMPLIFIER SECTION:** Dynamic power output per channel (Music power rating): 8 ohm load, 30 watts*; 4 ohm load, 20 watts; 16 ohm load, 17 watts. Continuous power output per channel: 8 ohm load, 20 watts*; 4 ohm load, 20 watts; 16 ohm load, 15 watts. Power bandwidth for constant total harmonic distortion: Less than 5 Hz to greater than 30 kHz*. Frequency response (1 watt level): —1 dB, 6 Hz to 35 kHz; —3 dB from less than 5 Hz to 60 kHz. Harmonic distortion: Less than 0.25% from 5 Hz to 20 kHz at 20 watts rms output. Less than 0.1% at 1000 Hz at 1 watt output. Intermodulation distortion: Less than 0.25% with 20 watts output, using 60 and 6,000 Hz mixed 4:1; less than 0.1% at 1 watt output. Damping factor: Greater than 50 dB. Input sensitivity (Using input level controls): Phono, 2.4 Millivolts (overload 155 millivolts); Tape, 180 millivolts (overload greater than 10 volts); Aux, 180 millivolts (overload greater than 10 volts). Tape Mon, 180 millivolts (overload greater than 10 volts). Hum and noise: Phono (10 millivolts reference), —65 dB; Tape and Aux. (200 millivolt reference), —75 dB. Volume control in minimum position: 90 dB below rated output. Channel separation: Phono, 50 dB or better; Tape and Aux, 55 dB or better. Output impedance (each channel): 4 ohm to 16 ohm. Tape output impedance: Approximately 50 ohm. Input impedance: Phono, 49 k Ohm (RIAA Equalized**); Aux., Tape and Tape Mon, 100 k Ohm. Tape output: 1 volt output with 0.2 volt input at Aux. or Tape input. AC Outlet sockets: Two, located on rear chassis apron for powering accessory equipment. One switched (350 watts maximum), and one unswitched (350 watts maximum). Power requirements: 105-125 or 210-250 volts 50/60 Hz AC 25 watts idling (zero output) and 130 watts at full output, with no load on accessory outlets. Dimensions: Overall, 16 1/2" W x 5 1/2" H x 14 1/2" D. Mounting: AE-19 Cabinet or custom mounting. Net weight: 26.5 lbs.

*Rated IHF (Institute of High Fidelity) Standards
**RIAA (Record Industry Association of America).

Recommended Speakers, ppg. 26-28; Changers & Turntables, ppg. 32-35

Acclaimed By Experts...Owned By Thousands



Kit AR-14
\$119⁹⁵
 (less cabinet)

Heathkit 30-Watt FM Stereo Receiver . . . Only Your Budget Can Tell The Difference

- 31 transistor, 10 diode circuit for cool, instant operation with the transparent, natural sound only transistors can deliver • ± 1 dB, 15 to 50,000 Hz at 10 watts per channel continuous (20 watts total), 15 watts per channel IHF music power (30 watts total) • Wideband FM/FM stereo tuner plus two preamplifiers and two power amplifiers • Front panel stereo headphone jack • Compact—just 3 $\frac{3}{8}$ " H x 15 $\frac{1}{4}$ " W x 12" D • Custom install it in wall, your own cabinet, or either Heath cabinet • Build it in 20 hours

WANT TODAY'S BEST VALUE IN THE TRANSISTOR STEREO MARKETPLACE? This is it. The superb AR-14. Just 20 hours from parts to programs. And what sound! Natural and transparent as only transistors can make it. Two preamplifiers and two power amps deliver the coolest 30 watts of music you've ever heard . . . at ± 1 dB from 15 to 50,000 Hz. And its sensitive FM tuner pulls in stations far and near. Stations you never knew existed before. You'll like the effortless way the flywheel tuning dial glides across the band. You'll like its low budget-saving price . . . unheard of until now in a stereo receiver of this quality.

AUDIO MAGAZINE REVIEWS THE AR-14: "Although it's seldom the policy of this department to use superlatives in describing any individual piece of equipment, this is one time when it is possible to say that the unit in question is undoubtedly one of the best values we have encountered to date. For where else can one obtain an FM-Stereo receiver at such a price? And the low price has not been reached by an apparent sacrifice in quality."

ADVANCED TRANSFORMERLESS OUTPUT CIRCUIT . . . provides "pure" sound, uncolored by reactive circuits. Each channel uses two output transistors—a complementary PNP and NPN pair. This design has proven superior in lower phase shift and distortion and wider response. A 6-position source switch selects tuner, tape, or records, stereo or mono; dual concentric volume control for separate adjustment of each channel; a tandem treble control with push-pull

power switch and tandem bass control with push-pull speaker on-off switch when listening with headphones. There's also a front panel stereo headphone jack for private listening; automatic stereo indicator light; and filtered outputs for beat-free stereo taping.

SAVE AN EXTRA 5% . . . order with speakers plus any turntable, and take the special Heath 5% stereo system discount from the total.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION. Measures only 3 $\frac{3}{8}$ " H x 15 $\frac{1}{4}$ " W x 12" D. Includes anodized aluminum front panel and lighted slide-rule dial. Install in a wall, your custom cabinet or either Heath walnut veneer and beige steel cabinets.

Kit AR-14, 18 lbs., less cabinet, no money down **\$119.95**
 Model AE-55, 6 lbs., walnut veneer cabinet **\$12.95**
 Model AE-65, 6 lbs., beige steel cabinet **\$3.95**

AR-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, all changers & turntables, **AMPLIFIER:** Continuous power output: 10 watts each channel—20 watts total. Music power output (IHF): 15 watts per channel. Speaker output impedance: 4 through 16 ohm. Tape output impedance: 3.5K 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 & 6,000 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 uv for less than 3% total noise, distortion hum—30 dB. 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: Mono-phono; 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 & Unswitched. Speaker Terminal Blocks: One Left & One Right Speaker Ground Terminals: 1; Triple Phone Sockets. Power requirement: 105-125 volts or 210-250 volts 50/60 Hz; 32 watts idling; 65 watts full output; (No load on AC power sockets). Dimensions: Overall 15 $\frac{1}{4}$ " W x 3 $\frac{3}{8}$ " H x 12" D. Mounting position: Horizontal or Vertical; Cutout required 15" x 3 $\frac{1}{2}$ "; Depth required from front of mounting surface 11 $\frac{1}{2}$ ".

Budget-Priced Audio Components



AR-17
\$72⁹⁵
(less cabinet)



AR-27
\$41⁹⁵
(less cabinet)

You Can Own A Heathkit AR-17 All-Transistor FM Stereo Receiver For Less Than You Think . . . Lots Less

• 28 transistor, 7 diode circuit for natural transparent sound, instant operation, long trouble-free life • 14 watts music power, 10 watts RMS from 25-35,000 Hz @ ± 1 dB • Automatic stereo indicator light • Adjustable phase control for maximum separation • Complete front panel controls • Flywheel tuning • All critical circuits including FM "front-end" factory assembled & aligned • Circuit board assembly • Compact 10 $\frac{3}{8}$ " D x 3" H x 12" W • Front panel stereo headphone jack

Kit AR-17, 10 lbs. . . (less cabinet for custom mounting) . . . **\$72.95**
no money dn . . .
Model AE-35, 4 lbs., beige metal cabinet . . . **\$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet . . . **\$9.95**

AR-17 SPECIFICATIONS—Recommended system mates: Speaker Systems, AS-16, AS-37, AS-41, AS-18, Separate Speakers, AS-27, AS-183, AS-173, AS-163, AS-153, AS-133 & AS-123, All Changers & Turntables, **FM SECTION:** Tuning range: 88-108 MHz. Antenna input impedance: 300 ohm, Balanced Input. Sensitivity: 5 microvolts*. Intermediate frequency (IF): 10.7 MHz. Hum & noise: -50 dB, 1 watt reference. Audio frequency response: Monophonic: 0 to -3 dB from 20 to 15,000 Hz. Harmonic distortion: 1% or less*. Image rejection: -40 dB*. Capture ratio: 3 dB*. AM suppression: -35 dB*. IF rejection: -80 dB*. Separation: 30 dB @ 1000 Hz. **AMPLIFIER SECTION:** Continuous power output: 5 watts per channel. Music power output: 7 watts per channel*. Speaker output impedance: 4 thru 16 ohm. Damping factor: 50 or higher. Hum & noise: Phono: 45 dB; Aux: 55 dB; Power Amplifier: 80 dB. Frequency response: (1 watt): 25 to 35,000 Hz ± 1 dB; 15 to 70,000 Hz ± 3 dB. Power response: (5 watt): 25 to 35,000 Hz ± 1 dB; 15 to 70,000 Hz ± 3 dB. Input sensitivity: Phono: 5 millivolts. Aux: 300 millivolts. Input impedance: Phono: 45k; Aux: 150k. Channel separation: 40 dB or better @ 1,000 Hz. Total harmonic distortion (at 5 watts): Less than 1% from 20 to 20,000 Hz. Intermodulation distortion (at 5 watts): Less than 2% using 60 & 6000 Hz mixed 4:1. Phono equalization: RIAA (Recording Industry Assoc. of America). **GENERAL:** Transistor & diode complement: 28 transistors, 7 diodes. Power requirements: 105-125 volts or 210-240 volts, 50/60 Hz, 21 watts idling, 45 watts full output. Dimensions: Overall: 12" W. x 3" H. x 10 $\frac{3}{8}$ " D. Mounting position: Horizontal or vertical. Custom mounting requirements: 11 $\frac{3}{4}$ " x 2 $\frac{1}{4}$ " cutout, 10" D. from front mounting surface. Net weight: 9 lbs.

*Rated IHF (Institute of High Fidelity) Standards.

The Heathkit AR-27 FM Monophonic Receiver

• 13 transistor, 6 diode circuit for high-fidelity sound reproduction, long life, low heat, freedom from hum, and service-free operation • 7 watts music power • ± 1 dB, 25 to 60,000 Hz at 5 watts • Input connectors for phonograph and auxiliary signals • Complete front panel controls • Flywheel tuning • Preassembled and prealigned FM tuner, all other critical parts factory aligned • Easy, circuit board assembly • Compact bookshelf size • 3 way installation . . . wall, custom or either Heath cabinet • 117 v. AC, or 210-240 v. AC, 50-60 Hz operation

You Can't Buy A Finer Monophonic FM Receiver At This Modest Price. And it's amazingly compact . . . measures only 10 $\frac{3}{8}$ " D x 3" H x 12" W . . . just right for close shelves. Takes only 8 hrs. to build. Kit AR-27, 9 lbs. . . (less cabinet for custom mounting) . . .

\$41.95
no money down . . .
Model AE-35, 4 lbs., beige metal cabinet . . . **\$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet . . . **\$9.95**

AR-27 SPECIFICATIONS—Recommended System mates: Speaker Systems, AS-16, AS-37, AS-41, AS-18, Separate Speakers, AS-27, AS-183, AS-173, AS-163, AS-153, AS-133 & AS-123, All Changers & Turntables, **FM SECTION:** Tuning range: 88-108 MHz. Antenna input impedance: 300 ohms, balanced input. Sensitivity: 5 microvolts*. Intermediate frequency (IF): 10.7 MHz. Hum & noise: -50dB, 1 watt reference. Audio frequency response: 0 to -3 dB from 20 to 15,000 Hz. Harmonic distortion: 1% or less*. Image rejection: 40 dB*. Capture ratio: 3 dB*. AM suppression: -35dB*. IF rejection: -80 dB*. **AMPLIFIER SECTION:** Continuous power output: 5 watts. Music power output: 7 watts. Speaker output impedance: 4 thru 16 ohms. Damping factor: 50 or higher. Hum & Noise: Phono: 45 dB. Aux: 55 dB. Power Amplifier: 80 dB. Frequency response: (1 watt): 25 to 70,000 Hz ± 1 dB; 15 to 120,000 Hz ± 3 dB. Power response: (5 watt) 25 to 60,000 Hz ± 1 dB. 15 to 100,000 Hz ± 3 dB. Input sensitivity: Phono: 5 millivolts. Aux: 300 millivolts. Input Impedance: Phono 45K ohms, Aux. 150 K. Total harmonic distortion: (5 watts): less than 1% from 20 to 20,000 Hz. Intermodulation distortion: (5 watts): less than 2% using 60 and 6000 Hz mixed 4:1. Phono equalization: RIAA (Recording Industry Assoc. of America). **GENERAL:** Transistor complement: 13 transistors, Diode complement: 6 diodes. Power requirements: 105-125 V. or 210-240 V., 50/60 Hz, 23 watts full output, 11 watts idling. Dimensions: Overall: 12" W. x 3" H. x 10 $\frac{3}{8}$ " D. Mounting position: Horizontal or vertical. Custom mounting requirements: 11 $\frac{3}{4}$ " x 2 $\frac{1}{4}$ " cutout, 10" deep from front mounting surface. Net weight: 9 lbs.

*Rated IHF (Institute of High Fidelity) Standards.



AA-18
\$19⁹⁵

Heathkit Solid-State 4 Watt Monophonic Amplifier ... The Best Value Going In Sound!

• 5 transistor, 2 diode circuit • Delivers 4 watts music power • Drives high efficiency speaker of 4 to 16 ohms • Accepts ceramic phono cartridge input, monophonic AM or FM tuners, or tape recorders • Front panel headphone jack and pilot lamp • Can be wired for 120 or 240 VAC • Brown and beige metal cabinet and panel • An ideal amplifier for adding background music to den or rec room • Excellent frequency response

Kit AA-18, 4 lbs. . . **\$19.95**

AA-18 SPECIFICATIONS—Dynamic Power Output: 4 watts.* Continuous power output: 3.25 watts.* Output impedance: 4 to 16 ohms. Input sensitivity: 250 millivolts. Input impedance: 125K ohms. Hum and Noise: -65 dB. Treble cut: -22 dB at 15 kHz. Power bandwidth for constant 1.5% total harmonic distortion: 20 Hz to 100 kHz. 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. Damping factor: 10 or better. Power requirements: 105-125 or 210-250 volts, 50/60 Hz, 5 watts maximum. Cabinet size: 7-11 $\frac{1}{16}$ " W x 5-9 $\frac{1}{16}$ " D x 2 $\frac{1}{8}$ " H. Net weight: 2 lb. 10 oz. *Rated IHF (Institute of High Fidelity) Standards.



AA-32
\$39⁹⁵

20 Watt Stereo Amplifier With 30-30,000 Hz Response

• Four stereo inputs . . . magnetic & ceramic cartridges, tuner & auxiliary • Furnishes 20 watts IHF music power • Full-range controls . . . found only on more expensive equipment • Handsomely styled in mocha brown and beige with black trim

Kit AA-32, 16 lbs. . . no money dn . . . **\$39.95**

AA-32 SPECIFICATIONS—Recommended System Mates: Speakers: AS-163, AS-133 & AS-123, Speaker Systems: AS-37 & AS-81, AS-18, Changers & turntables, Simultaneous power output per channel: 8 watts (16 watts total); IHF Music Power Output per channel, 10 watts (20 watts total). Frequency response: ± 1 dB from 30 Hz to 30,000 Hz at rated output. Harmonic distortion: (at rated output) 2% @ 30 Hz; 0.7% @ 1000 Hz, 2% @ 15,000 Hz. Intermodulation Distortion: (at rated output) Less than 3% using 60 and 6000 Hz mixed 4:1. Power requirements: 105-125 or 210-250 VAC, 50-60 Hz. Dimensions: 13 $\frac{1}{2}$ " W x 4 $\frac{1}{4}$ " H x 9 $\frac{1}{4}$ " D.

Heathkit AJ-15 . . . The Remarkable FM/FM Stereo Tuner Section of the Famous Heath AR-15 Receiver

FOR THE MAN WHO ALREADY OWNS A FINE STEREO AMPLIFIER, Heath now proudly offers the superb FM Stereo Tuner Section of the renowned AR-15 receiver. With the same imaginative design features and sophisticated circuitry that has made the AR-15 world famous.

INTEGRATED CIRCUITS . . . one of the most fascinating achievements of modern electronics. Each IC contains 28 separate parts (10 transistors, 11 resistors and 7 diodes), yet each IC is no bigger than an ordinary transistor. Like having 8 conventional IF stages.

FIELD EFFECT TRANSISTORS . . . the AJ-15 features an exclusive design FET FM tuner with two FET R.F. amplifiers and an FET mixer for high (1.8 uV) sensitivity and excellent cross modulation index. Six tuned circuits and a four-gang variable capacitor give extreme selectivity under conditions that would put other tuners out of the game. The factory-built and aligned tuner unit is completely shielded for optimum performance.

CRYSTAL FILTERS . . . another engineering wonder from the space age—and a Heath exclusive. The usual transformers in the IF amplifier section have been replaced by two crystal filters, to give an ideally shaped IF bandpass with minimum phase shift for sharp selectivity.

ALL-SILICON TRANSISTOR CIRCUITRY . . . for long-lived reliability and greater stability over a wide temperature range.

TWO CALIBRATED TUNING METERS . . . another Heath Exclusive. A Signal Strength Meter lets you know when you have the strongest signal (and doubles as an aid for adjusting the 19 kHz pilot signal); the tune meter indicates zero at the exact center frequency of an FM station . . . no more guessing.

AUTOMATIC NOISE-OPERATED FM SQUELCH CIRCUIT . . . actually two circuits. One operates as the station is detuned 40-50 kHz from exact center toward one side. This eliminates station threshold noise. The second circuit detects between-station noise to activate the squelch resulting in noise-free tuning over the entire FM band.

STEREO THRESHOLD CONTROL . . . just set the threshold control to the maximum amount of stereo FM noise that you will accept—and relax. If the noise level increases, the AJ-15 automatically switches to the mono mode for the duration of the noise; and when the noise subsides, it automatically reverts back to stereo.

STEREO ONLY SWITCH . . . Tired of hunting through the band looking for a station broadcasting in stereo? On the AJ-15 you just turn the mode switch to "Stereo" position and spin across the dial—the only stations you'll pick up will be in stereo.

Heathkit AA-15 . . . The Powerful Solid-State Stereo Amplifier Section Of The Highly Praised Heath AR-15 Receiver

FOR THE MAN WHO ALREADY OWNS A GOOD STEREO TUNER, here is the sophisticated stereo amplifier section of the famous Heath AR-15 Receiver as a separate component.

150 WATTS DYNAMIC MUSIC POWER . . . delivers the most realistic sound you can hear. 75 watts music power per channel (50 watts continuous power per channel). Provides enormous power reserves to handle sudden peaks, without clipping or distortion.

INDIVIDUAL INPUT LEVEL CONTROLS . . . hidden behind a front panel access door. These controls allow you to adjust the input level for each channel of Phono, Tape, Tuner, Tape Monitor and Auxiliary inputs.

VIRTUALLY FLAT RESPONSE . . . ± 1 dB from 8 Hz to 40 kHz at 1 watt. Easily one of the best response curves of any stereo amp, regardless of price.

LOW HARMONIC & IM DISTORTION . . . both less than 0.5% at 50 watts continuous output.

RECESSED INPUT AND OUTPUT JACKS . . . no more broken connectors from being pushed against the wall, yet the back of the AA-15 fits flush.

MAIN AND REMOTE STEREO SPEAKER SWITCHES AND CONNECTIONS . . . let you operate a remote stereo speaker system anywhere—without having to turn the main system on, and vice versa. Use either or both, at a touch of the rocker-type switches on the front panel.

STEREO HEADPHONE JACKS . . . not one, but two. Both AA-15 jacks are mounted right on the front panel—just plug in and listen.

STONE-FLAT SWITCH . . . bypasses the tone controls when absolutely flat amplifier response is wanted.

POSITIVE CIRCUIT PROTECTION . . . makes the power amplifier circuits virtually short-circuit-proof. Zener diodes limit the current to the output transistors if the speaker leads are accidentally shorted; thermal circuit breakers cut off the DC power supply voltage if the output transistors in either channel become too hot—and automatically reset themselves when the temperature returns to normal.

LOUDNESS SWITCH . . . converts the volume control to a loudness control so you can hear all the audio frequencies at low listening levels.

BIGGER THAN BIG POWER SUPPLY . . . just loafs along under loads that would be difficult for many other power supplies. Electronically filtered for superior regulation—electrostatically and magnetically shielded power transformer.

AUTOMATIC STEREO INDICATOR . . . you'll know at a glance when a station is stereo; the "FM Stereo" Indicator lights up.

ADJUSTABLE MULTIPLEX PHASE CONTROL . . . lets you adjust the 19 kHz pilot signal to be exactly in phase with the original from the broadcasting station, for the clearest separation and lowest distortion you've ever heard from any tuner.

STEREO HEADPHONE JACKS . . . not one, but two—right there on the front panel. Variable output.

EXTERNAL ANTENNA CONNECTORS . . . a 300 ohm balanced and a 75 ohm unbalanced for FM.

CIRCUIT BOARD CONSTRUCTION . . . two sturdy circuits boards and one wiring harness (with color-coded wires) eliminate most chassis-mounted components. Assembly time is decreased and the chance for wiring errors is minimized.

THREE-WAY INSTALLATION . . . mount the AJ-15 in a wall, your own custom cabinet or the optional Heath factory-assembled wrap-round walnut cabinet with vented top.

Kit AJ-15 (less cabinet), 18 lbs. . . no money dn., **\$189.95**
Assembled AE-18, 8 lbs. optional walnut cabinet **\$19.95**

AJ-15 SPECIFICATIONS—Tuner Section: Tuning range: 88 to 108 MHz. Intermediate Frequency (IF): 10.7 MHz. Frequency Response: ± 1 dB, 20 to 15 kHz. Antenna: 75 ohm unbalanced or 300 ohm balanced external antennas. Sensitivity: 1.8 uV*. Volume Sensitivity: Below measurable level. 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: 70 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 Response: ± 1 dB from 20 to 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 and Fixed: 1.5 Volts rms nominal with 100% modulation. Phono and Variable: 0 to 4 Volts rms before clipping (with 100% modulation). Output Impedance: Tape and Fixed: Approximately 9000 ohm. Phono and Variable: 100 ohm. General: AC Outlet Socket: Unswitched; 350 watts maximum. Power Requirements: 105-125 or 210-250 volts 50/60 Hz AC 0.25 watts. Dimensions: Overall: 16 7/8" wide x 4 3/4" high x 12 1/2" deep. Mounting: AE-18 accessory cabinet or custom mounting. Net Weight: 11 1/2 lbs. *Rated IHF (Institute of High Fidelity) Standards.

TAPE MONITOR SWITCH . . . allows you to hear either the source or the recorded signal during recording.

CIRCUIT BOARD CONSTRUCTION . . . five circuit boards and two color-coded wiring harnesses aid in reducing assembly time and minimizing the possibility of construction errors.

THREE-WAY INSTALLATION . . . mount the AA-15 in a wall, your own custom cabinet or the optional Heath factory-assembled wrap-around walnut cabinet with vented top.

Kit AA-15 (less cabinet), 28 lbs. . . no money dn., **\$179.95**
Assembled AE-18, 8 lbs., optional walnut cabinet. **\$19.95**

AA-15 SPECIFICATIONS—Recommended System Mates: All speakers & speaker systems, all changers and turntables. **Dynamic Power Output Per Channel (Music Power Rating):** 8 ohm load—75 watts; 4 ohm load—50 watts; 16 ohm load—45 watts. **Continuous Power Output Per Channel:** 8 ohm load—50 watts; 4 ohm load—45 watts; 16 ohm load—35 watts. **Power Bandwidth For Constant 5% Total Harmonic Distortion:** * Less than 6 Hz to 30 kHz. * Frequency Response (1 WATT LEVEL): ± 1 dB 8 Hz to 40 kHz; ± 3 dB 4 Hz to 80 kHz. **Harmonic Distortion:** Less than .5% from 20 Hz to 20 kHz @ 50 watts output; less than .2% @ 1000 Hz with 10 watts output; less than .2% @ 1000 Hz with 1 watt output. **Intermodulation Distortion:** Less than .5% with 50 watts output, using 60 and 6000 Hz mixed 4:1; less than .2% with 1 watt output. **Damping Factor:** 45 or higher. **Input Sensitivity:** Phono: 2.2 millivolts (overload 155 mV); Tape: 200 millivolts (overload 4.5 V); Aux; 200 millivolts (overload 4.5 V); Tape Mon: 200 millivolts (overload 4.5 V). Note: Input sensitivity is the rms input voltage needed to obtain 50 watts of output power per channel into 8 ohm loads. **Hum and Noise:** Phono (10 millivolt reference): —60 dB; Tape and AUX (200 millivolt reference): —65 dB; Volume control in minimum position: —80 dB below rated output. **Channel Separation:** Phono: 45 dB or better; Tape and AUX: 55 dB or better. **Output Impedance (each channel):** 4 ohm through 16 ohm. **Tape Output Impedance:** 120 ohm. **Input Impedance:** Phono: 51 k ohm (** RIAA Equalized). AUX, Tape, and Tape MON: 100 k ohm. **Tape Output:** .17 volt output with .2 volt input. **Front Panel: Bass Control:** Dual tandem for simultaneous adjustment of both channels. Clockwise rotation from center provides 15 dB boost at 20 Hz. Counterclockwise rotation from center provides 17 dB cut at 20 Hz. **Treble Control:** Dual tandem for simultaneous adjustment of both channels. Clockwise rotation from center provides 15 dB boost at 20 kHz. Counterclockwise rotation from center provides 15 dB cut at 20 kHz. **General: AC Outlet Sockets:** Three, located on rear chassis apron for powering accessory equipment. One Switched (350 watts maximum) and two Unswitched (350 watts maximum). **Power Requirements:** 105-125 or 210-250 volts 50/60 Hz AC. 55 watts idling (zero output) and 240 watts at full output, with no load on accessory outlets. **Dimensions:** Overall—16 7/8" W x 4 3/4" H x 12 1/2" D. **Mounting:** AE-18 Cabinet or custom mounting. *Rated IHF (Institute of High Fidelity) Standards. **RIAA (Recording Industry Association of America).

The World's Finest Stereo "Separates"



SAVE
5%
order a system
see page 29

AJ-15
\$189⁹⁵
(less cabinet)

**"Black Magic"
Panel Lighting.**
When not in use, the AJ-15 remains beautifully unobtrusive—the gleaming midnight face unmarred by dial and scale markings. A touch of the power switch brings the finest in stereo FM listening and the panel lights up for quick identification of all controls. The "Black Magic" is in the unique tinted acrylic "dual-panel" design.



AA-15
\$179⁹⁵
(less cabinet)

**"Black Magic"
Panel Lighting**
Turn off the AA-15 and the dial scale and nomenclature disappear—all that shows is a gleaming midnight face, unmarred by dial and scale markings. Turn it on and nomenclature appear in radiant, contrasting color, for quick identifications of all controls . . . thanks to the unique tinted acrylic "dual-panel" design.



All Kits On These 2 Pages Are Mailable

The Famous AA-14/AJ-14



AJ-14
\$57⁹⁵
 (less cabinet)

AA-14
\$67⁹⁵
 (less cabinet)

SAVE
5%
 order a system
 see page 29

Transistor FM Stereo Tuner . . .

Concert Hall Sound At An Amazing Price

• 14-transistor, 5 diode circuit for cool, instant operation, and the natural beauty of transistor sound • Stereo phase control to maximize stereo separation, minimize distortion • 4-stage IF section insures high sensitivity & selectivity • Filtered outputs for direct "beat-free" stereo recording • Automatic stereo indicator light • Prealigned, preassembled "front-end" tuner & one-circuit board for fast, simple assembly • Install any of 3 ways . . . wall, custom or either Heath cabinet

ADVANCED CIRCUITRY. 14 transistors, 5 diodes in all. 3 transistors in the "front-end" tuning section . . . 4 transistors in the 4-stage IF section produce sensitivity and selectivity comparable to far more expensive tuners. A solid-state transformer-operated power supply. Filtered outputs for beat-free stereo tape recording.

ONLY 4 CONTROLS FOR SIMPLE OPERATION . . . On-Off Switch, flywheel Tuning knob, Mono-Stereo switch, and Stereo Phase control for maximum separation. Also has an automatic stereo indicator light, edge-lighted slide-rule dial, and antenna connectors.

Kit AJ-14, 6 lbs., less cabinet for custom mounting . . . no money down . . . **\$57.95**
 Model AE-35, 4 lbs., beige metal cabinet . . . **\$3.50**
 Model AE-25, 4 lbs., genuine walnut veneer cabinet . . . **\$9.95**

AA-14 SPECIFICATIONS (RATED IHF STANDARDS)—Tuning range: 88 to 108 MHz. Antenna input impedance: 300 ohm, balanced input. Sensitivity (IHF): 5 microvolts. Intermediate frequency: 10.7 MHz. Audio frequency response (IHF):—3 dB to 0 dB. (20 to 15,000 Hz). Hum and noise (IHF):—50 db. Output impedance: 20 K ohm. Output voltage: 0.7 volt with a 1,000 microvolt input signal. 400 Hz with 100% modulation. Harmonic distortion (IHF): 1% or less. Image ratio (IHF):—45 dB. Capture ratio (IHF): 3 dB. IF rejection (IHF):—80 dB. AFC correction: 150 kHz per volt. AM suppression (IHF):—40 dB. Channel separation: 30 dB or more at 1,000 Hz. (Channel separation is measured using a 98 MHz, 1,000 microvolt input stereo signal that is 100% modulated.) Power requirements: 105-125 or 210-250 VAC. Dimensions: With Walnut Cabinet 12 1/2" W x 3 1/2" H x 9 3/4" D. Custom mounting dimensions: Horizontal or vertical, cutout required 11 3/4" x 2 7/8", depth required from front of mounting surface 9 3/4".

Matching 30-Watt Transistor Stereo Amplifier . . . Wide Response . . . Low Distortion

• 17 transistors, 6 diodes • ±1 dB, 15 to 50,000 Hz at 10 watts per channel continuous power (20 watts total) or 15 watts per channel IHF Music Power (30 watts total) • Concentric, clutched volume control • Tandem bass and treble controls • Edge-lighted control dial • Front panel stereo headphone jack

COMPLETE OPERATING CONVENIENCE. A 6-position source switch handles your records, tuner or tapes . . . stereo or mono. For independent adjustment of each channel there's a clutched volume control. And there are full-range tandem controls for bass and treble boost and cut; edge-lighted dial; and a front panel mounted stereo headphone jack, plus a speaker-off switch for private listening. Easy to build too, with fast circuit board construction . . . from parts to power in about 10 hours.

Kit AA-14, 11 lbs., less cabinet for custom mounting . . . no money down . . . **\$67.95**
 Model AE-35, 4 lbs., beige metal cabinet . . . **\$3.50**
 Model AE-25, 4 lbs., genuine walnut veneer cabinet . . . **\$9.95**

AA-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, all changers & turntables, Continuous power output: 10 watts each channel—20 watts total. Music power output (IHF): 15 watts per channel. Output impedance: 4 through 16 ohm. Damping factor: 50 or better. Hum and noise: Phono:—60 dB. Tuner:—63 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; Tuner: 300 mv; Auxiliary: 300 mv. Input impedance: Phono: 47K ohm; Tuner: 180K ohm; Auxiliary: 180K ohm. Channel separation: 45 dB or better. Total harmonic distortion (at Full Output): .5% or less @ 1000 Hz; 1% or less @ 20 & 20,000 Hz. Intermodulation distortion (at Rated Output): Less than 1% (60 and 6,000 Hz, 4:1). Phono equalization: RIAA. Front panel: 6-Position Source Switch; Mono phono; Stereo phono; Mono tuner; Stereo tuner; Mono Auxiliary; Stereo Auxiliary; Volume Control; Bass Control; Treble Control; Phone Jack; Power Switch; Speaker Switch. Rear Panel: Fuse, AC Power Socket, Switched & Unswitched. Speaker Terminal Block: One Left & One Right Speaker. Ground Terminal: 1. Triple Phono Input Sockets. Power requirements: 120/240 VAC, 50-60 Hz, 20 watts idling; 60 watts full output; (no load on AC power socket). Dimensions: With walnut cabinet 12 1/2" W x 3 1/2" H x 9 3/4" D. Custom mounting dimensions: Horizontal or vertical; cutout required 11 3/4" x 2 7/8", depth required from front of mounting surface 10 3/4".

Heathkit® Stereo Compacts With Famous AR-14 Circuitry



AD-27
\$169⁹⁵

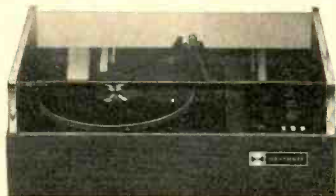


With its solid walnut sliding tambour door closed the AD-27 is a quietly impressive piece of furniture . . . and it will play with the door either open or closed.

- All solid-state circuitry • 15-watts per channel music power output • Virtually flat response • Full range tone controls • Low Harmonic & IM distortion • 45 dB channel separation • Tandem Volume, Balance, Bass & Treble Controls • Transformerless output circuit • Electronically filtered power supply • Stereo headphone jack • Auxiliary input • Filtered tape output • Excellent sensitivity & separation in the FM tuner section • Smooth inertia flywheel tuning • Stereo indicator light • 4 stage IF • Automatic Frequency Control • SCA Filter • Low hum and noise • Balanced 300 ohm antenna input • Low harmonic distortion • High quality BSR turntable features low mass counterbalanced tubular aluminum tone arm • Shure diamond stylus magnetic cartridge • Plays all four speeds, manual or automatic • Vernier stylus pressure • Adjustable Anti-Skating Control • Cue-Pause Control • Beautiful oiled walnut cabinet with sliding tambour door that disappears inside cabinet • Can be operated with door closed or opened • Connections recessed in side of cabinet • Can be used as a room divider, bookshelf system, etc • Sufficient power to operate most speaker systems



AD-17
\$109⁹⁵



To keep those favorite records clean and free from dust, order the attractive new protective cover. It's attractively styled in smoke gray see-through plastic with walnut sides to match the AD-17.

- 15 watts per channel music power output • All solid-state circuitry • Low Harmonic & IM distortion • Virtually flat frequency response • Full range Treble and Bass controls • 45 dB channel separation • Advanced transformerless output circuitry • Electronically filtered power supply • Auxiliary and tuner inputs • Headphone jack • Tape outputs • Precision-crafted BSR turntable features cueing and pause control • Adjustable stylus pressure • Adjustable anti-skate control • Plays all four speeds, manual or automatic • 4-pole induction motor for low wow & flutter • Handsomely styled cabinet • Circuit board plus wiring for easy assembly • Attractive new optional see-through cover adds extra beauty & protects valuable records from dust

Heathkit "27" Solid-State Component-Compact . . . With The Famous Heathkit AR-14 Stereo Receiver

The New Heathkit "27" Was Designed To Change Your Mind About Stereo Compact Performance . . . it sounds as if it were made from high quality stereo components . . . in fact it is. Heath engineers took the highly praised Heathkit AR-14 solid-state stereo receiver, modified it physically to fit the handsome walnut cabinet and combined it with the top performing BSR McDonald 500A Automatic Turntable. The result is stereo performance that is thoroughly impressive in every respect. The amplifier delivers an honest 15 watts per channel and has output impedances from 4 to 16 ohms—more than enough to drive any reasonably efficient speaker system.

Frequency response is virtually flat from 12 Hz to 60 kHz. The FM stereo tuner portion boasts 5 uV sensitivity and 27 dB channel separation. Harmonic & IM distortion throughout the system are both less than 1%. The BSR turntable has many performance features . . . cueing and pause control, counterbalanced aluminum tone arm, variable anti-skate control and comes with a famous Shure diamond stylus magnetic cartridge. Easy to build, a pleasure to listen to . . . the Heathkit "27" represents a remarkable value in stereo compacts. Order yours now.

Kit AD-27, 41 lbs. \$169.95

AD-27 SPECIFICATIONS—Recommended System Mates: All speakers & speaker systems, FM SECTION: Tuning range: 88-108 MHz. Antenna input impedance: 300 ohms, balanced input. Sensitivity: 5 uv.* Intermediate frequency (IF): 10.7 MHz. Hum & Noise: —45 dB, 1 watt reference. Audio frequency response: Mono: 0 to —3 dB from 20 to 15,000 Hz. Harmonic distortion: 1% or less.* Image rejection: —45 dB.* Capture ratio: 4 dB.* AFC Correction: 150 kHz per volt. AM Suppression: —35 dB.* IF Rejection: —80 dB.* Separation: 27 dB @ 1000 Hz. Amplifier Section: Continuous power output: 10 watts per channel. Music power output: 15 watts per channel.* Tape output: 0.5 volt, with a 0.3 volt signal at the AUX input. Speaker output impedance: 4 thru 16 ohms. Tape output impedance: 3500 ohms. Damping factor: 50 or higher. Hum & noise: Phono: —47 dB. Auxiliary: —60 dB. Frequency response: (1 watt): 12 Hz to 60 kHz ±1 dB, 6 Hz to 100 kHz ±3 dB. Power bandwidth: 5 Hz to 90 kHz. Input Sensitivity: Aux. 300 millivolts. Channel Separation: 45 dB or better at 1000 Hz. Total Harmonic Distortion (at full output): Less than 1% from 12 Hz to 60 kHz. Intermodulation Distortion (at full output): Less than 1% using 60 & 6000 Hz mixed 4:1. Phono Equalization: RIAA (Recording Industry Assoc. of America). Bass: 16 dB cut & 15 dB boost @ 20 Hz. Treble: 13 dB cut & 15 boost @ 20,000 Hz. Automatic Turntable Type: BSR McDonald 500A. Turntable speeds: 16 2/3, 33 1/3, 45 & 78 rpm. Record size: 7", 10", or 12". Wow: Less than 0.2%. Flutter: Less than 0.6%. Cartridge type: Shure model M44-7. Stylus: 0.7 mil diamond. Tracking pressure: 1.5 to 3 grams. GENERAL: Power requirements: 105-125 or 210-250 volts. 50/60 Hz. 32 watts idling. 65 watts full output. Plus 7.5 watts from automatic turntable motor. Dimensions: Overall: 21 1/4" W x 7 1/4" H x 14-11/16" D. Net weight: 29 lbs.

*Rated IHF (Institute of High Fidelity) Standards.

Heathkit "17" . . . With The Famous AA-14 30-Watt Solid-State Stereo Amplifier And Optional Protective Cover

Quality Stereo Sound At A Budget-Saving Price. Heath engineers took the top rated AA-14 solid-state stereo amplifier, matched it with the precision BSR McDonald 400 Automatic Turntable, and put both these able performers in a handsome walnut cabinet. The 17 transistor, 6 diode amplifier delivers 15 watts music power per channel—more than ample to drive any reasonably efficient speaker system.

Frequency response is a wide 12 Hz to 60 kHz ±1 dB and harmonic & IM distortion are both less than 1% at full output. Wide range Volume, Bass, Treble & Balance controls give you full command and there's even a stereo headphone jack for private listening. Tuner and auxiliary inputs allow the addition of stereo FM and tape recording later if you wish. The BSR McDonald 400 Turntable incorporates many advanced design features . . . variable cueing and pause control, adjustable stylus pressure . . . anti-skate control . . . and comes equipped with a Shure magnetic cartridge. The 5% Heathkit System Discount makes the "17" an even more remarkable value. Order yours today.

Kit AD-17, 29 lbs. \$109.95
Model ADA-17-1, protective cover, 5 lbs. \$14.95

AD-17 SPECIFICATIONS—Recommended System Mates: All speakers & speaker systems, AMPLIFIER SECTION: Continuous power output: 10 watts per channel. Music power output: 15 watts per channel.* Tape output: 0.5 volt, with a 0.3 volt signal at the AUX input. Speaker output impedance: 4 thru 16 ohms. Tape output impedance: 3500 ohms. Damping factor: 50 or higher. Hum & noise: Phono: —47 dB. Auxiliary: —60 dB. Frequency response: (1 watt): 12 Hz to 60 kHz ±1 dB, 6 Hz to 100 kHz ±3 dB. Power bandwidth: 5 Hz to 90 kHz. Input impedance: Aux. 180 K ohms, tuner 180 K. Input sensitivity: Aux.—300 mv; tuner—300 mv. Channel Separation: 45 dB or better at 1000 Hz. Total Harmonic Distortion (at full output): Less than 1% using 60 & 6000 mixed 4:1. Phono Equalization: RIAA (Recording Industry Assoc. of America). Bass: 16 dB cut & 15 dB boost @ 20 Hz. Treble: 13 dB cut & 15 dB boost @ 20,000 Hz. Automatic Turntable: Type: BSR McDonald 400. Turntable Speed: 16 2/3, 33 1/3, 45 & 78 rpm. Record Size: 7", 10", or 12". Wow: Less than 0.2%. Flutter: Less than 0.6%. Cartridge Type: Shure Magnetic. Stylus: 0.7 mil diamond. Tracking Pressure: 3 to 5 grams. GENERAL: Power Requirements: 105-125 or 210-250 volts, 50/60 Hz, 32 watts idling, 65 watts full output. Plus 7.5 watts from automatic turntable motor. Dimensions: Overall 21 1/4" W x 8 1/4" H x 14-11/16" D. Net Weight: 21 lbs.

*Rated IHF (Institute of High Fidelity) Standards.

Breathtaking Stereo Console With



Here Are The Components That Make The AD-19 As Exciting To Hear As It Is To See

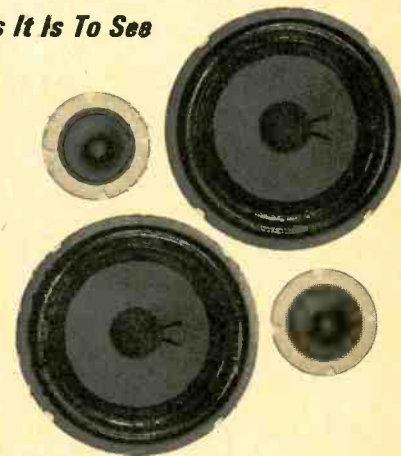
Real stereo performance from a console requires real stereo components . . . the kind people buy individually to custom-design their own system. The new Heathkit "Component Credenza" as the name implies, is designed around separate components integrated into a single, functional unit.



Component-Quality FM-Stereo Receiver. The heart of the new AD-19 is the famous Heathkit AR-14 FM-Stereo Receiver circuitry. The amplifier portion of this excellent receiver produces a solid 30 watts of IHF music power (not department store watts). The FM/FM-Stereo tuner section features excellent sensitivity and selectivity, smooth flywheel tuning, stereo indicator light and much more. The AR-14 has been rated as the best value available in a medium power stereo receiver.



Component-Quality Automatic Turntable . . . the famous BSR McDonald 500A. This fine example of British craftsmanship includes many features that are commonly found on very expensive turntables . . . cue/pause controls . . . anti-skate control . . . counter-balanced aluminum tone arm . . . automatic or manual play of all four speeds with interchangeable center spindles . . . and comes complete with a famous Shure diamond stylus magnetic cartridge.



Component-Quality Speaker Systems. The new AD-19 cabinet houses two completely independent, ported speaker systems for sound reproduction comparable to that of systems of individual components. The 10" woofer and 3 1/2" tweeter combine to give clean, life-like response.

Famous AR-14 Receiver Circuitry



The New Heathkit "Component Credenza" . . . High Quality Stereo Components In A Beautiful Mediterranean Cabinet

- Combines all solid-state stereo FM tuner, amplifier, 4-speed automatic turntable with diamond stylus and two full-range, two-way speaker systems into a luxurious Mediterranean cabinet • 15 watts per channel music power output • Full range tone controls • Very low Harmonic and IM distortion • Excellent channel separation • Transformerless output circuit for minimum phase shift, wide response & low distortion • Electronically filtered power supply • Stereo headphone jack • Auxiliary input • Filtered tape output • Excellent FM tuner sensitivity & separation • Smooth flywheel tuning • Stereo indicator light • 4-stage IF • Automatic Frequency Control • SCA filter • Very low hum & noise • 300 ohm antenna input • High quality BSR McDonald 500A automatic turntable features low mass counterbalanced tubular aluminum tone arm • Comes complete with famous Shure diamond stylus magnetic cartridge • Plays all four speeds, manual or automatic • Vernier stylus pressure adjustment • Built-in Anti-Skate Control • Cue-Pause Controls • Automatic system power—turntable will turn complete system on & off • Two ducted port reflex two-way speaker systems give performance comparable to fine component-type separate speaker system • Excellent dispersion and separation • Each speaker system contains a 10" high compliance woofer & a specially damped 3 1/2" closed back tweeter • 60-16,000 Hz response • 2000 Hz crossover • Complete system housed in a magnificent factory assembled Mediterranean cabinet of beautiful oak veneers with solid oak trim • Easy assembly with the famous Heathkit Manual • The finest value anywhere in quality stereo consoles

Now . . . Component Quality Stereo In A Magnificent Piece Of Furniture. Until now, if you wanted the sound of stereo that only separate components could give, you bought them . . . and lost the appealing effect of smartly styled cabinetry. Now Heath offers an alternative, for those who appreciate both fine sound reproduction and craftsmanship in wood . . .

The New Heathkit "Component Credenza". Heath engineers combined the renowned AR-14 Stereo FM Receiver, BSR McDonald 500A Automatic Turntable and two specially designed full-range two-way speaker systems with a masterfully designed, superbly crafted, all wood cabinet of luxuriant oak. The result is the Heathkit "Component Credenza" . . . a masterpiece in sight and sound.

The Components

The Heathkit AR-14 Solid-State FM Stereo Receiver, rated first in value by leading testing labs, high fidelity magazines and electronics editors. AUDIO Magazine had this to say: "Although it's seldom the policy of this department to use superlatives in describing any individual piece of equipment, this is one time when it is possible to say that the unit in question is undoubtedly one of the best values encountered to date. For where else can one obtain an FM-Stereo receiver at such a price? And the low price has not been reached by an apparent sacrifice in quality."

The Amplifier portion of the AD-19 puts out a solid 15 watts IHF music power per channel. Frequency response extends to 60,000 Hz. Total Harmonic and IM Distortion are both less than 1% at full output . . . assurance that the sound you hear is identical to the original. Channel separation is excellent. The advanced transformerless output circuitry provides lower phase shift and lower distortion. Full range command of the sound is yours with the front panel ganged controls for Volume, Bass & Treble. A Balance control allows attenuation of either left or right channels to compensate for room acoustics. Three rocker-type switches select Stereo/Mono modes, Power On/Off and allow you to turn the speakers off when using the built-in stereo headphone jack. An Auxiliary input position on the Source switch enables you to play an external tape recorder, TV set etc. through the AD-19.

The Tuner section features gear reduction inertia flywheel tuning for smooth, positive selection of FM & FM-Stereo stations. A built-in Stereo Indicator light tells you when the station is transmitting in stereo. The front panel Adjustable Phase Control allows you to adjust for best stereo separation and Automatic Frequency Control locks stations in, eliminates annoying drift. The pre-assembled, factory-aligned tuning unit makes assembly easy, and pulls in stations from far and near . . . you'll discover stations you didn't know existed in your area. For best stereo FM performance, attach an external FM antenna to the convenient terminals on the rear panel. Filtered tape output jacks give you a beat-free taping source. And for stable, low noise operation, the power supply is electronically filtered.

The Precision Crafted BSR McDonald 500A Automatic Turntable built with the care and attention to detail of British craftsmanship. The 500A plays all four speeds either manually or automatically with the interchangeable center spindles supplied, and comes complete with a famous Shure diamond stylus magnetic cartridge to insure top quality performance from your records. Many of the features of the automatic turntable are usually found only on very expensive units . . . a Cue-Pause control that lets you select different bands, even different grooves of a record—especially handy for taping. And you can stop listening with just a touch of the lever and resume later at the

same groove. The Adjustable Anti-Skate Control equalizes uneven side wall pressure in the record grooves for longer record and stylus life and for lower distortion. Stylus pressure & tone arm counterbalancing are adjustable to insure optimum tracking. And the entire AD-19 system can be turned on and off with the control on the 500A turntable. The entire system will turn off after the last record has been played.

The Speaker Systems of the new Heathkit "Component Credenza" are especially designed for use with the electronics. Functioning as two independent speaker systems would in a system designed around components, the AD-19 speaker systems are housed in two tuned port enclosures one at each end of the oak cabinet. Each system has a 10" high-compliance woofer for rich, deep bass down to 60 Hz and a closed-back, ring-damped 3 1/2" tweeter for crisp, natural high frequencies up to 16,000 Hz. A capacitive crossover network ensures that only frequencies above 2000 Hz will be reproduced by the tweeter.

The Cabinet . . . would be worthy of a place in your home even if it didn't contain this remarkable sound system. Designed in Mediterranean motif and flawlessly executed in rich, dark oak with a full furniture finish, it will make a truly elegant addition to your living room, rec room or den. It is a fine example of cabinetmaking art, created by one of America's leading furniture manufacturers entirely of wood with no plastic or other material used. The panels of the cabinet are of oak veneer on a solid wood base, and solid oak is used throughout for trim and decorative pieces. Rigidly braced, glued joints and corners, reinforced with wood screws contribute to its sturdy qualities . . . the cabinet alone weighs in excess of 100 lbs. A handy compartment in front of the automatic turntable will house a number of records and the top glides effortlessly on spring loaded hinges. For greater operating convenience, the new AD-19 will perform with the top either open or closed.

The AD-19 . . . a remarkable integration of component-quality stereo in a cabinet of singular design and beauty . . . a masterpiece of Sight And Sound . . . the new Heathkit "Component Credenza".

Kit AD-19, 158 lbs. \$299.95

AD-19 SPECIFICATIONS—FM SECTION: Tuning range: 88-108 MHz. Antenna input impedance: 300 ohm balanced input. Sensitivity: 5 microvolts*. Intermediate frequency (IF): 10.7 MHz. Hum and noise: —50 dB, 1 watt reference. Audio frequency response: Monophonic: 0 to —3 dB from 20 to 15,000 Hz. Harmonic distortion: 1% or less*. Image rejection: —45 dB*. Capture ratio: 4 dB*. AFC Correction: 150 kHz per volt. AM Suppression: —35 dB*. IF Rejection: —80 dB*. Separation: 27 dB at 1000 Hz. AMPLIFIER SECTION: Continuous power output: 10 watts per channel. Music power output: 15 watts per channel*. Tape output: .5 volt with a .3 volt signal at the AUX. input. Tape output impedance: 3500 ohm. Damping factor: 50 or higher. Hum and noise: Phono (10 millivolt reference), —60 dB without phono cartridge; —47 dB with phono cartridge connected. Auxiliary, —60 dB. Frequency response (1 watt): 50 Hz to 60 kHz ± 1 dB; 35 Hz to 100 kHz ± 3 dB. Power bandwidth: 12 Hz to 90 kHz. Input sensitivity: Phono, 4 1/2 millivolts; Auxiliary, 300 millivolts. Input impedance: Phono, 47 k ohm; Auxiliary 180 k ohm. Channel Separation: 45 dB or better at 1000 Hz. Total harmonic distortion (at full output): Less than 1% from 12 Hz to 60 kHz. Intermodulation distortion (at full output): Less than 1% (using 60 and 6000 Hz mixed 4:1). Phono equalization: RIAA (Recording Industry Association of America). Bass: 15 dB cut and 14 dB boost at 50 Hz. Treble: 13 dB cut and 15 dB boost at 20,000 Hz. ENCLOSURE AND SPEAKERS: Type: Two-way system in a ducted port enclosure. Speakers: Low frequency, 10" high-compliance with 8.5 oz. Alnico V magnet. High frequency, 3 1/2" cone-type with special damping ring, 1.32 oz. Alnico V magnet. Crossover frequency: 2000 Hz. Crossover type: Capacitive. Frequency response: 60 Hz to 16 kHz. AUTOMATIC TURNTABLE: Type: BSR McDonald 500A. Turntable speed: 16 2/3, 33 1/3, 45 and 78 rpm. Record size: 7", 10" or 12". Wow: Less than .2%. Flutter: Less than .06%. PHONO CARTRIDGE: Type: Shure M71, magnetic. Stylus: .0006 spherical diamond. Tracking pressure: 1 1/2 - 3 grams. GENERAL: Power requirements: 105-125 or 210-250 VAC, 50-60 Hz, 32 watts idling, 65 watts full output. Plus 7.5 watts for automatic turntable motor. Dimensions: 49 1/2" W x 27" H x 20 1/2" D.

*Rated IHF (Institute of High Fidelity) Standards.



Lifting the spring loaded hinged top reveals the neat, convenient control layout . . . everything is easily in reach from a standing position. Note the handy record storage compartment in front.

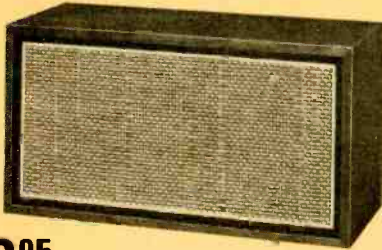
Low Cost Two-Way Acoustic Suspension Speaker System

- 10" acoustic suspension woofer, two 3½" cone-type tweeters • Takes only 10 watts to drive, yet handles up to 40 watts • Preassembled cabinets in two finishes • Simple to assemble, use vertically or horizontally

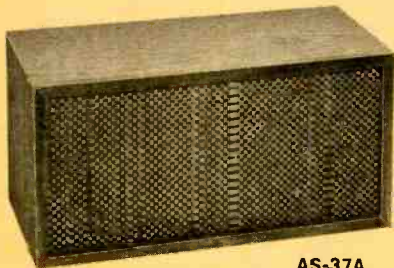
Good listening at a conservative price, that's what you get when you buy the Heathkit AS-10 speaker system. It's got a substantial woofer, midway between 6" and 14"—the proverbial "happy medium" that gives extended bass response with low distortion. The woofer has a 1 lb. Syntox 6 ceramic magnet. A convex housing aims the two 3½" cone-type tweeters in a "crossfire" pattern for wide horizontal dispersion of the high frequency. You can adjust the high frequency level by a variable control on the back panel. The AS-10 is compatible with many power ratings . . . from 10 watts to 40 watts program material per channel. Assembly is easy; the illustrated manual gives step-by-step direction for mounting the speakers and crossover components and doing the wiring. What do you get for your money? Good sound in a compact size with an attractive walnut-finished cabinet. Or spend even less and get the same fine system in an unfinished hardwood cabinet.



\$59⁹⁵ AS-10U



AS-16
\$49⁹⁵



AS-37A
\$41⁹⁵

Kit AS-10U, unfinished, 43 lbs. **\$59.95**
Kit AS-10W, walnut, 42 lbs. **\$64.95**

AS-10 SPECIFICATIONS—Recommended Amplifiers: AR-15, AR-29 & AR-19, AA-22, AA-21D, AA-15, AD-27 & AD-17, Frequency response: 30 to 15,000 Hz. Impedance: 16 ohms. Recommended amplifier power: 10 to 40 watts. Enclosure: Infinite baffle, sealed. Speakers: Woofer, 10" Acoustic Suspension ceramic magnet; Tweeter, two 3½" cone units in dispersed array. 1.47 oz. magnets. Crossover: L-C network, 2250 Hz. Control: High frequency level. Dispersion: 90° horizontal. Cabinet: Factory assembled ¾" furniture grade plywood. Dimensions: 13½" H x 24" W x 11½" D.

Heathkit Compact 2-Way System

- Wide 45-20,000 Hz frequency response • 8" acoustic suspension woofer • 3½" tweeters with 4.8 oz. magnet • Handles 10 to 25 watts of program material • High frequency level control • Speakers already cabinet mounted—just wire crossover network • Handsome assembled walnut veneer cabinet with scratch-proof, spill-proof vinyl covering • Compact size—fits well on bookcases, etc. • Buy two for superb stereo

Kit AS-16, 22 lbs. **\$49.95**

AS-16 SPECIFICATIONS—Frequency response: 45 to 20,000 Hz. Crossover frequency: 1500 Hz. Power rating: Program material—25 watts. Peak capacity—50 watts. Nominal impedance: 8 ohms. Speakers: Low frequency—8" 6.8 oz. magnet. High frequency—3½" 4.8 oz. magnet. Adjustable high frequency level control. Dimensions: 10" H x 19" W x 8½" D.

Famous Heathkit AS-37A . . . Choice of Thousands . . . Now Improved

- New special design speakers . . . 8" woofer with heavier, ceramic magnet; compression-type, exponential horn tweeter • 50-12,000 Hz response • New ruggedized satin walnut finish of polyester plastic—stain, heat, and wear resistant—non-fading color • 1600 Hz crossover • High frequency balance control • 25 watt power rating • Preassembled cabinet • Easy to assemble—just wire crossover network and mount the speakers

Kit AS-37A, 29 lbs. **\$41.95**

AS-37A SPECIFICATIONS—Recommended amplifiers: AR-15, AR-29 & AR-19, AA-15, AR-14 & AA-14, AD-27 & AD-17, AR-17, AR-27 & AA-21D, AA-22 & AA-32, Frequency response: 50 to 12,000 Hz. Speakers: 8" woofer, 10 oz. ceramic magnet; horn tweeter, 4.65 oz. Alnico magnet. Frequency range: 50 to 12,000 Hz. Crossover frequency: 1600 Hz. Power rating: 25 watts. Impedance: 8 ohm. Control: HF Balance. Dimensions: 11½" H x 23" W x 11½" D. Finish: Walnut, satin finish, polyester plastic.

Lowest Cost Speaker System

- 70-12,000 Hz response • 6 x 9" extended range speaker • Handles up to 12 watts of program material • Ideal as an extension speaker or center fill-in for stereo system • Easy assembly • Unfinished or walnut

Kit AS-41U, unfinished, 8 lbs. **\$15.95**
Kit AS-41W, walnut, 8 lbs. **\$16.95**

AS-41 SPECIFICATIONS—Recommended amplifiers: AA-14, AA-32, AR-14, Frequency response: 70 to 12,000 Hz. Impedance: 8 ohms. Capacity: 12 watts. Enclosure: Rear vented box. Speaker: 6" x 9" extended range dual cone, 6.8 oz. Alnico 5 magnet. Cabinet: Factory assembled, furniture-grade ½" plywood. Dimensions: 8" H x 11" W x 6½" D.



AS-41U
\$15⁹⁵



AS-81U
\$19⁹⁵

The Space-Problem Solver

- 2-way system—6" woofer & 3" tweeter • Wide 70-12 kHz range • Fast assembly • Unfinished or walnut cabinets

Kit AS-81U, unfinished, 10 lbs. **\$19.95**
Kit AS-81W, walnut, 10 lbs. **\$21.95**

AS-81 SPECIFICATIONS—Recommended amplifiers: AA-14, AA-32, AR-14, Frequency response: From 70 to 12,000 Hz. Crossover frequency: 4000 Hz. Recommended amplifier power: 6 watts. Nominal impedance: 8 ohms. Cabinet: Type: infinite. Dimensions: 10¼" W x 6½" H x 6-3/16" D. Material ½" veneer plywood. Speakers: Tweeter, 3" cone type, 8 ohms, .53 oz. Alnico 5 magnet; Woofer, 5½" cone type, 8 ohms, 10 oz. Syntox No. 6 magnet. Crossover: Capacitor type.



A Telex "Adjustatone" Stereo Headset

Model ADP-135, 2 lbs. **\$15.95**

ADP-135 SPECIFICATIONS—Driver element: Dynamic. Frequency response: 10-15,000 Hz. Impedance: 3-16 ohm sources. Distortion: At Normal Listening Levels, less than 1%. Cord length: 8 ft. 4-wire with 3-circuit phono plug.

B Telex ST-11 Stereo Headset

Model ADP-92, 2 lbs. **\$23.92**

ADP-92 SPECIFICATIONS—Driver elements: Dynamic. Frequency response: 16 to 15,000 Hz. Impedance: 3 to 16 ohm sources. Distortion: At Normal Listening Level less than 1%. Cord: 4-wire 12 ft. long with 3-circuit phono plug. Color: Tan & Brown.

C KOSS Pro-4A Stereo Headset

Model ADP-137, 2 lbs. **\$49.00**

ADP-137 SPECIFICATIONS—Driver element: Dynamic. Frequency response: 30-20,000 Hz. Impedance: 4 to 16 ohm sources. Distortion: Less than 1% at max. output. Cord: Coiled, 10', 4-wire, 3-circuit plug. Color: Gray-bronze cups, black cushions & band.

D Heathkit Stereo Headphone Control Unit

Kit AC-17, 3 lbs. **\$7.95**

AC-17 SPECIFICATIONS—Output: 2-three connector phone jacks. Controls: Dual concentric level control, speaker-headphone selector switch. Recommended headphone impedance: 4 ohm or more. Dimensions: 3" W x 4" D x 2½" H including control knobs. Cable length: 20 ft.

Speaker And Bookshelf Systems



Kit AS-38
\$134⁹⁵



Kit AS-48
\$174⁹⁵

Heathkit High Efficiency Bookshelf System With Famous JBL® Speakers Custom-Designed For Heath

- Features two JBL custom designed speakers—12" woofer with 6¾ lb. magnet assembly and 2" direct radiator tweeter with 1¼-lb. magnet assembly
- Wide 45 Hz to 20 kHz response
- High efficiency
- Handles up to 40 watts program material
- High frequency variable level control
- Handsome walnut cabinet with removable speaker grille

The Heathkit AS-38 is medium-priced, but its high efficiency and remarkable sound make it suitable for use with even the finest stereo components. The 12" JBL woofer with its large 6¾ pound magnet assembly reproduces rich, full-bodied bass down to 45 Hz, and the 2" JBL direct radiator delivers clear, natural sound up to 20,000 Hz. The 40-watts of program material that it will handle, its high efficiency, and 8 ohm impedance make the AS-38 compatible with practically any amplifier. A high frequency level control on the back of the fine walnut finish cabinet lets you modify the sound to suit your taste too. Simple, one-evening assembly . . . just wire the 2500 Hz LC-type crossover and the level control and mount the two speakers. All components mount from the front of the one-piece cabinet to insure an air tight cabinet seal, and the grille is removable for added convenience. For excellent stereo reproduction at a reasonable cost, order two of these systems now.

Kit AS-38, 38 lbs., no money dn. \$134.95

AS-38 SPECIFICATIONS—Recommended amplifiers: AA-14, AA-15, AR-14, AR-15, AD-17 & AD-27, Speakers: 12" woofer, 6¾ lb. magnet assy.; 2" piston-type direct radiator tweeter, 1.25 lb. magnet assy. Frequency range: 45 Hz to 20 kHz. Crossover: LC type 2500 Hz. Power rating: 40 watts program material. Impedance: 8 ohms. Control: High Frequency Level. Cabinet: Damped reflex, tube-ported. Walnut veneer and furniture grade hardwoods, oiled finish. Dimensions: 14" H x 23½" W x 11¼" D. Net weight: 37 lbs.

Our Finest Heathkit System . . . Featuring Two High Performance JBL® Speakers Custom-Designed For Heath

- 14" woofer with 4" voice coil and 11½-lb. magnet assembly, 2" direct radiator tweeter with 1¼-lb. magnet assembly . . . both custom made for Heath by JBL
- 40-20,000 Hz frequency response
- Three-position high frequency level control
- 2000 Hz crossover
- Rich, one-piece pecan finish cabinet

The Heathkit AS-48 is an extraordinary bookshelf system that will easily outperform anything in its price class by a wide margin, thanks to the custom-designed JBL speakers and famous Heathkit engineering. The special 14" woofer uses an inert, self-damping cone suspension and a massive 11½ pound magnet assembly to produce remarkably clear, full bass down to 40 Hz. Clean, lifelike highs come from the 2" JBL direct radiator. The AS-48 will handle up to 50 watts of program material—your assurance of distortion-free listening at any level. And the three position high frequency level control lets you adjust the highs to your liking. Assembles easily in just an hour or two . . . just wire the high frequency level control and the 2000 Hz crossover and mount the two speakers. All components mount from the front of the classic, one-piece pecan finish damped reflex, tube-ported cabinet. For the finest in home stereo reproduction, choose two of these AS-48 systems now.

Kit AS-48, 43 lbs., no money dn. \$174.95

AS-48 SPECIFICATIONS—Recommended amplifiers: AA-14, AA-15, AA-21D, AR-14, AR-15, AD-17 & AD-27, Speakers: 14" woofer, 4" voice coil, 11½ lb. magnet assy.; 2" piston-type direct radiator tweeter, 1.25 lb. magnet assy. Frequency range: 40-20,000 Hz. Crossover: LC-type, 2000 Hz. Power rating: 50 watts 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 23½" W x 12" D. Net weight: 42 lbs.

Heathkit Miniature Acoustic Suspension System . . . Perfect For The New Stereo Compacts

- Famous high quality speakers—6" woofer and 2½" tweeter
- Wide frequency response, 60 Hz to 20 kHz
- Handles 25 watts program material, 50 watts peak
- High frequency balance control
- Assembled walnut cabinet protected by rugged clear vinyl covering
- Ideal speaker for apartments, mobile homes, offices and reception rooms, etc.
- Buy two of these surprising performers for stereo

Kit AS-18, 16 lbs. \$34.95

AS-18 SPECIFICATIONS—Frequency Response: 60-20,000 Hz. Crossover Frequency: 3000 Hz. Power Rating: Program material—25 watts. Peak capacity—50 watts. Nominal Impedance: 8 ohms. Speakers: Low frequency—6" 8.4 oz. magnet. High frequency—2½" 2.15 oz. magnet. Control: HF balance. Dimensions: 8¼" H x 15¼" W x 6½" D. Cabinet: Walnut veneer, vinyl covered.



AS-18
\$34⁹⁵

Heathkit® High Performance Separates

(A) Deluxe 3-Way High Compliance Edge-Damped Hi-Fi Speaker . . . Covers 20-20,000 Hz

12" Unitary Speaker with woofer, compression mid-range and a horn-loaded compression super tweeter; 80 watts peak power capability; heavy die-cast frame; 600 and 4000 Hz crossovers; special mid and high frequency level control; 1-year guarantee, and cabinet recommendations included. Pick a pair for stereo.

Model AS-27, 16 lbs. . . no money dn. \$71.50
 Model AS-27-2, 28 lbs. . . no money dn. Pair \$136.00

AS-27 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 40 watts. Frequency response: 20-20,000 Hz. Cone resonance: 25Hz. Magnet Weights: 1 lb., 6.4 oz., 4.6 oz. Voice coil sizes: 1 1/2" and 1"

(B) 12" 2-Way High Compliance, Edge-Damped Speaker

12" high compliance, edge-damped woofer with a reflexed horn high frequency unit. Wide response: 20-15 kHz; low crossover frequency. 1 1/2" and 1" voice coils; heavy die cast frame; separate high frequency level control; 1 year guarantee. Buy two for superb stereo.

Model AS-183, 15 lbs. . . no money dn. \$54.95
 Model AS-183-2, 29 lbs. . . no money dn. Pair \$105.00

AS-183 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 30 watts. Frequency response: 20-15,000 Hz. Cone resonance: 25Hz. Magnet weights: 1 3/4 lbs., 4.65 oz.

(C) 12" 3-Way High Compliance, Edge-Damped Speaker

12" woofer; high compliance cone for mid-range; special Heath designed tweeter; heavy die-cast frame; built-in crossover networks; 1 3/4 lb. ceramic magnet; high frequency level control; 1 yr. guarantee. Choose two for stereo.

Model AS-173, 14 lbs. . . no money dn. \$44.95
 Model AS-173-2, 28 lbs. . . no money dn. Pair \$85.00

AS-173 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 25 watts. Frequency response: 35-15,000 Hz. Cone resonance: 40 Hz. Magnet weights: 1 3/4 lbs., 2 1/2 oz.

(D) 12" 3-Way Coax . . . 40-15 kHz Range

True coaxial design with 3 radiating elements: woofer, tweeter & specially-designed horn tweeter. Electrical & mechanical crossovers; high-efficiency ceramic magnet. High frequency level control. Cabinet recommendations & 1 yr. guarantee. You'll need two for stereo.

Model AS-163, 12 lbs. \$34.95
 Model AS-163-2, 24 lbs. . . no money dn. Pair \$66.00

AS-163 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 20 watts. Frequency response: 40-15,000 Hz. Cone resonance: 60 Hz. Magnet weights: 13 oz., 1 oz. Voice coil sizes: 1 1/2" and 1"

(E) 12" 2-Way Hi-Fi Coaxial Speaker

Covers 50-15,000 Hz, handles up to 15 watts. Separate woofer & tweeter with built-in capacitive crossover network. Rigid die cast frame; separate high frequency level control. Cabinet recommendations & 1 yr. guarantee. Exceptional value when you buy two.

Model AS-153, 10 lbs. \$24.95
 Model AS-153-2, 20 lbs. . . no money dn. Pair \$46.00

AS-153 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 15 watts. Frequency response: 50-15,000 Hz. Cone resonance: 60 Hz. Magnet weights: 10 oz., 1.47 oz. Voice coil sizes: 1" and 9/16"

(F) 8" Two-Way Coaxial Hi-Fi Speaker

True coax performance from the separate woofer and tweeter—50-14 kHz response. Handles up to 12 watts. Separate high frequency level control; 1 yr. guarantee. Buy two for stereo.

Model AS-133, 6 lbs. \$17.95
 Model AS-133-2, 12 lbs. . . no money dn. Pair \$34.00

AS-133 SPECIFICATIONS—Size: 8". Impedance: 8 ohms. Power rating: 12 watts. Frequency response: 50-14,000 Hz. Cone resonance: 70 Hz. Magnet weights: 10 oz., 0.68 oz. Voice coil sizes: 1" and 9/16"

(G) Space-Saver . . . 8" Dual Cone Hi-Fi Speaker

3 1/2" depth—ideal for in-wall mounting. 50-12 kHz response; handles up to 12 watts. Husky die-cast frame. 1 year guarantee. Enjoy extra savings by ordering two for stereo.

Model AS-123, 5 lbs. \$11.95
 Model AS-123-2, 10 lbs. . . no money dn. Pair \$22.00

AS-123 SPECIFICATIONS—Size: 8". Impedance: 8 ohms. Power rating: 12 watts. Frequency response: 50-12,000 Hz. Cone resonance: 70 Hz. Magnet weight: 10 oz. Voice coil size: 1"



(A) AS-27
\$71.50
 (pair \$136.00)

(B) AS-183
\$54.95
 (pair \$105.00)

(C) AS-173
\$44.95
 (pair \$85.00)

(D) AS-163
\$34.95
 (pair \$66.00)

(E) AS-153
\$24.95
 (pair \$46.00)

(F) AS-133
\$17.95
 (pair \$34.00)

(G) AS-123
\$11.95
 (pair \$22.00)

Plan Your Own Custom Stereo System

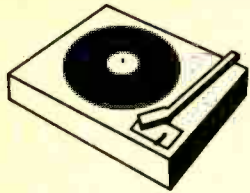
This is a guide to the best equipment combinations—matched in performance and style. One of them will satisfy your needs and fit into your budget. Order all components at the same time and save 5%.

HOW TO DESIGN A MUSIC SYSTEM: Start by choosing the receiver or the "tuner and amplifier set," then select one turntable among those suggested. All you have to do now is to decide which speaker

systems or separate speakers you require (order two identical for stereo) . . . and you've Custom Tailored your sound system. See bottom of page for discount information.

Choose Your Turntable

(See pg. 30-33)



AD-140
ADP-49
ADP-89

Choose Your Receiver or Tuner And Amplifier

TOP OF THE LINE STEREO



AR-15 Solid-State AM/FM/FM Stereo Receiver

or



AJ-15 FM/FM Stereo Tuner

or



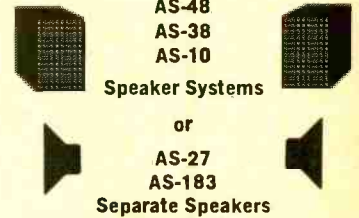
AA-15 Amplifier



or AR-29 AM/FM/FM Stereo Receiver

Choose Your Speaker System

(See pg. 26-28)



AS-48
AS-38
AS-10
Speaker Systems

or
AS-27
AS-183
Separate Speakers

MEDIUM PRICED STEREO

AD-130
ADP-39
ADP-79



AR-19 AM/FM/FM Stereo Receiver

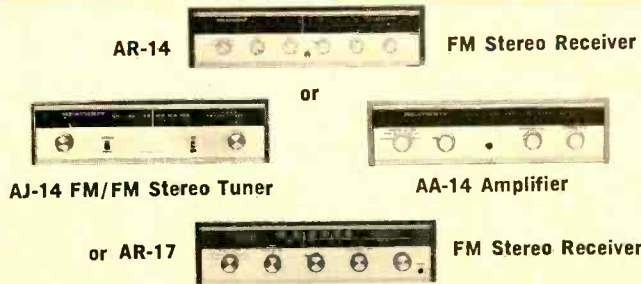


AS-37
AS-16
AS-18
Speaker Systems

or
AS-183
AS-173
Separate Speakers

LOW COST STEREO

AD-120
GD-187



AR-14 FM Stereo Receiver

or



AJ-14 FM/FM Stereo Tuner



AA-14 Amplifier

or AR-17 FM Stereo Receiver



AS-37
AS-18
Speaker Systems

or
AS-173
AS-163
Separate Speakers

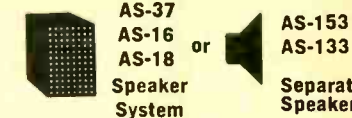
MONO SYSTEMS

AD-120
GD-187



AR-27

FM Receiver



AS-37
AS-16
AS-18
Speaker System

or
AS-153
AS-133
Separate Speakers

(With stereo cartridge connected for mono)

NOTES: 1. Separate Speakers must be provided with suitable acoustic enclosures. 2. All interconnecting cables provided except speaker wire.

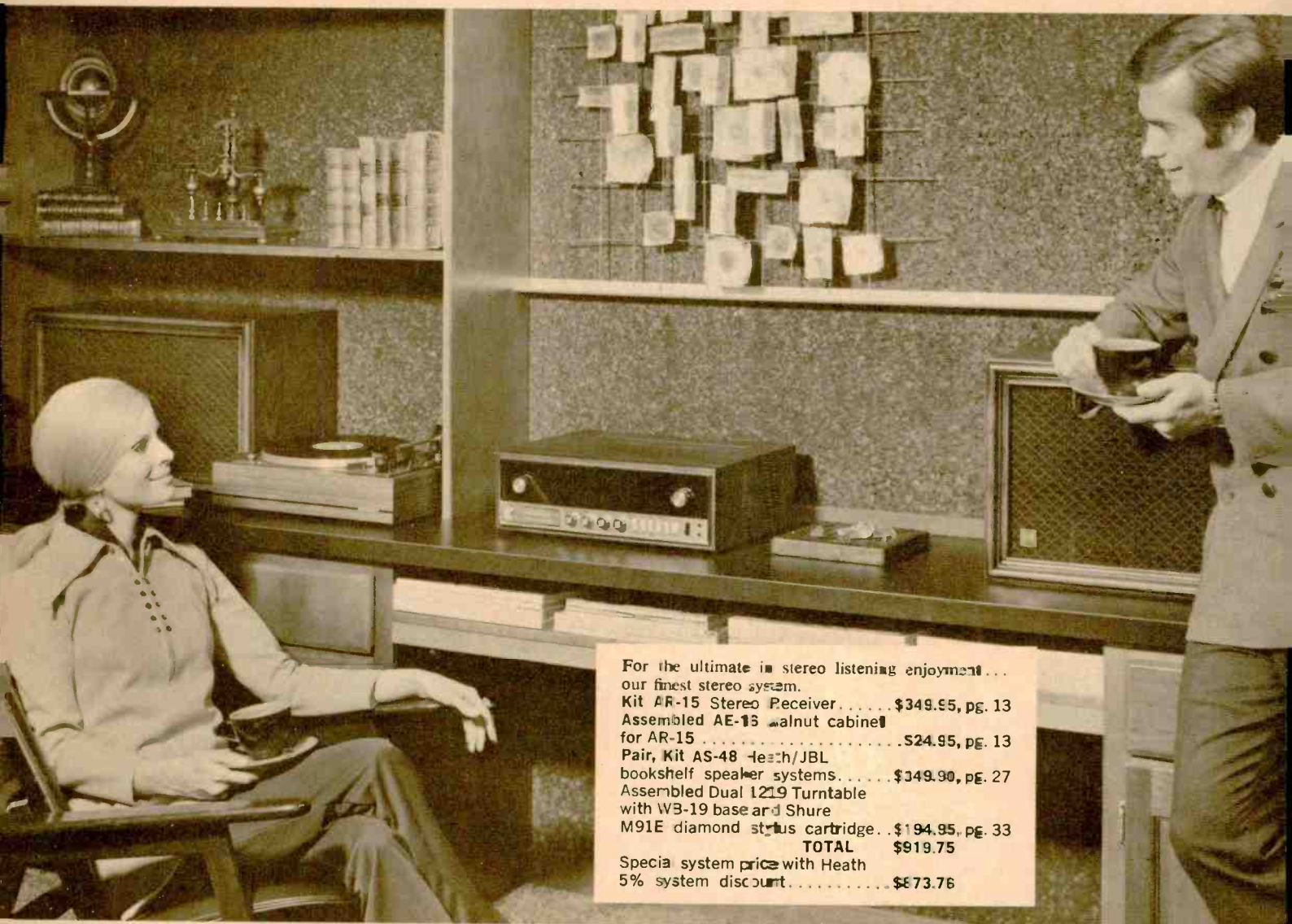
Save An Extra 5% By Ordering A Stereo System

Here's How . . . (1) order a stereo amplifier and stereo program source (such as a tuner, turntable, GD-28 tape player) plus a pair of speaker systems; (2) a stereo 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 total price. (This system discount does not apply to the Heathkit AD-19 "Component Credenza".)

Other catalog 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, headphones, AC-17 headphone control, antenna) will also qualify for the 5% discount.

Open Your Heath Account—No Money Down Up To \$300—Up To 18 Months To Pay—See Order Blank For Details.

Design your own Heathkit® Stereo System...



For the ultimate in stereo listening enjoyment...
our finest stereo system.

Kit AR-15 Stereo Receiver	.....	\$349.55, pg. 13
Assembled AE-15 walnut cabinet for AR-15	.....	\$24.95, pg. 13
Pair, Kit AS-48 Heath/JBL bookshelf speaker systems	.....	\$349.90, pg. 27
Assembled Dual 1219 Turntable with WB-19 base and Shure M91E diamond stylus cartridge	.....	\$194.95, pg. 33
	TOTAL	\$919.75
Special system price with Heath 5% system discount	.....	\$873.76



Superlative performance at a moderate price...
yours with this Heathkit stereo system.

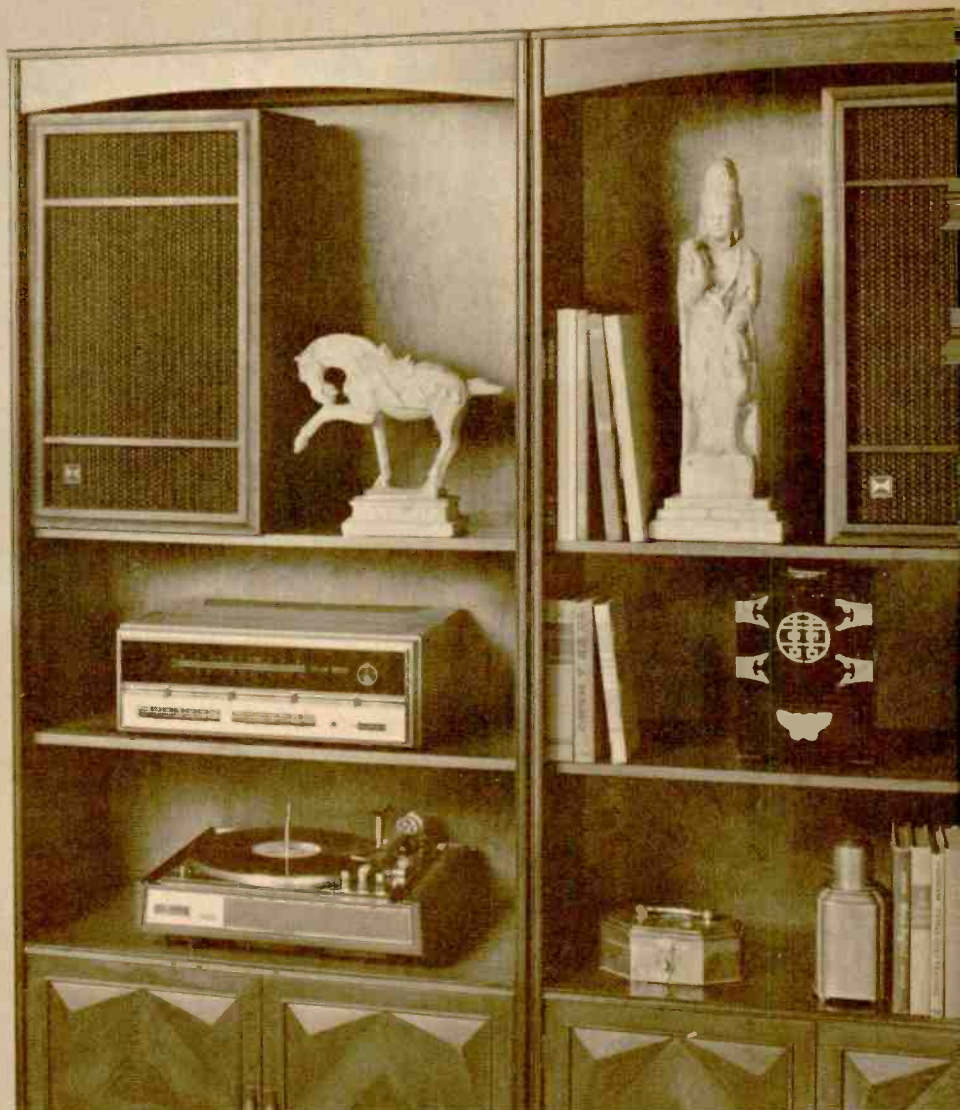
Kit AR-19 Stereo Receiver	.....	\$225.00, pg. 17
Assembled AE-19 walnut cabinet for AR-19	.....	\$19.95, pg. 17
Pair, Kit AS-10W acoustical suspension speaker systems	.....	\$129.90, pg. 26
Assembled Heath/BSR AD-140 Turntable system	.....	\$89.95, pg. 35
	TOTAL	\$464.80
Special system price with Heath 5% system discount	.....	\$441.56

Save 5% with Heath's System Discount Plan

When you design your own stereo system around quality Heathkit components you save two ways; traditional Heathkit do-it-yourself savings... plus the special Heath 5% System Discount add up to double-barreled stereo savings for you.

The four systems on these pages are popular combinations among Heathkit audiophiles, and represent a broad selection of prices. However, these systems are by no means the only ones that allow you to take advantage of Heathkit dual savings. Be creative! Design your own special system around your particular needs and budget. The chart on the previous page tells you how to choose those components that will best suit your own situation.

Choose one of the systems shown here... or plan your own from the pages of this catalog. Either way, you take advantage of the Heath 5% System Discount... and make a sound investment in a lifetime of listening enjoyment.



An extraordinary value in top-flight stereo components.

- Kit AR-29 Stereo Receiver.....\$285.00, pg. 15
- Assembled AE-19 walnut cabinet for AR-29.....\$19.95, pg. 15
- Pair, Kit AS-38 Heath/JBL bookshelf speaker system.....\$269.90, pg. 27
- Assembled Garrard SL95B Turntable with B2P Base and Empire 999 SE/X diamond stylus cartridge.....\$150.45, pg. 32

TOTAL \$725.30

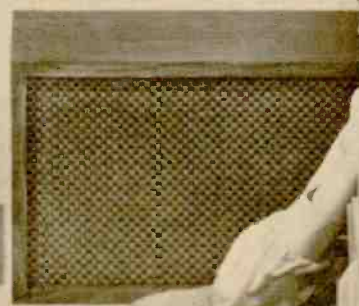
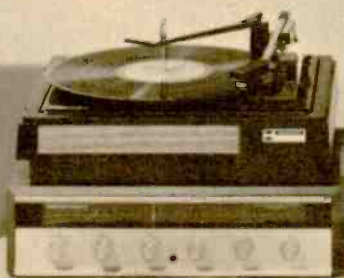
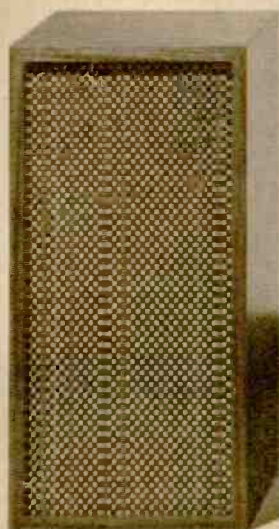
- Special system price with Heath 5% system discount.....\$689.03

Stereo system performance that belies its modest price.

- Kit AR-14 Stereo Receiver.....\$119.95, pg. 18
- Assembled AE-55 walnut cabinet for AR-14.....\$12.95, pg. 18
- Pair, Kit AS-37A bookshelf speaker systems.....\$83.90, pg. 26
- Assembled Heath/BSF AD-120 Turntable system...\$44.95, pg. 35

TOTAL \$261.75

- Special system price with Heath 5% system discount.....\$248.66



Famous Garrard® And



ADP-89
\$129⁵⁰

(less cartridge & base)

Cartridge Options for ADP-89 & ADP-79...Limit one per turntable order. Specify Heath model number—see below.

1c

Heath AD-58R
Shure M93E
Reg. \$39.95

Heath AD-126
Empire 999E/X
Reg. \$39.95

\$5

Heath AD-68F
Shure M91E
Reg. \$49.95

Heath AD-121
Empire 999SE/X
Reg. \$49.95



ADP-79
\$89⁵⁰

(less cartridge & base)

Garrard SL95B 3-Speed Automatic Transcription Turntable With Synchro-Lab Motor . . . Garrard's Finest

- Synchro-Lab motor for precise turntable speed • Automatic or manual play of 78, 45 & 33 $\frac{1}{3}$ RPM speeds with interchangeable center spindles • Manual spindle rotates with record . . . reduces center hole wear • 12" aluminum turntable with anti-static mat and safety grooves • Low mass dynamically balanced wood/aluminum tone arm with gyroscopically gimbaled pivots for minimal friction • Stylus pressure adjustment calibrated in exact $\frac{1}{4}$ gram increments . . . viewed through window in top of arm • Adjustable anti-skating control utilizing Garrard's patented sliding weight design • Counterweight adjustment screw permits ultra-fine arm balance • Garrard's exclusive two-point record support system for automatic play • Viscous damped cueing/pause control • Damped set-down of arm in automatic play • Slide-in cartridge clip • Combined record size and speed selector • Tracks and trips as low as $\frac{1}{4}$ gram • Choose either Heath 1c or \$5 cartridge option

Garrard's Finest . . . the new SL95B 3-speed automatic turntable. Designed for the serious audiophile, the new SL95B incorporates many improved performance features . . . viscous damped cueing/pause activated by a single control . . . new damped set-down of tonearm in automatic play . . . the easiest to use and most visible stylus pressure gauge of any automatic turntable . . . Garrard's patented sliding weight design anti-skate control . . . new counterweight adjustment for exact balance. Put this fine example of British craftsmanship in your stereo system now. And take advantage of the special Heath cartridge options.

ADP-89, turntable only (Garrard SL95B), 14 lbs. . . . \$129.50
 ADA-47-3, Power-Matic base, (Garrard B2P), 3 lbs. . . . \$15.95
 ADA-47-1, Coordinated base, simulated leather Ebony (Garrard B2), 3 lbs. . . . \$6.50
 ADA-47-4, dust cover, for use only with ADA-47-1, (Garrard D2), 4 lbs. . . . \$6.50
 ADA-57-2, 45 RPM spindle (Garrard LRS25), 1 lb. . . . \$3.80

ADP-89 SPECIFICATIONS: Speeds: 33 $\frac{1}{3}$, 45, & 78 RPM. Motor: Synchro-Lab. Tracking: Tracks per cartridge specifications. Color: Ebony with aluminum trim. Wiring: Stereo, 4-pin/5-wire system with separate ground connection for hum elimination. Cables Furnished: Line cord, 2 audio cables. Power requirements: 100-130 volts, 60 Hz AC. Dimensions: 15-13/16" W. x 14 $\frac{1}{4}$ " D. x 4 $\frac{1}{8}$ " above, 3" below motor board.

Garrard's Newest 3-Speed Automatic Transcription Turntable . . . the SL72B . . . High Performance Features At A Moderate Price

- Automatic or manual play of all three speeds with interchangeable center spindles • Famous Synchro-Lab motor for perfectly constant speed • Low mass tubular aluminum tone arm floats within a cast gimbal mounting • Adjustable counterweight • Adjustable stylus pressure gauge • Permanently accurate sliding weight anti-skate control • Viscous damped cueing/pause control • Damped tonearm set-down in automatic play • Special cartridge options

The new Garrard SL72B is a pedigreed performer in the long tradition of Garrard quality. The one-piece hexagonal aluminum tonearm floats on jewel-like needle pivots to insure practically friction-free vertical movement. Viscous damped cueing and pausing and smooth viscous damped tonearm descent provide convenience and safety for records and stylus both in automatic and manual play. Garrard's patented sliding weight anti-skate control and simple, effective adjustments for counterweight balance and stylus pressure make for flawless tracking. Studio-type unitized controls permit independent selection of automatic play, manual play and cueing/pausing. At the heart of this superb 3-speed automatic turntable is the famous Garrard Synchro-Lab motor that delivers rumble-free, pitch-perfect sound reproduction. For the value-conscious music lover, the new Garrard SL72B is the answer. And check the cartridge options too.

ADP-79, turntable only, (Garrard SL72B), 13 lbs. . . . \$89.50
 ADA-47-3, Power-Matic base, (Garrard B2P), 3 lbs. . . . \$15.95
 ADA-47-1, Coordinated base, simulated leather & ebony (Garrard B2), 3 lbs. . . . \$6.50
 ADA-47-4, Dust cover, for use only with ADA-47-1, (Garrard D2), 4 lbs. . . . \$6.50
 ADA-57-2, 45 RPM spindle (Garrard LRS25), 1 lb. . . . \$3.80

ADP-79 SPECIFICATIONS: Same as ADP-89 above.

Choose Either Cartridge For Just 1c More With Purchase Of Dual Or Garrard Turntable



Empire 999E/X

MANUFACTURER'S SPECIFICATIONS—Frequency response: 10-30,000 Hz. Output: 8.0 mV. Separation: 35 dB. Load impedance: 47k ohms. Stylus: 0.3x0.7 elliptical. Tracking force: $\frac{3}{4}$ to 2 grams. Model AD-126, 1 lb. . . . \$39.95



Shure M93E

MANUFACTURER'S SPECIFICATIONS—Frequency response: 20-20,000 Hz. Output: 6.2 mV. Separation: 25 dB. Load impedance: 47k ohms. Stylus: 0.4x0.7 elliptical. Tracking force: $\frac{1}{2}$ to 3 grams. Model AD-58R, 1 lb. . . . \$39.95

Dual® Turntables for 1970

New Dual 1219 Professional Automatic Turntable With Variable Pitch Control

- Manual or automatic play of 78, 45, & 33 $\frac{1}{3}$ RPM records with interchangeable center spindles • Manual spindle rotates with record to reduce wear • Four point gyroscopic gimbal tonearm suspension • Separate anti-skating adjustment for both spherical and elliptical cartridges • Perfect 15° stylus tracking in single play • Cue-control system silicone-damped in both directions to prevent bounce • Damped tonearm descent in both automatic and manual start • Precision elastically damped counterbalance adjustable in 0.01 gram click stops for exact tonearm balancing • Adjustable stylus overhang for minimum tracking error with any cartridge • Full 12" diameter dynamically balanced 7 lb. platter • Synchronous/continuous pole motor for exact speed • 6% speed adjustment on all three speeds for precise pitch

Proud Descendant of the Famous Dual 1019. Features like the massive 7 lb. dynamically balanced turntable, true 4-point gyroscopic gimbal tonearm suspension, variable pitch control, separate anti-skating adjustments for both spherical and elliptical cartridges and adjustable counterweight put the new Dual 1219 in the professional category. Even a better value when you take advantage of Heath's special cartridge offers.

ADP-49, turntable only (Dual 1219), 23 lbs. \$175.00
 ADA-49-1, walnut base (Dual WB-19), 5 lbs. \$14.95
 ADA-49-4, dust cover (Dual DC-9), 3 lbs. \$12.95
 ADA-39-2, 45 RPM spindle (Dual AS-12), 1 lb. \$5.95

ADP-49 SPECIFICATIONS—Speeds: 78, 45 & 33 $\frac{1}{3}$ RPM. Variable over 6% range. Motor: High torque synchronous/continuous pole. Tracking: Tracks per cartridge specifications. Record capacity: Up to 6. Record sizes: 7, 10 & 12". Color: Black/Silver. Cables furnished: Line cord & 2 audio. Power requirements: 100-130 VAC, 60 Hz. Dimensions: 18 $\frac{1}{2}$ " W. x 16" D. x 8" H.

New Dual 1209 3-Speed Auto/Professional Turntable

- Manual or automatic play of all three speeds with 6% pitch control • Separately calibrated anti-skating scales for spherical & elliptical styli • Adjustable counterbalancing • Stylus pressure adjustment • Flawless $\frac{1}{2}$ gram tracking

The deluxe Dual 1209 Auto/Professional Stereo Turntable features a new synchronous Hi-Torque motor for absolute speed accuracy. Plays all three speeds (33 $\frac{1}{3}$, 45 & 78 RPM) and holds up to six records at a time for Automatic operation. The single play spindle included rotates to protect your records. The dynamically balanced tonearm has a damped counterbalance and tracks and trips flawlessly at $\frac{1}{2}$ gram. Built-in Cue Control lets you remove the arm from the record and then return to the exact same groove . . . especially convenient for taping. To insure completely against skating, the Dual 1209 features two separately calibrated anti-skating scales for conical and elliptical styli. Other professional features include the famous 6% Dual Pitch Control and direct dial tracking force adjustment. For the serious-minded stereophile on a budget, you can't beat the Dual 1209 . . . check the special cartridge options too.

ADP-39, turntable only (Dual 1209), 18 lbs. \$129.50
 ADA-39-1, walnut base (Dual WB-12), 5 lbs. \$10.95

ADA-39-4, dust cover (Dual DC-2), 3 lbs. \$10.95
 ADA-39-2, 45 RPM spindle (Dual AS-12), 1 lb. \$5.95

ADP-39 SPECIFICATIONS—Speeds: 78, 45 & 33 $\frac{1}{3}$ RPM. Variable over 6% range. Motor: Synchronous/hi-torque. Tracking: Tracks per cartridge specifications. Color: Black/silver. Record capacity: Up to 6. Record sizes: 7, 10 & 12". Cables furnished: Line cord and 2 audio. Power requirements: 100-130 VAC, 60 Hz. Dimensions: 15 $\frac{1}{2}$ " W x 13 $\frac{1}{2}$ " D x 8" H.



ADP-49
\$175⁰⁰
 (less cartridge and base)

Cartridge Options for ADP-89 & ADP-79 . . . Limit one per turntable order. Specify Heath model number—see below.

1c

Heath AD-58R
 Shure M93E
 Reg. \$39.95

Heath AD-126
 Empire 999E/X
 Reg. \$39.95

\$5

Heath AD-68F
 Shure M91E
 Reg. \$49.95

Heath AD-121
 Empire 999SE/X
 Reg. \$49.95



ADP-39
\$129⁵⁰
 (less cartridge and base)

Choose Either Cartridge For Just \$5 More With Purchase Of Dual Or Garrard Turntables



Empire 999SE/X

MANUFACTURER'S SPECIFICATIONS—Frequency response: 8-32,000 Hz. Output: 8.0 mV. Separation: 35 dB. Load impedance: 47k ohms. Stylus: 0.2x0.7 elliptical. Tracking force: $\frac{1}{2}$ to 1 $\frac{1}{2}$ grams. Model AD-121, 1 lb. \$49.95



Empire 888E

MANUFACTURER'S SPECIFICATIONS—Frequency response: 10-30,000 Hz. Output: 8.0 mV. Separation: 30 dB. Load impedance: 47k ohms. Stylus: 0.4x0.9 elliptical. Tracking force: $\frac{3}{4}$ to 3 grams. Model AD-96H, 1 lb. \$39.95

All Kits On These Two Pages Are Mailable

Heath/BSR McDonald

New 'top of the line' Heath/BSR McDonald includes these extra convenience features . . . at no extra cost!



A AD-140
\$89⁹⁵



A

The new Heath/BSR comes complete with the deluxe Decor-matic Power Base that allows control of your entire stereo system . . . famous Shure elliptical diamond stylus magnetic cartridge . . . 45 RPM Adapter . . . and the deluxe BSR see-thru dust cover to protect those expensive records.



B AD-130
\$64⁹⁵



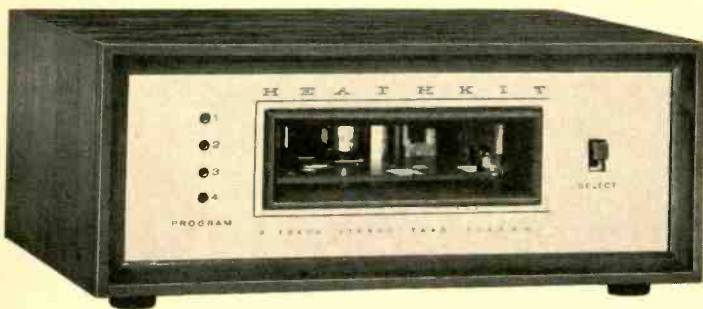
C AD-120
\$44⁹⁵

New medium & low cost Heath/BSR automatic turntables come complete with these extras . . . all at one low price!



B • C

Included with each new AD-130 and AD-120 is a handsomely styled base, 45 RPM Adapter, a rugged see-thru dust cover to assure protection of records, and a famous Shure spherical diamond stylus magnetic cartridge.



Kit GD-28
\$59⁹⁵

40 Minute Stereo Cartridge Included with your new GD-28. Features 16 instrumentals played by world famous Capitol Records recording artists. A \$7.95 value!



GD-187
\$29⁹⁵

Automatic Turntables

A *New AD-140 Heath/BSR McDonald 4-Speed Automatic Turntable . . . complete with power base, deluxe dust cover, 45 RPM adapter & famous Shure diamond stylus cartridge*

• A complete factory assembled & tested unit—no assembly necessary . . . just connect to your stereo system • Interchangeable center spindles permit manual, semi-automatic or full automatic play • New high torque synchronous motor for better overall performance • New viscous damped cueing and pause control—ideal for taping • Professional low mass aluminum tone arm permits minimal tracking and tripping • Dual range anti-skate control allows adjustment for both spherical and elliptical cartridges • Vernier counter-balance adjustment for sensitive, accurate tracking • Heavy cast turntable for maximum record support • Scientifically designed spring suspension system minimizes external shock • New swing-back control arm permits unobstructed manual play • Automatic tone-arm lock in "off" position • Stereo muting switch gives complete silence during change cycle • Handsome satin black and aluminum styling • Comes complete with automatic turntable, power base, dust cover, Shure cartridge, 45 RPM adapter and all connecting cables

Professional Features For The Discerning Audiophile . . . features usually found only on turntables costing up to twice as much . . . a new high torque synchronous motor, dynamically balanced, assures quick, positive starts, constant speeds and inaudible rumble. The new viscous damped cue/pause control permits selection of any individual groove with gentle, controlled

B *New AD-130 Heath/BSR McDonald 4-Speed Automatic Turntable . . . Your Best Buy In A Complete Turntable*

• Comes complete with turntable, base, dust cover, 45 RPM adapter, Shure cartridge and audio cables • 4-speed manual, semi-automatic or automatic play • New high torque synchronous motor for fast starts and constant speeds • New viscous damped cueing/pause control • Low mass tubular aluminum tone arm balanced both horizontally and vertically • Dual range anti-skate control for both elliptical and spherical cartridges • Micrometer stylus pressure adjustment enables continuous, infinite stylus pressure settings from 0-6 grams • Full size deep drawn turntable for full record support • New slide-in cartridge holder permits quick change, positive connections and universal mounting • Tone arm automatically locks in "off" position • New swing back control arm for unobstructed manual play

High Performance Features At A Modest Price. The new AD-130 provides

C *New AD-120 Heath/BSR McDonald . . . A Complete, 4-Speed Automatic Turntable Package At Lowest Cost*

• Manual, semi-automatic or full automatic play of all four speeds • 4-pole induction motor for constant speeds, low wow and rumble • Low mass aluminum tone arm with fixed counterweight • New slide-in cartridge holder for positive connections, easy interchange • New Cue/Pause control permits interruption and return to same groove—perfect for taping • New variable anti-skate control • Visible stylus force control and indicator permits exact stylus force adjustment • Spring suspension system overcomes susceptibility to external shock common on other low priced turntables • Deep drawn turntable provides complete record support • Comes complete with turntable, base, dust cover, famous Shure magnetic diamond stylus cartridge, 45 RPM adapter and audio cables . . . just plug in and use

Heathkit GD-28 Solid-State 8-Track Stereo Tape Player With Famous Motorola® Mechanism

Simple Operation. The new Heathkit GD-28 is designed to play back pre-recorded 8-track stereo tape cartridges through your present music system. Just plug it into the "Tape", "Tuner" or "Auxiliary" inputs of your amplifier . . . insert the cartridge of your choice and listen. 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.

Fast, Easy Assembly . . . the all solid-state 6-transistor, 2-diode preamplifier circuit goes together quickly on one small circuit board, and the tape player mechanism by Motorola® is preassembled and adjusted to make your kit building even easier. Total assembly time is about six hours. Comes complete with all necessary connecting cables, too. And the smart looking, walnut grained vinyl clad wood cabinet and gold front panel included with the kit blends with any decor. Add the sound of 8-track stereo tape cartridges to your home music system soon . . . with the new Heathkit GD-28.

Kit GD-28, 10 lbs. . . no money dn. \$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 1/4" W x 4 1/2" H x 8 1/4" D. **Net weight:** 6 1/4 lbs.

hydraulic descent. Pause feature allows interruption at any point and return to that exact same groove. The new professionally designed low mass aluminum tone arm system is supported both vertically and horizontally on virtually frictionless ball-bearing pivots, and is counterbalanced in both planes. And the new slide-in cartridge head is an easy-to-use added convenience. New dual-range dynamic anti-skate control provides settings for the different requirements of elliptical or spherical stylii . . . unfailingly applies continuously corrected degree of compensation, regardless of groove diameter. A resiliency-mounted vernier counter-balance adjustment allows precise "zero-balance" over the full range of stylii masses. Micrometer stylus pressure adjustment provides continuous, infinite pressure settings between 0 and 6.0 grams to exactly match your cartridge requirements.

The New AD-140 provides the full range of professional features, yet at a price appealing to even the most budget-minded. Why wait? Upgrade your system now!

Assembled AD-140, 14 lbs. \$89.95

AD-140 SPECIFICATIONS—Speeds: 78, 45, 33 1/3, 16 1/2 RPM. **Motor:** High torque, dynamically balanced synchronous type. **Cartridge:** Shure M93E magnetic, diamond elliptical stylus, 1 1/2-3 grams stylus pressure. **Color:** Satin black with aluminum trim. **Cables furnished:** 6 foot UL approved line cord; two 4-foot twin shielded audio cables. **Power requirements:** 105-130 VAC, 60 Hz. **Dimensions:** (includes dust cover & base) 15 1/4" W x 13-3/16" D x 7 1/4" H.

many of the same features found on the AD-140 above . . . new synchronous motor, cueing/pause control, dual range anti-skate control, vernier counter-balance adjustment, micrometer stylus pressure adjustment, slide-in cartridge holder, new suspension system and swing-back control arm. Comes complete with everything you need . . . just connect it to your system . . . and congratulate yourself on knowing a real value in automatic turntables. Order yours now.

Assembled AD-130, 14 lbs. \$64.95

AD-130 SPECIFICATIONS: Speeds: 78, 45, 33 1/3, 16 1/2 RPM. **Motor:** High torque, dynamically balanced synchronous type. **Cartridge:** Shure M75 magnetic, diamond spherical stylus; 3-5 grams stylus pressure. **Color:** Satin black with aluminum trim. **Cables furnished:** 6-foot UL approved line cord; two 4-foot twin shielded audio cables. **Power requirements:** 105-130 VAC, 60 Hz. **Dimensions:** (including base and dust cover) 15 1/4" W x 13-3/16" D x 7 1/4" H.

Excellent Performance For The Budget-Minded. The new Heath AD-120 is the perfect automatic turntable for that low cost system. Its remarkable performance, many professional features and down to earth price make it easy to own, a pleasure to use for years to come. Order yours today, and discover that high quality, top performance and low cost can be combined.

Assembled AD-120, 14 lbs. \$44.95

AD-120 SPECIFICATIONS—Speeds: 78, 45, 33 1/3, 16 1/2 RPM. **Motor:** 4-pole dynamically balanced induction type. **Cartridge:** Shure M75 magnetic diamond spherical stylus; 3-5 grams stylus pressure. **Color:** Satin black with aluminum trim. **Cables furnished:** 6-foot UL approved line cord; two 4-foot twin shielded audio cables. **Power requirements:** 105-130 VAC, 60 Hz. **Dimensions:** (including base and dust cover) 15 1/4" W x 13-3/16" D x 7 1/4" H.

MAESTRO 4-Speed Automatic Stereo Changer . . . High Performance At Low Cost

• Same high-quality changer as used in the Heathkit GD-107 phonograph
• Ideal for low-cost music systems and for replacement uses • Use with amplifiers having ceramic cartridge inputs • Complete instructions for conversion to magnetic cartridge inputs • Manual or automatic play of any size 78, 45, 33 1/3 and 16 rpm records • Ceramic cartridge has diamond stylus for LP's, sapphire for 78's • Cartridge comes wired for stereo, can be rewired for mono • Beautifully styled walnut-grained vinyl-covered wood base • Measures 2 3/4" H x 14 3/8" W x 12 1/2" D overall • Includes two 3' audio cables • 45 rpm spindle adapter included • Completely assembled

The Ideal "Starter" Changer For Low Cost Hi-Fi And Stereo Systems. The Heath GD-187 makes an excellent choice when coupled with other low cost equipment for that "first" music system . . . or use it as the music source for the rec room, den or office. Comes completely assembled—just connect it to your amplifier or receiver.

GD-187, 12 lbs., \$29.95

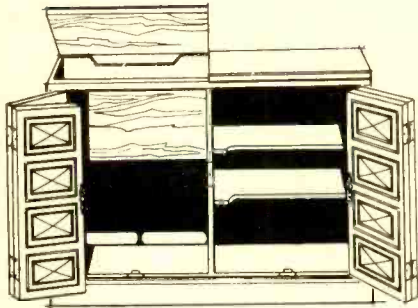
GD-187 SPECIFICATIONS—Changer: Type, Maestro Model 52-93. **Speeds:** 16 33 1/3, 45 and 78 rpm. **Record sizes:** 7", 10" and 12". **Cartridge:** Stereo ceramic. **Stylus:** 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **Power requirements:** 105-125 V., 60 Hz AC, 10 watts.



Deluxe Stereo Hi-Fi Furniture



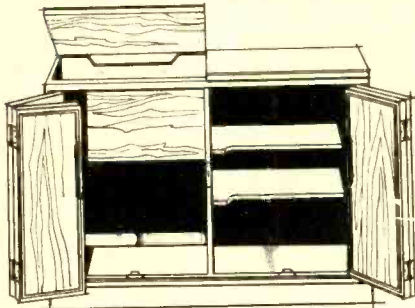
Now The Latest Motif . . . With An Exciting Spanish Flair . . . Heathkit Mediterranean Pecan Stereo/Hi-Fi Cabinet Ensemble . . . Completely Factory Assembled And Finished



- Custom designed for Heathkit stereo/hi-fi components . . . adjustable shelves accommodate most other makes
- Luxurious Mediterranean Pecan finish
- Speaker cabinet can be tuned to any 8" or 12" speaker for best tone

Deluxe Component Cabinet . . . elegantly and exclusively styled for Heath in the latest Mediterranean motif. Truly a masterpiece of superb furniture you'll be proud to have in your home. Features molded carving resin panels that won't chip, warp, shrink, expand or crack from age, humidity or abuse. Has bi-fold doors highlighted by beautifully sculptured Statuary Bronze handles. It's magnificently crafted of specially selected solids and veneers

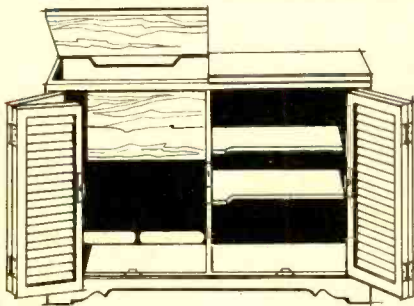
Heathkit Contemporary Walnut Ensemble Complements Modern Furnishings . . . Completely Factory Assembled And Finished



- Designed for Heathkit stereo/hi-fi components . . . adjustable shelves accommodate virtually all other makes
- Rich, modern walnut finish
- Speaker cabinet can be tuned to any 8" or 12" speaker

Equipment Center . . . Beauty Combined With Versatility. Exclusively styled for Heath, this new contemporary cabinet will be the center of attraction in any surroundings. It's masterfully crafted of fine furniture solids and veneers finished in a deep, rich walnut. And the slim, sculptured Statuary Bronze handles accent the clean, flowing lines. Perfect for your modern decor. But don't let its luxurious looks fool you. It's as practical as it is beautiful. The two adjustable shelves can be placed 4, 5, 6, 10, 11, 12, 16, 17 or 18 inches from the top of the cabinet to easily house all Heathkit

Add A Touch Of Our Proud American Heritage With This Luxurious Early American Stereo/Hi-Fi Ensemble . . . Completely Factory Assembled And Finished



- Accommodates any Heathkit stereo/hi-fi arrangement and virtually all other makes
- Adjustable shelves
- Beautiful Salem-Maple finish
- Speaker cabinet can be tuned to any 8" or 12" speaker for best tone

Versatile Equipment Cabinet . . . exclusively styled and crafted of fine furniture solids and veneers, stunningly finished in popular Salem-Maple. Has louvered doors accented with elegantly sculptured Statuary Bronze handles. Provides added luxury and good taste to any room. And with this new cabinet ensemble, you have all the beauty and charm of Early America combined with the right touch of the modern with its low, compact size and

dramatically finished in excitingly new Pecan. And its modern component layout is designed to accommodate all Heathkit receivers, tuners and amplifiers, plus virtually every other make. The two shelves are adjustable and can be placed 4, 5, 6, 10, 11, 12, 16, 17 or 18 inches from the top of the cabinet. And the turntable features an uncut mounting board that's also adjustable in height to house any turntable, changer or tape recorder of your choice. There's also room to store records or to front mount a tape recorder. Add a pair of matching speaker cabinets for a truly luxurious home entertainment ensemble.

Model AE-57, equipment cabinet, 109 lbs. . . no money dn
 **\$160.00**

AE-57 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19 3/8" D. x 28 3/4" H. Changer Compartment: 19" W. x 16" D., mounting board is uncut and can be adjusted in height to accept all record changers, turntables and tape recorders sold by Heath; lid has friction-loaded hinges. Record-Tape Recorder Compartment: 19" W. x 15" H. x 16" D. Shelf Compartment: Overall interior dimensions, 19" W. x 16" D. x 23 3/4" H. with two shelves adjustable 4, 5, 6, 10, 11, 12, 16, 17, or 18 inches from the top of the cabinet. Accepts any Heathkit receiver, tuner or amplifier.

Matching Speaker Cabinet. Same rich Mediterranean styling and superb craftsmanship as the AE-57 equipment cabinet. Tubular-duct reflex design so you can easily match it to any 8" or 12" speaker for perfect resonance with the instructions included. Ornate metal scroll grille adds to its Old World Spanish styling. Completely assembled and finished. Measures 17 3/8" W. x 19 3/8" D. x 28 3/4" H. Order a pair for stereo, and a beautifully matched ensemble.

Model AEA-57-1, speaker cabinet, 68 lbs. . .
 no money dn. **each \$82.00**

receivers, tuners and amplifiers, plus most other makes. And the turntable compartment features an uncut mounting board that's also adjustable in height to accommodate any turntable, changer or tape recorder of your choice. There's also room to store records or to front mount a tape recorder. Features bi-fold doors for easy accessibility. Mate it with a pair of matching speaker cabinets for a truly deluxe furniture ensemble.

Model AE-37, equipment cabinet, 108 lbs. . . no money dn
 **\$135.00**

AE-37 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19" D. x 28 3/4" H. Changer Compartment: 19" W. x 16 3/2" D., mounting board is uncut and can be adjusted in height to accept all record changers, tape recorders and turntables sold by Heath; lid has friction-loaded hinges. Record-Tape Recorder Compartment: 19" W. x 16 3/2" D. x 15 3/4" H. Shelf Compartment: Overall interior dimensions, 19" W. x 16 3/2" D. x 24 3/8" H. with two shelves adjustable 4, 5, 6, 10, 11, 12, 16, 17, or 18 inches from the top of cabinet. Accepts any Heathkit receiver, tuner or amplifier.

Matching Speaker Cabinet . . . Accommodates 8" or 12" Speakers. With the addition of the matching AE-37-1 speaker cabinets, you have a complete music system both in beautifully styled furniture and total stereo performance. Features louvered wood-grained molded carving resin grille that won't chip, warp, or crack from age, humidity or abuse. And you can easily match it to any 8" or 12" speaker for perfect resonance with the instruction sheet included, thanks to its special tubular-duct reflex design. Completely assembled and finished, measures 18" W. x 19" D. x 28 3/8" H. Order a pair for stereo.

Model AEA-37-1, speaker cabinet, 70 lbs. . .
 no money dn. **each \$65.00**

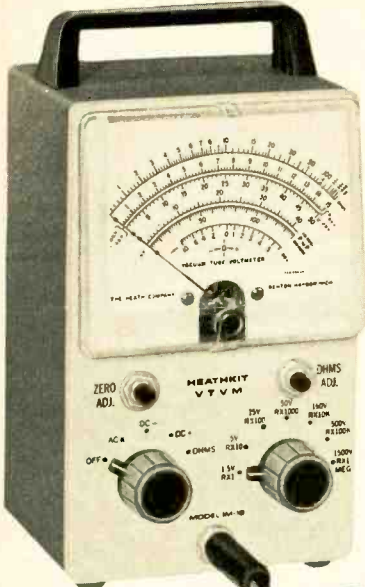
practical component layout. Designed to house all Heathkit receivers, tuners and amplifiers, plus virtually all other makes. The two shelves are adjustable and can be installed 4, 5, 6, 10, 11, 12, 16, 17 or 18 inches from the top of the cabinet. And the turntable features an uncut mounting board that's also adjustable in height to handle the turntable, changer, or tape recorder of your choice. There's also room to store records or to front mount a tape recorder. Pair it with two of its matching speaker cabinets for a rich hi-fi cabinet ensemble.

Model AE-47, equipment cabinet, 104 lbs. . . no money dn
 **\$145.00**

AE-47 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19" D. x 28 3/4" H. Changer Compartment: 19" W. x 16" D., mounting board is uncut and can be adjusted in height to accept all record changers, turntables, and tape recorders sold by Heath; lid has friction-loaded hinges. Record-Tape Recorder Compartment: 19" W. x 16" D. x 15 3/4" H. Shelf Compartment: Overall interior dimensions, 19" W. x 16" D. x 24 3/8" H. with two shelves adjustable 4, 5, 6, 10, 11, 12, 16, 17 or 18 inches from the top of the cabinet. Accepts any Heathkit receiver, tuner or amplifier.

Matching Speaker Cabinet . . . features tubular-duct reflex design so you can easily match it to any 8" or 12" speaker for perfect resonance with the instruction sheet included. Handsome wood spindle grille. Completely assembled and finished to match the AE-47 equipment cabinet. Measures 18" W. x 19" D. x 28 3/8" H. Order a pair for stereo.

AEA-47-2, speaker cabinet, 67 lbs. . .
 no money dn. **each \$70.00**



A Kit IM-18
\$29⁹⁵

Wired IMW-18
\$49⁹⁵



B Kit IM-28
\$39⁹⁵

Wired IMW-28
\$59⁹⁵

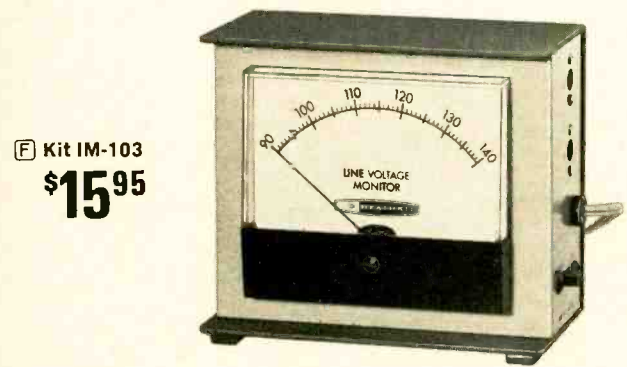


D Kit IM-38
\$41⁹⁵

Wired IMW-38
\$57⁹⁵



E IM-17
\$21⁹⁵



F Kit IM-103
\$15⁹⁵



C MM-1
\$34⁹⁵



Etched Circuit RF Probe Kit

- May be used with any 11 megohm input volt-meter
- Enables RF measurements over 100 MHz
- 1000 VDC maximum at probe tip
- 90 volts RMS RF maximum
- A handy service & ham aid

Kit PK-3, 1 lb. \$5.00
Assembled PKW-3, 1 lb. \$7.00



30 KV DC Probe Kit

- Invaluable for work involving extremely high voltages
- Multiplier factor of 100 on DC ranges of 11 megohm input meters
- 1100 megohm input for measuring voltage in hi-Z circuits

Kit 336, 1 lb. \$6.00
Assembled, 336W, 1 lb. \$7.50



A Heathkit IM-18 VTVM

- One probe makes all measurements • 7 AC, 7 DC, 7 Ohms ranges • Two-color scales are easy to read • Precision, sensitive, high-quality 4½" 200 µA meter • 1% precision divider network resistors • Extended frequency response ±1 dB 25 Hz to 1 MHz • Measures RMS and peak-to-peak AC voltage • Circuit board construction for easy assembly and exceptional stability • New beige and brown instrumentation colors • Wiring options for 120/240 VAC operation

For More Than 19 Years, Heathkit VTVM's have been the world's most popular meters and it's easy to see why. Convenient size, practical meter ranges, single test probe and low cost, have made them a remarkable value. And now the IM-18 continues this tradition of value by adding some features of its own to those established by its predecessors . . . handsome Heathkit styling in beige and brown, dual primary transformer to permit either 120 VAC or 240 VAC wiring and a three-wire line cord for added safety.

Check The IM-18 Specifications. You'll agree that for all-around performance at a low cost, the IM-18 is out in front to stay. Order yours now.

Kit IM-18, 5 lbs. \$29.95
Assembled IMW-18, 5 lbs. . . no money dn. \$49.95

IM-18 SPECIFICATIONS—Meter scales: DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. AC peak-to-peak: 4.0, 14, 40, 140, 400, 1400, 4000. Resistance: 10 ohm center scale x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures .1 ohm to 1000 megohms. Meter: 4½" 200µA movement. Multipliers: 1% precision type. Input resistance: DC: 11 megohms (1 megohm in probe) on all 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 volt size "C" flashlight cell (not supplied). Power requirements: 105-125 or 210-250 VAC, 50/60 Hz, 10 watts. Dimensions: 7½" H x 4¼" W x 4¼" D.

B Heathkit IM-28 "Service Bench" VTVM

- Measures AC volts (RMS), DC volts, resistance, and audio levels • 7 AC volts, 7 DC volts, and 7 resistance ranges • Separate 1.5 & 5 volt AC scales for high accuracy • Large, easy-to-read 6 inch meter face • Gimbal mounting bracket for added visibility from all locations around the test bench • Smooth ten-turn vernier controls for zero & ohms adjust • One test probe for all measurements—the ground lead has an alligator clip for added convenience • Easy calibration • Extra wide response • Quick, positive operation • Dual primary transformer for 120/240 VAC operation • New Heathkit beige and brown instrument colors • Fast, simple construction • Now kit or assembled

The IM-28 Has The Same Performance Specifications As The IM-18 . . . 7 AC scales . . . 7 DC scales . . . 7 Ohms ranges . . . 1% precision resistors . . . extended frequency response to 1 MHz . . . but it also has features all its own to make it more useful for service and repair work. The separate 1.5 & 5 VAC scales make reading those small voltages easy, and the large 6" meter gives you readings at a glance. All calibration controls are adjustable from the front panel too . . . no need to remove the attractively styled cabinet. The handy gimbal mounting bracket saves valuable space on your bench and makes the IM-28 easy to read and use from any location. Choose the IM-28 either kit or assembled . . . either way you'll reap big savings over comparable units. Put this top performing VTVM on your bench soon.

Kit IM-28, 7 lbs. . . no money down. \$39.95
Assembled IMW-28, 7 lbs. . . no money down. \$59.95

IM-28 SPECIFICATIONS—Meter scales DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale (1.5 and 5 volt AC ranges read on separate scales). Ohm-meter: Scale with 10 ohm center x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures 1 ohm to 1000 megohms with internal battery. Dividers: 1% precision type. Meter: 6" 200 µA movement. DC Input resistance: 11 megohms (1 megohm in probe) on all ranges. AC Input impedance: 1 megohm shunted by 40 pF (measured at input terminals). 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: 1.5 volt size "C" flashlight cell (not supplied). Power requirements: 105-125 or 210-250 volts 50/60 Hz, AC 10 watts. Dimensions: 5" H x 12¼" W x 4¼" D.

C Heathkit MM-1 VOM

- 20,000 Ohms/Volt meter movement • 2-color meter scale • Sensitive 50 microampere 4½" meter • 1% precision resistors for accuracy & stability • Polarity reversing switch

An Ideal Meter For All-Around Service Applications. Provides wide voltage, current, resistance, & dB ranges to cover most service requirements. Battery power and compact size make it well suited to field and test bench applications. Test leads included. Less batteries.

Kit MM-1, 5 lbs. \$34.95

MM-1 SPECIFICATIONS—Sensitivity: 20,000 ohms/volt DC, 5000 ohms/volt AC. Ranges: AC & DC volts: Full scale, 1.5, 5, 50, 150, 500, 1500, 5000. Direct current: 150 microamperes, 15, 150, 500 milliamperes, 15 amperes. Ohmmeter: 0.2 ohms to 20 megohms in three ranges. Decibels: —10 to +65 dB. Resistors: 1% precision type. Accuracy: ±3% of full scale. Controls: Range switch; Output, AC, DC, Reverse DC switch, Ohms adjust control. Batteries: 1 type "C" cell, 4 penlite cells. Dimensions: 7½" x 5½" x 4".

D Heathkit IM-38 Laboratory AC VTVM

- Especially useful for low-level AC & audio measurements • 10 voltage ranges—from 0.01 to 300 volts RMS full scale • Extended frequency response, ±1 dB from 10 Hz to 500 kHz • 10 megohm input impedance for high accuracy—minimal effect on circuitry under test • Calibrated scale for audio measurement • VU-type ballistic meter damping • New Heathkit instrumentation color styling • 120/240 volt wiring options—no special export order required

A Compact Instrument For Audio Design And Development, Laboratory Analysis Or General Service Work . . . features the same practical size as the Heathkit IM-18 VTVM, plus precision components for extended accuracy in measuring low-level AC voltages. A precision voltage divider provides 10 ranges, 10 millivolts to 300 volts RMS full scale.

Optimum Circuit Design . . . utilizes the high input impedance characteristics of the cathode follower which reflects 10 megohms to circuits under test. Total meter amplifier includes two stages with filament voltages supplied from a transformer winding balanced to ground to keep AC noise to a minimum.

Kit IM-38, 4 lbs., no money dn. \$41.95
Assembled IMW-38, 5 lbs., no money dn. \$57.95

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 volts 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 volts, 10 megohms shunted by 22 pF on ranges .01 to 3 volts. Tube complement: (1) 6AV8, (1) 6EJ7/EF184. Accuracy: Within 5% of full scale. Power requirements: 105-125/210-250 VAC, 50-60 Hz, 10 watts. Dimensions: 7¾" H x 4¼" W x 4¼" D.

E Heathkit IM-17 Volt-Ohm-Meter

- Solid-state circuit—high impedance FET input, 4 silicon transistors, 1 diode • 4 AC voltage ranges • 4 DC voltage ranges • 4 ohm ranges • 11 megohm input on DC • 1 megohm input on AC • 4½", 200 µA meter • Battery powered • Rugged molded plastic dark beige case features positive locking self cover with handle, and includes convenient storage space for test leads • Easy-to-build circuit board construction • Not recommended for use in RF fields.

The handiest piece of electronic equipment you can own. Perfect for homeowners, do-it-yourselfers, hobbyists, boaters, model builders, CB'ers, hams—just about everyone. And the IM-17 is even sophisticated enough for radio and TV servicing.

Does Hundreds Of Everyday Measurements At Lowest Cost. Features four ranges on AC and DC volts that measures from 1 to 1000 volts full scale . . . four resistance ranges (10 ohms center scale x1, x100, x10K, x1M) that measure from 0.1 ohm to 1000 megohms. All ranges are multi-colored. As an added convenience, there's an extra jack to connect high voltage and RF probes to extend its basic capabilities.

Battery Powered To Work Anywhere . . . runs on a "C" cell and an 8.4 V mercury cell (same as used in transistor radios). The IM-17 is housed in a tough, heavy duty, molded beige plastic case with a positive locking cover that stays closed under rough handling, yet opens with a flick of a finger to expose the tilted front panel and generous storage area. Also features zero and ohms-adjust controls, DC polarity reversing switch to eliminate lead switching, plus a continuous rotation 12-position function switch. Easy circuit board construction and the famous Heath manual combine to make assembly quick and enjoyable. Build the IM-17 in 3 or 4 hours . . . use it for years to come.

Kit IM-17, 4 lbs. \$21.95

IM-17 SPECIFICATIONS—DC VOLTMETER: Four Ranges: 0-1, 10, 100, 1000 volts full scale. Input resistance: 11 meg. on all ranges. Accuracy: ±3% of full scale. AC VOLTMETER: Four Ranges: 0-1, 10, 100, 1000 volts full scale. Input resistance: 1 meg. on all ranges. Accuracy: ±5% of full scale. Frequency response: ±1 dB, 10 Hz to 1 MHz. OHMMETER: Four Ranges: Rx1, x100, x10K, x1 meg. POWER SUPPLIES: Ohms circuit: 1.5 V "C" Cell. Amplifier circuit: 8.4 V mercury cell (NEDA #1611), batteries not supplied. GENERAL: Meter: 4½", 200 µA, 100° movement. Dimensions: 8½" W x 4¼" H x 7¼" D.

F New Heath IM-103 Line Voltage Monitor

The Ideal Accessory for labs, shops, hams & Cber's, hobbyists. Improper line voltage can cause poor operation of test equipment and circuits. With the new solid-state IM-103, you always know what your line voltage is. 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. Add this highly useful accessory to your bench now.

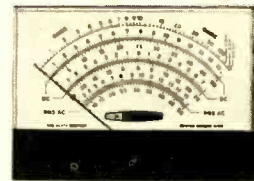
Kit IM-103, 3 lbs. \$15.95

IM-103 SPECIFICATIONS: Voltage Range: 90 VAC (rms) to 140 VAC (rms). Voltage Accuracy (Sine Wave): ±2% when calibrated at 95 VAC and 135 VAC from an accurate voltage source, ±5% when calibrated with a known line voltage. Power Requirements: 90 VAC (rms) to 140 VAC (rms), 50 to 60 Hz, 4.2 watts. Dimensions: 5½" H x 6¼" W x 3" D. Net Weight: 2 lbs.



Kit IM-25
\$85⁰⁰

Wired IMW-25
\$120⁰⁰



6", 200 Microamp Meter. Big, bold and readable . . . 150 millivolts is a full-scale reading—15 microamps is a full-scale reading. Easy—accurate.

Unique Heathkit IM-25 Solid-State High Impedance Volt-Ohm-Milliammeter

- 9 DC voltage ranges from 150 millivolts full scale to 1500 volts full scale • 9 AC voltage ranges from 150 millivolts full scale to 1500 volts full scale • 7 resistance ranges, 10 ohms center scale x1, x10, x100, x1k, x10k, x100k, x1 meg . . . measures from one ohm to 1000 megohms • 11 current ranges from 15 μ A full scale to 1.5 A full scale • 11 megohm input impedance on DC • 10 megohm input impedance on AC • Response to 100 kHz • 6" 200 μ A meter with Zero center scales for positive and negative voltage measurements without switching • 1% precision resistors • 13 silicon transistors plus 2 field effect transistors • Separate range switch for each test function eliminates constant switching • Ten-turn thumbwheel zero adjustment for precision settings • Portable or "line" operation . . . built-in 120/240 VAC, 50-60 Hz power supply, plus in-cabinet holders for batteries • Circuit board assembly • New Heath instrument styling with "unitized" construction and low profile appearance—color styled in handsome beige and black • Not recommended for use in RF fields

DESIGNED FOR ANALYSIS OF MODERN SOLID-STATE CIRCUITS . . . extra low current and voltage ranges enable the IM-25 to make all measurements required in both tube & transistor circuit work. And it does them with the low circuit loading, high impedance input of a VTVM, the convenient versatility of a VOM and the sensitivity of separate lab instruments.

ENGINEERED FOR UTILITY . . . for example, the "floating" input isolates circuit ground from the cabinet; the cabinet is grounded through the 3-wire line cord. Troublesome ground loops due to line coupling are easily eliminated by switching to battery power and disconnecting the line

cord. Zero-drift when changing from battery to line operation is negligible due to double Zener-diode regulation. DC voltage measurements require only a shorted input check of meter zero for maximum specified accuracy. And the ten-turn thumbwheel gives precise zero settings. Change from DC volts to Ohms-mA-AC with just a flip of the finger-tip switch on the improved probe . . . separate range switches for volts-ohms-mA permit leaving range switches in most-used position, switching function with one simple operation!

SET-AND-FORGET OHMS SCALE ADJUSTMENT. With less than 70 mV applied to the circuit under test, the possibility of circuitry damage or erroneous readings is avoided.

UNITIZED CONSTRUCTION . . . permits removal of top and bottom cabinet shells without impairing the operation of the IM-25—the easy to assemble circuit board is supported within the frame. The new push-on knobs with spring loaded inserts end slipping. Recessed carrying handles in the cabinet shell mounting strips too. Performance, reliability, versatility and value—that's the Heathkit IM-25 Solid-State VOM.

Kit IM-25, 10 lbs., no money down **\$85.00**
Assembled IMW-25, 10 lbs., no money down **\$120.00**

IM-25 SPECIFICATIONS—DC VOLTMETER—9 Ranges: 0-.15, .5, 1.5, 5, 15, 50, 150, 500, 1500 volts 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) to 10k ohm (.015 mA). **Accuracy:** $\pm 4\%$ of full scale. **AC VOLTMETER—9 Ranges:** 0-.15, .5, 1.5, 5, 15, 50, 150, 500, 1500 volts full scale. **Input resistance:** 10 megohm shunted by 150 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 10k 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, single jack input for Probe and Ground connections. Circuit ground isolated from cabinet. **Dividers:** 1% Precision Type. **Meter:** 6", 200 μ A, 100° movement. **Transistors & Diodes:** (2) 2N4304 FET transistor, (13) 2N3393 silicon junction transistor, (1) 9.1 V zener diode, (1) 13 V zener diode, (4) 1N191 germanium diode, (1) silicon Power Supply diode. **POWER SUPPLIES—Ohms circuits:** 3 volts ("C" cells). **Ohms circuit bias:** 1.35 volt (E1N mercury cell). **Amplifier circuit:** 18 volts. Battery operation; "C" cells. Line operation; Transformer operated 1/2 wave circuit, operable on either 120 or 240 V AC, 50-60 Hz. **Dimensions:** 16 1/2" W x 5 7/8" H x 7 3/4" D.



Ultra-Readable, Large, 6" Meter . . . numerals are bold, scales are quick to read, divisions are convenient for interpolation.



A Single Probe with Finger-Tip Flip Switch . . . makes all measurements . . . both probe lead and ground lead go to a single plug.

Kit IM-16
\$46⁹⁵



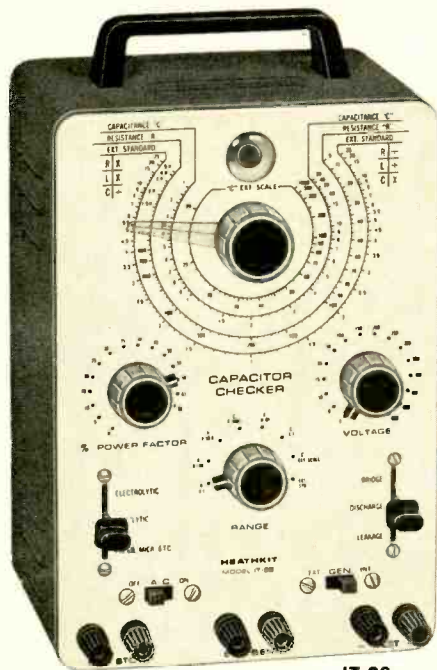
Heathkit IM-16 Deluxe Solid-State Volt-Ohm-Meter . . . Battery Powered Portability Plus Built-In AC Supply

- All solid-state circuitry • For heat-free trouble-free performance & easy portability • 8 DC voltage ranges from 0.5 volts to 1500 volts full scale • 8 AC voltage ranges from 0.5 volts to 1500 volts full scale • 7 ohm ranges x1 (with 10 ohms at center scale), x10, x100, x1k, x10k, x100k, and x1 megohm • 11 megohm input resistance on DC ranges • 1 megohm on AC ranges • Operates either from internal battery or from 120/240V, 50/60 Hz AC line voltage • Zener-diode regulation allows quick change from external to internal power with only a zero-adjust "touch-up" • Essentially drift-free zero • Special alligator clip on probe permits safe, hands-free voltage checks • Requires only 1 standard size "C" cell for "ohms" measurements and one 9 volt NEDA 1602 cell or equivalent for complete portability • Separate switches for individual functions reduce constant knob twisting • Wiring harness and circuit board construction help eliminate frustrating wiring errors, mean lighter weight • New Heathkit "unitized" instrument styling—front panels with straight-forward, uncluttered styling—cabinets that are truly functional, featuring carrying handles and separate top and bottom shells • Cabinet top & bottom shells remove easily to completely expose components and circuitry • Top and bottom are flat so instruments can be safely, conveniently stacked • Handsome beige and black styling • Not recommended for use in RF fields

Low Cost, Highly Versatile. All solid-state high input impedance circuitry, wide range of scales, battery or line voltage operation, easy assembly and handsome Heathkit styling add up to make the IM-16 the best value around. Compare the features . . . then order your IM-16.

Kit IM-16, 10 lbs., no money dn. **\$46.95**

IM-16 SPECIFICATIONS—DC VOLTMETER—8 Ranges: 0.5, 1.5, 5, 15, 50, 150, 500, 1500 volts. **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 volts. **Input resistance:** 1 megohm. **Accuracy:** $\pm 5\%$ full scale. **OHMMETER—7 Ranges:** x1 (10 ohm center scale), x10, x100, x1k, x10k, x100k, x1 megohm. Terminal voltage 70 mV (not sufficient to cause diode junction conduction). **Input—probe with shielded cable:** AC-Ohms/DC switch in probe. (Single plug for probe & common connections.) Circuit ground isolated from cabinet. **POWER SUPPLIES—Amplifier circuit:** Power line, 120/240 V, 50/60 Hz, AC. Battery; 9 V. NEDA 1602 or equivalent. **Ohms circuit:** Battery; 1.5 V (one "C" cell). **GENERAL SPECIFICATIONS—Voltage dividers:** 1% precision resistors. **Meter:** 6", 100 μ A (100° movement). **Transistor & diode complement:** (1) Field effect transistor; (6) 2N3393 silicon transistors; (1) 6.8 V. zener diode; (4) silicon diodes. **Dimensions:** 16 3/4" L x 7 3/4" D x 5 3/4" H. **Net weight:** 7 1/2 lbs. (with batteries).



IT-28
\$36⁵⁰

Heathkit Capacitor Checker . . . Complete, Accurate Capacitor Analysis At Low Cost

- Provides complete analysis of all capacitor types • Direct reading scales—no involved calculations • Features low bridge voltage for safe testing of miniature electrolytics • 16 leakage testing voltages • Measures capacitance from 10 pF to 1,000 uF • Measures resistance from 5 ohms to 50 megohms • Comparator circuit measures "L", "C" or "R" with external standard • Calibrated power factor control • "Eye" tube null & leakage indicator • Requires VTVM for alignment

FAST, EFFICIENT AND ACCURATE . . . The IT-28 has everything you need to do a complete analysis of any capacitor. Measure capacitance from 10 pF to 1000 uF in four switched ranges, using the eye tube as a null indicator. Read value from the calibrated scale directly—no figuring to do. Measure leakage in three sensitivity ranges: 2 mA for electrolytics; 15 uA for miniature transistor type electrolytics and 2 uA for paper, mica, ceramic, etc., 16 switch-selected leakage voltages—from 3 to 600 VDC. Features a low voltage bridge—no danger of damaging low voltage miniature electrolytics.

HIGHLY VERSATILE. With the IT-28 you can also measure unknown resistors . . . three ranges, from 5 ohms to 50 megohms. By using external standards with the comparator circuit, "L", "C" and "R" values can also be determined. Determine transformer turns ratio quickly and read directly off the dial. External generator provisions are included to allow measurements at frequencies up to 10 kHz.

HANDSOME STYLING. There's no more fumbling with control knobs that are difficult to turn . . . no more guessing about settings. The newly styled knobs on the IT-28 provide a sure, firm grasp and the pointers show up quickly on the clear, distinct panel markings. Styled in the "new look" beige and black of Heathkit instrumentation, the IT-28 stands out on a crowded service bench. For versatility, accuracy, value and performance, you can't beat the IT-28.

Kit IT-28, 7 lbs., **\$36.50**

IT-28 SPECIFICATIONS—Test Circuit: AC bridge, powered through special bridge transformer by the 50/60 Hz supply or by an external audio generator with 10 volts output. Upper frequency limit: 10 kHz. **Capacitance:** 4 Ranges: 10 pF to .005 uF; .001 uF to .5 uF; .1 uF to 50 uF; 20 uF to 1000 uF. **Capacitor leakage:** DC test voltages from 3 to 600 volts in 16 steps. **Resistance:** 3 Ranges: 5 ohms to 5000 ohms; 500 ohms to 500 K ohms; 50 K ohms to 50 megohms. **Comparator circuit:** External standard R, L, or C; Max. Ratio 25:1. **Power supply:** Transformer-operated, half-wave rectifier. **Power requirements:** 105-125 V or 210-250 V AC, 50/60 Hz, 30 watts. **Dimensions:** 9 1/2" H x 6 1/2" W x 5" D.



Kit IM-58
\$65⁰⁰

Heathkit Harmonic Distortion Meter

- Measures harmonic distortion as low as 1% full-scale reading • Frequency range—20 to 20,000 Hz • Meter scales calibrated in volts RMS, % distortion, and dB • Measures noise levels down to -60 dBm • Quality components for precision measurements • Easy assembly & operation • Full instructions included • 120/240 V operation • New styling • Requires Audio Generator for alignment

ACCURATELY MEASURES HARMONIC DISTORTION AT ANY FREQUENCY BETWEEN 20 AND 20,000 Hz. With an audio generator such as the IG-72 as a signal source, the IM-58 indicates the residual signal in an amplifier under test after the fundamental frequency has been suppressed. Gives an accurate reading of hum, noise, and harmonic distortion. Distortion values are read directly from 0 to 1, 3, 10, 30, and 100% full scale. Noise level measurements are read on a separate dB meter scale. High input impedance and 1% precision resistors in the VTVM voltage divider.

Kit IM-58, 13 lbs., no money dn. **\$65.00**

IM-58 Specifications—Frequency: 20 Hz to 20,000 Hz in three ranges. **Distortion:** 1, 3, 10, 30, 100% full scale. **Voltmeter:** 1, 3, 10, 30 volts full scale. **Input resistance:** 300 k ohm. **Minimum input voltage for distortion measurements:** 0.3 volts. **Output voltage for monitoring:** 2.5 volts at full scale meter reading. **Accuracy:** Voltmeter, $\pm 5\%$; Distortion, $\pm 5\%$ of full scale, $+0.1\%$ distortion. **Tube complement:** OA2, 6X4, 5879, 12AT7, 12AX7, 12BY7. **Power requirement:** 105-125 V or 210-250 V 50/60 Hz AC, 30 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

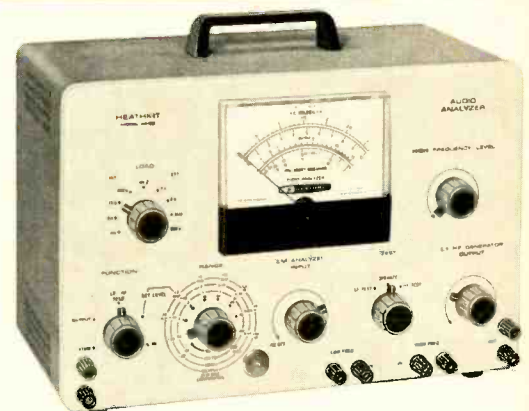
Heathkit Audio Intermodulation Analyzer

- Efficiently combines the function of AC VTVM, Wattmeter, and IM Analyzer
- Built-in high and low frequency signal sources for IM tests • Built-in load resistors for 4, 8, 16, & 600 ohms • Easy to read meter • Manual includes complete instructions • 120/240 V operation • New Heathkit styling

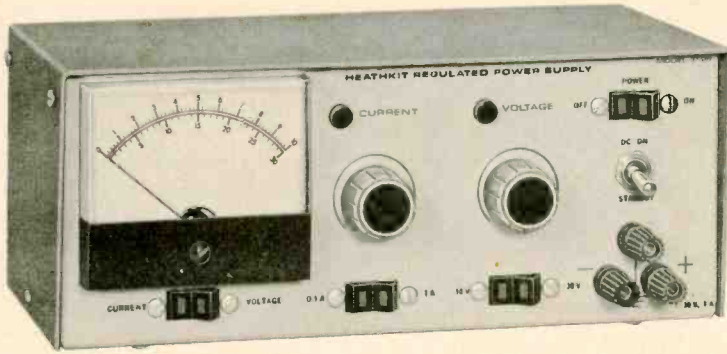
THREE AUDIO TEST INSTRUMENTS IN ONE . . . performs complete intermodulation distortion analysis on monaural or stereo high fidelity equipment. Eliminates a benchtop cluttered with instruments and test leads. Built-in non-inductive load resistors add extra convenience for versatile circuit analysis. Built-in 60 Hz and 6 kHz signal sources for IM tests . . . no additional equipment required.

Kit IM-48, 13 lbs., no money dn. **\$69.00**

IM-48 Specifications—Frequency response—AC VTVM: 10 Hz to 100 kHz ± 1 dB. **Wattmeter:** 10 Hz to 50 kHz ± 1 dB. **I.M. Analyzer high pass filter:** 2000 Hz to 12,000 Hz. **I.M. Analyzer low pass filter:** 10 Hz to 600 Hz. **AC VTVM Range:** .01, .03, .1, .3, 1, 3, 10, 30, 100, 300 volts RMS full scale. **dBm:** -40, -30, -20, -10, 0, +10, +20, +30, +40, +50. Reads from -65 to +52 dBm. **Wattmeter:** 0.15 mW, 1.5 mW, 15 mW, 150 mW, 1.5 W, 15 W, 150 W, full scale. Maximum continuous power 25 watts, intermittent power to 50 watts. **I.M. Analyzer:** 1%, 3%, 10%, 30%, 100% full scale. **Input impedance—AC VTVM:** 1 megohm or 4, 8, 16 or 600 ohm switch selected. **I.M. Analyzer:** 1 megohm or 4, 8, 16 or 600 ohm switch selected. **Wattmeter:** 4, 8, 16 or 600 ohm internal load, 10,000 ohm across external load. **Output Impedance—low and high frequency output:** 3000 ohm (600 ohm when shunted with 750 ohm resistor). **Internal generator frequencies—low frequency:** 50/60 Hz (line frequency); **High frequency:** approximately 6 kHz. **Accuracy—AC VTVM and wattmeter:** Within 5% of full scale. **I.M. Analyzer:** Within 10% of full scale. **Power requirements:** 105-125 or 210-250 volts 50/60 Hz 20 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.



Kit IM-48
\$69⁰⁰



A
Kit IP-28
\$47⁵⁰



B
IP-18
\$21⁹⁵



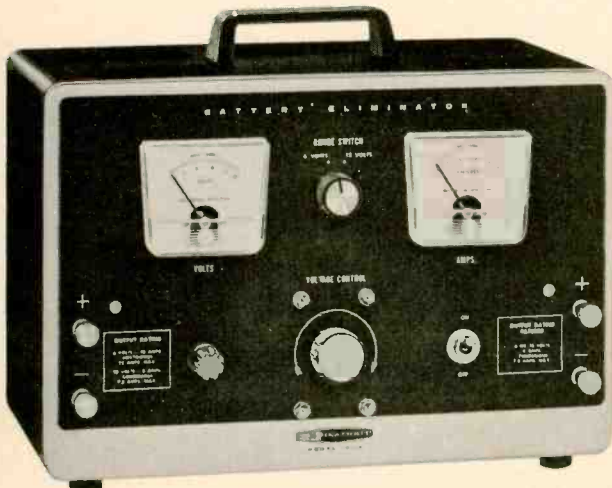
C
Kit IP-27 Wired IPW-27
\$79⁹⁵ \$125⁰⁰



E
Kit IP-17 Wired IPW-17
\$69⁹⁵ \$110⁰⁰



F
EU-40A
\$100⁰⁰



D
IP-12
\$59⁹⁵



G
EU-41A
\$65⁰⁰

A Heathkit IP-28 Regulated Power Supply, 1-30 VDC, With Adjustable Current Limiting

- Continuously variable output voltage in two ranges . . . 1-10 VDC and 1-30 VDC
- Continuously adjustable current-limiting in two ranges . . . 10-100 mA and 10 mA-1A
- Switch-selected metering function for both output voltage and current
- Pilot lamps indicate which function is being metered
- Good load and line regulation
- External voltage sensing
- External AC or DC Programming
- "Floating" output for either + or — ground
- Standby switch removes voltage from load without disturbing connections
- 120/240 VAC wiring options
- All solid-state construction for long life and top reliability
- Handsome Heathkit styling
- Easy to build with circuit board-wiring harness construction

A Versatile Low Voltage Source For All Transistor Work. It delivers up to 30 VDC at 1 amp with less than 50 mV variation . . . and less than 20 mV using Remote Sensing. Two continuously variable, switch-selected voltage ranges (1-10 VDC & 1-30 VDC) give the versatility you need for today's solid-state circuitry; and the two range (10-100 mA & 10 mA-1A) switch-selected adjustable current-limiting protects the load. Meter shows either voltage or current. AC or DC programming terminals are on back panel.

Kit IP-28, 9 lbs. \$47.50

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: 105-125 or 210-250 VAC, 50/60 Hz, 50 watts, at full load. Dimensions: 10 3/4" W x 4 3/4" D x 6 1/2" H overall. Net weight: 6 1/2 lbs.

B Low Cost Heathkit IP-18 Solid-State 1-15 VDC Power Supply

- Adjustable current limiting
- Output up to 500 mA continuous at 1-15 VDC
- AC and DC programming inputs
- "Floating" output for either positive or negative ground
- Darlington pair voltage regulation circuit
- Simple circuit board construction
- Compact size
- So low in cost you can afford one for positive supply, one for negative supply
- Requires VOM for adjustment

Ideal For Transistor Work. Here in one compact design is a solid-state power supply with voltage regulation, adjustable current limiting, AC or DC programming, and the correct output voltages . . . all at a remarkably low cost. Has less than 50 mV variation from no load to full load; less than 50 mV change in output voltage for a 10% change in line voltage input. Ripple and noise are less than 5 mV.

Kit IP-18, 5 lbs. \$21.95

IP-18 SPECIFICATIONS—Voltage output: 1-15 VDC, continuously adjustable. Load regulation: 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: 105-125 or 210-250 VAC, 50/60 Hz, 15 watts at full load. Dimensions: 5 1/2" W x 4 3/4" H x 5 3/4" D. Net weight: 3 1/4 lbs. Programming: AC or DC, 5000 ohm input resistance.

C IP-27 Solid-State Regulated Low Voltage Power Supply

- Zener reference-voltage power supply
- Virtually immune to overload from exotic transients
- 4 current ranges, 50 mA to 1.5 A
- Adjustable current limiting 30% to 100% all ranges
- Regulation better than \pm 15 millivolts

The Finest Low Voltage Supply Heath Has Ever Offered: Versatility and value are the reasons so many IP-27 supplies are used in shops, schools, and labs. 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 (meter scales are color matched to range switch markings). Panel meter may be switched from voltage to current. The relay is protected from short circuits and overloads. For higher outputs, several IP-27 supplies may be connected in series or parallel. Put the IP-27 to work for you now.

Kit IP-27, 16 lbs., no money dn. \$79.95
Assembled IPW-27, 14 lbs., no money dn. \$125.00

IP-27 SPECIFICATIONS—Input: 105-125 volts or 210-250 volts, 50/60 Hz; 135 watts at full load (50 V, 1.5A). Output: 0.5-50 volts DC; 1.5 amps max. DC. Load regulation: \pm 0.05% 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 microvolts. Transient response: Less than 25 microseconds. 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 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 3/4" H x 13 1/4" W x 9" D.

D IP-12 Battery Eliminator . . . Two Ranges with Variable Control for Versatile Servicing Needs

- Convenient switch-selection of 6 or 12 volt DC power
- Separate outputs for filtered & unfiltered DC
- Special filtering circuit holds AC ripple to less than 0.3%
- Separate panel meters for output voltage & current
- Doubles as a battery charger
- Heavy-duty well-rated components
- Dependable silicon diode rectifier circuit provides high efficiency

Kit IP-12, 18 lbs. no money down \$59.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IP-12 SPECIFICATIONS—Continuously variable output: 6 volt range: unfiltered, 10 amp continuous, 15 amp maximum; filtered, 5 amp continuous, less than .3% ripple. 12 volt range: unfiltered, 5 amp continuous, 7.5 amp maximum; filtered, 5 amp continuous, less than .3% ripple. Power requirements: 105-125 volts 50/60 Hz AC at 200 watts. Dimensions: 13" W x 8 1/2" H x 7" D.

E IP-17 Variable Regulated High Voltage Power Supply

- 6V and 12V AC filament voltage
- B+ from 0 to 400 VDC, bias from 0 to —100 VDC
- Separate voltage and current meters
- Regulation better than 1% up to 100 mA
- Isolated output
- Circuit board construction

Hundreds of Uses . . . for experimenters, servicemen, physics and chemistry labs, engineers. Its many supply voltages may be used in any combination up to 25 volt-amperes AC load.

Versatile Features . . . Separate filament and high voltage transformers permit switching all high voltages off while test circuit changes are made. Separate meters permit simultaneous observation of voltage and current output . . . the voltmeter can be switched to monitor bias voltage. AC and DC outputs are isolated from ground and each other (3/4" spacing to accept dual banana plugs). Circuit board construction with wiring harness make assembly easy. Put this fine lab power supply to work for you now.

Kit IP-17, 21 lbs. \$69.95
Assembled IPW-17, 19 lbs. \$110.00

IP-17 SPECIFICATIONS—Output: 0-400 volts regulated DC at 0-100 mA cont., 125 mA intermittent, 0 to —100 volts DC at 1 mA variable bias voltage, 6.3 volts AC at 4 amps., 12.6 volts 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 \pm 10 V change at 117 V AC 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: 105-125 V or 210-250 V, 50/60 Hz, 150 watts max. Dimensions: 5 1/2" H x 13 1/4" W x 11" D.

F New Heath/Malmstadt-Enke Solid-State Regulated HV Power Supply

- 50 to 300 VDC output
- 20 mA current limiting
- Overcurrent indicator light
- 6.3 VAC output for filaments
- Output regulated to 1%
- Less than 50 mV ripple & noise
- Output available at 5-way binding posts and octal socket
- Suitable for all tube circuits & SCR's, thyratrons, HV transistors, etc.
- Fully compatible with M-E Lab & new EU-51A System

The EU-40A supplies medium voltage DC power for experimental circuits using vacuum tube, glow-tube, thyatron, SCR, high-voltage transistors and other such devices. It's part of the Malmstadt-Enke Lab, and is compatible with the EU-51A Experimental Patch System.

Assembled EU-40A, 7 lbs. \$100.00

EU-40A SPECIFICATIONS—DC POWER SUPPLY: Output voltage: 50-300 DC, in 50 volt steps with each step continuously variable over 50 volt range. Output current: 0-20 mA regulated. 25 mA with output shorted. Regulation: 1% no load to full load. 0.5% with line voltages between 105 and 125 volts (or 210 to 250 volts). Ripple and noise: 50 mV maximum with either side of output to ground. Output impedance: Less than 0.5 ohm/V. Temperature range: 10 degrees C to 40 degrees C. 50 degrees F to 104 degrees F. AC POWER SUPPLY: Output voltage: 6.3 volts AC, center tapped. Output current: 1 ampere. GENERAL: Power requirements: 105-125 volts, or 210-250 volts, 50/60 Hz, 21 watts maximum at full load. Dimensions: 5" H x 8 1/4" W x 7 3/4" D. Weight: 4 1/4 lbs.

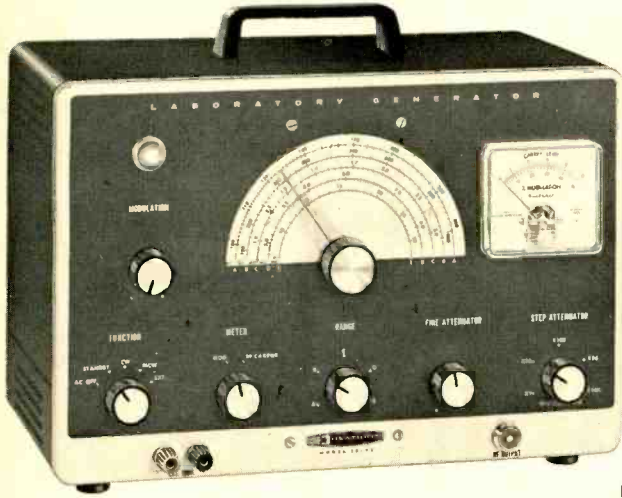
G New Heath/Malmstadt-Enke Regulated Solid-State LV Power Supply

- Variable output from 0-15 VDC
- Adjustable current limiting from 35-750 mA
- Overcurrent indicating light
- Output regulated to 0.02%
- Stable at 0.02% in 8 hrs.
- External programming feature
- Output available at 5-way binding posts or octal socket
- Fully compatible with M-E Lab and new EU-51A System

The EU-41A supplies low voltage DC power. When a person has both the EU-40A (above) and EU-41A he can power a wide range of vacuum tube and transistor circuits. The EU-41A is completely compatible with the EU-51A Experimental Patch System.

Assembled EU-41A, 7 lbs. \$65.00

EU-41A SPECIFICATIONS—Output voltage: 0-15 volts DC, continuously variable. Output current: 0-750 mA. Current limiting: 35-750 mA continuously variable. Current limit indicator: Lights when the preset current level is exceeded. Regulation: \pm 0.02% with line voltages between 105 and 125 volts (or 210 to 250 volts) or load current from 0-750 mA. Ripple: 0.2 mV RMS. Stability: \pm 0.02% for 8 hours. Temperature range: 10 degrees C to 40 degrees C. Temperature coefficient of voltage: \pm 0.01% per degree C. External programming: Output to input voltage ratio is adjustable from 0 to 1.2:1. Input impedance is 8,000 ohms. Power requirements: 105-125 volts, or 210-250 volts, 50/60 Hz, 55 watts maximum at full load. Dimensions: 5" H x 8 1/4" W x 7 3/4" D. Weight: 4 1/4 lbs.



IG-42
\$64⁹⁵

Heathkit Laboratory RF Generator

- Accurately metered output voltage and % modulation
- Operates on fundamentals—100 kHz to 31 MHz in five bands
- Double shielding on all oscillator circuits • Easy to build with point-to-point wiring

PRECISION CONTROL FOR DESIGN OR CRITICAL TROUBLE-SHOOTING PROBLEMS... the Heathkit IG-42 is adjustable to $\pm 3\%$ frequency calibration accuracy from 100 kHz to 30 MHz... RF output voltage is adjustable from 100,000 microvolts in attenuator steps of 1, 10, 100, 1000, & 10,000 and variable attenuation of 10:1 maximum with an overall accuracy of $\pm 20\%$... and the RF output voltage may be modulated with an internal 400 Hz AF generator to a modulation level from 0 to 50% with an accuracy of $\pm 5\%$. Effective use of internal shielding assures that the metered output level is accurate and free from spurious radiation. The IG-42 can be modulated by external sources from 60 to 10,000 Hz.

WELL-DESIGNED THROUGHOUT... with transformer power supply, generous filtering, voltage regulation, and quality components... for stable, noise-free signals, efficiency, safety. The generator output impedance is 50 ohms, and the terminating resistor, located in a plastic pod at the end of the coaxial cable, is easily changed for specific impedance requirements. Your IG-42 will give you years of reliable performance.

Kit IG-42, 15 lbs., no money down... **\$64.95**

IG-42 SPECIFICATIONS—Frequency range: Band A, 100 to 290 kHz; Band B, 280 to 1000 kHz; Band C, 0.95 to 3.1 MHz; Band D, 2.9 to 9.5 MHz; Band E, 9 to 30 MHz. **RF Output:** Impedance, 50 ohms—voltage adjustable from approx. 5 μ V—100,000 μ V max. **Attenuator:** Coarse, 10:1 per step, 5 steps. Fine, 10:1 continuous, indicated on meter. **Amplitude modulation:** CW, internal 400 Hz or external audio frequencies. **Modulation depth:** 0 to 50% variable, indicated on meter. **Tube complement:** 6AF4, 6AV5, 12AU7, OB2. **Power requirements:** 105-125 or 210-250 VAC 50/60 Hz. **Dimensions:** 13" W x 8 1/2" H x 7" D.



Kit IG-18
\$67⁵⁰

Wired IGW-18
\$99⁵⁰

Sine-Square Wave Generator... Solid-State Reliability... High Accuracy at Low Cost

- Output available from 1 Hz to 100 kHz using repeatable switch-selection • Sine & Square Wave output available simultaneously • Metered sine wave output • Less than 0.1% sine wave distortion • Less than 50 ns square wave rise time
- Floating outputs • 8-position output attenuator for sine waves
- 3-position output attenuator for square waves • 120 v or 240 v wiring options • New Heathkit instrumentation styling
- Easy to build • Requires VOM, AC VTVM & Scope for accurate alignment

A PRECISION SOURCE OF SINE-SQUARE WAVES. The all solid-state circuitry delivers 5% accuracy through the wide range of 1 Hz to 100 kHz. The sine wave section features less than 0.1% distortion thru the audio range, 8 output voltage ranges from .003 to 10 V, switch-selected internal 600 ohm load or external load and metered output of both voltage and dB. The square wave output has an excellent rise time of 50 ns, and three output voltage ranges from 0.1 to 10 volt P-P. Both sine and square waves are available simultaneously and switch selection of the frequency makes for fast operation and constant repeatability. New Heathkit styling makes the IG-18 easy to use, easy to service, and the circuit board construction goes together fast. For top performance at low cost, you can't beat the IG-18.

Order yours now.

Kit IG-18, 12 lbs., no money down... **\$67.50**
Assembled IGW-18, 10 lbs., no money down... **\$99.50**

IG-18 SPECIFICATIONS—GENERAL: Frequency Selection: Digital selection consisting of: 0-100 switch (steps of 10), 0-10 switch (steps of 1), 0-1 control (vernier) & multiplier switch (x 1, 10, 100, 1000). **Frequency Accuracy:** Within $\pm 5\%$. **SINE WAVE OUTPUT:** Frequency Range: 1 Hz to 100 kHz. **Output Voltage Ranges:** 8 ranges, .003 to 10 volts RMS (full scale) with 10 K ohm or higher external load, 6 ranges, .003 to 1 volt (full scale) with 600 ohm internal or external load. **dB Ranges:** -62 dB to +22 dB, -12 dB to +2 dB on the meter and -50 dB to +20 dB on the amplitude switch in 10 dB steps. +2 dB maximum into 600 ohm load. (0 dB = 1 mw in 600 ohm). **Output Variation:** +1 dB 10 Hz to 100 kHz. **Output Indication:** Two voltage and one dB scale on meter. **Output Impedance:** 10 volt range: 0-1000 ohm; 3 volt range: 800-1000 ohm; 1 volt range and lower: 600 ohm. **Meter Accuracy:** $\pm 5\%$ of full scale with proper load termination. **Distortion:** Less than 0.1% from 10 Hz to 20 kHz. **Type of Circuit:** Differential amplifier with complementary-pair output. Notch filter frequency determination. **SQUARE WAVE OUTPUT:** Frequency Range: 5 Hz to 100 kHz. **Output Voltage Ranges (Peak-To-Peak):** Three Ranges: .1, 1, 10 volt into 2000 ohm load or higher. **Output Impedance:** .1 V and 1 V ranges: 52 ohm; 10 V range: up to 220 ohm. **Rise Time:** Less than 50 ns. **Dimensions:** 5 1/8" H x 13 1/4" W x 7" D. **Net Weight:** 7 lbs. **Power Requirements:** 105-125 VAC or 210-250 VAC. 50/60 Hz, 6 watts.

Heathkit Visual-Aural Signal Tracer... Speeds Trouble-shooting

- Ideal for trouble-shooting transistor & tube-type AM receivers & audio equipment • Traces RF, IF, and audio signals • Locates troublesome noisy or intermittent components • Convenient audio/ RF probe with switch • Doubles as a test amplifier or speaker

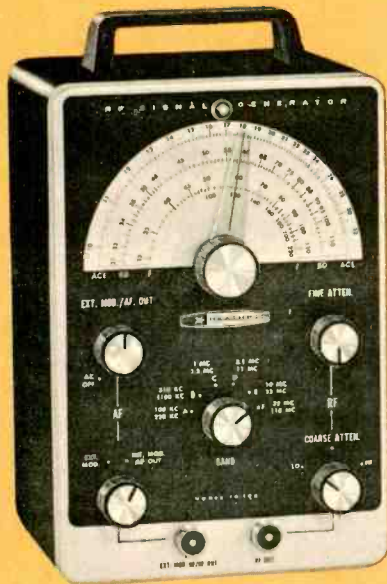
A QUICK, SAFE WAY TO TROUBLE-SHOOT TRANSISTORIZED CIRCUITRY... applies no voltage to circuit under test. Safe for delicate transistor circuits easily damaged through ordinary vacuum tube testing procedures. And even the minute signals of phono pickups, etc., can be checked out, since the IT-12 features a high-gain amplifier with adjustable level control. A worthwhile investment for time-saving test facilities.

Kit IT-12, 6 lbs. **\$24.50**

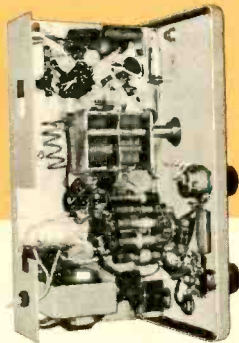
IT-12 SPECIFICATIONS—Power Supply: Transformer operated. **Power requirements:** 105-125 or 210-250 VAC 50/60 Hz. 25 watts. **Tube complement:** 12AX7, 12CA5, 1629. **Speaker:** 3 1/2" PM. **Probe and test leads:** 4' input lead for RF and audio with switch on probe body, 2-3' panel test leads with alligator clips. **Dimensions:** 4 1/2" W x 7 1/2" H x 4" D.



IT-12
\$24⁵⁰



Kit IG-102
\$31⁹⁵



Factory Aligned Coil And Bandswitch Assembly . . . assures accurate tuning calibration.



Kit IG-72
\$46⁹⁵

Wired IGW-72
\$69⁹⁵



Precision components . . . clean parts layout . . . well thought out circuitry . . . all combine to make a dependable instrument.

General Purpose RF Signal Generator Covers 100 kHz To 220 MHz With 2% Tuning Accuracy

- Covers 100 kHz to 220 MHz in six bands • 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 • High-level "RF Direct" output on Berkeley Physics Laboratory version

WIDE TUNING RANGE AND ACCURATE FREQUENCY CALIBRATION HAVE MADE THE IG-102 WIDELY IMITATED . . . and widely chosen too! The versatility and accuracy of this instrument, plus its low price, have put it into thousands of service shops and laboratories the world over. The value of a wide range test instrument and the additional manual entitled "How To Understand And Use Your Signal Generator" (see page 70) have caused the IG-102 and its sister the IGW-19 to be chosen by literally thousands of educational institutions, as well. Check the specifications. Chances are the IG-102 is the instrument you require.

400 Hz AM MODULATED OR UNMODULATED RF OUTPUT . . . OR 400 Hz AUDIO ALONE . . . are the signals available. The 100,000 microvolt RF output is controlled by both fixed-step and variable attenuators. The 400 Hz output is 10 volts under no-load conditions.

WIRED BERKELEY PHYSICS LABORATORY VERSION (IGW-19) . . . features the additional direct RF output jacks necessary for the Berkeley Physics Laboratory experiments, and a 3% tuning accuracy of the modified instrument. (Caution! This version of the instrument is not suitable for radio and TV servicing, since high-level RF radiates from the additional output jacks.) Order The IG-102 For The Best Value In General Purpose RF Generators . . . Bar None!

Kit IG-102, 7 lbs. \$31.95
IGW-19, Assembled Educational Model, 6 lbs. \$65.00

IG-102 SPECIFICATIONS—Frequency range: Band A, 100 kHz to 320 kHz; Band B, 310 kHz to 1.1 MHz; Band C, 1 MHz to 3.2 MHz; Band D, 3.1 MHz to 11 MHz; Band E, 10 MHz to 32 MHz; Band F, 32 MHz to 110 MHz. **Calibrated harmonics:** 100 MHz to 220 MHz. **Accuracy:** 2%. **Output:** Impedance, 50 ohms; Voltage, 100,000 μ V. **Modulation:** Internal, 400 Hz, 30% depth; External, approx. 3 V across 50 k ohms for 30%. **Audio output:** Approx. 10 V open circuit. **Tube complement:** (1) 12AT7, (1) 6AN8. **Power requirements:** 105-125 or 210-250 VAC 50/60 Hz, 15 watts. **Dimensions:** 6 1/2" W x 9 1/2" H x 5" D.

Heathkit Switch-Selected Audio Generator . . . A Precision Sine-Wave Signal Source

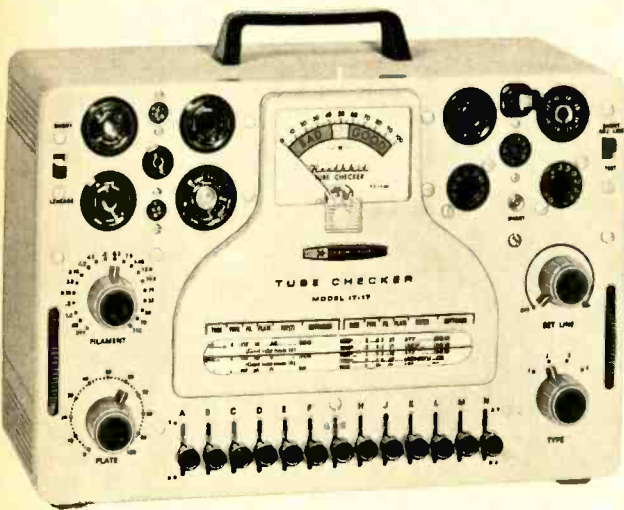
- A near-perfect output signal waveform • Ideal for servicing or trouble-shooting high-fidelity equipment—a required instrument for many R & D applications • Switch-selected output frequencies—10 Hz to 100 kHz • Less than 0.1% distortion from 20 to 20,000 Hz • Panel meter monitors output with scales in volts and dB • Metered output level and switch-selected frequency are accurate to within $\pm 5\%$ from 10 Hz to 100 kHz • Manual includes detailed operating instructions and an analysis of the IG-72's circuitry

LESS THAN 0.1% DISTORTION THROUGHOUT THE AUDIBLE RANGE . . . better than $\pm 5\%$ accuracy of metered output level and switch-selected frequencies from 10 Hz to 100 kHz. Those are the hard and fast specifications of the IG-72. Here is an excellent instrument for R & D work where a low-distortion sinusoidal signal source is required. Switch-selected frequency control saves valuable time, lets engineers flick to the desired frequency without hairline adjustments. First and second digits and multiplier are switch selected from 10 Hz to 100 kHz (Tuning accuracy is specified from 10 Hz . . . distortion percentage from 20 Hz), and the output attenuator is switch selected in 10 dB steps with vernier adjustment on each range. An ideal instrument for production quality control.

HOW CAN A KIT BE A PRECISION INSTRUMENT? . . . many of our potential customers ask. Very easily! . . . if the circuit is designed through careful "know-how" and meticulous testing . . . if durable, precision components are chosen from well-known manufacturers . . . if the layout of components is designed for logical, straight-forward assembly . . . and if the assembly manual is written with insight and care. Very easily for you, the kit-builder, when you choose Heathkit instruments, since that is the heritage built into every Heathkit electronic instrument . . . the IG-72, for example!

Kit IG-72, 8 lbs., no money down \$46.95
Assembled IGW-72, 9 lbs., no money down \$69.95

Export model available for 115/230 VAC, 50-60 Hz; write for prices. **IG-72 SPECIFICATIONS**—Frequency: 10 Hz to 100 kHz, switch selected, 2 significant figures and multiplier. **Output:** 6 ranges 0 to .003, .01, .03, .1, .3, 1 volts RMS into external 600 ohm load or with internal load into Hi-Z, 2 ranges 0 to 3, 10 volts RMS into a minimum of 10,000 ohms, -60 dB to $+22$ dB in 8 steps, -60 dBm to $+2$ dBm (0 dBm = 1 mw into 600 ohms). **Distortion:** Less than .1%, 20 to 20,000 Hz. **Tubes:** (1) 6AU6, (1) 6CL6, (1) 6X4. **Power:** 105-125 or 210-250 VAC 50/60 Hz, 40 watts. **Dimensions:** 9 1/2" W x 6 1/2" H x 5" D.



IT-17
\$54.95

Low Cost Heathkit Tube Checker... Color Styled To Match New Heathkit Instruments

- Fills most daily service requirements • Tests most tube types including new compactrons, nuvistors, novars, and 10-pin miniatures • Multi-colored "Bad-?-Good" meter scale • Tube-data chart is built-in—can't be misplaced • Features constant-tension free-rolling roll chart mechanism • Compact styling with carrying handle • Color-coded wiring harness simplifies point-to-point wiring • Requires AC VTVM for accurate alignment

AN ESSENTIAL INSTRUMENT FOR RADIO & TV SERVICING. 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. A fast, positive evaluation of tube quality. The relative quality is read on a multi-colored "bad-?-good" meter scale and a neon bulb indicator shows filament continuity and leakage or shorts between elements.

FLEXIBLE OVERALL OPERATION. A wide range of filament voltages is available through the front-panel control switch. Cathode current is adjustable. Meter sensitivity is variable for adjustment to individual tube characteristics. And individual switches matrix the tube base contacts. Thirteen 3-position lever switches allow each tube element to be checked independently for open or shorted conditions. These are features that protect your IT-17 against obsolescence... simplify the addition of new tube types to the chart tables. (See note below for replacement roll charts.)

SPECIAL ROLL CHART MECHANISM. The free-rolling chart mechanism featured in the IT-17 is spring-loaded to keep the chart taut as it is examined throughout its entire length. Chart and meter are both illuminated for easy reading of all tube test data.

EASY TO BUILD. Neat, professional wiring and simplified assembly is assured with the color-coded wiring harness and easy-to-follow instructions supplied. Order your Heathkit IT-17 now for dependable test facilities at low cost.

Kit IT-17, 12 lbs... no money down... **\$54.95**

IT-17 SPECIFICATIONS—Tests: Emission, short, leakage, open element, filament continuity. **Sockets:** 4-pin, 5-pin, 6-pin, 7-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:** 1mA BAD-?-GOOD scale, illuminated. **Line voltage adjustment:** Step type. **Roll chart mechanism:** Constant tension, free-rolling, thumb-wheel operation, illuminated. **Filament voltage:** .63, 1.4, 2, 2.35, 2.5, 3.15, 4.2, 4.7, 5, 6.3, 7.5, 9.45, 12.6, 19.6, 25, 32, 50, 70, 110 V AC. **Element test voltages:** 30, 100, 250 V AC. **Power requirements:** 105-125 V AC, 50/60 Hz. **Dimensions:** 13" W x 8 1/2" H x 5 1/2" D.

NEW SUBSCRIPTION SERVICE FOR REPLACEMENT TUBE DATA ROLL CHARTS
Updated replacement roll charts for all Heathkit tube checkers can be purchased either singly or on a subscription basis which assures a new roll chart plus two supplements per year. Prices are \$3.50 per chart; \$5.00 for the new chart plus two supplements during the following year. Write to: Heath Tube Data Service, P.O. Box 377, Hewlett, Long Island, New York 11557



TT-1A
\$179.95

Heathkit Mutual-Conductance Tube Tester Tests Gm For Most Critical Tube Evaluation

- An outstanding array of features • Indicates Gm to 24,000 micromhos • Ultra-sensitive grid current test • Direct reading ohmmeter leakage test • Constant-current heater supplies • Built-in calibration circuit for high accuracy • Built-in roll-type tube data chart • Built-in adapter for testing compactron, nuvistor, novar, and 10-pin miniature tube types • Handsome leatherette covered carrying case.

NO FINER TUBE TESTER IN KIT FORM ANYWHERE. Versatile switching facilities accommodate virtually all tube types. Sure protection against obsolescence. The TT-1A provides quick and accurate tests of mutual conductance (Gm) from 0 to 3,000 micromhos, with multipliers to extend this range to 24,000 micromhos. In addition there is an ultra-sensitive grid current test, a life test, hybrid tube test, a direct-reading ohmmeter leakage test, and more. A disconnect switch removes all voltages from the selector switches to protect both tubes and tester against possible damage during setup. "Cathode buss," "plate buss," and "grid buss," switches allow testing of both sections of a twin triode individually, with only one group of selector switch settings for extra operating convenience.

SPECIAL FEATURES TO ASSURE YOU YEARS OF SERVICE.

Constant-current heater supplies protect against obsolescence by supplying the correct current for tubes requiring a wide range of heater voltages. A switch-operated calibrating circuit designed into the TT-1A assures continued high accuracy for the life of the tester... no standardized tubes required... no extra voltmeters or other instruments. Chosen by professionals in virtually every phase of the electronics industry, the TT-1A offers sophisticated, thorough testing facilities at low cost.

Kit TT-1A, 33 lbs... no money dn. **\$179.95**

TT-1A SPECIFICATIONS—Power requirements: Voltage: 105-125, 60 Hz AC. Watts: 10-60 (dependent upon tube under test). **Plate supply (silicon rectifiers):** DC volts: 26, 90, 135, 225, variable 80 to 200. (Separate DC supply for space charge grids.) **AC volts:** 20, 45, 177. **Bias supply (silicon rectifier):** Low range: 0 to negative 5 volts DC. High range: 0 to negative 20 volts DC. **Signal voltages:** 2, 1, .5, .25 volts AC, 5000 Hz. **Filament supply:** Voltages: .65, 1.1, 1.5, 2, 2.5, 3.3, 5, 6.3, 7.5, 10, 13, 20, 27.5, 35, 47, 70, 115. Currents: 300, 450, 600 mA. (Note: Filament voltage is reduced 10% during life test.) **Testing circuits:** Gm: mutual conductance for amplifiers, 0-24,000 micromhos. Emission: rectifiers and diodes. Leakage: direct reading ohmmeter. Grid current: 1/4 microampere sensitivity. Voltage regulator: firing voltage and regulation tolerance. Low power thyatron: grid characteristics, conduction capabilities. Eye tubes: control grid characteristics. **Meter:** AC: 1000 ohms/volt (1 volt full scale). DC: .89 ma full scale. Scales: Gm, 0-3000 micromhos. VR test volts, 0-200. Leakage, 0-10 megohms. Diodes, OK. Rectifiers, OK. Line check arrow at midscale. **Tube complement:** (1) 3A4 oscillator and (1) 12AV6 meter control. **Calibration circuit:** Built-in, switch operated. **Socket accommodations:** 4-pin, 5-pin, 6-pin, 7-pin combination and pilot light, 7-pin miniature, 7-pin subminiature, 8-pin subminiature, octal, loctal, 9-pin miniature, 10-pin miniature, 5-pin and 7-pin nuvistors, 9-pin novar, 12-pin compactron and blank. **Line voltage adjustment:** Continuously variable. **Roll chart mechanism:** Constant tension, free rolling, dual thumbwheel operated, illuminated. **Dimensions:** Cabinet (outside): 17 3/4" W x 13 1/2" H x 8" D. Panel & chassis: 17" W x 12 3/4" H x 5 1/2" D.

**Heathkit Portable In-Circuit Transistor Tester . . .
Measures Transistor DC Beta In-Or-Out-Of-Circuit . . .
Measures Leakage Out-Of-Circuit . . .
Tests Diodes In-Or-Out-Of-Circuit . . .
All At A Market-Shattering Price of Only \$24.95**

- Compare to similar instruments selling for several times more • Tests transistors for DC gain in or out of circuit • Tests transistors out of circuit for I_{ceo} and I_{cbo} leakage • Tests diodes in circuit or out of circuit for opens and shorts • Identifies unknown diode leads • Identifies NPN or PNP type transistors • Matches NPN and PNP transistors • Cannot damage device or circuit even if connected incorrectly • Big 4½" 200 uA meter reads directly in DC Beta and Leakage • Two DC Beta ranges, 2-100 and 20-1000 • Expanded leakage current scale, 0-5000 uA, 1000 uA mid-scale • 10-turn calibrate control • Portable, battery powered • Long battery life from single "D" cell • Handy attached 3' test leads for in or out of circuit checks • Front panel socket for lower power devices • Rugged textured beige plastic case with attached positive locking cover, convenient handle, and lead storage compartment • Build it in less than two hours

PRICE BREAKTHROUGH FOR TRANSISTOR SERVICING. Heath engineers have done it again. This time they have taken the high cost of in-circuit transistor testers and brought them down to earth. The new Heathkit IT-18 has the facilities you need for fast, in-circuit transistor testing and it costs just a fraction of other brands.

VERSATILE TESTING. The new Heathkit IT-18 tests transistor DC Beta in-circuit or out-of-circuit from 2 to 1000 (this is the specification commonly used by manufacturers and equipment schematics to determine transistor gain). The IT-18 also will test in-circuit diode forward and reverse current, indicating opens, shorts, if not shunted by low impedance; tests diodes out-of-circuit if low impedance shunt is present. Emitter to collector (I_{ceo}) and base to collector (I_{cbo}) leakage current is measured out-of-circuit . . . range is 0 to 5,000 uA with 1000 uA mid-scale and 5 uA at first scale mark. Use the IT-18 to identify NPN or PNP devices, identify anode and cathode of unmarked diodes, match transistors of the same type or opposite types as used in complementary circuits.

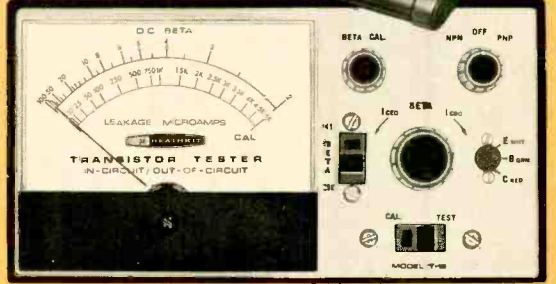
EASY TO USE. You can depend upon the IT-18 to quickly locate defective devices or stages . . . you don't even need special device specifications, just connect the IT-18, adjust the ten-turn calibrate control and press-to-test transistor gain. No need to worry about damaging a circuit either, the IT-18 is safe to use even if connected incorrectly. Completely portable, the IT-18 is powered by a standard "D" cell . . . ready to serve you anywhere in the shop or in the field . . . and the meter is shorted for damping when not in use to prevent in-transit damage.

EASY TO BUILD, EASY TO BUY. You'll complete the IT-18 construction in less than two hours . . . and you'll congratulate yourself on getting the best buy ever in in-circuit transistor testers. Order your IT-18 now!

Kit IT-18, 4 lbs. **\$24.95**

IT-18 SPECIFICATIONS—D. C. Beta: x1 range—2 to 100, x10 range—20 to 1000. **Out-of-circuit accuracy:** ±5%. **In-circuit accuracy:** Indicates good or bad (accuracy depends upon circuit being tested); I_{cea} (out-of-circuit only)—0-5000 uA; I_{cbo} (out-of-circuit only) 0-5000 uA diodes; forward or reverse current—0-5000 uA. **Power:** One standard "D" cell (not supplied). **Dimensions:** 8½" wide, 4¼" high, 7¼" deep (including handle). **Net weight:** 2¼ lbs.

Kit IT-18
\$24.95



Big 4½" 200 uA meter with red and black scales . . . sensitive and easy to read.

Everything up front . . . all switches, calibrate control, and panel-mounted socket for easy out-of-circuit testing of small devices.

Improved Heathkit Laboratory Transistor Tester

Kit IM-36
\$61.95

Wired IMW-36
\$92.50

- Features the "new look" of Heathkit instruments • Measures current gain (Beta) up to 400, read on calibrated scales • Provides complete DC analysis of PNP & NPN types • 15 uA basic range for leakage tests (I_{cbo} , I_{ceo}) • Variable bias for setting collector current up to 15 amps • Internal power to 9 volts in 1.5 v. steps • Four lever switches for fast, easy test selection • Separate voltage & current range switches for both Gain & Leakage settings • Convenient carrying handle • Unmatched in performance, quality & price

Kit IM-36, 9 lbs., no money dn. **\$61.95**
Assembled IMW-36, 11 lbs., no money dn. **\$92.50**

IM-36 SPECIFICATIONS—Checks: Transistors up to 15 amps and diodes up to 1.5 amps. **Tests:** Shorts, DC Gain (Beta 0-200 & 200-400), Leakage (I_{cbo} , I_{ceo}), Diode Forward and Reverse Current. **Meter:** Current Ranges: 15 uA, 150 uA, 1.5 mA, 15 mA, 150 mA, 1.5 A, 15 A; Voltage Ranges: 1.5 V, 5 V, 15 V, 50 V, 150 V (100 K ohm/volt). **Power supply:** Internal seven 1.5 volt size D batteries provide 1.5, 3, 4.5, 6, 7.5, 9 volts collector supply for gain or leakage and 1.5 volts for bias; External, 0-50 volts for gain, 0-150 volts for leakage and 0-5 volts for bias. **Bias control:** Permits any collector current from 10 uA to 15 amps for gain tests. **Gain control:** 3% wire-wound control has calibrated scales to give DC Beta directly when meter is at null. **Lever switch:** Four spring return levers will individually select the following tests: Base Current, Gain, Collector Voltage, Collector Current, Leak Voltage, Short Test, I_{cbo} and I_{ceo} or diode currents. **Two voltage selector switches:** Gain and Leak Test Voltage can be individually preset at different voltage levels. **Two current range switches:** Collector and Leak currents can be individually preset on different adjacent ranges. **Transistor and diode connections:** Universal transistor socket and binding posts. **External power supply connections:** Binding Posts for Gain, Leak and Bias supplies.



Heathkit Transistor/Diode Checker—Time Saving, Handy & Portable

- Features the new "look" in Heathkit instrumentation • Satisfies most servicing needs • Compact—handy for test bench or service kit • Checks both high and low power transistors • Checks PNP and NPN types • Checks for shorts, leakage, open element, and current gain • Checks forward and reverse current on diodes • Built-in switching eliminates transferring test leads • Completely portable—operates on two standard "C" flashlight cells • Plug-in leads with alligator clips for checking transistors which do not fit socket • Easy to use

Kit IT-27, 2 lbs. **\$6.95**

IT-27 SPECIFICATIONS—Transistor test: Leakage, short, open, and current gain. **Diode test:** Forward and reverse current. Also serves as a continuity checker. **Switches:** Forward-Reverse/PNP-NPN, Diode/Hi-Lo, Leakage-Gain. **Power supply:** Self-contained, two 1.5 volt size "C" flashlight cells (not supplied). **Dimensions:** 3¼" H x 3¼" W x 3¼" D.



Kit IT-27
\$6.95

New Solid-State IO-101 Vectorscope/Color Generator Only \$124.95

Accurately performs all of these adjustments:

- Raster
- Static & dynamic convergence
- Purity
- Gray scale
- 3.58 MHz oscillator
- Reactance coil
- Phase detector transformer
- Demodulator angle check
- Chroma bandpass touch-up

New Solid-State Versatility in Color TV Servicing. In response to numerous requests, Heath engineers combined the integrated circuitry of the popular IG-28 Color Pattern Generator with additional circuitry to provide visual readout of the important characteristics of the chroma signal.

The vector pattern—an important service aid. The vector or “petal” pattern indicates the ten color bars generated, amplified and demodulated by the color receiver circuitry. It’s an exact representation of the chroma signal being fed to the guns of the receiver CRT, shows at a glance missing or weak colors, and proper adjustment of the burst phase transformer, reactance coil, oscillator coil and bandpass transformers. Color demodulation angle can also be checked. The vector pattern gives you the means to diagnose virtually any chroma circuit problem in any color receiver . . . quickly, accurately, without guesswork or involved troubleshooting using numerous bench instruments.

All solid-state circuitry, using computer-type integrated circuits, produces twelve patterns plus a clear raster for purity adjustments . . . dots, cross-hatch, vertical and horizontal bars, color bars and shading bars. All of these patterns are available at the turn of a knob, either in the familiar 9 x 9 display or the exclusive Heath 3 x 3 display, which is especially convenient for centering, linearity and static convergence adjustments. Fifteen J-K Flip-Flops and eight gates count down from a crystal-controlled master clock oscillator to eliminate troublesome divider chain adjustment and instability.

Extra convenience for faster servicing. On some color sets the chroma signal is fed to the cathodes of the color CRT, causing the familiar vector pattern to be rotated 180 degrees from the position it occupies on grid-driven sets. To eliminate this possible cause of confusion, the IO-101 has a Grid-Cathode switch on the rear panel, enabling all vector patterns to be displayed in the same relative position, regardless of how the color CRT is driven. Variable front panel tuning for channels 2 through 6 offers added convenience, especially in areas served by many stations. Plus and minus going video signals are available at the turn of a front panel control. And for sync, chroma and in-circuit video problems there’s a handy front panel sync output. For sound trap adjustments there’s a 4.5 MHz crystal controlled sound carrier switchable from the front panel. Shielded leads on the rear panel enable fast connection of RF signal to the antenna terminals or video signal to video circuits, and greatly reduce stray pickup. Front panel gun shorting switches and lead-piercing grid jacks are built-in. For connection of other test equipment or the TV set under test, there are two 500 watt grounded AC outlets on the rear panel.

Fast, enjoyable assembly. The new IO-101 goes together in about 12 hours, and the use of circuit board-wiring harness design makes assembly easy and fun. Component layout is extremely clean and open, and chassis wiring has been kept to a minimum.

Start enjoying a faster, easier, more profitable way to service color TV—order your new Heathkit Vectorscope/Color Generator now!

Kit IO-101, 12 lbs. \$124.95



Fast Switch Selection Of Either
Standard 9 x 9 Display OR Exclusive Heath
“3 x 3” Display

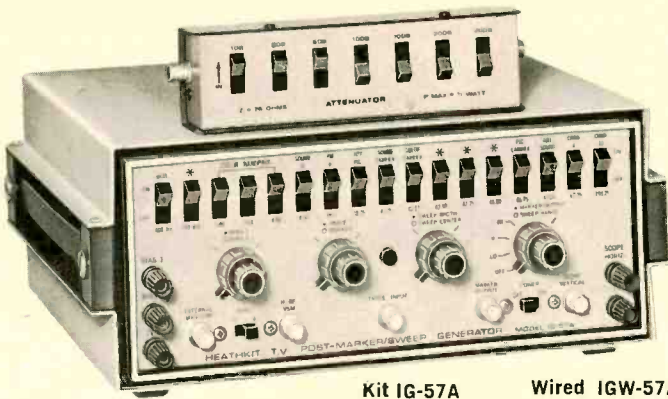


IO-101 SPECIFICATIONS—PATTERNS—Purity: Produces a snow-free raster for purity adjustments. **Dots*:** 9 x 9 produces a display of 110 small dots. 3 x 3 produces a display of nine dots for convergence adjustments. **Crosshatch*:** 9 x 9 produces a display of 11 vertical and 10 horizontal lines. 3 x 3 produces a display of three vertical and three horizontal lines for convergence and linearity adjustments. **Horizontal Lines*:** 9 x 9 produces a display of 10 horizontal lines. 3 x 3 produces a display of three horizontal lines for vertical linearity and pin-cushion adjustments. **Vertical Lines*:** 9 x 9 produces 11 vertical lines. 3 x 3 produces a display of 3 vertical lines for horizontal linearity and convergence adjustments. **Color Bars*:** 9 x 9 produces a display of ten standard color bars. 3 x 3 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 uV 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:** 6¾" W x 9¼" H x 14½" D. **Net Weight:** 9½ lbs.

*The number of dots, lines, and bars indicated for a 9 x 9 display is the number displayed if the receiver under test has no overscan.

Open Your Heath Account—No Money Down Up To \$300—Up To 18 Months To Pay—See Order Blank For Details

Maximum Performance At A Modest Price



Kit IG-57A **\$135⁰⁰**
 Wired IGW-57A **\$199⁰⁰**



Increase Your Profit . . . Decrease Your Alignment Time & Costs . . . With The New IG-57A Solid-State Post-Marker/Sweep Generator . . . Now With Video Sweep Modulation & Two Bias Supplies

- Unsurpassed value leader in TV alignment instruments • New video sweep modulation capability means faster, more accurate alignment of every TV set on the market • Exclusive Heathkit external attenuator with 7 shielded switches for up to 70 dB attenuation • Produces all the most used alignment frequencies for TV IF, color bandpass, FM IF and VHF channels 4 & 10 • Comprehensive manual with a liberally illustrated application section covers alignment of color and B&W TV and FM IF • Post-injection marker circuitry • 15 crystal-accurate markers • Three sweep oscillators cover the five most-used frequency ranges • Proven saturable reactor circuitry for dependable, linear sweep signals • 400 Hz modulation of all markers for easiest trap alignment • Hi-Z trace amplifier extends your scope sensitivity—provides up to 8 dB gain for weak signals • Phase control matches IG-57A to any scope • Switchable retrace blanking for easy phase control adjustment • Trace reverse function for proper marker sequence • Two variable DC bias supplies for positive or negative bias • Quick-disconnect BNC connectors • Complete with 4 coaxial cables, 4 test leads and demodulation probe • Unmatched by instruments costing hundreds of dollars more

Dependability-Proven . . . by major color TV manufacturers in their training clinics & service centers . . . by thousands of technicians and servicemen. Professionals can't afford to take a chance . . . so they bought the fastest, most accurate & economical instrument available. You can have these advantages too . . . with the new IG-57A. Here's why . . .

Now Complete Any Alignment Job Quickly & Successfully . . . a scope, a VTVM and the IG-57A are 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 input. The exclusive Heathkit external attenuator enables you to set bandwidth accurately in seconds . . . eliminates guessing important 6 dB amplitudes.

15 Crystal-Controlled Markers . . . 4 for color bandpass, 1 for FM IF, 8 for TV IF frequencies from 39.75 to 47.25 MHz . . . plus markers for channels 4 & 10 picture and sound carriers. Lets you accurately locate picture and sound carriers, 6 dB points and trap locations.

3 Sweep Oscillators . . . in stable Colpitts circuits produce 5 ranges using harmonics . . . for color bandpass, FM IF, Video IF bandpass, VHF channels 4 & 10.

Compact Size . . . Convenient Controls. The new IG-57A measures only 13 $\frac{3}{8}$ " W x 5 $\frac{1}{2}$ " H x 12" D . . . doesn't waste valuable bench space. The front panel controls are easy to read, easy to use . . . there are no gadgets, gimmicks or graphs to distract you. Put this new total capability Marker/Generator on your bench now . . . and discover what thousands of servicemen already know—that excellent alignment facilities don't have to be expensive. Order your Heathkit IG-57A today.

Kit IG-57A, 15 lbs. **\$135.00**
 Assembled IGW-57A, 15 lbs. **\$199.00**

IG-57A SPECIFICATIONS—Marker frequencies: 100 kHz. Marker frequencies, crystal-controlled: 3.08, 3.58, 4.08, and 4.50 MHz \pm .01%. 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 .005%. Modulation frequency: 400 Hz. Input impedance: External Marker/Sweep, and Attenuator—75 ohms. Trace in—220 k ohms. Output impedance: Marker Output, Sweep Output, and Attenuator—75 ohms. Scope Vert.—1 k ohms. Bias Voltage: Two individually adjustable supplies; Positive or negative polarity. 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 \pm 1 dB at 0.5 volts RMS (min.) fundamentals, and 10.7 MHz on harmonics. IF Band—38 to 49 MHz \pm 1 dB, at 0.5 volts RMS (min.) fundamentals. RF band—64 to 72 MHz \pm 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 volts, 60 Hz AC at 4.5 watts.

Heathkit FM Stereo Generator IG-37 . . . For RF, IF, And Multiplex FM Alignment

- Produces virtually all signals required for trouble-shooting and alignment of multiplex adapters, FM tuners, and receivers • Generates mono FM or composite stereo FM signals • Crystal-controlled 19 kHz (\pm 2 Hz) pilot signal, adjustable in level from 0 to 10% for check of tuner lock-in range • Switch selection of 400 Hz, 1000 Hz, 5000 Hz, 19 kHz, 38 kHz, and 65 kHz or 67 kHz SCA signals for complete alignment capability • 100 MHz sweep signal (adjustable \pm 2 MHz) for overall RF and IF alignment on a clear portion of the FM band • Built-in crystal controlled marker oscillator for IF and dial tracking checks • Phase test for accurate adjustment of subcarrier transformers • No balance adjustment required for equal right and left channel modulation levels

ALL THE SIGNALS YOU NEED FOR FAST, EASY 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 (\pm 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 & 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, 38 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.



IG-37 **\$79⁹⁵**

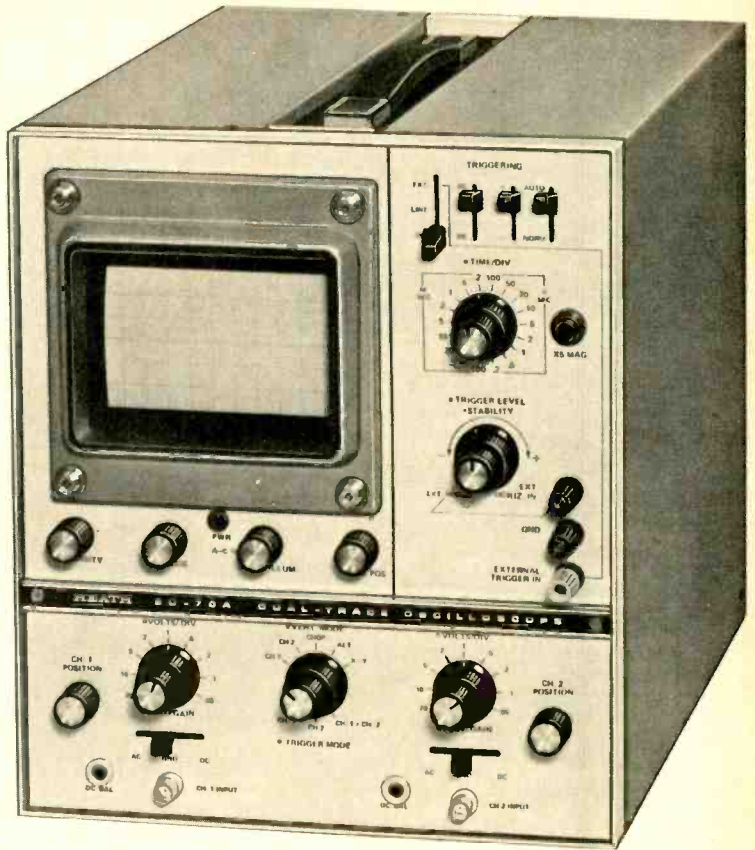
Kit IG-37, 12 lbs., no money dn. **\$79.95**

IG-37 SPECIFICATIONS—RF Signal frequency: 100 MHz adjustable by approx. \pm 2 MHz. Pilot modulating frequency: 19 kHz \pm 2 Hz. FM Modulation: Left channel (stereo), right channel (stereo), Phase Test (left plus right channel in phase), Monophonic FM. Deviation: Adjustable to 75 kHz. Sweep rate: (used for RF and IF alignment) 60 Hz. Sweep width: (used for RF and IF alignment) Adjustable to 750 kHz. RF Attenuator range: 60 dB in 20 dB steps. Crystal-controlled markers: 10.7, 90.95, 96.30, 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 (\pm 2 Hz); 38 kHz & SCA (65 or 67 kHz). Distortion: (At 400, 1000 & 5000 Hz) Less than 5%. Front panel controls: Pilot level control, function level control, function switch, frequency switch, RF frequency adjust, & RF attenuator switches. Rear panel adjustments: Balance adjust, 38 kHz sync, pilot level adjust, & SCA frequency switch. Chassis adjustments: Oscillator adjust, frequency adjust & modulation adjust. Tube complement: 12AT7—19 kHz oscillator & 19 kHz doubler; 6AU6—19 kHz buffer & 38 kHz amplifier; 6AN8—Reactance tube modulator & 100 MHz oscillator; (3) 12AU7—Audio osc., audio cathode follower & 19 kHz pilot amplifier; composite audio amplifier & 5.35 MHz crystal osc. Power requirements: 105-125, 210-230 volts AC, 50/60 Hz, 35 watts. Dimensions: 5 $\frac{1}{2}$ " H x 9" D x 13 $\frac{1}{2}$ " W.

Announcing the new Heath EU-70A Solid-State scope

- ★ 8 x 10 cm
- ★ Dual trace
- ★ Triggered sweep
- ★ DC to 15 MHz
- ★ \$565.00 assembled

• All solid-state circuitry for long life, high reliability • Rock-solid triggered sweep with full bandwidth capability in both Automatic & Normal modes • Channel 1, Channel 2, Channel 1/Channel 2 triggered modes • 18 calibrated time base positions in 1, 2, 5 sequence plus vernier control • External horizontal input • Complete dual trace capability—Ch. 1, Ch. 2, Chop, Alternate • X-Y mode—Under 1% Phase Shift to 100 kHz • DC to 15 MHz bandwidth, both vertical channels • 24 nsec rise time • 50 mV/cm sensitivity • 9 position 1, 2, 5 sequence vertical attenuator • Continuously variable gain between attenuator positions • Rear panel CRT blanking, TTL compatible • Sweep Gate output • 8x10 cm rectangular CRT with complete mu-metal shield • Low power operation permits convection cooling—eliminates fan • Front & rear tilt bails • Standard camera mount on CRT bezel • Die-cast front and rear panel frames for extra durability • Completely factory assembled & calibrated



The New Heath EU-70A is a high performance solid-state oscilloscope designed to handle the wide range of measurements required in engineering, R&D Laboratories and electronics and instrumentation courses. Its many features, exceptional performance and versatility, state-of-the-art design, and very low cost make it comparable to scopes costing far more.

Complete Dual Trace and X-Y Capability. Dual trace capability is a particularly useful feature for a great many applications, such as comparing input/output signals for loss or gain, phase shift, distortion, etc., or for comparing an unknown signal against a standard. In the new EU-70A, two separate input signals can be individually displayed on an 8x10 cm screen in the Channel 1 or Channel 2 mode. The alternate and chopped modes allow both signals to appear on the screen for direct visual comparison. In the Alternate mode the two signals are alternately displayed on successive sweeps so that at faster sweep speeds the signals are retained on the screen for comparison of their time relationships. In the Chop mode both input signals are sampled at a 100 kHz rate so that both appear as a function of the same time base. In the X-Y mode, the two channels are displayed as a function of each other, with Channel 1 controlling the Y (vertical) axis and Channel 2 controlling the X (horizontal) axis. Both input channels have been precisely balanced for identical phase characteristics (under 1% shift) to greater than 100 kHz.

Versatile Triggering. Precise, extremely versatile triggering is a necessity for most scope applications, and the new EU-70A incorporates the most wanted features of much higher priced equipment. Switch-selected AC or DC coupling enables the user to trigger the time base at a given point on the signal or at a selected DC level. In addition, automatic triggering at the crossover (0) point is available by flipping a switch. Auto triggering is particularly useful when monitoring simple waveforms. Triggering on either positive or negative slope is also switch-selectable. Internal, External and Line trigger inputs are provided.

An 18-Position Time Base Switch in a 1, 2, 5 sequence gives a selection of convenient sweep rates from 0.5 sec./cm to 0.2 usec/cm. A separate vernier control, with a calibrated position, allows continuous control between fixed time base settings. A x5 magnifier switch allows detailed trace viewing.

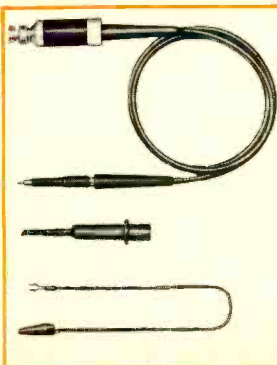
DC to 15 MHz Bandwidth and 24 nsec rise time for each of the two identical vertical amplifiers permit analysis of high frequency and sharp-front signals. Full bandwidth from 20 v/cm to 50 mV/cm in a 1, 2, 5 sequence.

Extra Capability and Convenience Features. An all solid-state design eliminates the problems in many high-performance scopes caused by heat and tube failure. The Sweep Gate Output on the rear panel delivers a +5 VDC pulse in sync with the sweep for special applications. Another rear panel input allows external blanking, and is TTL compatible. New rectangular CRT has an 8x10 cm flat face for reduced parallax, and is completely enclosed in a mu-metal shield. The CRT bezel incorporates a standard camera mount. The circuitry is designed for efficient convection cooling... no noisy fan. The handle mounts flush with the top of the attractive blue gray and pearl white case for easy stacking. Both side panels remove in seconds for accessibility. Tilt bails front and rear allow the cabinet to be tilted up for bench work, down for installation above the bench on a shelf. Die cast front and rear panel frames and sturdy chassis contribute greater durability. Short 15" depth permits convenient use on bench—no cart required.

The New EU-70A enables you to greatly increase your measurement and analysis capability at a fraction of the cost of comparable instruments. Write for the free EU-70A specification sheet.

Assembled EU-70A, 31 lbs. \$565.00

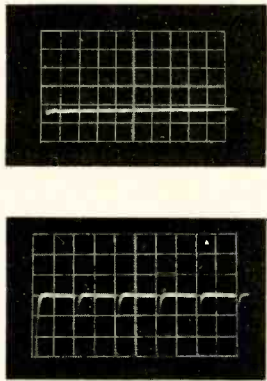
EU-70A SPECIFICATIONS—Vertical channel: Input impedance: 1 megohm shunted by 35 pf. Sensitivity: AC or DC, 0.05 V/cm. **Frequency response:** 4 cm deflection DC to 15 MHz, Down 3 dB; DC to 10 MHz, Down 1 dB; DC to 30 MHz, Down 6 dB. **Rise time:** 24 nsec. **Overshoot:** Less than 10%. **Attenuator:** 9 position 1, 2, 5 sequence; 0.05 to 20 volts/cm $\pm 3\%$. Variable gain (uncalibrated) between attenuator steps. **AC Response,** Down 3 dB at 2 Hz. **Horizontal channel—Time base:** Triggered with 18 calibrated rates. 0.2 usec/cm to 100 msec/cm in 1, 2, 5 sequence; $\pm 3\%$. Continuously variable (uncalibrated) throughout this range to 500 msec/cm. **Sweep magnifier:** x5, time base accuracy $\pm 5\%$ with magnifier. **External horizontal input:** .075 volts/div. uncalibrated; not adjustable. Input impedance 100 k ohms minimum DC to 100 kHz. **Triggering capability:** Internal—Channel 1; Channel 2; Channel 1/2. External. Line. Adjustable. + or - slope. AC or DC coupled. Input, 1 meg. AC—Triggering 3 dB @ 120 Hz. **Triggering requirements:** Internal—triggers from Channel 1, Channel 2 or Channel 1/2. Amplitude—0.5 to 8 cm display. External—.075 volts minimum. Input Impedance—1 megohm. **X-Y Mode: Capability** (X or Y input): Sensitivity—0.05 to 20 V/cm. $\pm 3\%$. Response—100 kHz, -3 dB. Phase Shift— $\pm 1^\circ$ or less between channels, DC to 100 kHz within graticule limits. **Vertical display modes:** Channel 1, Channel 2, Channel 1/2, alternately. Channels 1 and 2 chopped at 100 kHz. **General: Input Connections—Vertical:** BNC. **Horizontal:** Binding post. **External trigger:** Binding post. Binding posts on $\frac{3}{16}$ " centers with ground. **External CRT Blanking/Z-Axis** (on rear panel). TTL Logic 0 Blanks, Logic 1 Unblanks. **Sweep Gate Output** (on rear panel): +5 VDC Pulse. **CRT accelerating potential:** 2000 VDC, regulated. **Retrace suppression:** DC-coupled unblanking of CRT. **GRATICULE:** 8x10 cm grid, edge lighted. **Power requirements:** 105-125 or 210-250 VAC, 50/60 Hz, 60 watts. **Dimensions:** 10 1/2" W x 12 1/2" H x 15 D. **Net weight:** 28 lbs.



New Hi-Z General Purpose Scope Probe

An essential accessory for examining high frequency waveforms... high impedance eliminates loading & distortion. An internal trimmer allows matching to any 1 megohm scope input shunted by 15-47 pf. Combination hook & fine-point tip allows hands-free operation.

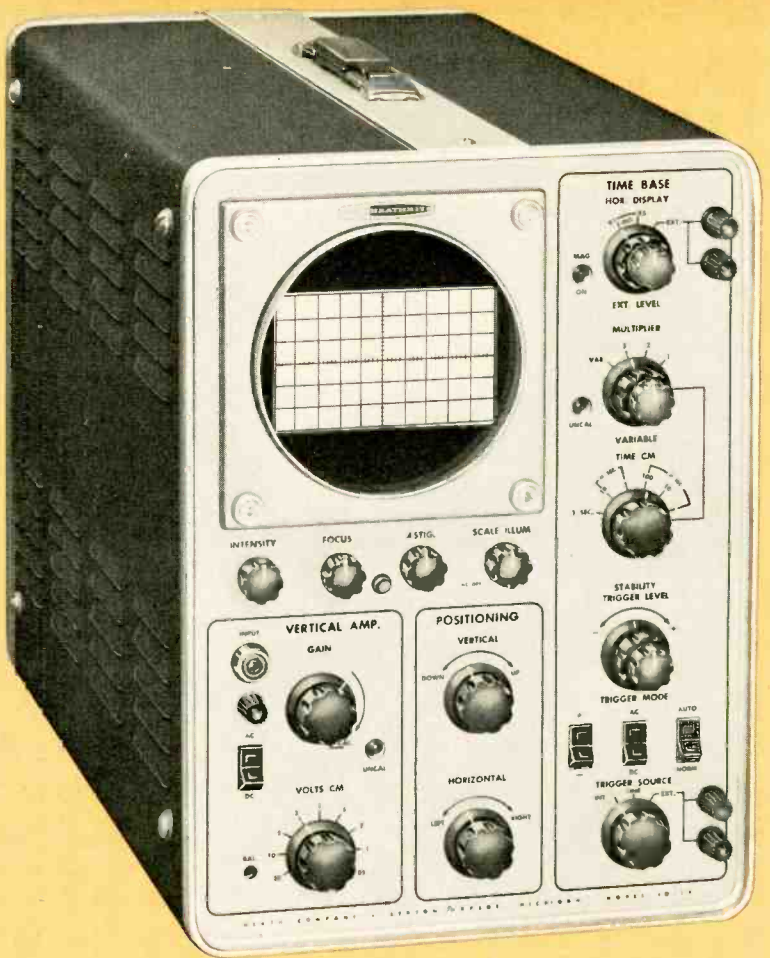
Assembled PKW-101, 2 lbs. \$19.95
PKW-101 specifications—Input impedance: 10 megohm shunted by 11.5 pf. **Compensation:** Allows matching to any 1 megohm scope input shunted by 15-47 pf. **Bandwidth:** DC to 30 MHz. **Attenuation:** x10. **Voltage rating:** 500 Volts, AC & DC. **Scope connector:** BNC. **Probe:** Spring-loaded outer hook connector and fine-pointed inner tip combination. **Length:** 3 1/2 feet.



Here Actual Signal Waveforms Indicate Scope Quality. The waveform on the top (a 100 kHz fast rise square wave) illustrates the capability of the IO-14 to clearly display fast-rise signals. Mode is "triggered" "AC". Time base is 0.2 microseconds per centimeter. The entire leading edge of this signal is available for analysis, since the vertical deflection occurs 0.25 microseconds after the sweep is initiated. The waveform on the bottom (precision 20 millisecond timing pulses) illustrates the linearity of the horizontal sweep . . . through the accurate 2 cm pulse intervals. Both waveforms are photographs of signals produced by Telequipment® Type C-1 scope calibrator. Scope sensitivity for both waveforms is 0.2 volts/cm.

Kit IO-14
\$275⁰⁰

Wired IOW-14
\$399⁰⁰



Heathkit IO-14 Triggered-Sweep, Delay Line DC Scope
. . . The Value And Performance Standard

- A high stability 5" DC oscilloscope with triggered sweep
- DC to 8 MHz bandwidth and 40 nanosecond rise time
- Vertical signal delay through high linearity delay lines
- Calibrated vertical attenuation
- Calibrated time base
- Forced air cooling
- Input for Z axis modulation
- Input for direct access to vertical deflection plates
- Fulfills many production and laboratory requirements at far less cost than comparable equipment—particularly scopes capable of fast-rise waveform analysis
- No special order for export version required—wiring options enable 115/230 volt, 50-60 Hz operation
- Requires VTVM & accurate sine-square wave generator for alignment

HERE IS A TRULY SOPHISTICATED INSTRUMENT . . . capable of satisfying the most critical demands for performance. The IO-14 features precision delay-line circuitry to allow the horizontal sweep to trigger "ahead" of the incoming vertical signal. This allows the leading edge of the signal waveform to be accurately displayed after the sweep is initiated. What is more, the IO-14's delay line is capable of reproducing sharp rise time signals far beyond the high frequency limitations of the oscilloscope. This assures the utmost ability for critical analysis of signal waveform characteristics . . . right up to the limits of the published specifications.

FEATURES YOU'D EXPECT ONLY IN HIGH PRICED SCOPES. For example, a calibrated vertical attenuator, a 5x sweep magnifier, and a magnifier indicator lamp . . . external sweep input and external trigger input . . . and many others, including an accurately engraved graticule with variable intensity lighting for optimum results in "scope photography."

PRECISION PARTS USED THROUGHOUT. Switches are quality, ball-detent type. All major control potentiometers are precision, high-quality sealed components. All critical resistors are 1% precision. And circuit boards are low-loss fiberglass laminate.

CIRCUIT BOARDS & WIRING HARNESS ASSEMBLY . . . make building the IO-14 a real pleasure. Alignment requires an accurate voltmeter, an accurate, fast rise time square wave generator, and a sine wave signal source.

NO MONEY DOWN UP TO \$300
Build your Heathkit now . . . pay later with the convenient Health Time Payment Plan. No money down and up to 12 months to pay on orders from \$35 to \$300 . . . 10% down and up to 18 months on orders from \$300 to \$500. See Order Blank for details.

Kit IO-14, 53 lbs., Express or Motor Freight, no money down **\$275.00**

Assembled IOW-14, 47 lbs., Express or Motor Freight. **\$399.00**

IO-14 SPECIFICATIONS—(Vertical) Sensitivity: 0.05 V/cm AC or DC. **Frequency response:** DC to 5 MHz —1 dB or less; DC to 8 MHz —3 dB or less. **Rise time:** 40 nsec (0.04 microseconds) or less. **Input impedance:** 1 megohm shunted by 15 pF. **Signal delay:** 0.25 microsecond. **Attenuator:** 9-position, compensated, calibrated in 1, 2, 5 sequence from 0.05 V/cm. **Accuracy:** ±3% on each step with continuously variable control (uncalibrated) between each step. **Maximum input voltage:** 600 volts peak-to-peak; 120 volts provides full 6 cm pattern in least sensitive position. **(Horizontal) Time base:** Triggered with 18 calibrated rates in 1, 2, 5 sequence from 0.5 sec/cm to 1 microsecond/cm with ±3% accuracy or continuously variable control position (uncalibrated). **Sweep magnifier:** x5, so that fastest sweep rate becomes 0.2 microseconds/cm with magnifier on. (Overall time base accuracy ±5% when magnifier is on.) **Triggering capability:** Internal, external, or line signals may be switch selected. Switch selection of + or — slope. Variable control on slope level. Either AC or DC coupling. "Auto" position. **Triggering requirements:** Internal; ½ cm to 6 cm display. **External:** 0.5 volts to 120 volts peak-to-peak. **Triggering frequency response:** DC to 2.5 MHz approx. **Horizontal input:** 1.0 V/cm sensitivity (uncalibrated) continuous gain control. **Bandwidth:** DC to 200 kHz ±3 dB. (General) 5ADP31 or 5ADP2 Flat Face C.R.T. interchangeable with any 5AD or 5AB series tube for different phosphor characteristics. 4250 V. accelerating potential. 6 x 10 cm edge lighted graticule with 1 cm major divisions & 2 mm minor divisions. **Power supply:** All voltages electronically regulated over range of 105-125 VAC or 210-250 VAC 50/60 Hz input. Z axis Input provided. DC coupled CRT unblanking for complete retrace suppression. **Power requirements:** 285 watts. 115 or 230 VAC 50-60 Hz. **Cabinet dimensions:** 15" H x 10½" W x 22" D includes clearance for handle and knobs. **Net weight:** 40 lbs.

Low Capacitance

Scope Probe . . .

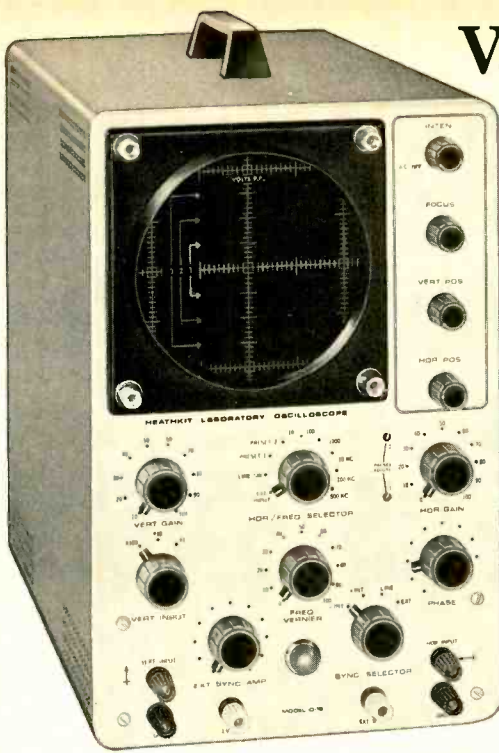
Factory Assembled

PKW-2 PROBE MINIMIZES CIRCUIT LOADING & SIGNAL DISTORTION . . . designed for scopes with 1 megohm input, such as Heathkit IO-14. Features miniature switch for x1 or x10 attenuation. Impedance in x1 position is 1 meg shunted by 110 pF . . . 10 meg shunted by 20 pF in x10 position. Response is DC to 25 MHz. Max. DC voltage is 600 V. Features spring-loaded clip tip for hands-free operation.
Wired PKW-2, 1 lb. **\$12.00**



Value-Packed Heathkit® Scopes

Introducing the Heathkit "Extra Duty" Wide Band 5" Scope . . . Peak Performance, Versatility & Value



Kit IO-18
\$92.50

Wired IO-18
\$149.95

- Bandwidth to 5 MHz for TV signal analysis • Heath patented sweep circuit—10 Hz to 500 kHz in five ranges • Two extra sweep positions which may be preset to often-used sweep rates • Frequency-compensated vertical attenuation • Built-in peak-to-peak calibration reference • Intensity-modulated Z-axis input • Retrace blanking • New Heathkit instrumentation look—easy-to-grasp knobs, quick-to-read pointers, handsome beige and black styling • Combination circuit board and wiring harness construction speeds assembly • Up to 50% savings over equivalent oscilloscopes

THE HEATHKIT IO-18 shares the enviable heritage of the all-time value favorite of the industry—the IO-12, which is being used in thousands of service shops, professional and educational laboratories, industries and home test benches all over the world. And Heath engineers have added a few extras too . . . like the new look of Heathkit instrumentation . . . new Heathkit knobs which are easier to grasp and new pointers and markings for quick, accurate reading. The IO-18 also can be wired for either 120 volt or 240 volt use and a 3-wire line cord with grounded cabinet is standard.

CHOSEN FOR THE BERKELEY PHYSICS LABORATORY. Factory assembled version IOW-18S is part of the Basic Instrument Group of Heath instrumentation for the Berkeley Physics Laboratory. Special provisions on this scope are two banana jacks connected to the HV & horizontal sweep voltage . . . otherwise all specifications are identical to IO-18.

A DEPENDABLE INSTRUMENT THROUGH QUALITY ENGINEERING . . . Excellent linearity and lock-in characteristics assure stable waveform presentations even at upper frequency limits. Peak-to-peak voltage calibration reference adds extra convenience. Wide band amplifiers and wide range sweep frequencies make the IO-18 ideal for many specialized as well as general investigations. The two "pre-set" sweep frequency choices are a valuable aid in servicing the vertical and horizontal circuits in television receivers.

RATED FOR PROFESSIONAL USE . . . the husky, well-rated power supply and sturdy chassis assure you years of dependable performance.

Kit IO-18, 25 lbs. . . no money down . . . **\$92.50**
 Assembled IO-18, 25 lbs. . . no money down . . . **\$149.95**
 Assembled IO-18S. Wired Berkeley Physics Version, 25 lbs. . . **\$152.00**
 See page 70 for comb. offer with EF-2 Applications course, EF-2-5 . . . **\$102.50**

IO-18 SPECIFICATIONS:—Vertical Sensitivity: 70 mV peak-to-peak per inch at 1 kHz. Frequency Response (Referred to 1 kHz level): ± 1 dB, 8 Hz to 2.5 MHz; ± 1.5 to -5 dB, 3 Hz to 5 MHz; response at 3.58 MHz -2.2 dB. Rise Time: 0.08 micro-seconds or less. Input Impedance: (at 1 kHz) 2.7 megohms at $\times 1$, 3.3 megohms at $\times 10$ and $\times 100$. Horizontal Sensitivity: 0.85 volts peak-to-peak per inch at 1 kHz. Frequency Response: ± 1 dB 1 Hz to 200 kHz; ± 3 dB 1 Hz to 400 kHz. Input Impedance: 4.9 megohms at 1 kHz. Sweep Generator: Range—10 Hz to 500 kHz in five steps, variable, plus any 2 switch-selected preset sweep frequencies in this range. Synchronizing: Automatic lock-in circuit using self-limiting synchronizing cathode follower. Power Requirements: 105-125 volts or 210-250 volts AC, 50-60 Hz at 80 watts, fused. Dimensions: 14 1/4" H x 8 3/4" W x 16" D.

The Heathkit IO-17 3" General Purpose 'Scope . . . With The Wideband Response, Extra Sensitivity, And Utility You Need

- 5 MHz bandwidth for TV signal analysis • 30 mV Peak-to-Peak sensitivity • Recurrent sweep generator, 20 Hz to 200 kHz in four ranges • Vertical gain control also has a pull-out $\times 50$ attenuator • Front panel 1 volt Peak-to-Peak reference voltage • Horizontal sweep from internal generator, 60 Hz line, or external source • Wide range automatic sync for easy operation • Shielded CRT • New modern Heath instrument styling conserves bench space, improves appearance • Circuit board construction speeds assembly • Solid-state power supply operates on 105-125v or 210-250v. AC, 50/60 Hz

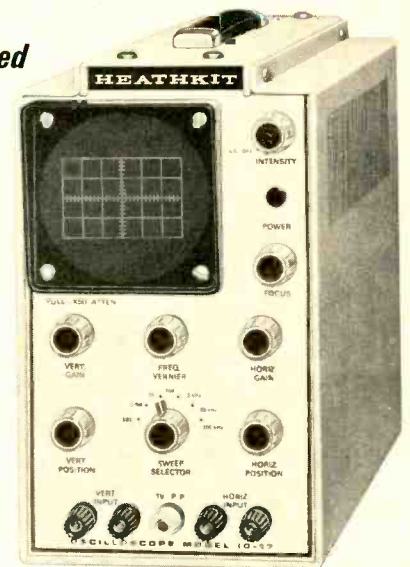
Destined To Set The Value Pace . . . the Heathkit IO-17 with its superior response and sensitivity . . . its professional features . . . compactness . . . handsome new styling . . . and low cost . . . will find its way into shops and labs the world over. The TV service man will find its extended response, extra sensitivity, and small size "just right" for work in the shop or in the field. Schools will find its superior performance at small cost "just right" for equipping labs of all kinds. Hobbyists will appreciate its high value. 'Scope users in industry and overseas will find its dual primary voltage power supply requires no accessories to operate on 220v, 50 or 60 Hz systems.

Extra Features, Extra Quality. Extra features such as the 5 MHz bandwidth, 30 mV P-P sensitivity, the extra $\times 50$ frequency compensated vertical attenuator, front panel reference voltage output, choice of horizontal sweep source, automatic sync, plastic graticule with four major vertical divisions and 6 major horizontal divisions, all front mounted controls (except astigmatism). Extra quality such as the nickel-alloy shield which completely protects the CRT from stray fields, solid-state high and low voltage power supplies, Zener diode regulators to minimize trace bounce due to line voltage variations.

Modern Compact Styling. The new Heath instrument motif with its integrated chassis, panel design permits removal of the left and right cabinet halves for servicing without impairing its operation . . . front and rear panel and chassis as well as the top girder support with convenient handle remain in place. Color styled in new Heath instrument beige and black with grey knobs . . . handsome, professional looking . . . and it is just 9 1/2" high, 5 1/2" wide, and 14 1/2" long. You'll put this one together in a hurry, too, thanks to the fact that one circuit board mounts most components. Put the new Heathkit IO-17 to work for you . . . it's the new value in 'Scopes.

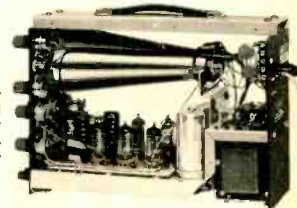
Kit IO-17, 16 lbs., no money down . . . **\$79.95**

IO-17 SPECIFICATIONS:—VERTICAL CHANNEL: Input impedance: 1 megohm shunted by 25 pF; $\times 50$ attenuator position 1 megohm shunted by 15 pF. Sensitivity: 30mV P-P/div. (uncalibrated). Frequency response: 5Hz to 5MHz ± 3 dB. HORIZONTAL CHANNEL: Input impedance: 10 megohm shunted by 15 pF. Sensitivity: 300 mV P-P/div. Frequency response: 2Hz to 300 kHz ± 3 dB. HORIZONTAL SWEEP GENERATOR: Sweep generator: Recurrent type. Frequency: 20Hz to 200 kHz in four overlapping ranges. Retrace: Blanked by a pulse from blanking amplifier. Synchronizing: Automatic type. GENERAL: Tube complement: (1) 3RP1 cathode ray tube, medium persistence, green trace; (3) 12AU7; (1) 12AX7; (1) 6GH8; (1) 6BH6; (1) 6BQ7. Power requirements: 105-125 or 210-240 volts 50/60 Hz. Power consumption: 60 watts. Overall dimension: 9 1/2" H x 5 1/2" W x 14 1/2" L. (Dimensions include handle, knobs, etc.). Net weight: 12 lbs.



IO-17
\$79.95

IO-17 Inside . . . clean, uncluttered, thanks to circuit board construction and thoughtful layout of power supply and other components. Note completely shielded CRT.



Heathkit® Oscilloscopes



Kit IO-10
\$99⁹⁵

Heathkit Ultra-Compact 3" DC Oscilloscope Identical X And Y Channels

- Identical vertical & horizontal amplifiers • Switch selection of AC or DC coupling
- DC to 200 kHz bandwidth—less than 5° relative phase shift • Recurrent sweep generator, 5 Hz to 50 kHz in four ranges • External capacitor binding posts for slower sweep rates • Small, compact, easy to carry and store • Same panel size as IM-11 VTVM

A TRULY HIGH-QUALITY, PROFESSIONAL INSTRUMENT. The IO-10 offers exceptional features found normally only in oscilloscopes costing many times more . . . plus, the added feature of compact size. The capability of extremely slow sweep rates . . . identical horizontal and vertical amplifiers . . . less than 5° phase shift between channels . . . and 0.1 volt sensitivity with x1, x10, x100 attenuation have made the IO-10 popular for many bio-medical, industrial, and general service applications. It is an ideal instrument for readout or circuit analysis of analog computers.

FAITHFUL WAVEFORM PRESENTATIONS . . . trace distortion is minimized by a special alloy CR tube shield. An astigmatism control helps obtain sharp, fine traces. All critical voltages are regulated for high stability.

Kit IO-10, 16 lbs. . . no money dn. **\$99.95**

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IO-10 SPECIFICATIONS—(Vertical & horizontal channels identical): Bandwidth: DC to 200 kHz (2 dB point). Sensitivity: 0.1 V (peak-to-peak) per 1/4" (uncalibrated). Attenuator: 3-position, compensated type; x1, x10, & x100. Gain control: Continuously variable. Input impedance: 3.6 megohms shunted by 35 pF. Coupling: Either AC or DC, switch-selected. Relative phase shift between channels: Less than 5°. Sweep generator (Recurrent type): Linear sawtooth produced by multivibrator type generator covering 5 Hz to 50 kHz in four overlapping ranges. "External capacitance" binding post for lower sweep rates. Sync provision: Either internal or external, switch-selected. Power requirements: 105-125 V, 50-60 Hz AC at 100 watts max. Dimensions: 8 3/8" H x 4 3/8" W x 13" D.



IO-21
\$61⁹⁵

Heathkit "General Purpose" 3" Oscilloscope

- Fulfills hundreds of general service shop and classroom requirements • Frees "expensive" equipment for more sophisticated circuit analysis • Features identical vertical and horizontal amplifiers—2 Hz to 200 kHz response • Wide-range sweep generator—20 to 100 kHz, Automatic Sync, retrace blanking • Professional-quality components throughout • Clean, open circuit layout for easy assembly • Features direct access to vertical deflection plates

A DEPENDABLE, WELL-RATED OSCILLOSCOPE . . . EXCELLENT FOR GENERAL PURPOSE REQUIREMENTS. This handy scope is lightweight, surprisingly versatile, and is provided with modern, stable circuitry. Direct connection to the vertical deflection plates enables convenient display of transmitter modulation envelopes. The vertical signal response and horizontal sweep range satisfy basic educational requirements. Here is a highly capable instrument for the hobbyist or classroom.

EXTRA QUALITY IN CIRCUIT DESIGN . . . Includes focus and astigmatism controls and a special alloy neck shield for the 3RP1 CR tube to assure a sharp, well-defined trace. The husky, well-rated transformer-operated power supply is equivalent to those found in "expensive" equipment. And it is fused for protection. Order this fine scope to solve your general instrument requirements.

Kit IO-21, 12 lbs. . . no money down **\$61.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IO-21 SPECIFICATIONS—(Vertical and horizontal amplifiers identical): Frequency response: ±2 db, 2 Hz, to 200 kHz. Sensitivity: 25 volts RMS/inch P-P deflection at 1 kHz. Input impedance: 10 megohms shunted by 20 pF. (Direct connection to vertical CRT plates on rear panel). Sweep generator: Range 20-100,000 Hz. Automatic sync, retrace blanking. Tube complement: (1) 3RP1 (CR tube), (4) 12AU7 (deflection amplifiers), (1) 12AX7 (sweep generator), (1) 6X4 (LV rectifier), (1) 1V2 (HV rectifier). Controls: Gain controls, Horizontal & Vertical; Centering controls, Horizontal & Vertical; Frequency Vernier; Horizontal Input Selector/Sweep Range Switch. (Focus and Astigmatism controls mounted on chassis). Power requirements: 105-125 volts AC, 50-60 Hz, 40 watts. Dimensions: 9 1/2" H x 6 1/2" W x 10" D.

Dual-Trace Scope Display With The Heath Electronic Switch



IO-22 **\$25⁹⁵**

- Provides dual-trace scope presentation—permitting display of two separate signals on screen, appearing simultaneously through persistence of CRT phosphor • Displays signal levels as low as 0.1 volt • ±1 dB, 0-100 kHz response • Separate gain controls for each channel to prevent overdriving of the input circuits • All-electronic switching • Four switching rates—150, 500, 1500 and 5000 Hz • Position control allows superimposing or separating signals for comparison purposes • Sync output to control scope sweep

Kit IO-22, 7 lbs., **\$25.95**

Assembled Low Capacitance Scope Probe

Impedance in x1 position is 1 Meg/110 pF, 10 Meg/20 pF in x10 position. Response is DC to 25 MHz. 600 VDC maximum. Features spring-loaded clip tip. Ideally suited for IO-14.
Wired PKW-2, 1 lb. **\$12.00**

Low Capacitance Scope Probe Kit

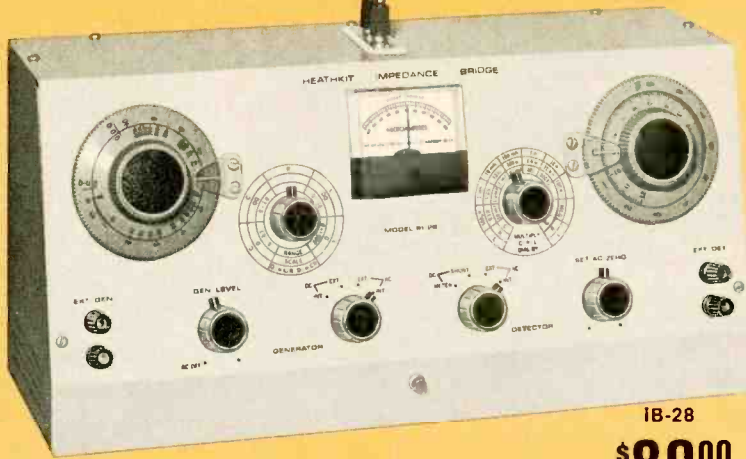
Switch provides direct or x10 attenuated operation and a trimmer capacitor provides proper match to scope input. Wiring options 3.3 Megohm (IO-18) or 1 Megohm (IO-14).
Kit PK-1, 1 lb. **\$4.95**

Scope Demodulator Probe Kit

For distortion checks and observation of modulation of RF and IF signals. Functions as an AM detector. 30 V RMS, 500 VDC maximum.
Kit 337-C, 1 lb. **\$5.00**
Assembled 337W-C, 1 lb. **\$6.50**



Heathkit® Test And Service Gear



IB-28
\$89.00

Heathkit Impedance Bridge

- Features the "New Look" of Heath instrumentation
- Four separate bridge circuits to measure resistance, capacitance, low Q and high Q inductance
- Easy operation and reading with the slanted control panel
- Built-in generator and amplifier
- Battery-type vacuum tube circuitry for fast warmup
- 1/2% precision resistors and silver-mica capacitors for higher accuracy
- Operates on 120 v. or 240 v., 50/60 Hz
- Requires headphones or scope for alignment

Kit IB-28, 11 lbs. \$89.00

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 μF. Inductance: 0.1 mH to 100 H. Dissipation Factor: (D) 0.002 to 1. Storage Factor: (Q) 0.1 to 1000. Accuracy: 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



IN-17
\$27.95

Decade Resistance Box

Kit IN-17, 3 lbs. \$27.95

IN-17 SPECIFICATIONS: Range: 1 ohm to 999,999 ohms in 1 ohm steps. Resistors: Precision 1/2% accuracy, 1 watt. Minimum DC resistance: .25 ohms or less at terminals with all sw. set at zero. Dimensions: 7 1/2" W x 5" H x 6 3/8" D.



IN-27
\$18.95

Decade Capacitance Box

Kit IN-27, 3 lbs. \$18.95

IN-27 SPECIFICATIONS—Range: 100 pF to 0.111 μF in increments of 100 pF. Voltage rating: 350 V. DC continuous; 500 V. DC intermittent; 1000 V. DC instantaneous test. Accuracy of incremental capacity: ± 1%. Stray capacitance: 10 to 15 pF at terminals. Dimensions: 7 1/8" W x 4" H x 5" D.



IN-37
\$7.95

Resistor Substitution Box

Kit IN-37, 2 lbs. \$7.95

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 3/8" L x 3 3/8" W x 3" H.



IN-47
\$7.50

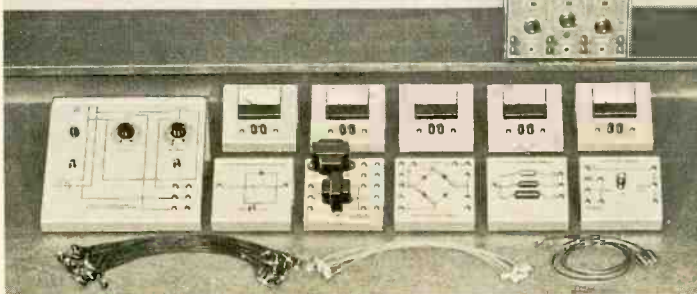
Capacitor Substitution Box

Kit IN-47, 2 lbs. \$7.50

Select any of 18 EIA standard capacitors from 100 pF to .22 μF. All rated at 600 V except three lowest & two highest values, 500 & 400 V respectively.

Heath Teaching Systems

New Heath X-Ray Machine Simulator . . . The Safe, Low Cost Way To Teach X-Ray Machine Operation

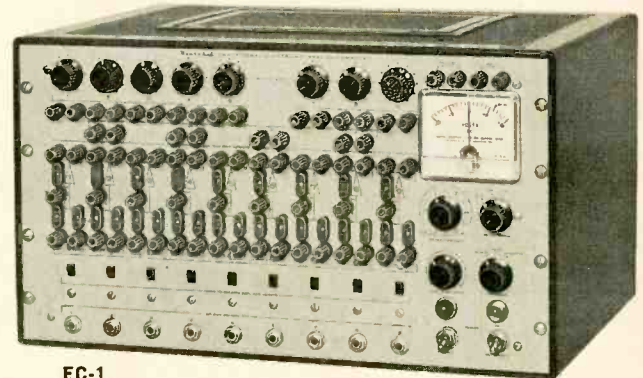


The New Heath X-Ray Machine Simulator is based on a system originally developed by Dr. E. Dale Trout, radiological physicist and his staff at Oregon State University, under contract to the U.S. Dept. of Health, Education & Welfare, and further refined by Heath into a low cost, versatile system for teaching basic X-ray machine operation. Designed for use in the radiological technology classroom, the factory assembled and tested IDW-39 simulates the electrical operating characteristics of the three basic types of X-ray machines (self-rectified, half-wave rectified & full-wave rectified) . . . frees actual X-ray machines for their intended purpose and eliminates the cost, size & hazard problems of using actual X-ray equipment for teaching.

If you are involved in the teaching or supervision of an X-ray Technology Course, the new Heath X-ray Simulator can provide safe facilities and save valuable time and money. Order now, or write for the complete system brochure at no cost.

IDW-39, X-Ray Machine Simulator (less oscilloscope) 23 lbs. . . . \$220.00

IDS-100, X-Ray Machine Simulator (incl. oscilloscope) 41 lbs. . . . \$395.00



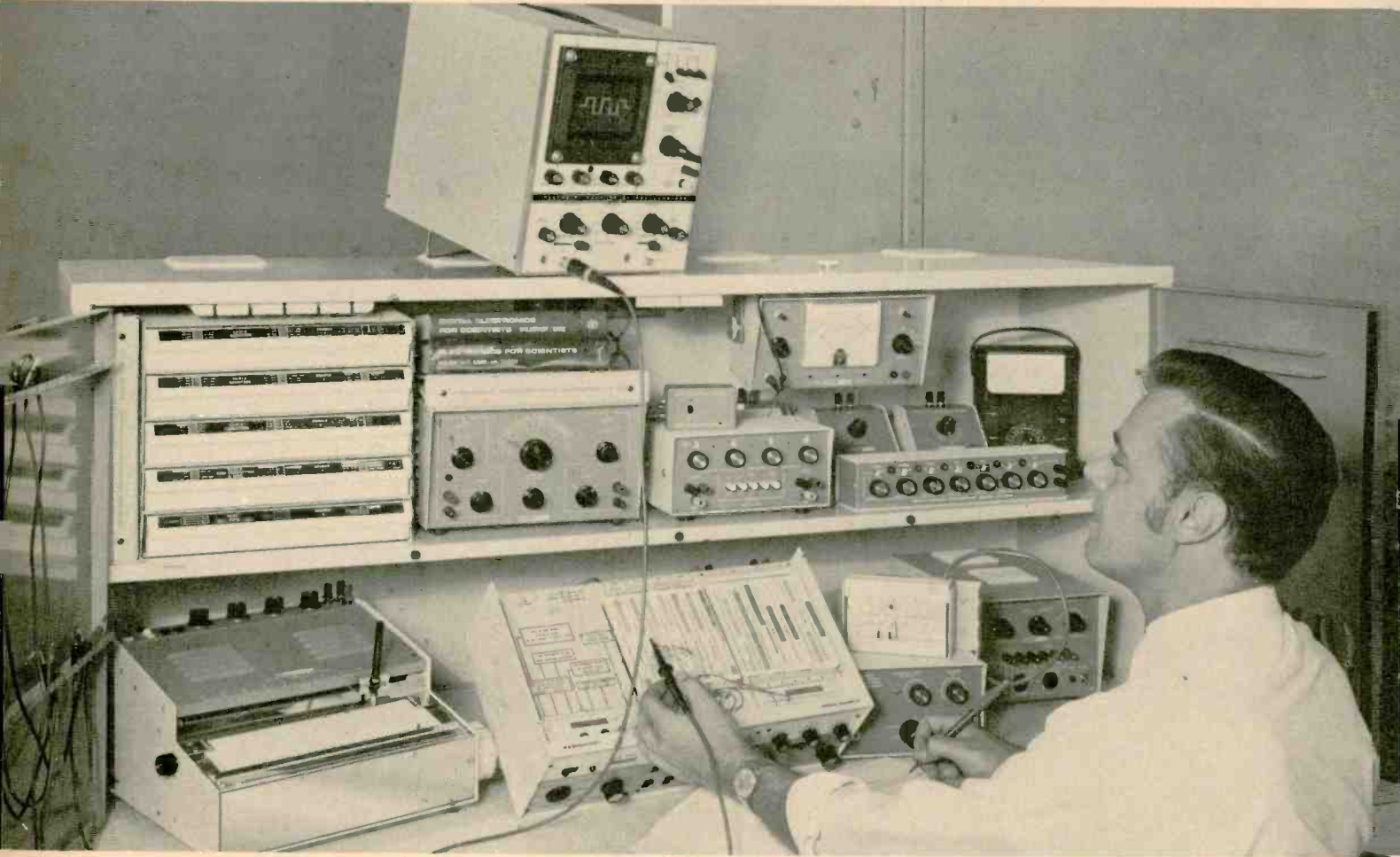
EC-1
\$225.00

Heathkit Educational Analog Computer

- Excellent teaching aid for a course in computer electronics
- Vividly illustrates the electronic analogies to mathematical problems
- Handles problems as complex as fluid flow, damped harmonic motion, and flight of a projectile in a viscous medium
- 9 DC operational amplifiers
- Switching allows amplifier balance without removing problem setup
- Built-in regulated power supply—3 initial condition power supplies
- 5 variable-coefficient potentiometers
- Built-in oscillator for re-cycling computer through problem
- Provides students with dramatic illustration of varying mathematical parameters
- Simple assembly and operation
- Complete instructions supplied

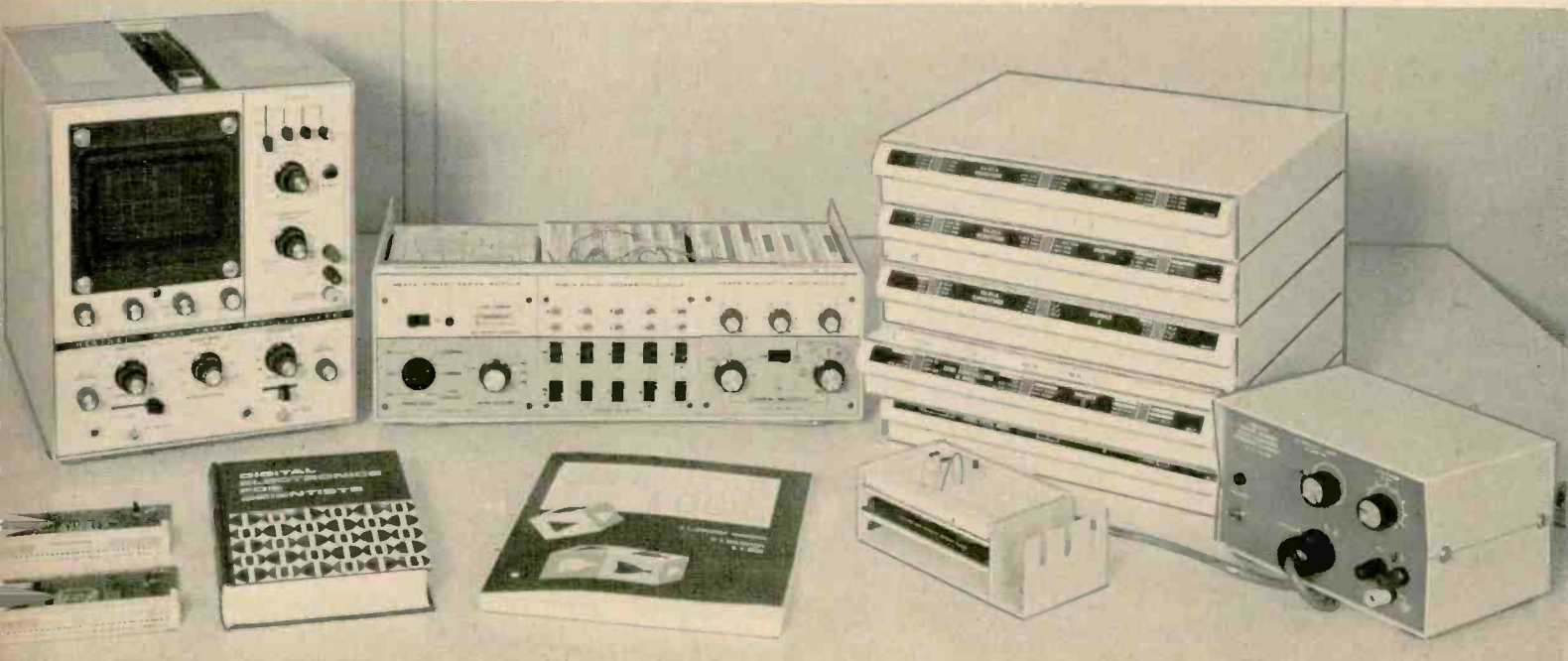
Kit EC-1, 48 lbs. \$225.00

EC-1 SPECIFICATIONS—Amplifiers: Open loop gain approximately 1000. Output—40 +60 volts at .7 ma. Power supplies: ±300 volts at 25 ma electronically regulated, variable from +250 to +350 by control with meter reference for setting +300 volts. Negative 150 volts at 40 ma regulated by VR tube. Repetitive operation: Multivibrator cycles a relay at adjustable rates (0.1 to 15 Hz), to repeat the solution any number of times; permits observation of effect of changing parameters on solution. Meter: 50-0-50 uA movement. Power requirements: 105-125 or 210-250 V., 50-60 Hz, 100 watts. Dimensions: 19 3/4" W x 11 1/2" H x 15" D.



New M-E Lab Expansion Package

*Gives Teaching And Design Capability In
Digital Electronics And Computer Logic For Present Lab Owners*



Enke Basic and New Expanded Lab Stations

Basic Lab . . . Assembled Instruments, Accessories And Text For Education In Electronic Instrumentation

The Heath/Malmstadt-Enke Basic Instrumentation Lab provides all of the instruments, power supplies and components necessary for a university course in instrumentation electronics . . . for physics, engineering, chemistry and the bio-medical sciences. In combination with the text, "Electronics For Scientists" by Drs. Malmstadt and Enke, the Basic Lab enables genuine experience in electronics to be a part of any graduate or under-graduate course. In use in hundreds of colleges, universities and research institutions, this single, compact unit provides students with all the materials needed for a comprehensive course in instrumentation electronics. Teachers and researchers obtain a thorough background in electronics. And research institutions can provide unequalled training facilities for their staffs. Since the Basic Lab is fully outfitted not only for teaching, but also for in-depth analysis and design work, it is a highly functional adjunct to the operating physics, chemistry or bio-research lab. For complete information on the Basic Lab, write for your free copy of the new Heath Scientific Instrumentation Catalog.

New Expanded Lab . . . All The Capability Of The Famous Basic Lab . . . Plus New Instrumentation For Digital Electronics & Computer Logic

The New Heath/Malmstadt-Enke Expanded Lab provides schools and research institutions with the capability to teach and design not only basic instrumentation, but also to investigate the critically important areas of digital electronics and computer logic, using sophisticated, state-of-the-art instrumentation and methods. The text, "Digital Electronics For Scientists", by Drs. Malmstadt & Enke provides students and researchers in all fields of science, engineering & technology with a systematic introduction to the concepts and devices basic to the new instrumentation-computation revolution. The reader is led a step at a time from simple switching devices, such as diodes and transistors, to the latest high speed integrated circuits, sub-systems and instruments. The workbook, "Computer Logic", also by Drs. Malmstadt & Enke, systematically "opens up" the computer so that its basic logic functions and data handling methods become clearly understood. Its six chapters detail Gate Logic, Flip-Flops, Counters & Shift Registers, Counting Measurements and Binary Computation. The text and workbook, together with the new instrumentation (described below) bring these important areas of knowledge within easy reach of all school and research facilities. Write now for complete information.

New Expansion Package Gives Digital Electronics & Computer Logic Capability To Basic Lab Owners

New Expansion Package Adds Important Capabilities To Your Basic Lab Station. The development of high-speed integrated circuits and the accompanying radical changes in design concepts have made possible laboratory and research instrumentation undreamed of just a few years ago. The trend toward even more change in these areas is apparent, and the need for teaching, design and research methods and instrumentation to cope with these changes is obvious.

For the thousands of owners of the Basic EU-100 Series Lab Station, Heath now offers the Malmstadt-Enke Lab Expansion Package . . . an integrated, completely compatible group of sophisticated instruments and absorbing texts designed to extend the capabilities of the Basic Lab into the areas of digital electronics and computer logic. Here is a coordinated, thoroughly proven series designed to meet the increasing need for detailed knowledge in all Scientific & Engineering disciplines. The complete Expansion Package, or selected parts of it, can be used for teaching, for design, for pure research . . . specialized, highly functional instrumentation and powerful texts that permit the unhampered extension of the Basic Lab into those areas where need is greatest. All instruments in the Expansion Package are factory assembled and calibrated.

The EU-801A Analog-Digital Designer (ADD™), including the fast selling text "Digital Electronics For Scientists", provides a highly flexible tool for probing into digital techniques and circuitry. Designed to complement each other, the 801A and the text can be used for formal classroom instruction, either as a course by itself or incorporated into an existing course containing linear circuits . . . as a very effective self-teaching course . . . for design and experimentation into new areas of measurement, computation or control systems & circuits. The text/801A combination assumes no knowledge of electronics, and hence has proved extremely useful to scientists and engineers who must be familiar with digital concepts yet have no formal background in electronics. Complete information on the 801A can be found on page 62.

The chart below can be used to quickly determine the differences between the Basic and Expanded Lab Stations, and the cost of individual components. All units are assembled. Note special group prices.

Component	Basic Lab	Expanded Lab
	EU-100C/W	EU-100D/Y
EUA-11	Manual	4.50
EUP-11	Text, "Electronics for Scientists"	14.00
EU-13A	Universal Experimental Chassis & Parts	185.00
EU-14A	Special Experimental Chassis & Parts	68.00
EU-51A	Experimental Parts Group	145.00
EUW-15	Universal Power Supply	100.00 (1)
EU-80A	Voltage Reference Source	120.00
EUW-17	Solid-State Low Voltage Power Supply	32.00 (2)
EU-41A	Regulated Solid-State Low Voltage P.S.	65.00
EUW-18	Lab Meter with shunts	30.00
EUW-19B	Operational Amplifier System	180.00
EU-20V	21-Speed Chart Recorder	320.00
EU-801A	ADD with "Digital Electronics for Scientists" text	499.00
EU-800-JE	And-Or-Invert Gates card	18.00
EU-800-CC	Quad J-K Flip-Flop card	24.00
EUP-20	Workbook, "Computer Logic"	3.50
EUW-24	Vacuum Tube Voltmeter	88.00
EUW-25	DC Oscilloscope	225.00
EU-70A	Solid-State Dual-Trace Oscilloscope	565.00
EUP-26	Weston 980 VOM	61.00
EUW-27	Sine-Square Wave Generator	125.00
EUW-28	Resistance Substitution Box	25.00
EUW-29	Capacitance Substitution Box	26.00
EU-30A	Decade Resistance Box	55.00
GH-25	Deluxe Tool Set	19.95
Total		1678.45
EU-100W	Basic Lab with EU-20V 21-Speed Chart Recorder; Special Group Price	1595.00
EU-100Y	Expanded Lab with EU-20V 21-Speed Chart Recorder; Special Group Price	2195.00

(1) EU-40A may be substituted

(2) EU-41A may be substituted; add \$33.00 to system price

NOTE: The Digital Expansion Package is available separately for present Lab Station owners who wish to add it. See below for detailed description and prices.

Systems also available with single-speed chart recorder EU-20B in place of EU-20V. Deduct \$85.00 from EU-100W & EU-100Y group prices above; order Basic Lab System EU-100C, Expansion Lab System EU-100D.

Export versions of above groups available—write for prices.

Add Two New Cards & the "Computer Logic" Workbook to the 801A—You Get a Logic Training System. In conjunction with the 801A these additions give the user total capability to investigate basic computer logic functions. In effect, this combination transforms the digital cards of the EU-801A ADD into an EU-801C Computer Logic Training System. This system, which is fully described on page 63, systematically opens up the computer to show its basic logic functions and data handling methods. As with the 801A, the 801C can be used for classroom or self instruction, research or design . . . and a knowledge of electronics is not required.

The EU-51A Experimental Parts Group, fully described on page 61, is a compact, highly adaptable breadboard system for circuit design and teaching. Circuits constructed on the Patch Card of the 51A can be used in the 801A, and plug-in logic circuit cards from the 801A can be used in the Desk Top Chassis of the 51A. The Experimental Parts Group contains almost 500 standard electronic components and can be used with virtually any off-the-shelf item as well. As a general purpose breadboard system, the 51A has a limitless range of applications.

The New EU-70A Solid-State Oscilloscope is an extremely useful adjunct to the Basic Lab. It features DC to 15 MHz response, total dual-trace capability, also an X-Y mode, highly sophisticated triggering and a great many more professional convenience features. See page 51.

Expand The Capabilities Of Your Basic Lab . . . order your Expansion Package now.

EU-801A & text (page 62)	\$499.00
EUP-20, "Computer Logic" workbook (page 63)	\$3.50
EU-800-JE, And-Or Invert gate card	\$18.00
EU-800-CC, Quad J-K Flip-Flop card	\$24.00
EU-70A, Solid-State Dual Trace Scope (page 51)	\$565.00
EU-41A, Low Voltage Power Supply (page 43)	\$65.00
EU-51A, Experimental Parts Group (page 61)	\$145.00

EU-41A may be substituted; add \$37.00 to system price.

Systems also available with single-speed chart recorder EU-20B in place of EU-20V. Deduct \$100.00 from EU-100W & EU-100Y group prices above; order Basic Lab System EU-100C, Expansion Lab System EU-100D.

How to Order...The Easy Heathkit® Way

1. BY MAIL

Complete the simple-to-follow Heath order form—including the reverse side if you wish to use the liberal Heath Time-Payment Plan.

Always Use The Same Name Whenever You Order. Enclose your check or money order to cover the type of payment plan you've chosen. Include shipping charges only if item can be mailed Parcel Post (see shipping information, opposite page). If your order is to be shipped REA or Motor Freight, do not include shipping charges. If you wish us to send your order to another address, be sure to fill out section 2 of the order blank.



2. BY TELEPHONE

For kit or parts orders **ONLY** . . . on time payment, COD, or commercial accounts call 616-983-7381 weekdays from 8:00 a.m. to 4:30 p.m. EST . . . for fast order service and information on kit availability. After 4:30, our Electronic Secretary will take your COD order **ONLY**.

For all other business . . . kit building assistance, repair service, product info, order tracing, and if you would like to place an order at the same time, call 616-983-3961 for proper routing.



3. VISIT OUR SHOWROOM SALES/SHOWROOM

Heath is located on Hilltop Rd., in St. Joseph, Michigan. And our Sales/Showroom is open Mon. thru Fri. from 8:30 a.m. to 5 p.m. and on Saturdays from 9 a.m. to 3 p.m. You can take your kit with you, or arrange for shipment to your home. You'll see and hear Heathkit equipment in action, giving you an opportunity to make just the right selection for your needs.

Methods of Payment

1. IN CASH

Do Not Send Currency Or Postage Stamps . . . send personal check or money order.

2. C.O.D.

A 20% deposit is required on any C.O.D. order. The balance will be collected by the carrier. Payment must be made in cash, money order, or certified check (they will not accept personal checks). C.O.D. Shipments cannot be made if balance is over \$200.

3. CONVENIENT HEATH TIME-PAY PLAN

No money down and up to 12 months to pay on orders from \$35 to \$300. 10% down and up to 18 months to pay on orders from \$300.01 to \$500. See details below.

To Make "Add-On" Purchases. See details below.

RESIDENTS OF PUERTO RICO AND OTHER U.S. POSSESSIONS!

A special time pay plan is now available . . . write our Credit Dept. for details.

SPECIAL ACCOUNTS FOR GOVERNMENT, BUSINESS AND EDUCATIONAL INSTITUTIONS

We offer 30 day terms to governmental, business and educational institutions. An acceptable Dun and Bradstreet rating or names and addresses of five firms with whom you are presently doing business are required.

HEATHKIT OVERSEAS

Many Heathkits are available in special export versions for 115/230 v AC, 50-60 Hz operation. Look for the "Export model available" note at the bottom of the price lines or check the specifications for primary voltages. For details on international orders and shipments, see the list of overseas units on the back cover or write to International Division, Heath Company, Benton Harbor, Michigan 49022.

Heath Easy Payment Plan

ABOUT EASY PAYMENT PLAN

The "Cash Price" of merchandise on Heath's Easy Payment Plan includes the Cash Price as listed on the page describing the merchandise plus applicable sales tax, shipping charges and less any advertised allowances. The "Deferred Payment Price" is the Cash Price plus the **FINANCE CHARGE**. The "Total Payments" is the "Deferred Payment Price" less any "Down Payment". The **ANNUAL PERCENTAGE RATE** of the **FINANCE CHARGE** is 18%.

Minimum amount that can be financed is \$35.00. No down payment is required on orders up to \$300; however, a down payment will reduce your monthly payments and **FINANCE CHARGE**. On orders over \$300, a down payment of 10% is required. Write for details on orders over \$500.

HOW TO OPEN AN ACCOUNT

Just fill out the statement, sign the agreement, and mail to Heath with your order.

ADD-ON PURCHASES

Once your credit is established you can add-on purchases of \$35.00 or more with no down payment. List items you want on order blank, **check the add-on box** and **give your account number**. Sign the time payment agreement and send to us with original payment book.

NOTICE TO BUYER:

- Do not sign the contract before you read it.
- Under certain conditions you may redeem the property if repossessed for a default.
- If you pay in full in advance, any unearned **FINANCE CHARGE** will be rebated under The Rule of 78. **IF FULL AMOUNT IS PAID WHEN FIRST INSTALLMENT DUE (30 days after shipment), THEN YOU SAVE ENTIRE FINANCE CHARGE.**

EASY PAYMENT CHART

If Cash Price Less Down Payment Amounts To:	12 Monthly Payment Plan		If Cash Price Less Down Payment Amounts To:	12 Monthly Payment Plan		*Final Payment is an odd amount. Can be larger or smaller than regular payment.
	Finance Charge	Monthly* Payment		Finance Charge	Monthly* Payment	
\$ 35.00 - \$ 37.50	\$ 3.65	\$ 3.30	220.01 - 230.00	22.60	21.00	
37.51 - 40.00	3.90	3.55	230.01 - 240.00	23.60	22.00	
40.01 - 42.50	4.15	3.80	240.01 - 250.00	24.60	22.50	
42.51 - 45.00	4.40	4.00	250.01 - 260.00	25.70	23.50	
45.01 - 47.50	4.65	4.25	260.01 - 270.00	26.70	24.50	
47.51 - 50.00	4.90	4.50	270.01 - 280.00	27.70	25.00	
50.01 - 55.00	5.25	4.75	280.01 - 290.00	28.70	26.00	
55.01 - 60.00	5.75	5.25	290.01 - 300.00	29.70	27.00	
60.01 - 65.00	6.25	5.75	300.01 - 310.00	30.70	28.00	
65.01 - 70.00	6.80	6.25	310.01 - 320.00	31.70	29.00	
70.01 - 75.00	7.30	6.75	320.01 - 330.00	32.70	30.00	
75.01 - 80.00	7.80	7.00	330.01 - 340.00	33.70	31.00	
80.01 - 85.00	8.30	7.50	340.01 - 350.00	34.70	32.00	
85.01 - 90.00	8.80	8.00	350.01 - 360.00	35.70	33.00	
90.01 - 95.00	9.30	8.50	360.01 - 370.00	36.70	34.00	
95.01 - 100.00	9.80	9.00	370.01 - 380.00	37.70	35.00	
100.01 - 110.00	10.45	9.50	380.01 - 390.00	38.80	36.00	
110.01 - 120.00	11.50	10.50	390.01 - 400.00	39.80	37.00	
120.01 - 130.00	12.55	11.50	400.01 - 410.00	40.80	37.50	
130.01 - 140.00	13.60	12.50	410.01 - 420.00	41.80	38.00	
140.01 - 150.00	14.60	13.50	420.01 - 430.00	42.80	39.00	
150.01 - 160.00	15.60	14.00	430.01 - 440.00	43.80	40.00	
160.01 - 170.00	16.60	15.00	440.01 - 450.00	44.80	41.00	
170.01 - 180.00	17.60	16.00	450.01 - 460.00	45.80	42.00	
180.01 - 190.00	18.60	17.00	460.01 - 470.00	46.80	43.00	
190.01 - 200.00	19.60	18.00	470.01 - 480.00	47.80	44.00	
200.01 - 210.00	20.60	19.00	480.01 - 490.00	48.80	45.00	
210.01 - 220.00	21.60	20.00	490.01 - 500.00	49.80	46.00	

ON ORDERS OVER \$500.00 - WRITE FOR DETAILS

Terms chart prepared by D. J. Moffo, Heath Co., Benton Harbor, Michigan

How to Figure Shipping Costs

First, check the footnote at the bottom of each right hand page to determine if your kit is mailable or must be shipped another way, then use the appropriate information below.

Mailable Items

How To Use Your Zip Code To Find Parcel Post Zone. To determine the cost of a parcel post shipment to your area, use the first three digits (prefix) of your zip code and find your zone in the Zone Chart. Then refer to the Parcel Post Rate Table below. For Example, If Your Zip Code is 10036, use the first 3 numbers . . . 100 . . . and Check The Chart below for your Parcel Postal Zone, which is 5.

Zone Chart

Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone	Zip Code Prefixes	Zone
006-009	8	260-261	3	370-386	4	478	3	600-609	2	823-826	6
010-069	5	262-278	4	387	5	479-489	2	610-619	3	827	5
070-089	4	279	5	388	4	490-491	1	620-623	4	828-832	6
090-099	5	280-283	4	389-397	5	492	2	624-628	3	833	7
		284-285	5			493-495	1	629-668	4	834	6
100-108	5	286-293	4	400-406	3	496-499	3	669-679	5	835-838	7
109	4	294-295	5	407-409	4			680-687	4	840-847	6
110-119	5	296-297	4	410-412	3	500-516	4	688-693	5	850-864	7
120-123	4	298-299	5	413-422	4	520-524	3	700-722	5	865-884	6
124-126	5			423	3	525	4	723-727	4	890-898	7
127-128	4	300-303	4	424-426	4	526-528	3	728-768	5		
129	5	304	5	427-432	3	530-534	2	769	6	900-921	8
130-152	4	305-307	4	433-436	2	535-539	3	770-778	5	922-928	7
153	3	308-329	5	437-457	3	540	4	779-789	6	930-934	8
154-160	4	330-334	6	458	2	541-546	3	790-792	5	935	7
161	3	335-338	5	460-462	3	547-548	4	793-799	6	936-960	8
162-163	4	339	6	463-464	2	549	3			961	7
164-165	3	350-352	4	465-466	1	550-566	4	800-803	5	962-976	8
166-199	4	354	5	467-469	2	567	5	804-805	6	977-979	7
		355-359	4	470-472	3	570-572	4	806-807	5	980-987	8
200-232	4	360-361	5	473	2	573-588	5	808-816	6	988-994	7
233-237	5	362	4	474-475	3	590-597	6	820-822	5	995-999	8
238-259	4	363-369	5	476-477	4	598-599	7				

PARCEL POST RATES for MAILABLE ITEMS

Postal Regulations . . . limit parcel post shipments to 40 pounds, all zones. EXCEPTION: Shipments up to 70 pounds will still be accepted to RFD addresses, and to APO numbers.

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 10 lbs. or over (but less than 30 lbs.), and mark "Airlift" on your order.

IMPORTANT

- Figure the postage charges for each kit separately.
- Then, total the individual charges and remit the full amount for Parcel Post.

Ship. Wt.	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
2 lbs.	\$0.60	\$0.60	\$0.65	\$0.70	\$0.80	\$0.85	\$0.90
3 lbs.	.65	.70	.75	.85	.95	1.05	1.15
4 lbs.	.70	.75	.85	.95	1.10	1.20	1.35
5 lbs.	.75	.80	.90	1.05	1.25	1.40	1.60
6 lbs.	.80	.90	1.00	1.15	1.40	1.55	1.75
7 lbs.	.90	.95	1.10	1.30	1.50	1.75	1.95
8 lbs.	.95	1.00	1.15	1.40	1.65	1.90	2.15
9 lbs.	1.00	1.05	1.25	1.50	1.80	2.05	2.35
10 lbs.	1.05	1.15	1.35	1.65	1.90	2.25	2.55
11 lbs.	1.10	1.20	1.40	1.75	2.00	2.40	2.75
12 lbs.	1.15	1.25	1.50	1.85	2.15	2.55	2.90
13 lbs.	1.20	1.35	1.55	1.95	2.25	2.70	3.10
14 lbs.	1.25	1.40	1.65	2.05	2.40	2.85	3.25
15 lbs.	1.30	1.45	1.75	2.15	2.50	3.00	3.45
16 lbs.	1.35	1.55	1.80	2.25	2.60	3.15	3.60
17 lbs.	1.40	1.60	1.90	2.35	2.75	3.30	3.80
18 lbs.	1.45	1.65	1.95	2.45	2.85	3.45	4.00
19 lbs.	1.50	1.75	2.05	2.55	2.95	3.60	4.15
20 lbs.	1.55	1.80	2.10	2.65	3.10	3.75	4.35
21 lbs.	1.60	1.85	2.15	2.75	3.20	3.90	4.50
22 lbs.	1.65	1.90	2.25	2.80	3.30	4.05	4.70
23 lbs.	1.70	1.95	2.30	2.90	3.40	4.20	4.85
24 lbs.	1.75	2.00	2.35	3.00	3.55	4.35	5.00

Rates on this page were in effect when this catalog was published. They are subject to change without notice.

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. shipments 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
25 lbs.	1.75	2.05	2.45	3.05	3.65	4.50	5.20
26 lbs.	1.80	2.05	2.50	3.15	3.75	4.65	5.35
27 lbs.	1.85	2.10	2.55	3.25	3.90	4.80	5.55
28 lbs.	1.90	2.15	2.60	3.35	4.00	4.90	5.70
29 lbs.	1.90	2.20	2.70	3.40	4.10	5.05	5.90
30 lbs.	1.95	2.25	2.75	3.50	4.20	5.20	6.05
31 lbs.	2.00	2.30	2.80	3.60	4.35	5.35	6.25
32 lbs.	2.05	2.35	2.90	3.65	4.45	5.50	6.40
33 lbs.	2.10	2.40	2.95	3.75	4.55	5.65	6.55
34 lbs.	2.10	2.45	3.00	3.85	4.65	5.75	6.75
35 lbs.	2.15	2.50	3.05	3.95	4.80	5.90	6.90
36 lbs.	2.20	2.55	3.15	4.00	4.90	6.05	7.10
37 lbs.	2.25	2.60	3.20	4.10	5.00	6.20	7.25
38 lbs.	2.25	2.65	3.25	4.20	5.10	6.35	7.40
39 lbs.	2.30	2.70	3.35	4.25	5.25	6.45	7.60
40 lbs.	2.35	2.75	3.40	4.35	5.35	6.60	7.75
45 lbs.	2.55	2.95	3.70	4.80	5.90	7.30	8.55
50 lbs.	2.75	3.20	4.05	5.20	6.45	8.00	9.35
55 lbs.	2.90	3.45	4.35	5.65	7.00	8.65	10.15
60 lbs.	3.05	3.65	4.65	6.05	7.55	9.30	10.95
65 lbs.	3.20	3.90	5.00	6.45	8.10	9.95	11.75
70 lbs.	3.40	4.15	5.30	6.85	8.65	10.60	12.55

Note: These parcel post rates were in effect at the time of printing. They are based upon Oct. 19, 1968 postage rates.

Non-Mailable Items

*REA EXPRESS & MOTOR FREIGHT INSTRUCTIONS FOR NON-MAILABLE ITEMS

For shipments exceeding parcel post limits. Non-mailable items will be sent to you by Motor Freight or REA Express. We suggest that you check with these local carriers to determine the service available for delivery in your area. Do not enclose money for Motor Freight or Express. Shipping charges will be collected by the carrier.

Please note that it may be necessary for us to change routings because of irregularities in service from our city, or at points of transfer en route.

We stamp all waybills "HOLD AT TERMINAL NOTIFY CONSIGNEE." The carrier will contact you by phone or mail for your instructions as soon as your shipment reaches a terminal that would normally make the delivery. We have made this notation so that you can avoid a residence delivery charge by picking up the merchandise yourself if you so desire, or, by notifying you in this way, a suitable time can be arranged for home delivery thus avoiding re-delivery charges.

PREMIUM ROUTINGS

We can ship via Air Parcel Post, Parcel Post Special Handling, or Special Delivery, Air Express, Bus or Air Freight, if you so request. Contact your local office for rates and delivery information.

IF YOU MOVE . . .

please send us your old address, and your new address including Zip Code. This will keep catalogs, correspondence, and your shipments coming without interruption. Use coupon below.

If You Are Receiving Duplicate Copies

of Heathkit catalogs, return the mailing labels of those copies you wish discontinued.

Have You Moved Since Your Last HeathKit Order?

Fill in and mail this coupon to Heath so we can bring your records up to date.

If you have an address label from a previous Heathkit flyer or catalog, send it along with the coupon.

My New Address Is:

Name _____

Address _____

City _____ State _____ Zip _____

My Old Address Was:

Name _____

Address _____

City _____ State _____ Zip _____

Be sure to include your zip code no.

EUW-15 Laboratory Power Supply

- Functions as a full-wave, half-wave, bridge or voltage doubler power supply
- Spring-clip connectors on jumper wires permit fast, simple circuit changes
- Partial schematic diagrams are screened inside the chassis for handy reference
- Separate power & high voltage on/off switches • Fully assembled & tested

EUW-15, 14 lbs. \$100.00

The following specifications are for the EUW-15 Power Supply when it is wired for voltage-doubler operation.

EUW-15 SPECIFICATIONS: B+ voltage output: 200 to 350 volts DC regulated, at 0 to 100 milliamperes continuous. Filament voltage output: 6.3 volts AC at 3 amperes. B+ regulation: Output variation less than 1% from no load to full load at 300 volts. Output variation less than ± 1 volt for a ± 10 volt variation in the AC line input. B+ ripple: less than 10 millivolts rms ripple, jitter, and noise. B+ output impedance: Less than 10 ohms from 5-100,000 Hz. Divider voltage (unregulated): Approximately 500 v, 400 v, 300 v, 200 v, 100 v. Voltage divider: Internal, using five 1500 ohm 10 watt resistors . . . also can be used as a variable internal load. Power requirements: 105-125 volts, 50/60 Hz, 85 watts. Dimensions: 8 1/4" W x 6 1/2" H x 12 1/2" D.

New EU-80A Voltage Reference Source

- 0-10 VDC output • 15 ppm/hr. stability • Pushbutton Polarity Reversal & Chopped DC Output
- Includes Voltage-To-Current Accessory • Convenient Sum-Difference and Calibrator Modes

EU-80A, 6 lbs. \$120.00

EU-80A SPECIFICATIONS: OUTPUT: Output Voltage: 0-10 VDC, regulated. Accuracy: As allowed per 0.1% resistors. Stability: 15 ppm/hr.; 1000 ppm/mo. Regulation: Less than 0.05% change with a 90 to 130 VAC line voltage change. Output Current Using Voltage-To-Current Accessory: 0-10 uA in 1 M ohm position; 0-10 mA in 1 G ohm position. Output Current Accuracy: 1% in 1 M ohm position; 2% in 1 G ohm position. CONTROLS: Range Selector: Four position—10V, 1000 mV, 100 mV & 10 mV. Voltage Selectors: 10 position switches for first two digits & continuous adjustment for third digit. Function Switches: On/Off; S/A+S; DC-S/Chop-S; +S/-S.

EUP-26 20,000 Ohm/Volt VOM

- Large 50-microampere meter, Diode Protected • Weston model 980 Mark II Analyzer • Battery powered for portable convenience • Completely factory assembled and tested

EUP-26, 4 lbs. \$61.00

EUP-26 SPECIFICATIONS—Sensitivity: 20,000 ohm/volt DC, 1000 ohm/volt AC. Range: DC Volts; 1.6-8-40-160-400-800-4000. AC Volts; 1.6-8-40-160-400-1600. DC Current, 80 microamperes, 1.6-8-80-800 milliamperes, 8 amperes. Ohmmeter: Rx1, Rx10, Rx100, Rx1000, Rx10,000. Decibels (DB): -15 to +6, -1 to +20, +13 to +34, +25 to +46, +33 to +54. Accuracy: $\pm 2\%$ full scale on 1.6 to 800 V DC ranges. $\pm 3\%$ full scale on 4000 V DC range. $\pm 3\%$ on all AC ranges. ± 2 divisions, as read on the 0-16 scale, on all ohms ranges. Front Panel Controls: Function-Range switch. Ohms Adjust control. Meter Movement: 50 microamperes, 1125 Ω , diode-protected. Batteries: 1 type D cell, 1.5 volts. 1 "B-C" battery, 15 volts (Eveready #411). Dimensions: 6 1/2" wide x 7 1/2" high x 3 1/2" deep (overall). Net weight: 3 lbs. 1 oz. Shipping weight: 4 lbs.

EUW-27 Sine-Square Generator

- Less than .25% sine wave distortion • Less than .15 microsecond square wave rise time • Sine and square wave output available simultaneously • 20 Hz to 1 MHz in 5 bands • Factory assembled and tested

EUW-27, 14 lbs. \$125.00

EUW-27 SPECIFICATIONS—Sine wave: Frequency range: 20 Hz to 1 MHz. Output volts (RMS): 0 to 10 volts, 0 to 1 volt, 0 to .1 volt, or 0 to .01 volt when working into a high impedance load. Source impedance: ($\pm 10\%$); 10 volt range, 0 to 3.5 k ohm; 1V, .1V, and .01V range, 600 ohm. Distortion: Less than .25%, 20 to 20,000 Hz. Frequency response: ± 1.5 db 20 Hz to 1 MHz. Square wave frequency range: 20 Hz to 1 MHz. Output volts: (P. to P.) $\pm 5\%$; 0 to 10 volt, 0 to 1 volt, 0 to .1 volt, into a high impedance load. Source impedance: ($\pm 10\%$); 10 volt range, 0 to 220 ohm; 1V and .1V ranges, 52 ohm. Rise time: less than .15 microsecond. General: Frequency accuracy: $\pm 5\%$. Power requirements: 105-125 V AC, 50/60 Hz, 55 watts. Dimensions: 13" W x 8 1/2" H x 7" D.

EUW-24 Vacuum Tube Voltmeter

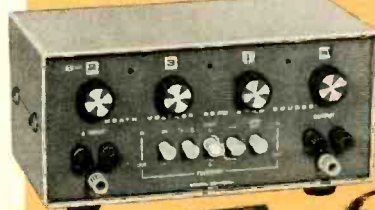
- Single AC/Ohms/DC probe • 7 AC, 7 DC, & 7 Ohms ranges • Easy to read 4 1/2" meter • 1% precision resistors • Factory assembled and tested • Front panel Servo Recorder connections

EUW-24, 6 lbs. \$88.00

EUW-24 SPECIFICATIONS—Meter scales: DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. AC peak-to-peak: 0-4, 14, 40, 140, 400, 1400, 4000. Resistance: 10 ohm center scale x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures 0.1 ohm to 1000 megohms with internal battery. Meter: 4 1/2" 200 ua movement. Multipliers: 1% precision type. Input resistance DC: 11 megohms (1 megohm in probe) on all ranges. Circuit: Balanced bridge (push-pull) using twin triode. Accuracy: DC $\pm 3\%$, AC $\pm 5\%$ of full scale. Frequency response: ± 1 db, 25 Hz to 1 MHz (600 ohm source). Battery: 1.5 volt, size "C" flashlight cell. Power requirements: 105-125 volt 50/60 Hz 10 watts. Dimensions: 6 1/2" H x 11 1/2" W x 5" D.



EUW-15
\$100⁰⁰



EU-80A
\$120⁰⁰



EUP-26
\$61⁰⁰



EUW-27
\$125⁰⁰



EUW-24
\$88⁰⁰

Additional M-E Lab Instruments Available—See Your Heath Scientific Catalog For Details . . .



EUW-18 Lab Meter with shunts, 2 lbs. \$30.00



EUW-28 Resistance Substitution Box, 2 lbs. \$25.00



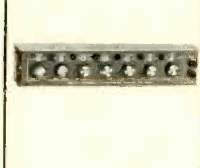
EUW-17 0-35 VDC Power Supply, 3 lbs. \$32.00



EUW-29 Capacitance Substitution Box, 2 lbs. \$26.00



EU-13A Universal Experimental Chassis & Components, 18 lbs. \$185.00



EU-30A 7-Decade Resistance Box, 3 lbs. \$55.00



EUW-25 3" DC scope, 18 lbs. \$225.00

Heath/Malmstadt-Enke Modular Analog/Digital System

the only completely compatible system which includes:

- Wire-Patch Breadboarding
- Component & IC Patching
- TTL Digital Circuit Cards
- Analog Circuit Cards
- Basic & Complex Function Cards
- Power & Rack Modules
- Generator & Indicator Modules
- Compatible Instruments

Here is a system that is revolutionizing instrumentation in labs and classrooms throughout the world. The basic design concepts of Professors H. V. Malmstadt and C. G. Enke combined with the engineering of Heath's scientific instrument group have resulted in the unique 801 Analog Digital Designer (ADD) and the EU-51A breadboard and parts group. This versatile system can perform equally well in constructing high performance research-quality instruments, in performing hundreds of experiments in the teaching laboratory, in rapid testing of new digital ideas, or in interfacing to computers.

A realistic, low cost, highly functional solderless breadboard system

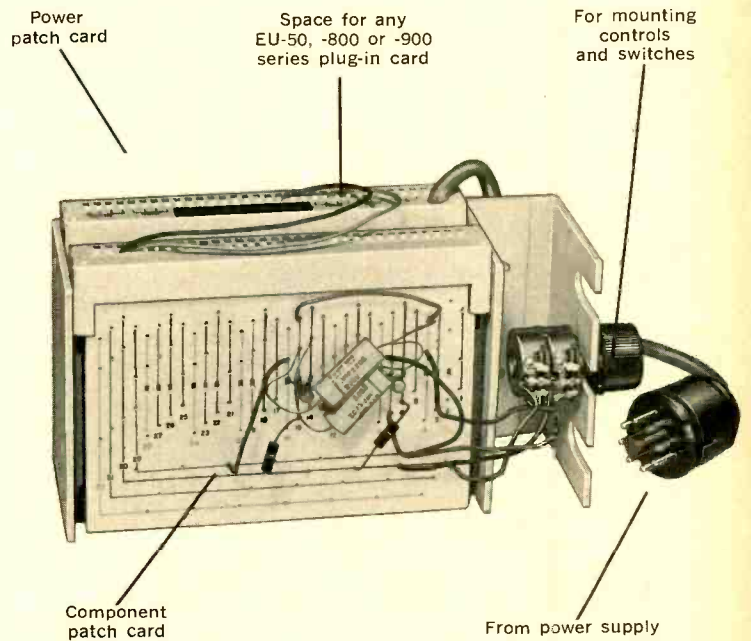
The EU-53A "Stack-n-Patch" is a totally solderless breadboarding concept designed around special connectors which accept ordinary hookup wire or component leads. Because there's no soldering, there's no waste . . . expensive FETs can't be damaged from heat . . . limited quantity samples can be reused. The 177 patch connectors on the Component Patch card are laid out according to common circuit board practice and closely simulate the circuit density and layout of today's circuitry.

The 53A is designed to be used with the 801 ADDs, modules & cards. Circuits constructed on the 53A Patch Card can be directly used in the 801A or 801C ADD modules, and all EU-50, -800 & -900 Series circuit cards can be plugged into the Desk Top Chassis of the 53A.

Your Design—Stack It . . . Patch It. The 53A includes a Desk Top Chassis, Power Patch Card for bringing power from your choice of supply, and the Component Patch Card. Pick your supply & connect it to the Power Patch Card . . . stack the Component & Power cards in the chassis . . . patch power to the Component Card and you're ready to design. The Chassis holds the Patch Cards plus any other card in the System, as well as switches, controls and other parts.

The 53A is the ideal breadboard system . . . small, lightweight, fast, simple and convenient to use. Put this remarkable new design tool on your bench soon.

Assembled EU-53A, 2 lbs. \$46.50

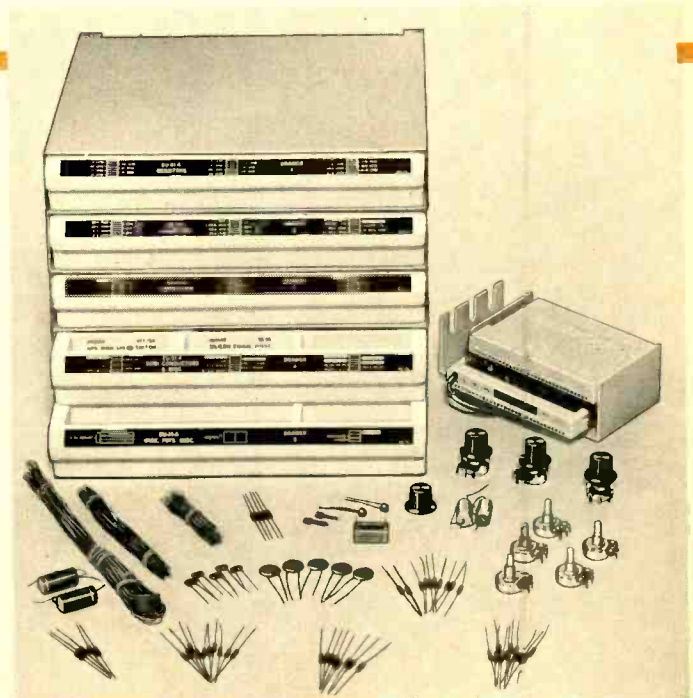


A Complete breadboard & parts set for constructing solid-state circuits

The EU-51A Experimental Parts Group includes the complete EU-53A "Stack-n-Patch" described above, plus a Parts Drawer Assembly containing 493 common electronic components, including transistors, diodes, resistors, capacitors, lengths of wire, etc.

As a part of the Heath/Malmstadt-Enke Modular Analog-Digital System, this Experimental Parts Group is useful not only in learning electronic concepts and basic circuit design elements, but also in research and development and in control instrumentation applications. The Experimental Parts Group, together with the 801A ADD, provide all the necessary components, cards and modules to perform virtually all of the experiments studied in the text "Digital Electronics For Scientists," and serves as a highly useful adjunct to the 801C Computer Logic ADD and its companion workbook, "Computer Logic."

Assembled EU-51A, 17 lbs. \$145.00



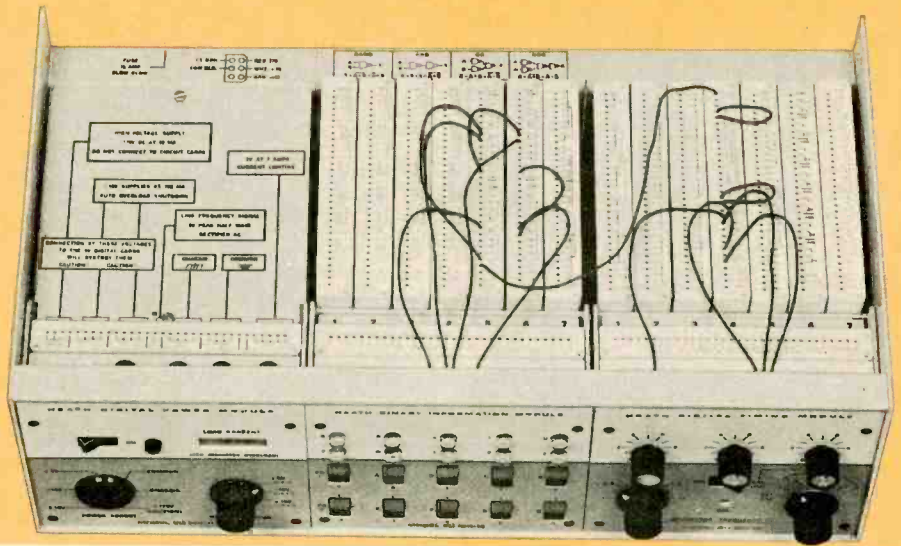
All items on these two pages are available

Heath Basic Analog-Digital Designer—ADD™

The Heath/Malmstadt-Enke 801A Analog-Digital Designer (ADD) has everything you need to:

INVESTIGATE DIGITAL CIRCUITRY: • Relay and NAND Gate logic circuits • Counting circuits • Frequency measurements • Digital voltmeters • Timing and Sequencing circuits • Adders • Subtractors • Registers • Comparators • Digital/Analog and Analog/Digital Converters • Special circuits of your own

CUSTOM DESIGN YOUR OWN: • Counters • Frequency Meters • DVMs • Precision timers • Frequency standards • Digital computer interfaces • Hundreds of other digital instruments



A Unique, Highly Flexible System. The 801A ADD provides the first instrumentation package with the means to achieve virtually everything you wish in analog and digital circuitry. To investigate existing digital circuitry or design your own, just plug in the components required. To design your own special digital or analog/digital instrument, again it's just a matter of plugging in the right cards. It's all here in the system. The basic ADD consists of 3 factory assembled modules (EU-801-11 Power Module, EU-801-12 Binary Information Module, EU-801-13 Digital Timing Module) in the EU-800-RC 3-Module Cabinet. 13 plug-in circuit cards are also supplied: 4 EU-800-JC NAND Gate cards; 2 EU-800-CB Dual J-K Flip-Flop cards; 1 EU-800-LA Dual Monostable card; 1 EU-800-JD Relay card; 1 EU-800-HB Comparator/V-F card; 1 EU-900-NA Op Amp card; 1 EU-50-MC Dual in-line IC card; 2 EU-50-MD Multiple Connector/Blank PC card. The "Digital Electronics for Scientists" text and EU-50-HA Patch Wire Assortment are also included. Two optional modules and a wide selection of additional plug-in circuit cards are also available which extend the ADD capabilities considerably... see below.

Expandable. Any EU-800, -900, or -50 Series plug-in circuit card may be used in the ADD, increasing its possibilities. Some of the cards in the ADD are designed to be "customized" by the user to fit specific needs by simply etching a printed circuit or plugging ICs into existing sockets.

Convenience And Adaptability is emphasized throughout the ADD. Power connections between modules are made with 6-pin connectors and cables at the rear of each module. Modules may be easily pulled out of the cabinet or removed when necessary. The circuit cards plug into each module in any order for minimum wiring and maximum flexibility... power supply connections are made automatically. The circuit card connector boards feature "wire patch" solderless connectors to accept ordinary hookup wire and component leads. Color coded labels identify connections at a glance and show standard logic symbols.

"Hard Wiring" Capability. The EU-50-JA Patch Accessory enables commonly used circuits or subsystems to be prewired and plugged into the top of up to seven cards in any module, and comes with enough patch connec-



New Decimal Readout Module

The new Heath EU-801-15 Decimal Readout Module provides 4½ digits of decimal readout for a 1-2-4-8 BCD TTL input, and the basic display-cycle controls which permit patching of a wide variety of digital circuits. When used with other modules and cards of the EU-50, -800 or -900 Series, it is a very convenient readout device for all decimal and octal counting, computing and memory circuits; and counter, timer, frequency meter and DVM instruments.

Several controls & circuits which are frequently used with the display function are included: an adjustable pulse width monostable for display time control; a preset 1 usec monostable for counter or register reset signals; a momentary pushbutton controlled logic output for manual reset control; a push-push switch controlled logic output for memory state control; a no-contact-bounce pushbutton-controlled logic output for manual clocking, counting & start/stop control. Also included are 4 status indicator lights behind a frosted glass panel and rear panel binding posts/banana jacks, BNC connectors to patch-wire connectors for in or out signal coupling.

Assembled EU-801-15, 5 lbs. \$195.00

tors for a full seven cards in each of two modules. The EU-50-JA gives a complete, permanent patch for 2 modules that can be installed, removed, interchanged in seconds.

TTL Logic ICs provide high performance, reliable operation at low cost: operational speed up to 20 MHz... greater noise immunity... fewer circuit components.

Open Ended... the unique ADD design expands to more and more uses as new components become available. New modules and circuit cards are introduced regularly... see below.

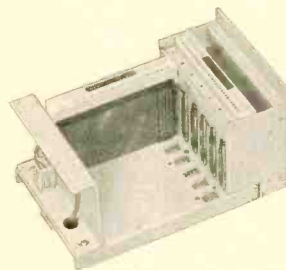
Valuable Manuals for the 801A, the modules and the cards are supplied. They give a detailed explanation of principles, illustrate various applications, describe circuits and show mode of operation for each component of the system.

The Text "Digital Electronics For Scientists" by Drs. Malmstadt & Enke gives a complete course on digital electronics, including basic switching concepts and devices, logic gates & circuits, flip-flops, counters, registers, A-D and D-A conversion, digital instrumentation and basic computation. Almost all of the experiments in the text can be performed using just the ADD.

Interface With the External Environment. Unlike most digital training devices, the ADD, with its analog-digital interfaces, is able to accept and process externally generated information... thus making the ADD ideally suited for the study, design and construction of basic computer techniques, computer interfacing, digital instruments and analog/digital measurement and control systems.

Investigate the unique capabilities of the EU-801A ADD... send for your free copy of the Heath Scientific Instrumentation Catalog now.

Assembled EU-801A ADD, including 3 modules, cabinet, 13 circuit cards, patch wire ass't and text, 28 lbs. \$499.00
EU-50-JA Patch Accessory, 2 lbs. \$39.50



New Auxiliary Module

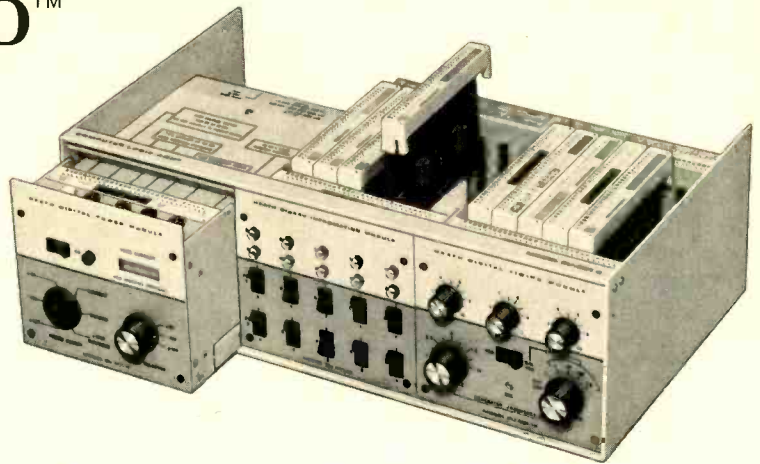
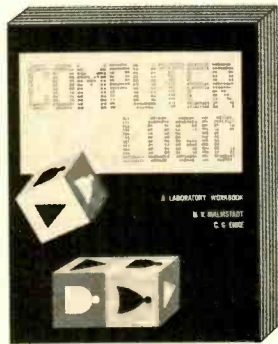
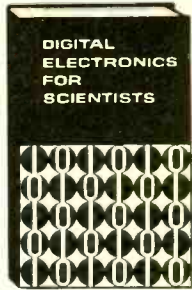
The EU-801-14 Auxiliary Module is a dual function ADD accessory. It holds and provides power connections for up to 7 additional circuit cards. It also allows the user to custom design special purpose modules, as the sub-panel & front panel are both blank allowing mounting of various controls, switches etc. Supplied with a permanent multiple connector card & a plug-in Multiple Connector/Blank PC card.

Assembled EU-801-14, 5 lbs. \$37.00

New—800 Series Plug-In Logic Circuit Cards

EU-800-DF Dual 4-Bit Shift Register, 1 lb. \$32.00
EU-800-JF Dual Hex Inverter, 1 lb. \$18.00
EU-800-JG Dual 8-Input Nand Gate, 1 lb. \$21.00
EU-800-DD Quad DCU, 2 lbs. \$90.00
EU-800-DE IC DCU, 1 lb. \$40.00

The NEW Heath EU-801C Computer Logic ADD™



A Complete Self-Teaching Computer Logic Training System For Schools, Scientists, Researchers, Engineers And Experimenters

THE NEW HEATH EU-801C COMPUTER LOGIC TEACHING SYSTEM is a radical departure from other computer logic systems in that it is equally at home in the classroom, on the design bench or in the research lab. Designed by Drs. Malmstadt and Enke in conjunction with Heath Company, the 801C System will do a thorough, highly effective job of teaching this important subject of computer logic to anyone who desires to learn—scientists and researchers who must know how a computer functions to be able to interface with it . . . engineers who could be using a computer to aid them in design work . . . students and teachers in any of the sciences—Physical, Social or Life. The general purpose computer is already in use in thousands of labs and classrooms and it becomes more common every day. The new 801C System can broaden your understanding of how these computers work and what they can do for you . . . and greatly increase your capability in your own field.

A Complete System. The new 801C System includes the EU-801C (A Specialized Computer Logic version of the famous Heath EU-801A ADD), the pioneering new text "Digital Electronics For Scientists" by Drs. Malmstadt and Enke, and a detailed, comprehensive workbook containing 50 experiments keyed to the text. The 801C ADD is a complete computer logic training device, including Power Binary Information and Timing Modules, 3 EU-800-JC NAND gate cards, 1 EU-800-JE And-Or-Invert gate card, 1 EU-800-CC Quad J-K Flip-Flop card, 2 EU-800-CB Dual J-K Flip-Flop cards, 2 EU-50-MD Multiple connector/Blank PC cards & the EU-50-HA Patch Wire Assortment. The 500 page book is an up-to-date course text for the study of modern digital logic. Although only the non-electronic portions of the text are used with the 801C system, the complete text is an invaluable study and reference source for modern digital techniques. The Workbook, "Computer Logic" is written to lead the newcomer a step at a time through basic logic functions and methods of manipulating data. Table of Contents by Chapter: (1) Gate Logic; (2) Flip-Flops; (3) Counters & Scalars; (4) Shift Registers; (5) Counting Measurements; (6) Binary Computation. The 801C System can give you the knowledge you must have to use a general purpose computer effectively in whatever manner required—interfacing, design, instrumentation, control applications, etc.

More Versatile Than Any Other Logic Training Device Available. Each plug-in circuit card contains a discrete function such as a gate or a flip-flop, and the cards can be arranged in any order. All cards are clearly labeled with standard logic symbology to facilitate connection according to common logic diagrams. Ordinary hook-up wire is used to patch the cards together without soldering to form complete logic subsystems or systems. The three Chassis Modules can be removed, interchanged, even rack mounted.

Expandable. The 801C, like all Heath Modular Digital System equipment, can be expanded to an unlimited number of other uses quickly, efficiently and inexpensively with the addition of the appropriate circuit cards. Combinations of these low cost cards can be used to provide teaching and design capability for computer interfacing, digital instrumentation and analog-digital measurement and control systems. No other logic teaching system at any cost can give you the vast flexibility that is part of the design of the new 801C.

Sophisticated, Modern Design. TTL Intergrated Circuit Logic—the same used in the latest generation of computers—is used throughout the 801C System to provide reliable operation, high speed (20 MHz typical), immunity to noise and compatability with today's computers. With the 801C you learn the logic of computers by using that logic. And because new circuit cards are continually being introduced, the 801C will never be obsolete.

Low in Cost. The complete 801C Computer Logic Teaching System, including two Workbooks, "Digital Electronics For Scientists" text, complete operations manuals and the EU-801C Computer Logic ADD, is much lower in cost than any other system. And the unique low cost plug-in circuit cards give you the teaching, research and design flexibility you must have to stay abreast of the latest developments in this fast moving field . . . something most other systems are unable to give you at any cost.

Order Your 801C System Now . . . it can be the key to full utilization of your small computer.

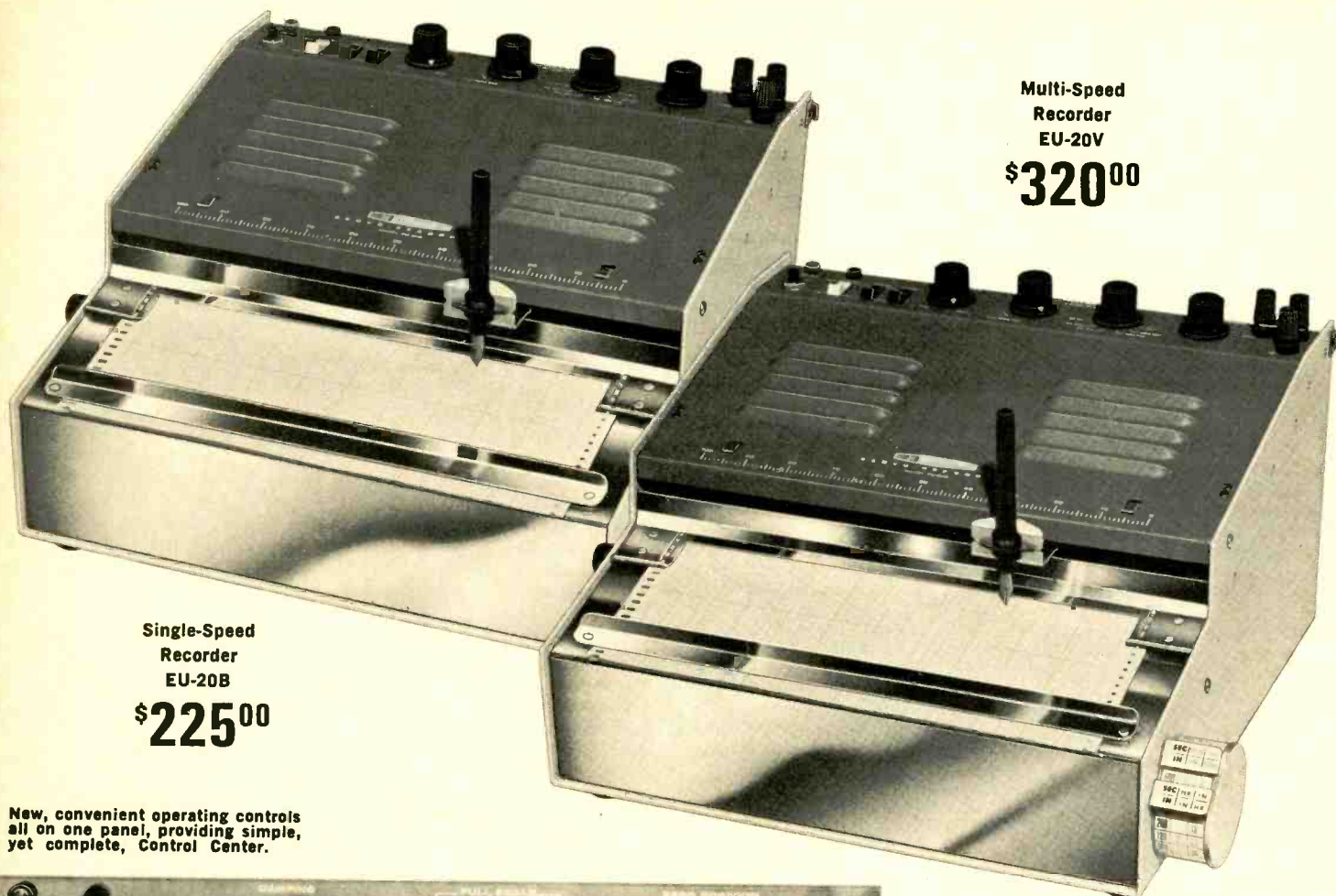
Assembled EU-801C System, 30 lbs. \$388.00
Text "Digital Electronics For Scientists," 5 lbs. \$10.75



EU-805A Universal Digital Instrument

- Performs 7 different functions—Events Counter; Integrating Digital Voltmeter; 12.5 MHz Frequency Meter; Ratio Meter; Time Interval Meter; Period Meter; Voltage Integrator • Plug-in logic circuit cards permit expansion to other uses • Compatible with EU-801A ADD • Accurate to ± 1 count + time base error • DVM accuracy 0.05% • TTL ICs • 5 parts in 10^6 short term stability • 10 mV Input Comparator sensitivity • 10 μ V resolution in DVM mode • Complete trigger controls including Auto • 6 digit readout • Available with or without DVM function • Lowest priced instrument of its kind available • Send for latest Heath Scientific Instrument catalog for complete details

EU-805A (with DVM), 42 lbs. \$1250.00
EU-805D (less DVM), 32 lbs. \$940.00
EU-805-12, DVM Conversion Pack, 5 lbs. \$340.00



Multi-Speed
Recorder
EU-20V
\$320⁰⁰

Single-Speed
Recorder
EU-20B
\$225⁰⁰

New, convenient operating controls
all on one panel, providing simple,
yet complete, Control Center.



**Heath Log/Linear Current Module Converts Heath
Recorders For Use In Spectrophotometry and Chromatography**
*Equip Your Laboratory Now With A Multi-Speed
Log/Linear Current Recorder*



EU-20-28
\$220⁰⁰

EXPANDED CAPABILITIES FOR NEW AND PREVIOUS MODELS OF HEATH CHART RECORDERS. The Heath EU-20-28 Log/Linear Module converts the Heath voltage-measuring recorders into current-measuring devices permitting their use in the small current area of photodetectors as used in spectrophotometry or ionization detectors used in gas chromatography, or other micro-current measuring applications. Absorbance spans of 0-1 and 0-2 can be read directly on the 10 inch scales of the chart recorder as the Log current ranges of this new module can be switched to provide 1, 2, or 4 log decades in the full-scale span. In the Linear mode, eleven linear ranges from 5×10^{-7} to 2×10^{-10} amperes full scale are switched in a 5, 2, 1 sequence. Thus percentage of Transmittance can be read 0-100% and 0-10% on a full scale span. Other 10% Transmittance spans such as 10-20%, 20-30%, etc. can be selected. Ten full-scale ranges of current suppression (zero offset) permit measurement of smaller currents superimposed on larger current. See full details in the new Scientific Instrumentation Catalog.

- EU-201V, Log/Linear Current Recording System with Multi-Speed Chart Drive, 34 lbs. **\$525.00**
- EU-20-28, Log/Linear Module only (converts Heath EU-20V, EU-20B, EUW-20A & M Servo-Recorders to Log/Linear Current Recording System) 11 lbs. **\$220.00**
- EUA-301-1, Conversion Parts Kit for Independent use of the Recorder portion of Heath Log/Linear Recording System, 2 lbs. **\$30.00**

Heath/Malmstadt-Enke Servo Chart Recorders

Increased Efficiency For Heath Malmstadt-Enke Servo Chart Recorders with new practical features . . . at no extra cost

- New built-in Zener supply • New drive cord layout • New chart paper drive • New circuit board construction • New 3 terminal floating input • New, more convenient operating controls • Five ranges of input sensitivity—10, 25, 50, 100 & 250 millivolts full scale • True potentiometric null-point balance on all ranges • Better than 1% accuracy • Better than 0.2% repeatability • 0.1 sec./inch response • 10 inch linear scale • Either 2 inches/minute single-speed version (EU-20B) with additional chart motors available or multi-speed version (EU-20V) with 21 electronically-accurate, switch selected chart speeds from 12 inches/minute to 1/2 inch/hour • Multi-speed version features auxiliary input to chart drive circuitry allowing electronic synchronization of recorder time base with external events • Uses inexpensive cartridge pen • Completely factory assembled and tested

PRECISION AND VERSATILITY FOR RESEARCH, EDUCATION AND INDUSTRY AT LOW COST. Heath Servo Chart Recorders are high performance instruments designed to provide direct readout of signals in the range 10 to 250 millivolts DC (full scale readings). Maximum response to changing signal values is 0.1 seconds/per inch . . . 1 second for a full scale deflection. All components have passed careful evaluation, and high quality is emphasized throughout the instruments. Another important feature of this design is the simplicity with which it can be modified for special requirements, such as the control of automatic burettes and other closed-loop feedback mechanisms. The Heath Recorders provide all scientists with an accurate, dependable instrument that fulfills a multitude of research, education, and control applications. Typically, these instruments are used for recording pressure, speed, temperature, strain, pH, metallic ion concentrations, percentage of oxygen, intensity of light, radiation and many other phenomena when used with suitable transducers and modular circuitry.

MODULAR PLUG-ON ADAPTER CHASSIS AVAILABLE. The blank chassis EUA-20-1 plugs onto the rear of the Heath recorders for adding modular circuitry of your own design, such as special electrometer inputs, and integrating amplifiers. Heath supplies a factory-assembled module for converting the recorder to a recording pH meter and millivolt electrometer, and a log-linear current detector for spectrophotometry and gas chromatography.

FULL-FEATURED NEW DESIGN. New Zener supply provides long-term stability. New 3 terminal input permits operation without the chassis being common to signal. New improved drive-cord layout assures uniform pen response in both directions with low friction and low maintenance. New circuit board construction provides stable, consistent circuits. Other features include the use of standard cartridge type pen or popular felt tip pen (multi-colored chart plots can be obtained quickly and simply by merely changing the clip-on pen), rapid chart advance, paper tear-off guide. Special stand-by circuit prolongs the life of the chopper. The impedance reduction damping feature of the recorder makes it possible to introduce damping into the servo system without appreciably increasing the dead zone. Additional chart-speed motors are also available at low cost for Model EU-20B recorders. Easy access to motor mounts permits fast, easy change to other speeds. Model EU-20V provides a selection of 21 chart speeds from 12 inches per minute to 1/2 inch per hour for convenient matching of read-out time base to the time base of the experimental phenomena . . . plus, the capability of slaving the chart speed (X coordinate) to experimental parameters or events. The Multi-Speed Chart Drive is described separately on this page. Send for the free Scientific Instrumentation Catalog.

EU-20B, Single-Speed Chart Recorder, 23 lbs.
(REA Express or Motor Frt. only) \$225.00

EU-20V, 21-Speed Servo-Chart Recorder, 26 lbs.
(REA Express or Motor Frt. only) \$320.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

EUA-20-1, Blank plug-in adapter chassis, 5 lbs. \$9.00

Chart Drive Motors for EU-20B and EU-20V Recorders, provided with 3 gears for correct installation. Wt. 1 lb. Price each \$17.00
EU-20-2, .1 inch/min.; EU-20-3, .2 inch/min.; EU-20-4, .5 inch/min.
EU-20-5, 1.0 inch/min.; EU-20-9, 12.0 inch/min.; EU-20-10, 2.0 inch/hour

EU-20V SPECIFICATIONS—Chart Paper: Grid width, 10". Length, 120 foot roll. Markings, 0-100, right to left. **Chart Speed:** 5 seconds per inch to 2 hours per inch in 21 speeds, with internal signal. Any speed up to 5 seconds per inch with external signal. (See complete EU-20-26 specifications.) Model EU-20B features standard speed 2 inches per minute only with additional chart-drive motors available. **Chart Span:** Five fixed ranges: 10, 25, 50, 100, and 250 mv, plus a sensitivity control to permit adjustment for any value from 10 to 250 mv. Also external position available for special plug-in ranges. **Pen:** Standard fountain pen, cartridge-type. **Balancing Time:** 0.1 second per inch, 1 second full scale (10"). **Error (includes dead zone):** Less than 1% of full scale for all ranges. 10 to 250 mv. **Repeatability:** 0.2%. **Maximum Source Resistance:** 50 K ohms. **Reference System:** Zener supply. **Power Requirements:** 105-125 volts 60 Hz AC; 57 watts. **Dimensions:** (includes clearance for control knobs) 15" W x 8 3/4" H x 13 3/4" D

EU-20-26
\$120⁰⁰

Five Scales Show The 21 Chart speeds in Sec./Inch, min./Inch, Inch/Min., Hr./Inch, and Inch/Hr.



New Lighted Heath Chart Viewer



Here's a new easy way to rapidly review long recorder charts. Just insert chart paper (adjustable front & rear hubs accept standard 3/4" inside dia. chart paper up to 12" W.) and crank either forward or reverse . . . self-lubricating crank bearings make action smooth & fast. Self-starting circular fluorescent lamp & translucent top. Size: 3 3/4" H x 20 1/2" W x 15" D.

Assembled SD-29A, 14 lbs. \$65.00

Add 20 More speeds to Your EU-20B from 12" min. to 0.5"/hr.

With this Chart Drive Unit

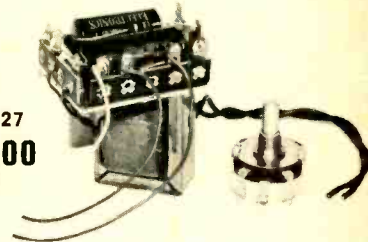
- Instantaneous selection of 21 accurate speeds from 5 seconds to 2 hours per inch when using internal line frequency signal • Unlimited variation in speeds up to 12 inches per minute when using an external chart drive signal • All chart speeds as accurate as 60 Hz AC line frequency, when using internal drive signal • The chart motor may be programmed by external signals • Output signal for synchronizing related events or other recorders • Install in any Heath EU-20B, EUW-20A Servo-chart recorder or EUW-301 Recording pH meter/electrometer • Includes complete, detailed instruction manual • Factory wired and tested • Provided with 3 gears for correct installation
- EU-20-26, Multi-Speed Chart Drive, 5 lbs. \$120.00

EU-20 CHART PAPER PRICES (EUA-445-8)

Quan.	Price ea.
1-9 rolls	\$4.75
10-24 rolls	\$4.50
25-99 rolls	\$4.00
100-199 rolls	\$3.50
200-500 rolls	\$3.00

Write for prices on orders exceeding 500 rolls.

EUA-20-27
\$23⁰⁰

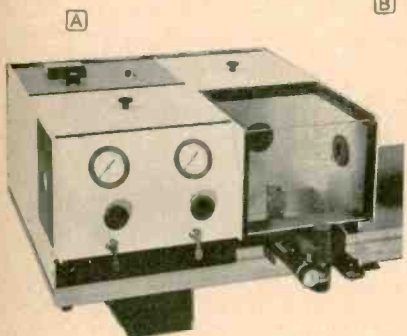
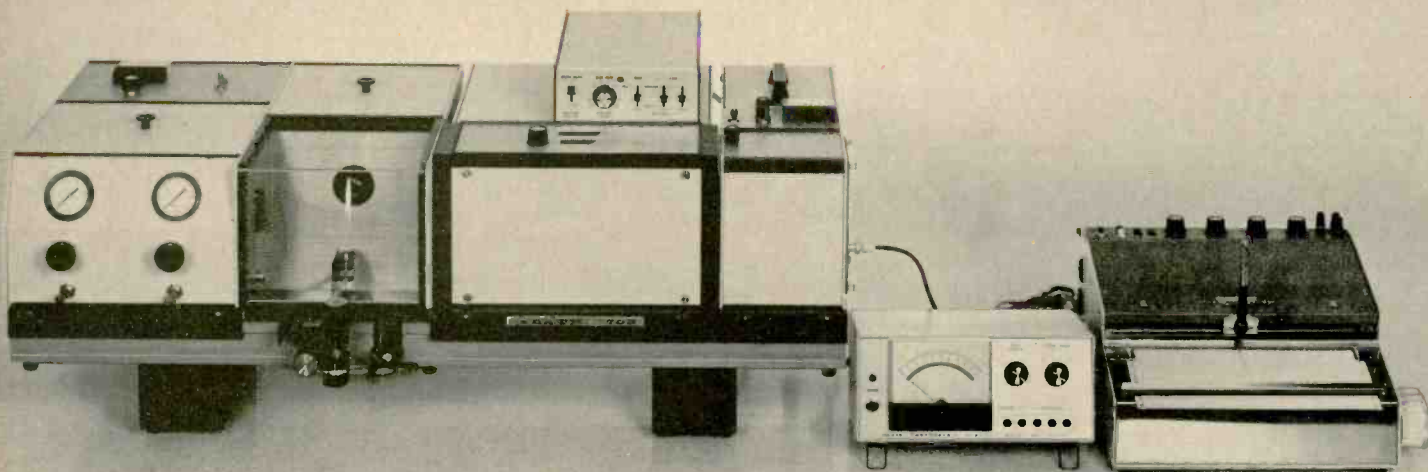
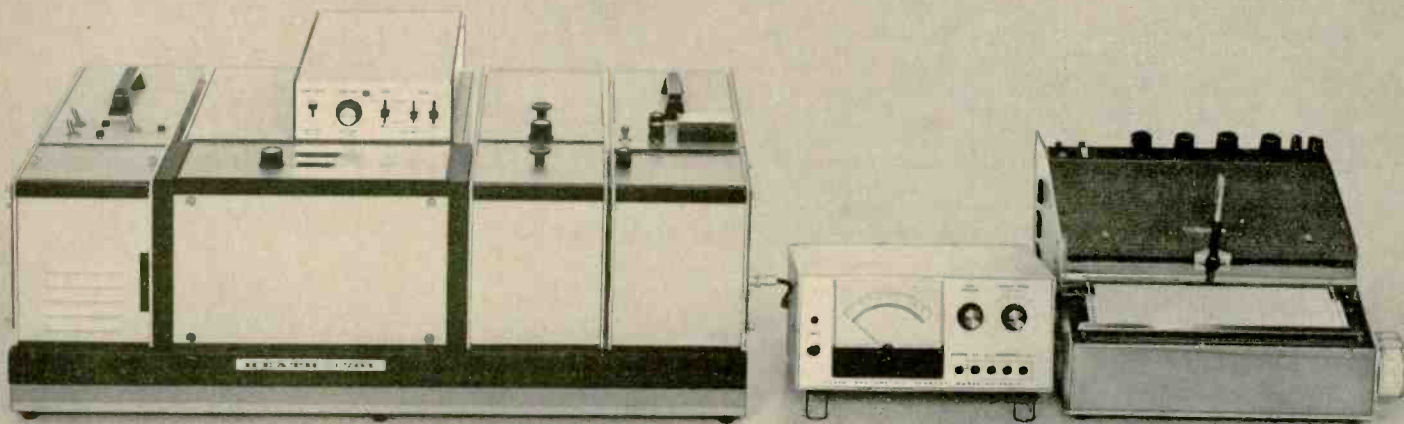


Modernize Your Heath EUW-20A And EUW-20M Recorders By Adding Factory Assembled Zener Supply

THE EUA-20-27 ZENER REFERENCE SUPPLY REPLACES MERCURY CELLS SUPPLIED FOR HEATH EUW-20A & EUW-20M RECORDERS. Stability exceeds that of mercury cells. No change in calibrating or operating procedures. Manual includes full instructions for easy installation. Designed for operation in previous Heath recorders . . . not intended for general use.

EUA-20-27, reference supply plus control, 2 lbs. \$23.00

EUA-20-27 SPECIFICATIONS—Load Current: 4.1 ma for optimum voltage stability. **Output Voltage Stability:** with 300 ohm load, regulation 0.1% from 100-130 VAC. **Temperature Stability:** essentially that of a zener diode. 0.005% per degree centigrade 0 to 70 degrees centigrade. **Power Requirements:** 105-125 volts AC, 50-60 Hz, 2.5 watts. **Size:** 2 1/2" H x 2 1/4" W x 1 3/4" D.



A EU-703-70 Atomic Absorption Module. Useable in Atomic Absorption, Flame Emission & Atomic Fluorescence modes. Accepts most burner types. EU-703-70, 63 lbs.\$1145.00



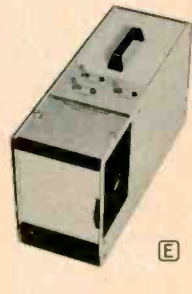
B EU-700 Monochromator. Wavelength range from 1900-10,000 Å, ±1 Å tracking accuracy, ±0.2Å reproducibility. Very low stray light. Resolves to better than 1 Å. EU-700, 70 lbs.\$1275.00



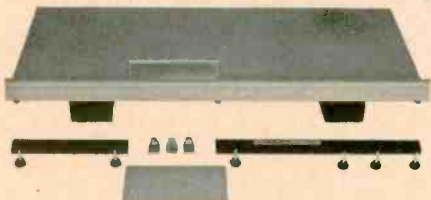
C EU-701-30 PM Module. Contains a 1P28A PM tube in a double light-tight compartment. PM voltage adjustable and programmable 150-1500 V. EU-701-30, 20 lbs \$375.00



D EU-701-11 Sample Cell Module. Large sample compartment holds a wide range of cells and beakers. Space provided for auxiliary equipment. EU-701-11, 19 lbs. \$210.00



E EU-701-50 Light Source Module. Produces UV, VIS & near IR radiation at very constant intensity from Deuterium & Tungsten lamps. EU-701-50, 25 lbs. \$475.00



F EU-703-02 Instrument Base & Alignment Bar. Accepts EU-700, EU-703-70 & EU-701-30 modules for rapid, accurate assembly & alignment of EU-703 System. Also adaptable to "701" system. EU-703-02, 41 lbs.\$190.00



G EU-701-01 Instrument Base & Alignment Bar. Permits rapid, accurate assembly & alignment of EU-700, EU-701-50, EU-701-11 and EU-701-30 modules of EU-701 system. EU-701-01, 32 lbs.\$145.00

Malmstadt-Enke Modular Spectroscopy Systems

New Heath "701" And "703" Systems . . . Precision Spectroscopy Capability

At Low Cost . . . Unequaled Modular Versatility . . . High Accuracy

Heath Model EU-701 Single-Beam Spectrophotometer

- UV, VIS & Near IR • $\pm 1 \text{ \AA}$ wavelength tracking accuracy • Better than 1 \AA resolution • Less than 0.1% stray light • Spectral bandwidth continuously adjustable between 0.5 and 40 \AA • 1900 to 7000 \AA range • Extendable to 1700-10,000 \AA with accessory detectors and nitrogen flushing • Digital wavelength drive control in 0.1 angstrom steps • Bi-directional slewing at 5,000 $\text{\AA}/\text{minute}$ • Exceptional stability • Sample Cell Module holds vessels up to 5" diameter • PM Module accepts a wide variety of special-purpose PM tubes and detectors • Photometric Readout Module displays %T and A directly or can be used as an interface for EU-20 Series chart recorders or EU-805A Universal Digital Instrument • Two or more readouts can be used for simultaneous direct readout and chart recording

The EU-701 UV-Visible Single Beam Spectrophotometer is a departure from classical spectrophotometer design in that it is a combination of discrete modules locked together into a single unitized instrument. With this approach, the need for multiple instruments is eliminated . . . conversion of the "701" into other spectrophotometric systems is just a matter of substituting the appropriate module. The original investment is thereby considerably reduced and the system's versatility is limited only by the creativity of the user. The EU-701 System consists of the following modules:

EU-700 Monochromator . . . featuring Czerny-Turner f/7, 350 mm, 1180 lines/mm grating optical design with MgF₂ coated aspheric mirrors for maximum UV efficiency. Electronic scanning remote control and synchronized chart recorder output are standard. The remote control unit provides 9 fixed scanning rates to 20 angstroms/second; variable with external generator. Digital control wavelength drive resolves to 0.1 angstrom steps; two front panel controls give bi-directional slewing at better than 5000 angstroms/minute.

EU-701-50 Light Source Module . . . provides very constant intensity UV, VIS and near-IR radiation. In one compact module are both Deuterium and Tungsten lamps, controlled power supplies, 4-position sector disc for optical filters, cooling fan, precise mechanical adjustments for lamp posi-

New Heath EU-703 Atomic Absorption Spectrophotometer

- A high performance system for Atomic Absorption, Atomic Emission and Atomic Fluorescence spectrophotometry • Combines Heath Monochromator, PM & Readout Modules with new EU-703-70 AA/AE/AF Flame Module • Supplied with Beckman 4020 total consumption burner • Accepts all major types of laminar-flow and total consumption burners with brackets supplied • Precision micrometer adjustment system for accurate, repeatable xy, yz burner positioning • Hollow-cathode lamp turret accepts four lamps • Lamp power supply stability better than 0.1% • Power supply can operate most high intensity and multi-element lamps • Built-in chopper • Choice of readout—EU-703-31 Analog Readout, EU-201-V Log-Linear Current Recorder or EU-703-31/EU-805A for digital readout

The New Heath EU-703 Spectrophotometer combines the EU-703-70 Atomic Absorption/Atomic Emission/Atomic Fluorescence Module with the Heath EU-700 Monochromator, EU-701-30 PM Module and choice of readout modules to provide a research-quality instrument for atomic analysis at low cost. All of the basic techniques of atomic absorption, atomic emission and atomic fluorescence are readily performed with the new "703" System.

Mounted on the front panel of the EU-703-70 Flame Module are the needle valves, gauges and controls for the burner system. Quick-shutoff controls for both fuel and oxidant allow you to turn the flame off without disturbing needle valve adjustments. A total consumption burner unit is supplied, and

tioning and lamp selector lever. Optical output is stable to 0.1% for both lamps.

EU-701-11 Sample Cell Module . . . contains a large light-tight cell compartment capable of holding a wide variety of cells. Provides accurate and reproducible positioning of any of several cells. A compartment for auxiliary equipment is also provided.

EU-701-30 PM Module . . . suitable for most types of UV-VIS spectrophotometry. One compartment contains a very stable, programmable, adjustable-output power supply. The other compartment contains a highly sensitive 1P28A PM tube and shutter assembly. Because of the versatile PM tube mounting system used, the module can easily be adapted for other photo-detector applications.

EU-701-01 Instrument Base & Alignment Bar . . . provides accurate reference surfaces for setting up the complete "701" system in less than ten minutes with precise optical alignment.

Choice of Readout. The EU-701 System can be supplied with either the EU-703-31 Readout Module, the EU-201-V Log Linear Multi-Speed Current Recording System or both, as your application requires.

Write Heath Company for complete, detailed specifications and description of this unique new approach to research-quality spectrophotometry at low cost.

EU-701-B, complete system plus EU-703-31 Analog Readout Module. \$2700.00

EU-701-C, complete system plus EU-201-V Log/Linear Multi-Speed Current Recording System. \$2900.00

EU-701-D, complete system with both EU-703-31 Analog Readout Module & EU-20V, 21 Speed Chart Recorder. \$3000.00

Note: Above systems can be ordered with EU-703-02 Base permitting easy future conversion to "703" AA/AE/AF System. Add \$40 to above prices and "L" suffix to model no. Ex.: EU-701-D becomes EU-701-DL.

the versatile burner compartment will accommodate a wide assortment of burner systems. Brackets are supplied so that Techtron, Jarrell-Ash Tri-Flame, Hetco, Beckman and other commonly-used total consumption and laminar-flow burners can be readily used. A precision micrometer adjustment system provides accurate and repeatable xy, yz positioning of the flame for optimum performance with a specific burner or technique.

The rotatable turret accepts up to four hollow-cathode lamps, and once initial position adjustments are made, changing lamps is easily done by just rotating the turret. The hollow-cathode power supply in the module is stable to 0.1% and is designed to handle all high-intensity lamps, as well as most multi-element types.

The EU-703-B System includes the EU-703-70 Flame Module, EU-700 Monochromator, EU-701-30 PM Module, EU-703-02 Base and the EU-703-31 Readout Module. The EU-703-D System includes all the modules of the "A" system, plus the EU-20V Multi-Speed Chart Recorder readout. For additional information on the new EU-703 system, write for free specification sheet.

EU-703-B, 200 lbs. (w/EU-703-31 Readout). \$3125.00

EU-703-D, 226 lbs. (w/EU-703-31 & EU-20V Readouts). \$3425.00

New Heath EU-703-31 Photometric Readout Module For "701" And "703" Systems



The new Heath EU-703-31 Photometric Readout Module is a versatile readout instrument applicable to all types of spectrophotometry where photomultipliers, phototubes or other photon-to-current transducers are used. It can be used with continuous or modulated input current signals. The instrument contains a precise current-to-voltage converter and logarithmic amplifier system for small currents in the nanoampere and microampere range. The linear (%T) and logarithmic (A) functions of the input current can be selected for display on an accurate 6" taut-band panel meter. Both functions of the input current are also available as voltage and current signals at output terminals for feeding a chart recorder and/or a DVM. Front panel pushbuttons select Absorbance in 0-1, 0-2, or 1-2 spans or 0-100% Transmittance. The same functions are available for chopped input currents.

EU-703-31, 10 lbs. \$315.00

- Direct meter readout for "701" & "703" Systems • Meter reads in 0-1, 0-2, 1-2 Absorbance units and 0-100% Transmittance • Output Accuracy 0.25% • Meter accuracy 0.5% • Can be used as current-to-voltage interface between PM module and EU-20 Series chart recorders or EU-805A DVM • Can be used with chopped or unchopped input current signals

For complete details on the Heath/Malmstadt-Enke Single and Multi-Speed Chart Recorders and Log-Linear Current Module, see pages 64-65.

**New Heath/Malmstadt-Enke Digital pH/Volt Meter . . .
ideal for classroom and general purpose work . . . \$170.00**



EU-302A SPECIFICATIONS—RANGES: 0-14 pH; 0-1.4 volts. **RESOLUTION:** 0.02 pH; 0.002 volts. **ACCURACY:** $\pm 0.5\%$ of full scale. **TEMPERATURE COMPENSATION:** 0 to 100 degrees Centigrade, manual control. **INPUT CONNECTORS:** Standard glass electrodes (Beckman Type), BNC, and pin or banana jacks for reference electrodes. 5-way binding posts for polarization current. **OUTPUTS:** Potentiometric chart recorder EU-20 B/V or equivalent 10 mV/pH. **POLARIZATION:** 10 μ A. **TOTAL POWER REQUIREMENTS:** 10 watts, 120-240 VAC, 50/60 Hz. **DIMENSIONS:** 11" W x 7 1/8" H x 9" L. **NET WEIGHT:** 8 lbs.

Assembled EU-302A, 10 lbs. \$170.00

New Economy in Lab Instrumentation: the new Heath EU-302A pH/Volt Meter is specifically designed for general purpose lab and classroom applications. Its research quality accuracy, high capability, straightforward, rugged design and low cost enable any lab or classroom to enjoy modern pH instrumentation.

Servo-Digital Readout gives the 302A a meter scale equivalent length of over 44 inches . . . and resolution comparable to meters costing three times as much—0.02 pH over the entire range. Parallax and reading errors are completely eliminated, and the servo-digital readout will withstand shock, vibration and user abuse that would ruin conventional meter or display tube readout systems.

All Solid-State Design for high reliability, cool operation and easy maintenance.

High Impedance Potentiometric Input using a Field Effect Transistor provides near infinite impedance at balance, and more than 500 megohms input impedance when the servo is off balance. An isolated, shielded chopper and phase-lock amplifier give high stability and immunity to noise.

High Stability. All voltage supplies are highly stable & Zener diode regulated. True servo null-point operation eliminates reference-point drift.

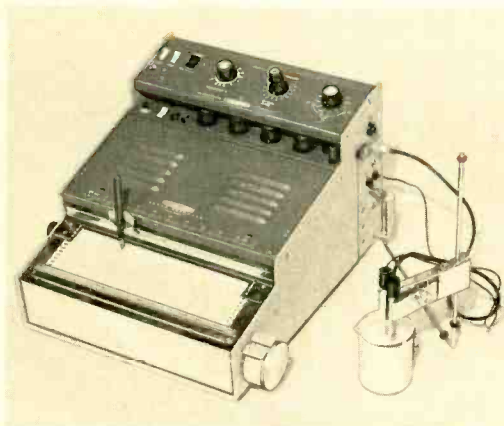
Front Panel Calibration Controls. Temperature and Standardization Controls allow temperature compensation from 0-100° C. and exact pH readout. **Multiple Inputs . . .** for Beckman, Corning, Coleman, Fisher, and most other glass electrodes, and auxiliary BNC and reference electrode jacks accept either banana or pin-type plugs. A high impedance current source is also available at terminals on the rear panel for polarization of electrodes as required for the Karl Fischer titration.

Recorder and DVM Outputs. Output voltages equal to 10 mV per pH unit are available at the rear panel terminals. These signals can be directly connected to the inputs of chart recorders, and also to digital voltmeters that can provide BCD output to printers or computers.

New Electrode Holder accepts electrodes from a pencil-thin combination to a pair of the largest-sized glass and calomel electrodes. Height is adjustable with just finger-tip pressure.

Other features include pushbutton operation, convenient gimbal mount and operating instructions screened right on the mounting bracket. Send for the free pH Brochure now and get the details on the new Heath EU-302A.

Heath Recording pH Meter/ Recording Millivolt Electrometer



Compare The Features And Price With Any Other Instrument

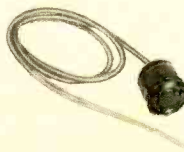
- **MULTI pH RANGES!** Full scale pH spans of 1, 2, 5, 10 and 14. Any 1 pH unit, 2 pH units (etc.) over entire pH region of interest can be switched for full scale on 10" scale or chart recorder.
- **MULTI MV RANGES!** Full-scale millivolt spans of ± 100 , 200, 500, 1000 and 1400. There are 14 calibrated 50 mv increments of zero suppression that can be switched in on all millivolt spans.
- **DIRECT READING!** pH is read directly from a 10" scale; expanded ranges are made direct reading by interchangeable scales (e.g. 6.000-8.000 pH, etc.).
- **ACCEPTS GLASS AND CALOMEL ELECTRODES!** Beckman, Corning, Leeds & Northrup, Thomas, etc. without adapters.
- **MULTI-SPEED MODEL WITH 21 ELECTRONICALLY SYNCHRONIZED RECORDING SPEEDS.** The EU-301V model features chart speeds from 12"/min. to 1/2"/hour. The wide range of chart speeds

allows the X axis (chart rate) of data readout to be adjusted for convenient and meaningful graphs of the chemical reaction or process. With auxiliary input the chart rate may be continuously varied from no motion to 12"/min. This permits the chart rate to be slaved to associated laboratory apparatus.

- **SCALE READABILITY!** 0.1% of full-scale span (e.g. 0.001 pH on span of 1 pH, 0.01 pH on 10 pH, 0.05 MV on span of 50 MV, etc.).
- **HIGHLY ACCURATE!** Better than 1% of any calibrated full span, 0.005 pH on span of 1.
- **TEMPERATURE COMPENSATION!** Calibrated 0 to 100° C manual control. May be automatically controlled by accessory Thermistor probe.
- **COMPLETELY ASSEMBLED & TESTED!** Made of the finest components, and factory tested to insure you many years of faithful performance.
- **ACCOMMODATES ELECTRODES OF DIFFERENT DIAMETERS!** Pencil-size combination electrodes & larger diameter standard glass and calomel electrodes.
- **POLARITY REVERSAL!** All pH and millivolt scales can be switched to provide lower values on the right or left end of scale or chart.
- **CAPABLE OF HIGH INPUT SOURCE RESISTANCE!** More than 2000 megohms.
- **ADAPTS TO PLUGS, MODULES, OR MAY BE "BROKEN DOWN" FOR ADDED VERSATILITY.** Modular design permits convenient plug-in of accessory cables or modules. Recorder module may be used independently as a 10, 25, 50, 100 & 250 mV (full scale) strip-chart servo recorder, when EUA-301-1 Parts Kit is installed. Heath EU-20V Recorder accepts EU-20-31 pH Module without modification.

- EU-301V, pH Recording Electrometer with Multi-Speed Chart Drive, 34 lbs. (REA Express or Motor Frt. Only) **\$460.00**
- EU-20-31, pH Module only, 11 lbs. (Converts Heath EU-20B or EU-20V to pH Recording Electrometer). **\$160.00**
- EUA-301-1, Parts Kit, 2 lbs. (Chopper kit converts EUW-301/EU301A Series or EUW-301M/EU-301N Series recorder portion to standard EU-20B or EU-20V Servo Chart Recorder). **\$30.00**

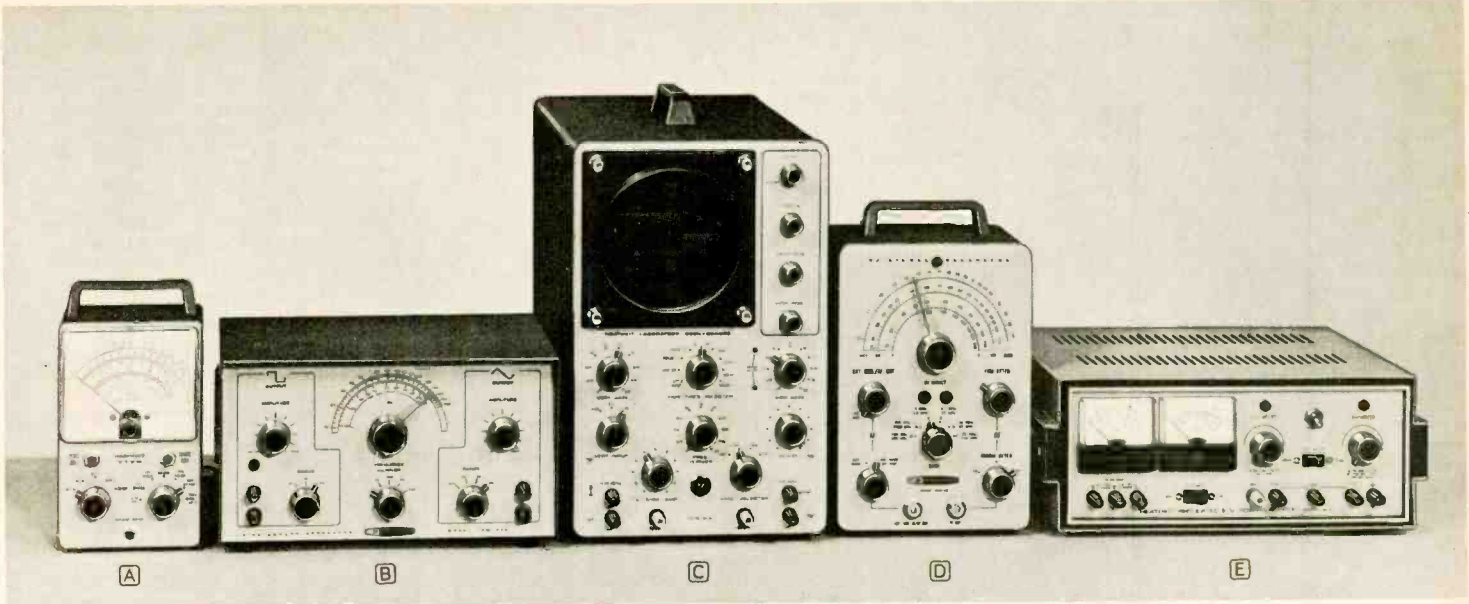
EUA-20-12 pH Test Box 4 lbs., \$50.00
Provides quick pH meter check-out independent of cell or buffers through switch-selected output calibrated in pH units. 1% component accuracy. Checks linearity of pH meter from pH 0 to 14.



EUA-20-16 Temperature probe 1 lb., \$26.00
Provides automatic temperature compensation of the EUW-301 Recording pH Electrometer. Simple plug-in connection.

Write For Information On 10% Quantity Discount

The Berkeley Physics Laboratory By Heath



Heath Company, Manufacturer Of Test Instruments & Materials As Used At Berkeley To Develop This Unique Course, Provides All Instrumentation Required To Outfit Complete Berkeley Physics Laboratory Stations

A MODERN ELECTRONIC APPROACH TO TEACHING THE PRINCIPLES OF PHYSICS . . . (as described in the article in the June 1964 issue of American Journal of Physics by University of California Professor A. M. Portis, developer of the Berkeley Physics Laboratory) the basic concepts of physics are taught through the advantages of modern instrumentation and electronics. The Berkeley Physics Laboratory provides a basic laboratory course completely independent of lecture sessions, although the McGraw-Hill Publishing Company provides excellent texts for correlated lecture sessions as well as for the parts A, B, C of the laboratory. The Berkeley Texts and Laboratory Manuals are modern, mathematically sophisticated, and thorough. The laboratory instruments and components represent "state-of-the-art" instrumentation typical of the modern research laboratory. They provide up-to-date analogous models to illustrate the mathematical and intuitive concepts of physics.

UNIQUE HEATH INSTRUMENTATION MANUALS ARE AN INVALUABLE REFERENCE . . . contain full descriptions and specifications of Heath instruments and components . . . plus side-by-side schematic and pictorial wiring diagrams showing the setups. Manuals are provided individually for Parts A, B, & C of the Berkeley Course. They are included with each Component Set, or may be ordered separately from Heath.

HOW TO PLAN YOUR BERKELEY LABORATORY EQUIPMENT INVENTORY . . . select only the instrumentation that fulfills your requirements. If you are setting up your Berkeley Physics Course, for each lab station you will need the Basic Instrument Group, plus the Components for as many of the Parts of the laboratory course as you intend to teach. Each instrument group and component set will serve one two-student lab station.

CATHODE-RAY TUBE AND DEFLECTION COIL SET—EPW-24. Includes: Cathode-ray tube, mounting assembly, bezel & graticule assembly, transparent cover, and all cables pre-assembled. With two deflection coils, lab & instrumentation manuals.

EXPERIMENT CHASSIS AND SMALL PARTS SET—EPW-14. Includes: Experiment chassis, small parts & box, and all necessary interconnecting test leads, lab manual and instrumentation manual.

TRANSISTOR POWER SUPPLY—EUW-17. Provides 0 to 35 volts DC for laboratory experiments.

BATTERY PACK—EPA-10-1. Provides batteries for Part A. Contains one 0, —22½, —45 volt and one 0, —1½, —3, —4½, —6, —7½ volt battery.

MICROWAVE TRANSMITTER & RECEIVER SET—EPW-25. Includes: X-band klystron transmitter, microwave receiver, microwave interference & diffraction accessories, and hardwood meter stick, lab and instrumentation manuals.

EXPERIMENT CHASSIS & ACCESSORIES—EPW-15. Includes: Experiment chassis, small parts, 15-section delay line, 40 kHz transducers, 100 MHz ¾ wavelength transmission line, and all necessary interconnecting wires. Lab and instrumentation manuals.

BATTERY PACK—EPA-10-2. (Two) 0, —1½, —3, —4½, —6, —7½ volt batteries.

OPTICAL COMPONENTS SET—EPW-26. Includes: Michelson Interferometer, mercury light source, photo-multiplier tube & assembly, line light source, rotating filter holder, accessory holders, slitfilm slide, projection screen, filter holders, filters & polarizers, and photo tube & assembly, lab & instrumentation manuals.

EXPERIMENT CHASSIS & SMALL PARTS—EPW-16. Includes: Experiment chassis & small parts, test leads, guard-ring diode assembly, Geiger-Mueller probe assembly, and radioactive samples, lab and instrumentation manuals.

TRANSISTOR POWER SUPPLY—EUW-17. Provides 0 to 35 volts DC for laboratory experiments.

BATTERY SET—EPA-10-2. Provides the necessary battery voltages for Part C experiments . . . (two) 0, —1½, —3, —4½, —6, & —7½ volt batteries.

Heath Basic Instrument Group—For Berkeley Parts A, B, & C (All Instruments Factory Assembled & Tested)

A	IMW-18, Vacuum Tube Voltmeter,	\$ 54.95
B	IGW-47B, Sine-Square Wave Generator, see EUW-27	100.00
C	IOW-18S, Laboratory 5" Oscilloscope,	152.00
D	IGW-19, R.F. Signal Generator,	65.00
E	IPW-17, Regulated Power Supply,	110.00
	EPW-100M, Basic Instrument Group	\$481.95

HEATH COMPONENTS FOR PART A		
	EPW-14, Experiment Chassis and Small Parts	\$ 72.00
	EUW-17, Transistor Power Supply	32.00
	EPW-24, Cathode-Ray Tube & Deflection Coil Set	150.00
	EPA-10-1, Battery Set	6.50
	GROUP PRICE, PART A, Components plus instruments above. Wired EPW-100N	\$260.50

HEATH COMPONENTS FOR PART B		
	EPW-25, Microwave Transmitter & Receiver Set	\$125.00
	EPW-15, Experiment Chassis & Accessories	135.00
	EPA-10-2, Battery Set	5.00
	GROUP PRICE, PART B, Components plus instruments above. Wired EPW-100P	\$265.00

HEATH COMPONENTS FOR PART C		
	EPW-16, Experiment Chassis & Accessories	\$150.00
	EPW-26, Optical Components Set	195.00
	EPA-10-2, Battery Set	5.00
	EUW-17, Transistor Power Supply	32.00
	GROUP PRICE, PART C, Components plus instruments above. Wired EPW-100Q	\$382.00

	GROUP PRICE, PART C, Components plus instruments above. EUP-23E, Step down transformer for operating above instruments on 220 VAC, 50/60 Hz	\$810.00
		\$39.95



Heath Components For Part A



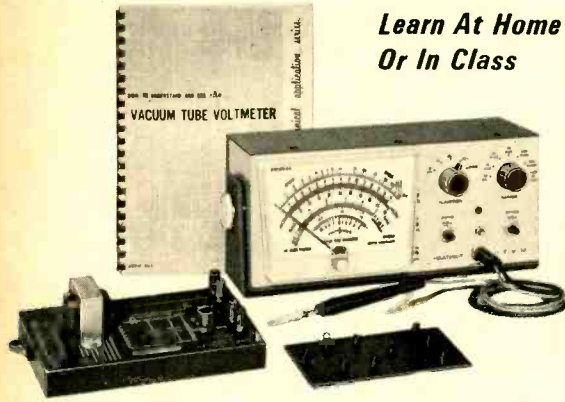
Heath Components For Part B



Heath Components For Part C

All Components On These 2 Pages Mailable Except EU-301V & Berkeley Groups

*Learn At Home
Or In Class*



EF-1
Text & Chassis
\$10⁹⁵

EF-1-6
Text & Instrument
\$49⁹⁵



EF-2
Text & Chassis
\$11⁹⁵

EF-2-3
Text & Instrument
\$72⁹⁵



EF-3
Text & Chassis
\$14⁹⁵

EF-3-2
Text and Instrument
\$44⁹⁵

"How to Understand & Use Your Vacuum Tube Voltmeter"

Learn the theory, advantages and applications of the Vacuum Tube Voltmeter . . . use this Heathkit combination kit and textbook. A special power supply lets you learn-by-doing, experiments are outlined in the text. Material in the text is arranged to assist the beginner and the professional alike. Real value, and an opportunity to get the most out of your VTVM.

- Kit EF-1, Text and special power supply (for VTVM owners), 3 lbs. **\$10.95**
- Kit EF-1-5, Includes EF-1 and IM-18 VTVM, p. 39, 8 lbs. . . no money dn. . . **\$39.95**
- Kit EF-1-6, Includes EF-1 and IM-28 VTVM, p. 39, 10 lbs. . . no money dn. . . **\$49.95**
- Manuals Only For EF-1 (single copy) . . . **\$5.00**
- (10 or more copies) ea. **\$3.00**

"How to Understand & 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. Change circuits as often as desired . . . special solderless spring-clip connectors for fast and simple circuit changes. Large 150-page textbook for future reference.

- Kit EF-2, Text and special chassis & parts, 4 lbs. **\$11.95**
- Kit EF-2-3, includes EF-2 and IO-21 Oscilloscope, p. 54, 16 lbs. . . no money dn. **\$72.95**
- Kit EF-2-5, Includes EF-2 and IO-18 Oscilloscope, p. 53, 28 lbs. . . no money dn. **\$102.50**
- Manuals Only For EF-2 (single copy) . . . **\$5.00**
- (10 or more copies) ea. **\$3.00**

"How to Understand & Use Your Signal Generator"

Understand Signal Generators . . . use, service and align them correctly! Now you can! This easy-to-understand text covers theory, function, and use of RF and Audio frequency generators. Study at home or in the classroom! Perform experiments using furnished test chassis—illustrates and clarifies text material. "Solderless" spring-clip connectors make circuit changes fast and simple. Textbook contains valuable information for use now or anytime later!

- Kit EF-3, Text and special test chassis, 4 lbs. **\$14.95**
- Kit EF-3-2, Includes EF-3 and IG-102 Signal Generator, p. 45, 10 lbs. . . no money dn. **\$44.95**
- Manuals only for EF-3, (single copy) . . . **\$5.00**
- (10 or more copies) ea. **\$3.00**



EK-1
\$24⁹⁵

Basic Electricity Kit

- Learn principles of voltage, current and resistance • Designed by a science educator

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**



EK-2A
\$21⁵⁰

(less cabinet)

Basic Radio Course—2 Parts

- Simplified theory • Textbook/kit project

Start by building a simple crystal receiver . . . improve it chapter by chapter. Result: a regenerative tube-type receiver! In Basic Radio Part II you learn more advanced circuits and terminology. Result: You build a 2-band superheterodyne receiver! Part I and Part II combine theory and actual construction and experimentation to enhance learning. Get this valuable experience—order now!

- Basic Radio Part I (EK-2A), 7 lbs. **\$21.50**
- Basic Radio Part II (EK-2B), 5 lbs. **\$21.50**
- AK-8, Cabinet for completed receiver, 3 lbs. **\$3.95**



EK-3
\$19⁹⁵

Basic Transistors

- Simplified text • Interesting experiments • You build a handy two-station intercom

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, Basic Transistors, 4 lbs. **\$19.95**

Citizen's Band Radio



Heathkit Solid-State 5-Watt CB Transistor . . .
23 Crystal Controlled Channels . . . At New Low Prices

- 14 transistor, 6 diode circuitry • Provision for 23 crystal-controlled transmit & receive channels • Crystal pack available • Full 5 watt performance . . . a minimum of 3 watts RF output, plus 3 watts audio modulating power • Front panel "S" meter • Adjustable squelch control • Automatic noise limiter • Built-in PM speaker • 1/2 uv sensitivity • Easy to build circuit board construction • Gimbal mounting bracket • Attractive Turner Ceramic PTT mike • Die-cast, chrome-plated front panel with charcoal gray cabinet • Fits under dash of your car, boat, jeep, truck, etc.

INSTANT 2-WAY COMMUNICATIONS ON ALL 23 CHANNELS
 . . . with crystal-controlled reliability . . . on this versatile solid-state transceiver. And its 14 transistor, 6 diode circuit stays calm and cool, with no tubes to deteriorate . . . draws only 0.75 amps when transmitting, 0.12 on receive. Measures a mere 2 7/8" H x 7" W x 10 1/2" D . . . fits snugly under the dash of your car, boat, jeep, truck, etc. Mounts in any position, too, with the handy gimbal mounting bracket. Buy two and deduct 5% with Heath System Discount.

- Kit GW-14A, 8 lbs. . . (less crystals) \$76.95
- GWS-14A, System: kit (GW-14A) plus 23 channel crystal pack, 9 lbs. . . \$152.95
- Kit GWA-14-1, AC Power Supply, 5 lbs. \$14.95
- Kit GWA-14-2, 23 Channel Crystal Pack, 1 lb. \$79.95

GW-14 SPECIFICATIONS—RECEIVER SECTION: Intermediate frequency: 455 kHz. Sensitivity: 1/2 uv or less for a 10 dB signal plus noise to noise ratio. Selectivity: Adjacent channel attenuation is down 30 dB. Audio power output: 3 watts minimum. **TRANSMITTER SECTION:** Nominal power input to final RF amplifier: 5 watts. Frequency control: 3rd overtone quartz crystal as selected by the 23-position channel selector switch. Frequency control effectiveness: Operating frequency will be within .005% of nominal crystal frequency over an ambient temperature range of -20 to +130 degrees F. Modulation: High level AM limited to less than 100%. Output impedance: 50 ohms nominal. Output circuit: Twin "Pi" matching network. Power output: 3 watts minimum into 50 ohm load. **GENERAL—Controls:** Squelch; off/on volume; channel selector. **Tuning meter:** For receiving, S-9 corresponds to approximately 100 uv signal input. For transmitting, the meter indicates the presence of power output and modulation peaks. **Power requirements:** Positive 12 volts system (13.5 volts); receiver current drain, standby—120 ma; transmitter current drain —750 ma.



Kit GW-14A
Was \$89.55
Now Only
\$76.95

GWS-14A System
(Includes kit GW-14A
& 23 channel crystal pack)
\$152.95

Low Cost Heathkit® Siren P/A System



GD-18 System Price
\$99.95
 (with either horn)

**A "Wail" And "Yelp" Siren, Public Address System
 And Radio Call Alert . . . For Authorized Emergency Vehicles**

- 55 watt siren output, 20 watt PA/Radio output • Works on any 12-volt auto system, pos. or neg. ground • Control panel selector for "wail" or "yelp" • Adjustable siren pitch • Radio Call Alert function with adjustable radio input level control • Interrupt siren with PA without changing function knob • Circuitry accommodates remote manual siren switch • Lift-out circuit board • Edge lighted control panel • Output transistor circuitry is temperature and voltage compensated • Operates over -20° F to +150° F range

Heath Introduces The First Really Low Cost Siren/PA. Save over 50% of the cost of outfitting your new emergency vehicles or modernizing cruisers, ambulances etc. having old-fashioned motor driven sirens. Build the new Heathkit GD-18 Siren/PA. It performs all the functions of the others yet costs less than half as much.

An Extra Measure of Value . . . The Heathkit GD-18 has been designed and tested to operate in -20° to +150° F conditions. It can be used with any 12 volt auto electrical system with either a positive or negative ground. The solid-state circuit includes 13 silicon transistors and 5 silicon diodes. A lift-out circuit board makes assembly and service checks easy. The GD-18 comes with an edge-lighted glare-free control panel and gimbal mounting bracket.

GDA-18-1 Exterior Horn

A weatherproof speaker having superior efficiency, dispersion and frequency response. Transformer isolated speaker terminals protect circuitry from accidental open circuits or grounding. All wires are concealed, out of reach of vandals.



GDA-18-2 Concealed Horn

A high performance speaker using the same driver as the GDA-18-1 in a compact package. Versatile mounting brackets and unique design make installation possible in any vehicle with at least 4 1/2" x 4 1/2" x 13" behind the grille.

- Kit GD-18 Siren/PA Amplifier, 6 lbs. \$54.95
- Assembled GDA-18-1 Exterior horn, 9 lbs. \$49.95
- Kit GDA-18-2 Concealed horn, 10 lbs. \$49.95
- System GD-18A (includes GD-18 & exterior horn), 16 lbs. \$99.95
- System GD-18B (includes GD-18 & concealed horn), 16 lbs. \$99.95

GD-18 SPECIFICATIONS—Siren Output Power: 55 watts, normal intermittent duty. **PA Or Radio Output Power:** 20 watts continuous. **Wail Frequency Range:** Approx. 550 Hz to 1300 Hz (pitch control at center). **Wail Sweep Rate:** Approx. 6 sec. per cycle. **Yelp Sweep Rate:** Approx. 1/2 sec. per cycle. **Radio Input Sensitivity:** 0.3 volts RMS min. for rated output. **Speaker Requirement:** 16 ohm, 75 watt (nominal) weatherproof, horn loaded driver. **Controls:** Gain (PA and Radio); Manual siren button (in PA only); Function selector switch; provision for external remote manual siren switches; Siren pitch adjust; Radio input level adjust. **Power Requirements:** 12 to 15 VDC, pos. or neg. ground; 5.5 amp, max. **Idle Current:** 1.25 amp. or less. **Dimensions:** 7 3/4" D x 8 3/4" W x 2 3/16" H (less gimbal bracket). **Finish:** Gunmetal gray, wrinkle finish.

GDA-18-1 SPECIFICATIONS—Impedance: 16 ohms. **Frequency Range:** 275 to 8000 Hz. **Dispersion:** 100 degrees. **Power Rating:** 75 watts. **Dimensions:** 8 3/4" Dia. x 8 3/4" H x 8 1 1/4" L. **Material:** Bell & base, aluminum. **Finish:** Corrosion resistant baked gray enamel. **Mounting Base:** Sand cast aluminum. **Net Weight:** 7 lbs.

GDA-18-2 SPECIFICATIONS—Impedance: 16 ohms. **Frequency Range:** 300 to 3000 Hz. **Power Rating:** 75 watts. **Material:** Sheet metal enclosure. **Finish:** Corrosion resistant baked gray enamel. **Dimensions:** 4 1/2" H x 4 1/2" D x 13" W. **Net Weight:** 8 lbs.

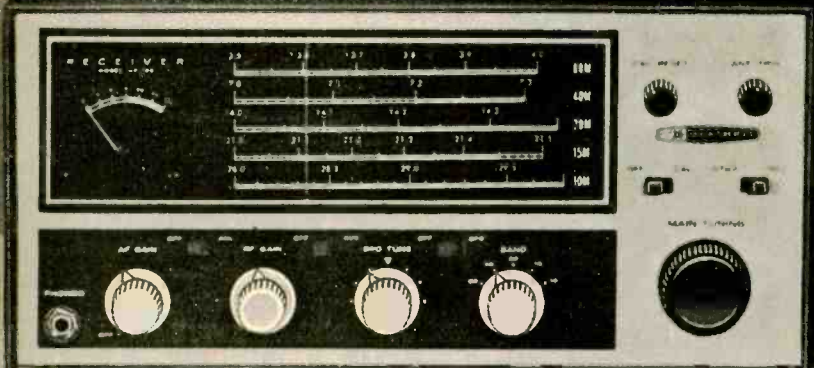




B DX-60B
\$79⁹⁵

A HR-10B
\$79⁹⁵

C HG-10B
\$44⁹⁵



The World's Most Popular Ham Gear

A Heathkit HR-10B Amateur Band Receiver

- Deep forest-green cabinet and pale gray-green panel matches DX-60B and the HG-10B VFO • "Amateur Bands only" coverage for high stability and excellent tuning accuracy • Tunes SSB, AM, & CW on 80-10 meter bands • High quality crystal-filter for optimum communications selectivity • Optional plug-in 100 kHz crystal calibrator • 7-tube superheterodyne circuit • RF amplifier for extra sensitivity—high image rejection • Pre-built, pre-aligned tuning unit for easy assembly

A QUALITY RECEIVER ANY HAM WOULD BE PROUD OF. Ideal for the novice or beginning general class ham who desires full AM, CW and SSB tuning capability, with solid stability for CW & sideband. Each amateur band 80 through 10 meters is accurately calibrated on the illuminated slide-rule dial. Separate RF and AF gain controls and BFO tuning give you the facility you need in a communications receiver. The "S" meter, AVC on/off, and automatic limiter, and provisions for the optional HRA-10-1 plug-in 100 kHz crystal calibrator add the convenience you'll demand. Alignment requires RF signal generator and VTVM.

Kit HR-10B, less speaker, 20 lbs., no money down. \$79.95
Kit HRA-10-1, Plug-in 100 kHz crystal calibrator, 1 lb. \$9.95

HR-10B SPECIFICATIONS—Frequency coverage: 80 through 10 meters. IF frequency: 1681 kHz. Sensitivity: 1 uv for 10 dB signal-to-noise ratio. Image rejection: 40 dB or better. Selectivity: 3 kHz at 6 dB, 9 kHz at 40 dB. Input impedance: 50 to 75 ohm, coaxial. Audio output impedance: 8 or 500 ohm. Tube complement: 6BZ6, (2) 6EAB, 6BA6, 6BJ7, 6EB8, 6X4. Power requirements: 120/240 V. AC, 50/60 Hz, 50 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.

B Heathkit DX-60B Phone & CW Transmitter For Novices & General Class Operation

- Color styled in deep forest-green & pale gray-green • 90 watts AM or CW on 80 through 10 meters • Neutralized final amplifier for stable, dependable operation on all bands • Built-in low pass filter to eliminate TVI • Grid-block keying—ideal with the HD-10 Electronic Keyer • 4 crystal sockets easily accessible • Full provisions for operation with matching HG-10B VFO • Operates at reduced power for Novice Class • Performance and styling

mate to the HR-10B • A better value than any transmitter in this price range • Alignment requires VTVM

MORE FOR YOUR TRANSMITTER DOLLAR THANKS TO HEATH TOTAL ENGINEERING. Run 75 watts CW input power for novice class operation—then run the full 90 watts input power on phone or CW (with the HG-10B VFO) when you move up to "general". Pi network output circuit enables easy tuneup to any 50-75 ohm load. Drive Level Control, grid-plate current meter, and Drive Tune control enable you to peak up your DX-60B for maximum output, minimum radiated harmonics, best quality audio characteristics. You will not outgrow your DX-60B.

Kit DX-60B, 24 lbs. . . (less crystals) . . . no money down. \$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 V. AC, 50/60 Hz, 225 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.

C Heathkit HG-10B VFO . . . Perfect Mate To DX-60B & HW-16

WORK VFO ON 80 THROUGH 2 METERS! Calibrated for "80 through 2," the Heathkit HG-10B provides 5 volts RMS output (enough to drive most transmitters) in the 3.5 to 4, 7 to 7.425 and 8 to 9 MHz ranges. The HG-10B features a 28-to-1 dial drive, plus a "spot" switch for off-the-air tuning. It's the perfect addition to your amateur station when you go from novice to general class.

Kit HG-10B, 12 lbs. . . no money down. \$44.95

HG-10B SPECIFICATIONS—Band coverage: 80 through 2 meters with output frequency in the 3.5 to 4 MHz, 7 to 7.425 MHz, and 8 to 9 MHz ranges. Load impedance: 50,000 ohms or more. Output voltage: 5 volts RMS, open circuit. Output connector: Phono-type socket. Power requirements: 108 volts DC at 25 ma & 6.3 VAC or DC at 0.75 ampere. Power available directly from the DX-60 series (thru "B" model) and HW-16. Dimensions: 9 3/4" W x 6 1/2" H x 9 3/4" D.

Radio Amateur's Handbook

Used all over the world by thousands of hams, engineers, experimenters and students as a reliable, authoritative source of information on almost any phase of electronics and communications. Covers all phases of theory, construction, and operation

principles. Includes "plain-talk" sections on basic electronics; receivers and transmitters for HF, VHF, UHF; gear for AM, CW, and SSB; antennas; and workshop practices; plus, comprehensive tube and transistor data.
HDP-293, 3 lbs. \$4.50



Open Your Heath Account — No Money Down Up To \$300 — Up To 18 Months To Pay — See Order Blank For Details.

THE RADIO AMATEUR HANDBOOK FORTY-FOURTH EDITION
 THE RADIO AMATEUR HANDBOOK FORTY-FOURTH EDITION
 THE RADIO AMATEUR HANDBOOK FORTY-FOURTH EDITION



HW-16
\$109⁹⁵

Comes From Heath!

Heathkit HW-16 Novice Rig . . . A High-Performance CW Transceiver

- An unequalled value for the beginning ham • Provides optimum CW operation on the first 250 kHz of the 80, 40, & 15 meter bands • True "break-in" CW operation—solid-state TR switching & receiver muting • 75-watt input power level for novice class CW • Up to 90 watts input power for general class 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 CW selectivity comparable to "expensive" receivers • RF amplifier stage in receiver for better than 1 microvolt sensitivity • Built-in sidetone • Grid-block keying—keys beautifully with the Heathkit HD-10 Electronic Keyer • Easy to assemble and put on the air—requires only a VTVM, dummy load, and crystals for the bands in which you intend to operate

NOT JUST FOR THE NOVICE, BUT A HIGH-PERFORMANCE 3-BAND TRANSCEIVER FOR ALL CW OPERATORS. Use the HW-16 at your beginning code speed—the built-in sidetone lets you hear what you send, helps you build up speed, helps you develop a near-perfect fist. And through the added gain of the dual conversion circuit, plus an RF amplifier stage, the HW-16 has the high sensitivity you need for working DX. That RF amplifier means excellent image rejection for "clean" reception and superior weak signal capability. Crystal controlled first conversion oscillators and a low frequency VFO provide maximum frequency stability. You'll appreciate the

sharp (500 Hz) selectivity for peeling through crowded nighttime amateur bands provided by the built-in crystal lattice filter. Better than 1 microvolt sensitivity plus a solid state TR switch for automatic antenna change over and receiver muting means real performance. You'll never outgrow your HW-16. You can work fast "break-in" rag chews and high speed traffic nets with ease. Your HW-16 will even outperform many of the "expensive" rigs on CW.

EASY ASSEMBLY GETS YOU ON THE AIR FAST! Layout is open, uncluttered. Solder points are easy to get at. The HW-16 goes together with a combination of circuit board construction and rugged chassis mounting of components that makes simple, straight-forward assembly—assures electrical and mechanical stability. 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., no money dn. \$109.95
- GD-396, Headphones (not a kit), 1 lb. \$4.50
- Kit HS-24, Speaker, 4 lbs. \$7.95
- Kit HD-10, Electronic Keyer, 6 lbs. . no money dn. \$39.95

HW-16 SPECIFICATIONS—TRANSMITTER SECTION: RF power input: 50 to 90 watts (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 microvolt 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. **Transmitter tube complement:** 6CL6 Crystal Oscillator; 6CL6 Driver; 6GE5 Final. **Receiver tube complement:** 6EW6 RF Amplifier; 6EAB Heterodyne Mixer-Oscillator; 6EAB VFO Mixer-Oscillator; 6EW6 IF Amplifier; 12AX7 Product Detector-Oscillator; 6HF8 1st Audio and Audio Output. **Transistor complement:** 2N1274 muting circuit. **Dimensions:** 13 1/4" W. x 11 1/2" D. x 6 1/2" H.

Get Your FCC Ham Ticket Fast With This Complete Course

COURSE INCLUDES FOUR HANDBOOKS FROM THE AMERICAN RADIO RELAY LEAGUE: "How To Become A Radio Amateur"; "Radio Amateur's License Manual"; "Learning The Radio-Telegraph Code"; and "Operating An Amateur Radio Station"; plus a Heathkit HD-16 code oscillator kit with key and 3 records that teach code by the revolutionary "word-method."

- HDP-22, Complete Amateur Radio Starter Group, 6 lbs., Save \$3.00 \$18.95
- HDP-32, Code Records Only, 3 lbs. \$9.50
- HDP-42, ARRL Books Only (4), 2 lbs. \$2.50
- Kit HD-16, Oscillator plus Key only, 3 lbs. \$9.95

REVOLUTIONARY
 NEW
 WORD METHOD
 to learn
 RADIO CODE
 by
HDP-22
\$18⁹⁵



Kit SB-102
\$380⁰⁰

**Heathkit SB-102 . . . New Solid-State LMO For Improved Stability, Quicker Warmup . . .
New Receiver Circuitry For Greater Sensitivity . . . Plus 80-10 Meter Coverage . . .
180 W PEP Input . . . Another Great Rig From The Hams At Heath**

• New all solid-state Linear Master Oscillator features 1 kHz dial calibration • Bandspread equal to 10 feet per Megahertz • Improved stability—less than 100 Hz per hour drift after 10 minute warmup • Dial resettable to 200 Hz • New receiver circuitry provides sensitivity of better than 0.35 uV for 10 dB signal plus noise to noise ratio • 180 watt PEP SSB input—170 watts CW input • 80 through 10 meter coverage • Switch-selection of upper or lower sideband and CW • Built-in CW sidetone for monitoring • Built-in 100 kHz crystal calibrator • Triple Action Level Control® reduces clipping and distortion • Front panel switch selection of built-in 2.1 kHz SSB Crystal filter or optional 400 Hz CW Crystal filter • Operate with built-in VOX or PTT • Fast, easy circuit-board wiring harness construction • Run fixed or mobile with appropriate low cost power supplies

The New Heathkit SB-102 . . . proud descendant of the rigs that put many thousands of hams on the air—the famous Heathkit “100” and “101”. With a heritage like this you expect top performance, reliability and value . . . and you get it.

Improved Stability & Linearity. The already excellent frequency stability and dial linearity characteristics of the “101” have been improved by the addition of an all-solid-state, factory assembled and aligned Linear Master Oscillator. The result is a rig that stabilizes from a cold start in half the time and tracks more accurately than ever.

New, Hotter Receiver. The SB-101 was known throughout the world for having the most sensitive receiver section of any transceiver on the market . . . so we made it even more sensitive. The new SB-102 delivers a S+N/N of less than 0.35 uV for 10 dB . . . an increase that gives you solid copy longer when the band is on the way out.

Operating The New SB-102 Is Sheer Pleasure. Select the band, feel the smooth, light action of the LMO as you dial your frequency, peak up the preselector and tune. Receiver and Transmitter bandswitching are simultaneous. The preselector control peaks up the driver. Final tuning is quick, sure and positive . . . and the five-position metering leaves no doubt about the important operating conditions. The optional 400 Hz CW crystal filter aids immeasurably to the ease of receiver tuning during the crowded evening hours or in a DX pile-up. And for those who prefer headphone listening, there’s a separate level control to adjust headphone audio level independently of speaker volume. These features plus the separate offset CW carrier crystal and built-in sidetone make the new “102” as much a leader in CW as in SSB transceivers.

Versatile “Locked” Or “Unlocked” Operation. When operated with the SB-640 External LMO, a front panel switch permits selection of transceive with the “102” or “640”, receiving with the “102” & transmitting with the “640”, or transceiving with the “102” or “640” on either of two crystal controlled frequencies.

The New “102” . . . all the flexibility, performance and value that made the “101” the world leader in transceivers plus important new features. Put the world’s finest rig in your shack now . . . the new SB-102—from the Hams At Heath.

- Kit SB-102, 24 lbs. \$380.00
- SBA-301-2, Optional 400 Hz CW crystal filter, 1 lb. \$21.95
- Kit HP-23A, AC Power Supply, 19 lbs. \$51.95
- Kit HP-13A, DC Power Supply, 7 lbs. \$69.95
- SBA-100-1, Mobile Mount, 6 lbs. \$14.95

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—6.60 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 ±10% line voltage variations. **Modes of operation:** Selectable upper or lower sideband (suppressed carrier) and CW. **Visual dial accuracy—“Resettability”:** 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; RF gain control; 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 7/8" W x 6 3/4" H x 13 3/4" D.

Heathkit Solid-State Mobile Power Supply for SSB Rigs

Kit HP-13A, DC Supply, 7 lbs. \$69.95

HP-13A SPECIFICATIONS—Input voltage: 12 to 16 volts DC (for negative ground only). **Input current:** 25 amperes maximum with full load. **High voltage output:** 800 volts DC, 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 volts DC, no load; 300 volts DC @ 150 ma. (low tap) 265 volts DC, no load; 250 volts DC @ 150 ma. **AC ripple:** Less than .05% @ 150 ma. **Continuous duty cycle to 175 ma.** **Adjustable bias voltage:** —40 to —130 volts DC @ 20 ma max. **Duty cycle:** Continuous. **Switching frequency:** 1500 Hz (approx.). **Ambient temperature:** —10° to 122° F. **Dimensions:** 7 3/4" W x 7-5/16" L x 2 3/4" D. All voltages referenced at 13 VDC input.



Heathkit Fixed-Station Power Supply for SSB Transceivers

Kit HP-23A, AC Supply, 18 lbs. \$51.95

HP-23A SPECIFICATIONS—Power requirements: 120/240 volts AC, 50-60 Hz, 350 watts maximum. **High voltage output:** 820 volts DC no load; 700 volts DC @ 250 ma ±10%. **AC ripple:** Less than 1% @ 250 ma. **Duty cycle:** 150 ma continuous to 300 ma @ 50%. **Low voltage output:** (High tap) 350 volts DC, no load; 300 volts DC @ 150 ma ±10%. (Low tap) 275 volts DC, no load; 250 volts DC @ 100 ma ±10%. **Less than .05% AC ripple @ 150 ma, continuous duty to 175 ma.** **Fixed bias:** —130 volts DC, ±10%, no load; —100 volts DC @ 20 ma. **Adjustable bias:** —40 to —80 volts DC @ 1 ma maximum. **Less than .5% AC ripple.** **Filament voltage:** 6.3 V AC @ 11 amps; 12.6 V AC @ 5.5 amps. **Dimensions:** 9" L x 4 3/4" W x 6 3/4" H.

A Powerful Combination From Heath

Kit SB-220
\$349⁹⁵



**Heathkit SB-220 . . . 2 kW PEP SSB . . .
80-10 M Coverage . . . Built-In Power Supply . . .
The Lowest Cost, Hottest Performing Linear Available**

- A complete 2 kW rig in a compact desk top unit • Uses a pair of Eimac 3-500Z's to develop up to 2000 watts PEP SSB input, 1000 watts on CW and RTTY • Requires only 100 watts drive • Pretuned broadband pi input on 80-10 for maximum efficiency and low distortion • Built-in solid-state power supply • Zener diode regulated operating bias reduces zero signal plate current for extended tube life and cooler operation • Quiet, high volume fan for maximum air flow • Double-shielded for TVI protection and solid construction • Built-in ALC prevents overdriving • Two front panel meters give continuous monitoring of plate current, plus switch selection of grid current, relative power and plate high voltage • Built-in cover interlock for safety • Fast, easy tune up • No after assembly adjustment required • Sharp Heathkit SB-Series styling • Easy 20 hour assembly

The New Heathkit SB-220 uses a pair of conservatively rated Eimac 3-500Z's in the grounded grid final to provide up to 2000 watts PEP input on SSB . . . and is one of the very few finals available that can be loaded to 1000 watts input on CW and RTTY. The broadband pretuned pi input circuit delivers high efficiency with low distortion . . . and the new "220" can be used with most exciters since it requires only 100 watts of drive for full output.

Built-In Solid-State Supply . . . can be wired for either 120 or 240 VAC—and changed to the other in minutes should your power requirements change. Circuit breaker protection eliminates keeping fuses on hand. Zener diode regulated operating bias reduces idling current to a bare minimum for longer tube life and cooler running, and the large quiet fan coupled with an open layout permits the SB-220 to run cooler than most exciters.

Double Shielded. The new Heathkit "220" is the only linear amplifier on the market with double shielding for really maximum TVI protection.

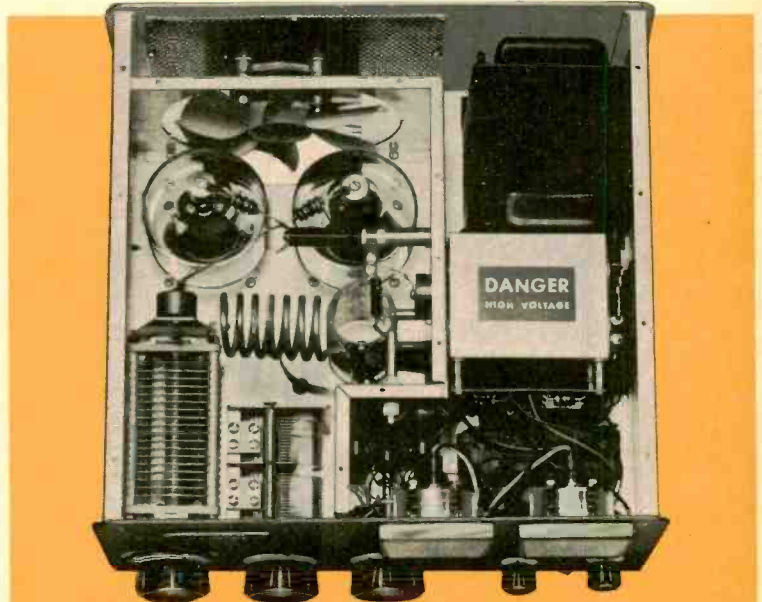
Fast, Easy Tune-Up . . . set the band switch, push the CW-Tune/SSB rocker switch to the CW-Tune position and adjust the Load & Tune controls for maximum relative power. Push the rocker switch to the SSB position and you're ready to go with 2 kW PEP input . . . push it back to CW and you've got a full gallon on CW or RTTY.

Other Features include ALC to prevent overdriving, complete front panel monitoring facilities, easy 20 hour assembly and the sharp styling common to all the famous members of the Heathkit SB-Series.

Tired Of Stumbling Barefoot Through The QRM? Put some big shoes on . . . the Heathkit SB-220—the big new hot one from the Hams at Heath!

Kit SB-220, 58 lbs. (REA or Mtr. Frt.) \$349.95

SB-220 SPECIFICATIONS—Band coverage: 80, 40, 20, 15 and 10 meter amateur bands. Driving power required: 100 watts. Maximum power input: SSB: 2000 watts PEP; CW: 1000 watts; RTTY: 1000 watts. Duty cycle: SSB: Continuous voice modulation. CW: Continuous (maximum key-down 10 minutes). RTTY: 50% (maximum transmit time 10 minutes). Third order distortion: —30 dB or better. Input impedance: 52 ohm unbalanced. Output impedance: 50 ohm unbalanced; SWR 2:1 or less. Front panel controls: Tune, Load, Band, Sensitivity, Meter Switch, Power, CW/Tune—SSB, Plate meter, Multi-meter (Grid mA, Relative Power and High Voltage). Rear panel: Line cord, circuit breakers (two 10 A), Antenna Relay (phono), ALC (phono), RF Input (SO-239). Ground post. RF Output (SO-239). Tubes: Two Eimac 3-500Z. Power required: 120 VAC, 50/60 Hz at 20 amperes maximum. 240 VAC, 50/60 cycles, at 10 amperes maximum. Cabinet size: 14 1/4" W x 8 3/4" H x 14 1/2" D. Net weight: 47 lbs.



Inside The New Heathkit SB-220 . . . a clean yet compact design. Note the liberal use of internal shielding for extra strength and isolation of components. The power supply components are on the right, metering and bandswitching circuitry at lower right and the final compartment is at left.



Power To Spare. Two rugged, dependable Eimac 3-500Z's in the final give your signal the sound of authority. Note the large fan behind the finals . . . the SB-220 actually runs cooler than most exciters.



Giant Power Supply. It takes a husky, well regulated supply to meet the demands of high power operation . . . and the SB-220 has one. Note the massive plate transformer on the right and the large filament & bias transformer on the left. The 25 ufd capacitor bank in the center delivers excellent dynamic regulation.



Complete Metering Facilities. You're never in doubt about the important operating characteristics of this final . . . the left meter gives continuous monitoring of plate current, and the one on the right can be switched to read grid current, relative power and plate high voltage.



AVAILABLE
NOVEMBER



Kit SB-303
\$319.95

Kit SB-600
\$19.95

New Heath SB-303 Solid-State Amateur Receiver

Heathkit SB-303 . . . the new standard of performance in amateur receivers

- State-of-the-art solid-state circuitry using 27 silicon transistors (including 4 dual gate, diode protected MOSFET's), 1 Integrated Circuit and the new Heath preassembled, factory aligned solid-state Linear Master Oscillator provide instant warmup, improved stability and tracking, and reduced maintenance
- A unique Heath design using 9 plug-in circuit boards for easy assembly and adjustment • Receives USB, LSB, AM, CW, and RTTY • Complete 80 through 10 meter coverage plus 15 MHz WWV reception for exact calibration • 25 kHz and 100 kHz calibration markers • Front panel selection of antenna and power connections for up to two VHF converters with rear panel jacks built-in • Fast and Slow AGC selectable from front panel • Front panel selection of built-in 2.1 kHz SSB crystal filter or optional AM & CW crystal filters • Built-in, extremely stable regulated solid-state power supply with circuit breaker protection • Speaker and/or headphone selection from front panel • Handsome SB-Series styling in a much smaller package than the famous SB-301—measures only 12¼" W x 7-15/16" H x 14" D • Fast, enjoyable assembly • Requires only an 11 megohm VTVM for alignment

The New Heathkit SB-303 . . . another proud member of the world-famous SB-Series. Just as the "300" and "301" were the choice of thousands due to their obvious performance superiority and value, the new "303" will be too.

Advanced Design. Dual Gate MOSFET front end provides greater dynamic range with low distortion . . . gives you the sensitivity you need to copy weak signals without danger of overloading on very strong ones. New RF Attenuator allows you to adjust the receiver sensitivity for optimum signal handling capability.

All Solid-State Circuitry employing the latest in techniques and devices delivers instant warmup, 100 Hz stability in 10 minutes and superior tracking. The exclusive Heath solid-state LMO with 1 kHz dial readout is factory assembled and aligned to assure peak performance and provide the smooth, linear tuning that's become a hallmark of all SB-Series gear.

Compare The Specs. What really counts in any receiver is solid all-around performance under varying conditions . . . and the "303" has the specs to deliver. Sensitivity . . . less than a quarter of a microvolt for 10 dB S+N/N! Selectivity . . . 2.1 kHz on SSB with the built-in crystal filter, with low cost crystal filters available for both AM & CW. Image Rejection: 60 dB or more. IF Rejection: 50 dB or more. Spurious Response . . . Dial Accuracy . . . AGC Characteristics—check them all and compare the "303" against the competition. You'll see how far the "303" comes out ahead.

Compare The Performance Features. The new "303" offers as standard the features and versatility required for today's operations, yet most other receivers offer only endless (and costly) options. The new "303" gives complete SSB/CW transceive compatibility with the famous "400" or "401". Three position AGC (off, fast & slow) is also standard on the "303". The new 25 kHz and 100 kHz crystal calibrator lets you spot the new subbands quickly, easily, without interpolation and error. Work the high bands? The "303" has antenna and power connections already installed for up to two VHF converters, and front panel switch selection eliminates changing cables. Four spare sockets on the rear panel allow connection of a wide range of Heath station accessories.

New Construction Techniques speed assembly, reduce chance of error. Point-to-point wiring has been virtually eliminated with the use of wiring harnesses. All nine circuit boards plug-in . . . and the special extender boards supplied enable you to bring a board out of the compact chassis while the

"303" is operating to check voltage and resistance readings without probing into tight spaces, and, of course, the famous Heath manual guides you a step at a time, with clear, unambiguous instructions and giant foldout pictorials.

The New SB-303 . . . the most value-packed, hottest performing receiver ever available. Send for a free spec sheet and make the comparison yourself . . . then order your new "303"—it's another great new piece of gear, from the Hams at Heath, of course.

- Kit SB-303, 19 lbs. \$319.95
- SBA-301-1, optional 3.75 kHz AM crystal filter, 1 lb. \$20.95
- SBA-301-2, optional 400 Hz CW crystal filter, 1-lb. \$21.95

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 per hour after 10 minutes warmup under normal ambient conditions. Less than 100 Hz drift for ±10% line voltage variation. Frequency Selection: Built-in Linear Master Oscillator. Modes Of Operation: SSB—Single sideband (suppressed carrier, with selectable upper or lower sideband). CW—Keyed continuous wave. AM—Amplitude modulated continuous wave. RTTY—Radio teletype (frequency-shift keyed continuous wave). Sensitivity: Less than 0.25 μ V for 10 dB S+N/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 RANGE: 10°C to 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 BACKLASH: No more than 50 Hz. ANTENNA INPUT IMPEDANCE: 50 ohm nominal unbalanced. AUDIO RESPONSE: SSB—350 to 2450 Hz nominal at 6 dB. CW (with accessory filter)—800 to 1200 Hz nominal at 6 dB. AM (with accessory filter)—200 to 3500 Hz nominal at 6 dB. RTTY—1840 to 3940 Hz nominal at 6 dB. AUDIO OUTPUT IMPEDANCE: Matching Speaker—8 ohm. 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 125 or 210 to 250 VAC, 40 watts maximum. FRONT PANEL CONTROLS: Main tuning dial; function switch; mode switch; band switch; AGC switch; converter 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; VFO out; CW shift; four spare sockets; 3-wire line cord socket; accessory socket: VHF Converter, +15 VDC @ 25 mA, switched. RTTY Keyboard. CABINET DIMENSIONS: 12¼" W x 6½" H x 13" D. OVERALL DIMENSIONS (with knobs & feet installed): 12¼" W x 7-15/16" H x 14" D. NET WEIGHT: 15¼ lbs. NOTE: specifications measured with 120 VAC line voltage at 25°C.

Heathkit SB-Series Communications Speaker

OFFERS FIXED-STATION "SPEAKER" FACILITIES IN HANDSOME SB-SERIES STYLING. Now you can complete your SB-Series station with this complementary communications speaker. The SB-600 provides the necessary 8 ohm impedance to match the audio output from Heathkit SB-Series and HW-Series equipment. Its audio response is shaped to 300 to 3000 Hz for optimum reproduction of voice frequencies. And for Heathkit Transceiver owners, it provides mounting enclosure for the "remote" HP-23 power supply. Cabinet size is identical to SB-620, SB-640, etc. . . . 10" W x 6½" H x 10½" D. Kit SB-600, 6 lbs. \$19.95



Kit SB-401
\$295⁰⁰

Kit SB-200
\$220⁰⁰

The Famous Heathkit SB-401 & SB-200

Heathkit SB-401 Amateur Band Transmitter Operates USB/LSB & CW . . . "Separate" Or "Transceive"

- Single panel switch selects transceive or independent operation of SB-401 and an SB-300 series receiver combination—no cable changing required • Can be operated as an independent transmitter with any receiver when SBA-401-1 crystal group is installed • New simplified assembly procedure through modular "sub-pack" packaging & assembly techniques • Built-in power supply • Built-in antenna change-over relay • LMO (Linear Master Oscillator) frequency control • ALC (Automatic Level Control) for higher talk power • 180 watts PEP SSB, 170 watts CW • Crystal filter SSB generation • Operates upper or lower sideband • VOX and PTT control • 1 kHz dial calibration—100 kHz per dial revolution • 500 kHz coverage per band-switch position • Requires VTVM & RF probe for alignment

PERFORMANCE COMPANION TO THE NEW SB-303. The Heathkit SB-401 provides full transceive operation with an SB-300 series receiver . . . gives you outstanding performance on 80 through 10 meters with single-knob LMO control. In addition, this SB series "combo" goes from transceive operation to independent transmitter-receiver operation with a flip of a single switch on the SB-401 front panel . . . perfect for DXing! The SB-401 derives all the necessary crystal oscillator voltages from an SB-300 series receiver . . . eliminates redundant circuitry! Include the SBA-401-1 crystal pack for complete, independent transmitter operation with receivers other than the SB-300 series.

UNIQUE DESIGN FEATURES. The SB-401 employs compactron tubes for space-saving component layout, and heavy-duty circuit board construction plus precut wiring harness enables fast assembly, assures stable operating characteristics. Complete shielding and isolation of circuits provides a maximum of TVI protection.

NEW EASY ASSEMBLY TECHNIQUE! Use of "modular sub-pack" packaging and assembly procedure adds even greater pleasure and satisfaction to building this deluxe rig . . . like building small kits within a kit! The prebuilt LMO and crystal SSB filter eliminate critical alignment. Make the SB-401 your next ham radio project.

Kit SB-401, 36 lbs. \$295.00

SBA-401-1 Crystal Pack, 1 lb. \$29.95
(Required for SB-401 operation without the SB-301 or SB-300 Receiver)

HDP-21A, SSB "Ham" Microphone
4 lbs., \$29.95

SB-401 SPECIFICATIONS—Emission: SSB (upper or lower sideband) and CW. **Power input:** 170 watts CW, 180 watts P.E.P. SSB. **Power output:** 100 watts (80-15 meters), 80 watts (10 meters). **Output impedance:** 50 to 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 per 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). **Electrical dial accuracy:** Within 400 Hz after calibration at nearest 100 kHz point (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 watts STBY, 260 watts key down @ 120/240 V. AC, 50/60 Hz. **Dimensions:** 14 1/8" W x 6 1/2" H x 13 3/4" D.

Heathkit SB-200 Linear . . . A Complete, Self-Contained KW SSB Linear

- 1200 watts P.E.P. input SSB—1000 watts CW • 80 through 10 meter band coverage • Built-in SWR meter—Antenna relay—Solid-state power supply • Automatic Level Control (ALC) • Shielded, fan-cooled amplifier compartment • Pre-tuned cathode input circuit for maximum efficiency & low distortion • Circuit-breaker power supply protection—no fuses • Designed for 120/240 volt operation • Alignment requires VOM

A SINGLE, COMPACT, DESK-TOP UNIT with built-in power supply and SWR meter, providing up to 1200 watts P.E.P. input SSB and 1000 watts CW. And it can be driven by most popular transmitters and transceivers since it requires only 100 watts P.E.P. driving

LATEST DESIGN FEATURES . . . such as the choice of a pair of heavy-duty 572-B's or T-160-L's (the two are equivalent) for final amplifier tubes. They're fan-cooled for maximum tube-life, completely shielded for maximum TVI protection, and always readily available from Heath for replacement. Closer examination of the SB-200 will reveal a pre-tuned cathode input circuit for maximum efficiency and low distortion . . . an ALC output for automatic exciter control . . . and a rugged, conservatively-rated, built-in, solid-state power supply with circuit breaker protection (no fuses to replace or worry about keeping in reserve). And for versatile operating convenience, the antenna relay automatically switches the antenna to the exciter input when the linear is "off."

UP-TO-DATE CONSTRUCTION TECHNIQUES COMBINED WITH HEATH ENGINEERED LAYOUT AND DESIGN . . . 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. Clean, open circuit layout assures easy assembly.

Kit SB-200, 41 lbs., no money dn. \$220.00

SB-200 SPECIFICATIONS—Band coverage: 80, 40, 20, 15 & 10 meters. **Maximum power input:** 1200 watts P.E.P. SSB, 1000 watts CW. **Driving power required:** 100 watts. **Duty cycle:** SSB, continuous voice modulation; CW, 50% (key down time not to exceed 5 min.). **Third order distortion:** 30 db or better at 1000 watts P.E.P. **Output impedance:** 50 to 75 ohm unbalanced; variable pi-output circuit. **SWR not to exceed:** 2:1. **Input impedance:** 52 ohm unbalanced; broad-band pretuned input circuit requires no tuning. **Meter functions:** 0-100 ma grid current, 0-1000 ma plate current, 0-1000 relative power, 1:1 to 3:1 SWR, 1500 to 3000 volts high voltage. **Front panel controls:** Load; Tune; Band; Relative Power Sensitivity; Meter Switch; Grid-Plate-Rel. **Power-SWR-HV;** and Power Switch, on/off. **Tube complement:** Two 572B/T-160-L (in parallel). **Power requirements:** 120 volts AC @ 16 amperes (max.), 240 volts AC @ 8 amperes (max.). **Cabinet size:** 14 1/8" W x 6 1/2" H x 13 3/4" D. **Net weight:** 35 lbs.

Heathkit "Cantenna" Transmitter Dummy Load



NOW AN EVEN MORE FUNCTIONAL "CANTENNA"! Now the HN-31 features all specifications and power derating curve (maximum power input vs. time) screened onto the finish of the container . . . keeps the specifications at hand where you need them. HN-31 provides 50 ohm non-inductive load with SWR less than 1.5:1 for frequencies from 1.5 to 300 MHz. Coax fitting to transmitter line. Phono jack for relative power measurements. Oil coolant (capacity 1 gallon—oil not included) permits power up to 1 kw.

Kit HN-31, 3 lbs. \$10.95

**Put Your SB-Series Rig On "2"
For Only \$179.95 With The New SB-500**

- Provides complete 2-meter transceive capability for SB-101, SB-110A, HW-100 and the SB-301/401 combination • 144 to 148 MHz coverage • 130 watts PEP input... 50 watts PEP output • Highly sensitive receiver • Fast, easy tuning • Built-in meter monitors plate current and relative power • Built-in power supply • Built-in 1 MHz crystal calibrator • No cable switching • Handsome SB-Series styling

Now, in answer to many requests, Heath has a fast, low cost way to put you on 2-meters... without having to buy a whole new rig. If you own an SB-101, SB-110A, HW-100 or the SB-301/401 combination, you're almost there. Here are the details on how to get on "2"... the Heathkit SB-500 way.

Here's How It Works. On Receive, the "500" takes an incoming 2-meter signal and heterodynes it to either 6 or 10 meters, where the low band gear handles it in the usual way. On Transmit, a 28 or 50 MHz driver output is heterodyned to 2-meters, amplified and coupled to the output.

Here's What It Delivers. When used with any of the gear above, the "500" gives you complete SSB or CW transceiver operation from 144 to 148 MHz. Two low cost 6146's in the final deliver a husky 50 watts output into a 50 ohm non-reactive load. The driving unit supplies final plate voltages, but all other operating voltages come from a built-in power supply. Receiver sensitivity is 0.2 uV for solid copy QSO's. A front panel on-off switch puts the "500" into operation or allows the low band gear to operate straight through or drive a linear... a combination of rear apron jacks and internal relay switching eliminates cable changing completely. Tuning is quick and easy, and a built-in meter monitors final plate current or relative power. ALC voltage is supplied to the driver to aid in preventing overdriving. Reliable relay-controlled T/R switching and a built-in 1 MHz calibrator are also included.

Rugged, Stable Construction. The sensitive receiver and oscillator go together on well-planned circuit boards. To insure stability and make adjustment exact, the transmitter and power supply components are chassis mounted. The "500" comes complete with all connecting cables too. Start enjoying the QRM-free world of 2-meters now... with the new Heathkit SB-500.

Kit SB-500, 19 lbs. \$179.95



SB-500
\$179.95

SB-500 SPECIFICATIONS—RECEIVER—Sensitivity: 0.2 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. **Spurious Response:** All are below 0.1 microvolt equivalent signal input, except at 145.310 MHz (50 MHz IF only). **Antenna Input Impedance:** 50 ohm unbalanced. **TRANSMITTER—DC Power Input:** 130 watts PEP. **Power Output:** 50 watts (50% duty cycle). **Output Impedance:** 50 ohm with less than 2:1 SWR. **GENERAL—Frequency Range:** Any 2 MHz Segment between 144 and 148 MHz into 50 MHz or 28 MHz tuned IF. **Mode of Operation:** SSB or CW only. **Power Requirements:** (1) 120/240 VAC, 50/60 Hz at 82 watts (internal). (2) 700 to 800 VDC at 200 mA (from driving unit). **Fuse:** 1/2 ampere slow-blow for 120 VAC (formerly 3AG); 1/2 ampere slow-blow for 240 VAC. **Front Panel Controls:** Meter-calibrate switch, final tuning, off-on (function) switch, preselector, final loading, driver tuning. **Chassis Controls:** Relative power adjust & bias adjust. **Rear Apron Connectors:** RF output, ALC, linear relay, relay, drive, power plug, low f receiver, low f antenna, fuseholder. **Tube Complement:** 6CB6 transmitter mixer, 6CB6 crystal calibrator, 6DS4 receiver RF amplifier, 6DS4 receiver mixer, 12GN7 transmitter RF amplifier, (2) 6146 final amplifiers, (types 6146A or 6146B may be directly substituted), 7059 heterodyne oscillator-amplifier, 8156 RF driver, OA2 voltage regulator. **Diode Complement:** 5 silicon diodes, 750 mA, 500 PIV; 3 in power supply, 2 in ALC. 1 Germanium diode, 1N191 REL PWR. **Cabinet Dimensions:** 12 1/4" wide x 6 3/4" high x 13" deep. **Overall Dimensions:** 12 1/4" wide x 7-15/16" high x 14" deep including knobs and feet. **Net weight:** 14 1/2 pounds.

Heathkit SB-110A . . . The Only "No Compromise" Six Meter Rig



SB-110A
\$299.00 (less mike)
(less speaker)

- The only truly high-performance SSB transceiver on six meters
- Uncompromised engineering—the SB-110A features the same high quality crystal lattice filter found on Heathkit 80-10 Meter SB-Series rigs
- The same Heath LMO (Linear Master Oscillator) found on 80-10 meter SB-Series rigs
- Full SSB-CW transceive operation on Six meters • 180 watts PEP SSB-150 watts CW input • Switch select for Upper Sideband/Lower Sideband/CW operation • Operates PTT & VOX • Separate offset CW carrier crystal for clear, pure CW note • ALC and ANL • Built-in 100 kHz calibrator • Built-in antenna switching • Covers 50-52 MHz with crystals supplied—total coverage 49.5-54 MHz • One kHz dial calibrations—bandspread equal to ten feet per megahertz • Fixed station or mobile power supplies

Kit SB-110A, 23 lbs. \$299.00
Kit HP-13A, DC Power Supply, 7 lbs. no money dn. \$69.95
Kit HP-23A, AC Power Supply, 19 lbs. no money dn. \$51.95
Kit SBA-100-1, Mobile Mounting Kit, 6 lbs. \$14.95

SB-110A SPECIFICATIONS—RECEIVER SECTION: Noise Figure: 3 db or less. **Sensitivity:** 0.1 uv for 15 dB signal-plus-noise to noise ratio. **Selectivity:** 2.1 kHz @ 6 dB down, 5 kHz max. @ 60 dB down. **Image Rejection:** 50 dB or better. **IF Rejection:** 50 dB or better. **Antenna Input Impedance:** 50 ohm nominal (unbalanced). **Audio Output Impedance:** Speaker, 8 ohms, Headphones, 600 ohms or higher. **Audio Output Power:** 1 watt. **AGC Characteristics:** Audio output level varies less than 10 dB for 50 dB change of input signal level (0.5 uv to 150 uv). **TRANSMITTER SECTION:** **DC Power Input:** SSB, 180 watts PEP. CW, 150 watts PEP. **RF Power Output:** SSB, 100 watts PEP. CW, 90 watts (50 ohm non-reactive load). **Output Impedance:** 50 ohm nominal with not more than 2:1 SWR. **Carrier Suppression:** 55 dB down from rated output. **Unwanted Sideband Suppression:** 55 dB down from rated output @ 1000 Hz & higher. **Distortion Products:** 30 dB down from rated PEP output. **Harmonic Radiation:** 35 dB below rated output. **Hum & Noise:** 40 dB or better below rated carrier. **Audio Input:** .007 v. minimum for rated input. **CW Side-tone:** Internally switched to speaker with transmitter in CW mode & key depressed. Approx. 800 Hz tone. **Keying Characteristics:** VOX operated from keyed tone using grid-block keying. **GENERAL:** **Frequency Coverage:** 49.5 to 54.0 MHz in 500 kHz segments (50.0 to 52.0 MHz with crystals supplied). **Frequency Selection:** Built-in LMO or crystal control. **Frequency Stability:** Less than 100 Hz drift per hour after 20 minutes warmup under normal ambient conditions. Less than 100 Hz drift for ±10% supply voltage variations. **Modes of Operations:** SSB, single sideband (suppressed carrier, with selectable upper or lower sideband). TUNE, continuous wave. CW, keyed continuous wave (800 Hz offset crystal for cross-mode operation between USB and CW). **Dial Accuracy:** Electrical, within 400 Hz on all band segments, after calibration at nearest 100 kHz point. Visual, within 200 Hz. **Dial Backlash:** No more than 50 Hz. **Calibration:** Every 100 kHz. **Intermediate Frequencies:** Receiver First IF ± Transmitter Second IF, 8.395 to 8.895 MHz passband. Receiver Second IF & Transmitter First IF, 3.395 MHz center frequency. **Power Requirements:** High voltage, +700 v. DC @ 250 ma with 1% max. ripple. Low voltage, +250 v. DC @ 100 ma with .05% max. ripple. Bias voltage, -115 v. DC @ 10 ma with .5% max. ripple. Filament voltage, 12.6 v. AC/DC @ 4.355 amps. **Dimensions:** 14 7/8" W x 6 3/4" H x 13 3/8" D.

Universal Mobile Mounting Bracket For SB-110A, SB-101 and HW-100
SBA-100-1

\$14.95



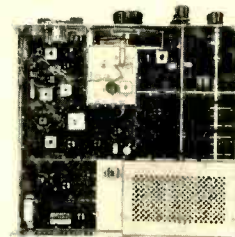
Go mobile with the SB-110A, SB-101 or HW-100. Installation is easy with the SBA-100-1 mounting bracket. Fits either the transmission hump or under the dash. Heath engineered cantilever suspension provides firm support and allows quick plug-in of the entire transceiver for easy change from fixed to mobile operation. Supporting rods are concealed when not in use.

Kit SBA-100-1, 6 lbs. \$14.95

Low Cost 5-Band SSB-CW Transceiver



HW-100
\$250⁰⁰



Top View of the HW-100 . . . shows the neat layout provided by the five circuit boards which mount on the top of the chassis. Note the completely enclosed VFO and shielded Final Amplifier.

The Heathkit HW-100 5-Band SSB-CW Transceiver . . . Red Hot Performance At A Money-Saving Kit Price

- Solid-state (FET) VFO • 80-10 meter coverage • Switch selected upper or lower sideband or CW • 180 watts input PEP SSB—170 watts input CW • Crystal filter • Full coverage on all bands with 500 kHz per band segment • Smooth vernier control of frequency with patented Harmonic Drive™ dial mechanism • Built-in 100 kHz calibrator • Separate offset CW carrier crystal • TALC • Quiet, enclosed relays • Fixed or mobile operation with HP-23A or HP-13A power supplies • Easy assembly with circuit boards and wiring harness

The World's Fastest Selling Transceiver . . . and the reasons are clear. The HW-100 is easy to build, a pleasure to use, and most important, it delivers what every ham wants—a solid signal coupled with a hot receiver . . . at lowest possible cost. Here's the hot one close up.

The Receiver boasts a sensitivity of 0.5 uV for 10 dB S+N/N ratio for SSB operation. Crystal filter selectivity is 2.1 kHz @ 6 dB down, 7 kHz @ 60 dB. Image & IF rejection are both better than 50 dB.

The Transmitter delivers 180 watts PEP SSB input, 170 watts CW input. Carrier and unwanted sideband suppression is 45 dB down; 3rd order distortion 30 dB down; RF compression (TALC) is 10 dB or better. Outstanding stability . . . less than 100 Hz/hour drift after 30 minute warmup . . . less than 100 Hz variation under a 10% line voltage change. The HW-100 operates PTT or VOX on either sideband, and semi-break-in transceive by operating VOX from a keyed tone, using grid-block keying. The 1 kHz CW sidetone is internally switched to either speaker or headphones.

A Pleasure To Use . . . the patented Harmonic Drive™ provides 28 knob revolutions per 500 kHz band segment with 5 kHz divisions. Front panel controls include Band & Mode Selectors, Load, Final Tune, Driver Pre-selector, Mic/CW Level, Mic Connector & Phone Jack. Switches for metering functions and PTT/VOX/CAL are adjacent. Put the world's best value in sideband in your shack now . . . the HW-100—another hot one from the Hams at Heath.

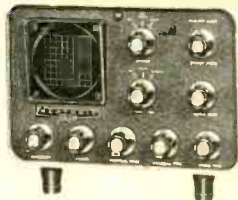
Kit HW-100, 22 lbs. \$250.00
Kit SB-600, 8 ohm speaker, 6 lbs. \$19.95
Kit HP-13A, DC power supply, 7 lbs. \$69.95
Kit HP-23A, AC power supply, 19 lbs. \$51.95

HW-100 SPECIFICATIONS—RECEIVER. Sensitivity: Less than .5 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. Selectivity: 2.1 kHz minimum at 6 dB down 7 kHz maximum at 60 dB down (3.395 MHz filter). Input: Low impedance for unbalanced coaxial input. Output impedance: 8 Ω 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 P.E.P. [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 Ω non-reactive load). Output impedance: 50 Ω to 75 Ω 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 Side-tone: 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; 29.5 to 29.0; 29.0 to 29.5, 29.5 to 30.0 (megahertz). Frequency stability: Less than 100 hertz per hour after 30 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. Rear apron connections: CW Key jack; 8 Ω output; ALC input; Power and accessory plug; RF output; Antenna; 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: 14 1/4" W x 6 3/4" H x 13 3/4" D. *Triple Action Level Control™

NO MONEY DOWN UP TO \$300
Build your Heathkit now . . . pay later with the convenient Heath Time Payment Plan. No money down and up to 12 months to pay on orders from \$35 to \$300 . . . 10% down and up to 18 months on orders from \$300 to \$500. See Order Blank for details.

Add Extra Performance To Your Shack . . . With These Heathkit Accessories

SB-610
Signal
Monitor



- Operates with transmitters from 160 through 6 meters • Handles 15 W to 1 kW • Accurately displays transmitted and received AM, CW, SSB and RTTY signals • Displays signal envelope, AF and RF trapezoid patterns • Fully mu-metal shielded CRT • Improved two-tone audio test oscillator with separate balance and output level controls • Improved voltage doubler power supply • Designed and styled to match the famous Heath SB-Series equipment • Provisions to operate with virtually any other equipment on the market • Manual includes complete instructions for interpreting waveforms • Simple connection and operation • Fast, easy assembly

Kit SB-610, 14 lbs. \$79.95

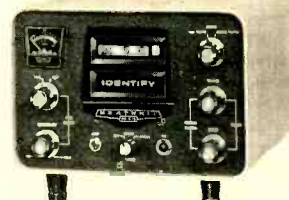
SB-620
Spectrum
Monitor



- Narrow sweep widths with crystal filter for single signal analysis—10 kHz, 50 kHz; variable sweep width to 500 kHz • Increased sweep width for monitoring larger band segments—up to 500 kHz for IF's above 455 kHz; up to 100 kHz for IF's below 455 kHz • Operates with common receiver IF's up to 6 MHz • Both linear and logarithmic amplitude displays • Long-persistence CRT for optimum display of narrow band segments • Mu-metal shielded CRT • When used with RF signal generator permits bench measurement of carrier unwanted sideband & distortion products down to 60 dB • Simple assembly, connection and operation

Kit SB-620, 15 lbs. \$119.95

SB-630
Station
Console



- Four Control-Monitor units in a single, SB-Series styled package • Includes 24 hour clock with digital readout—calibrated in hours, minutes and seconds • Built-in SWR bridge for proper antenna and transmission line match • Built-in hybrid phone patch with separate controls for receiver-to-line and line-to-transmitter audio level • Automatic, resettable electronic 10-minute timer, audio-visual signal reminds you its time to identify • Timer has continuous recycle provision • Simple assembly with the famous Heathkit manual

Kit SB-630, 10 lbs. \$79.95



HW-12A
\$109⁹⁵

Heathkit Single-Banders Have More Performance, Better Looks, Yet Cost Less

• Fixed or mobile operation with the appropriate power supply (HP-23A or HP-13A) • Electronically stable, easy-to-assemble circuit board construction • Time-saving wiring-harness cable assemblies • Durable wrinkle finish • Upper Or Lower sideband operation on all Single Banders • Choose 80, 40, or 20 meter model • Convenient control locations • 200 watts P.E.P. input • Single knob tuning with 2 kHz dial calibration • ALC input for use with external linear amplifiers • Excellent exciters for operation on the band of your choice with the SB-200 Linear Amplifier • Superior audio & AVC response • Crystal filter type SSB generation • Built-in S-meter, VOX, PTT, and ALC

AN IMPROVED VERSION OF THE SSB TRANSCEIVER THAT OPENED UP A NEW ERA IN AMATEUR RADIO. The number of Single-Banders you hear on the air is proof of their popularity . . . yet to bring you even greater economy and performance Heath improved on these favorite "Hard Working" transceivers. These are truly high-performance transceivers that get you on the air on the band of your choice with a full 200 watts P.E.P. input SSB—either fixed or mobile.

UP-TO-DATE ENGINEERING, UNCLUTTERED STYLING, COMPACT SIZE. Microphone input and gain control are located on the front panel as is the bias adjustment for ease in changing from fixed to mobile operation. A function switch position controls the optional HRA-10-1 crystal calibrator. The 11 pin power plug is compatible with SB Series power supply connections. The receiver is a 10-tube super-heterodyne with 1 uV sensitivity, 2.7 kHz selectivity, and slow AVC action for optimum SSB reception. Heathkit experience in transceiver tuning circuitry has provided the Single-Banders with stable, smooth tuning with the temperature-compensated 1.5 to 1.8 MHz VFO. The

high quality crystal lattice filter produces identical tuning characteristics for both upper and lower sideband signals—for clean transmitted signals with the carrier and unwanted sideband at least 45 dB down. Here is the performance you expect in "high priced" equipment.

DESIGNED FOR EASY ASSEMBLY. Over 90% of the components mount on a heavy-duty circuit board, and the remainder of the circuit is connected with a pre-cut wiring harness. Easy alignment with just a VOM. The only other gear you need to get on the air are microphone, antenna, power supply, and speaker. (See amateur radio accessories.)

- Kit HW-12A: 80-meter, 15 lbs. **\$109.95**
- Kit HW-22A: 40-meter, 15 lbs. **\$109.95**
- Kit HW-32A: 20-meter, 15 lbs. **\$109.95**
- GH-12A, Push-to-talk and VOX microphone, 1 lb. **\$8.95**
- Kit HRA-10-1, Plug-in 100 kHz crystal calibrator. . . 1 lb. **\$9.95**
- Kit HP-13A, DC Power Supply (Mobile), 7 lbs. **\$69.95**
- no money down.
- Kit HP-23A, AC Power Supply (Fixed Station), 19 lbs. **\$51.95**
- no money down.
- Kit HS-24, Mobile Speaker, 4 lbs. **\$7.95**

SPECIFICATIONS—RF input: 200 watts PEP. **Sideband generation:** Crystal lattice band-pass 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:** 1 uV for 15 dB (S+N)/N ratio. **Receiver selectivity:** 2.7 kHz @ 6 dB, 6.0 kHz @ 50 dB. **Output:** 50 ohm fixed (unbalanced). **Operation:** LSB, USB. **Audio output:** 1 watt @ 8 ohms. **Mike input:** Hi-Z. **Tube complement:** Fourteen tube heterodyne circuit; (3) 6EAB's, mic. amp., VOX relay amp., IF amp., RF amp., Recvr. mixer; (5) 6AU6's, VFO, VOX amp., IF amps., Xmt. mixer; (1) 6BE6, VFO isolator (HW-12A), Het. osc. and mixer (HW-22A & HW-32A); (1) 12BY7 Driver; (1) 12AT7 Xtal. osc., product det.; (1) 6EB8 Audio amp. and output; (2) 6GE5 RF output. **Power requirements:** 800 VDC @ 250 MA peak, 250 VDC @ 100 MA, —130 VDC @ 5 MA, 12 VAC or VDC @ 3.75 amperes. **Cabinet dimensions:** 6 1/4" H x 12 1/4" W x 10" D.

Famous Low-Cost "Benton Harbor Lunch Boxes" Compact 6 & 2 Meter Transceivers



HW-29A
\$49⁹⁵

HW-30
\$49⁹⁵

• Perfect for the ham-on-the-go • Ideal for CAP, MARS, local net, or emergency operations • 5-watt input crystal-controlled A.M. transmitter • HW-30 2-meter model capable of operation on new USCG Auxiliary frequency 143.28 MHz

GO VHF FOR LESS . . . complete transceivers, lunch-box size. Feature crystal controlled transmitter with straight-through final amplifier. Crystals (not supplied) are in the 8 MHz range. Receiver is super-regenerative with RF stage . . . features 1 uV sensitivity! The built-in 120 VAC power supply, speaker, press-to-talk switch on front panel, and ceramic mike included make these units ready to go on the air with your antenna. Power cables for mobile and A.C. operation are included.

- Kit HW-29A (6 meter), 9 lbs., no money dn., **\$49.95**
- Kit HW-30 (2 meter), 9 lbs., no money dn., **\$49.95**

The World's Best Values



HW-17A 2-Meter Transceiver . . .

Now With Optional HWA-17-2 FM Adapter Kit

• Frequency Range 143.2 to 148.2 MHz • Solid-state, dual-conversion super-heterodyne receiver • Pre-built, pre-aligned FET tuner • Spot function for finding transmit frequency on receiver dial • Hybrid transistor-tube type transmitter design • 8 to 10 watts power output • 4 crystal sockets plus provision for external VFO such as Heathkit HG-10B (page 77) • Built-in 120-240 VAC power supply • Optional DC mobile supply (see below) • PTT operation, electronically switched • Front panel meter for signal strength and relative power output • Built-in automatic noise limiter and squelch • Lighted dial • Built-in speaker • Battery saver feature for low current drain during mobile monitoring • Low profile aluminum cabinet for easy mobile mounting • Gimbal mount included for mobile use • Ceramic PTT microphone included • 15 transistors, 20 diodes, 3 tubes, 2 circuit boards • Builds in about 20 hours • Add the new HWA-17-2 FM Adapter kit to join the activity on FM

A Compact, Versatile Package . . . really a separate receiver & transmitter on one chassis (the only common circuitry are the power supply and the audio output/modulator). The solid-state dual conversion superhet receiver has 1 uV sensitivity, 100 kHz dial calibration, ANL and squelch. Selectivity of 27 kHz at 6 dB down makes for easy tuning and the front panel meter indicates received signal strength & relative power output. The front panel, 3-position switch has a "Spot" position, Receive/Transmit position and a Battery-Saver position that's ideal for mobile monitoring (draws only 100 mA). A 3x5" speaker is built in. The transmitter has a 25-30 watt input and an AM output of 8-10 watts. Modulation is automatically limited to less than 100%. Choose any of 4 front panel selected crystal frequencies or use an external VFO (the HG-10B is perfect, see p. 77). Includes a PTT mike & mobile mount. When you go 2-meter phone, go HW-17A. And check out the HWA-17-1 Solid-State mobile power supply and HWA-17-2 FM Adapter Kit too.

Kit HW-17A, 2M Transceiver, 18 lbs., no money dn. \$129.95



HW-17A
\$129⁹⁵

HW-17 SPECIFICATIONS—RECEIVER: Frequency coverage: 143.2-148.2 MHz. Dial calibration: 100 kHz. IF Frequencies: Double conversion: 1st IF: 24.965 MHz; 2nd IF: 2 MHz. Sensitivity: 1 uV input for 10 dB S/N + N. Selectivity: 27 kHz @ 6 dB down. Input impedance: 50-72 ohm, unbalanced. Audio output: 1 watt @ less than 10% distortion. Headphone jack: Low impedance, accepts PL-55 type plug (standard 2-conductor 1/4" sleeve). Transistor complement: (2) 2N4416 RF Amplifier, 1st Mixer; SE5023 HF variable oscillator; (4) 2N3694 2nd Mixer; crystal oscillator, 1st IF amplifier, 2nd IF amplifier; (2) 2N3393 Audio Pre-amplifier, Squelch amplifier X29A829 Squelch Gate; 2N1274 Audio Driver; (2) 40050 Audio/Modulator output. Transmitter: Frequency coverage: 143.2-148.2 MHz. RF Power input: 25-30 watts. RF Power output: 8-10 watts. Mode: Type A3 (AM). Modulation: Automatically limited to 100% or less. Output Impedance: 50-72 ohm, unbalanced. Crystal sockets: Accepts FT-243 type holders, pin diameter .093", pin spacing .466" & HC6/U type in diameter .050", pin spacing .466". Transistor/tube complement: 7050 Oscillator/Amplifier Tripler-Tripler; 12GN7 Double/Driver; 8156 Power Amplifier; (2) 2N3393 Microphone Pre-amplifier, Microphone Driver. Temperature range: -20° to +50° C. Power requirements: 120 or 240 VAC input. Receiver Trans.—20 watts; Batt. Saver—8 watts; Spot—35 watts; Transmitter—100 watts. Cabinet dimensions: 14 1/2" W x 8 1/2" D x 6 1/2" H including microphone and mounting feet. Net weight: 13 lbs.

Solid-State DC Supply For HW-17A

Going Mobile With The HW-17A? You'll need this compact little power supply that delivers all necessary voltages for the HW-17A. The all solid-state circuit uses a "C" core transformer for reliable, efficient operation. Big heat sinks assure cool operation with a 50% duty cycle. Circuit breaker protection guards your mobile battery source. All necessary cables & connectors supplied.

HWA-17-1
\$24⁹⁵

Kit HWA-17-1, Transistorized DC supply, 4 lbs., \$24.95

HWA-17-1 SPECIFICATIONS—Input voltage: 12 to 15 volts DC (Note: a 13.5 volt DC input was used in determining the electrical specifications). For negative ground systems only. Input current: 10 amperes maximum. Allowable ambient temperature: 10 degrees F. to 122 degrees F. High voltage output: 380 VDC no load, 340 VDC at 150 mA load. Ripple: 1% at 150 mA. Duty cycle: 50%. Conversion frequency: 2500 Hz (approx.). Dimensions: 3 1/2" W x 7-5/16" L x 2 1/2" H. Net weight: 3 lbs.

FM Adapter For HW-17 Series Rigs

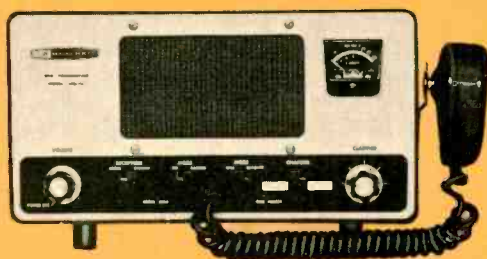
Join Your Friends On 2-Meter FM . . . with the new HWA-17-2 FM Adapter. This easy to build kit allows transmission of wide band (15 kHz) FM signals with any HW-17 series rig. Installs without drilling any holes. Once installed, going from AM to FM is just a matter of throwing a switch on the adapter. Two crystal controlled positions are provided, and a crystal for the national calling & working frequency of 146.94 MHz is included. Get on 2-Meter FM now . . . the low cost HWA-17-2 way.



HWA-17-2
\$17⁹⁵

Kit HWA-17-2, 2 lbs. \$17.95
HWA-17-2 SPECIFICATIONS—Band Coverage: 144-148 MHz (crystal controlled). Input Load Impedance: 50 k ohms or greater. Output Voltage: 7 volts RMS, open circuit. Crystal Frequency: 8,000 to 8,222 MHz. Deviation: Adjustable. Tube Complement: (1) 12BA6 Crystal Oscillator; (1) 12AT7 Phase Modulator and Buffer. Power Required: (furnished by HW-17 series) 12.6 VAC @ 300mA; 300 VDC @ 25mA.

A Unique Low Cost Crystal-Controlled SSB Transceiver Especially Designed For Use By CAP



Kit HW-18-1
\$119⁹⁵

• 200 watts PEP SSB input • 25 watts input with carrier for compatibility with AM stations • Employs upper sideband • Complies with new FCC rule effective June 21, 1968 which establishes a CAP SSB frequency tolerance of .005% until Jan. 1, 1973 and 50 Hz thereafter • Crystal filter sideband generation • 2 channels, switch selected, crystal controlled (tolerance .005%) • Fixed tuned for simple PTT operation • Transmit and receive frequencies locked together for true transceiver operation • Clarifier control adjusts transceiver frequency ±100 Hz • Relayless transmit-receive switching • Local-Distance switch prevents receiver overload from strong local stations • Built-in speaker • PTT mic. included • Carrier & sideband suppression 45 dB • Sensitivity 1 uV • Selectivity 2.1 kHz • 50 ohm coax output • Mobile or "fixed" use HP-13A & HP-23A power supplies • Mobile mount included • Requires only a voltmeter, ohmmeter & dummy load for alignment

Kit HW-18-1, CAP transceiver and crystals for any two channel frequencies from list below; specify choices; 16 lbs., no money dn. \$119.95

Assembled HWW-18-1, ready to operate CAP transceiver with crystals for any two channel frequencies from list below; specify choices; 16 lbs., no money dn. \$179.95

CAP CRYSTALS; channel frequency: 4467.5, 4507.5, 4585, 4602.5, 4630 kHz; 1 lb. ea. \$4.95

HW-18 SERIES SPECIFICATIONS—RECEIVER SECTION: Frequency coverage: 4450 to 4650 kHz. Channels: 2. Sideband: USB. Clarifier range: ±100 Hz. Sensitivity: 1 uV input signal will provide at least a 15 dB signal-plus-noise-to-noise ratio. Selectivity: 2.1 kHz nominal @ 6 dB down, 6 kHz @ 50 dB down (3395 kHz filter). Intermediate frequency: 3395 kHz. Image rejection: 100 dB. IF Rejection: 50 dB. Antenna input impedance: 50 ohm, unbalanced. Receiver audio response: 400 to 3000 Hz. Receiver audio power output: 1 watt. Internal speaker: 8 ohm impedance 4" x 6". **TRANSMITTER SECTION:** Frequency coverage: 4450 to 4650 kHz. Channels: 2. Transmitting mode: Upper sideband carrier suppressed, and low level carrier with sideband. Frequency accuracy: .005% overall (after adjusting to channel frequency). Clarifier range: ±100 Hz. RF Power input: 200 watts PEP. Output impedance: 50 ohm, unbalanced. Transmitter audio response: 400 to 3100 Hz. Microphone: High impedance ceramic. Unwanted sideband suppression: 45 dB min. below peak output with 1000 Hz modulation. Carrier suppression: 45 dB min. below peak output. Ambient temperature range: +10° to +110° F. Controls: Front panel: VOLUME with on/off switch, Reception, Mode, Meter, Channel, Clarifier, Meter Zero, Bias Adjust. **Circuit board:** Carrier null. Chassis rear: Mic. gain. **GENERAL SPECIFICATIONS: Power requirements:** 800 VDC @ 250 mA peak, 250 VDC @ 100 mA, -130 VDC @ 5 mA, 12.6 VAC or VDC @ 3.75 amperes. Tube complement: (3) 6EA8 microphone amp & AF cathode follower, transmitter IF amp & relay amp. RF amp & receiver mixer; (4) 6AU6 heterodyne osc., IF amps (2), transmitter mixer; (1) 12B7 transmitter driver; (1) 12AT7 prod. detector & carrier osc.; (1) 12BE8 AF amp & AF output; (2) 6GE5 transmitter RF output. Cabinet dimensions: 6 1/4" H x 12 1/4" W x 10" D. Add 1" to height, width, & depth for gimbal bracket, knobs & connecting plugs. Net weight: 12 lbs.

A HD-10
\$39⁹⁵



B HD-16
\$9⁹⁵



C HM-15
\$14⁹⁵



D HD-15
\$24⁹⁵

E HD-20
\$14⁹⁵



F PM-2
\$12⁹⁵



G HM-10A
\$29⁹⁵



H GH-12A
\$8⁹⁵



Amateur Radio Accessories

A Heathkit Solid-State Electronic Keyer

• Dependable solid-state circuitry • Speed range—15 to 60 words per min., Slow-speed option—10 to 20 wpm • Self-completing dashes • Solid-state switching—no relays to stick or chatter—no contact bounce to punch holes in characters • Built-in paddle—"feel" is adjustable to your fist during assembly • Adaptable to either right or left handed operators • Engineered to convert easily to semi-automatic operation if desired • Variable dot-space ratio • "Hold" switch for transmitter tuning • Built-in side-tone and speaker • Built-in transformer-operated power supply isolates the keyer from the power line • Fused for protection • For use only with transmitters employing grid-block keying circuits, negative 105 volts @ 35 ma. maximum

Kit HD-10, 6 lbs., no money dn. \$39.95

HD-10 SPECIFICATIONS—Keying: Speed range—15 to 60 wpm. Slow speed option—10 to 20 wpm. Keying output: Keyed line to chassis ground. Voltage polarity: Negative to ground only. Maximum open circuit or spike voltage: 105 volts. Key-closed voltage: 0.2 volts max. Key-closed current: 35 milliamperes, max. General-Audio: Internal speaker or high impedance headphone jack. Transistor complement: (7) 2N407 PNP; (3) 2N2712 NPN; (1) 2N398A PNP. Controls: Off-Operate-Hold switch; Speed control; Dot-To-Space ratio control; sidetone volume control. Rear panel connections: Keyed line; receiver audio; battery +45 volts; battery +22½ volts. External key options: hand key, dash arm, dash, dot. Power requirements: AC operation, 105-125V. AC, 50-60 Hz. Battery operation, 45 volts with 22½ V. tap; 14 milliamperes. Dimensions: 3¼" W x 4¼" H x 10½" D.

B Heathkit Solid-State Code Practice Oscillator

HD-16 UTILIZES A UNIUNCTION TRANSISTOR WITH SEPARATE CONTROLS TO VARY TONE FREQUENCY AND VOLUME. Speaker is built in and jack for headphones is provided on front panel. For visual monitoring, just flip the front panel switch and watch the top-panel blinker light. Includes key with phone plug and cord. Requires two 9 volt transistor radio batteries and one "C" flashlight cell.

Kit HD-16, 3 lbs. \$9.95

C Heathkit SWR Meter—Get More Efficiency From Your Rig

• Shows antenna/transmission line match—indicating forward & reflected power & SWR • Covers 160-6 meters • Handles peak power well over 1 kw • Matches 50 or 75 ohm lines with wiring options • Styled to match SB-Series equipment

Kit HM-15, 2 lbs. \$14.95

HM-15 SPECIFICATIONS—Operation: Indicates percentage of reflected power to 25%, and voltage standing wave ratio (SWR) to 3. RF Power Handling Capability: One kilowatt. Input and Output Impedance: 50 or 75 ohm. Band Coverage: 160 through 6 meters. Meter: 100 microamperes, full scale. Dimensions: 9¼" L x 3⅝" W x 2⅝" H.

D Heathkit Hybrid Phone Patch—A Useful Addition To Any Shack

• Features individual gain controls for receiver-to-line and line-to-transmitter audio level • Convenient one-switch operation • VU meter for quick monitoring of audio levels; also indicates null depth • 30 dB isolation between transmit and receive circuits for positive VOX operation • Matches 3-16 ohm speakers and hi-Z or 600 ohm inputs • Operates VOX or PTT • Matches SB-Series equipment in styling

Kit HD-15, 3 lbs., \$24.95

E Heathkit 100 kHz Crystal Calibrator

Produces a signal every 100 kHz through 54 MHz. An ideal instrument for checking receiver dial calibration, band limits, receiver RF alignment etc. Can be calibrated with trimmer against WWV. Uses 9 v. battery, not included.

Kit HD-20, 1 lb. \$14.95

F Heathkit RF Relative Power Meter

A popular, inexpensive accessory for any "ham." The PM-2 features 0.3 volt RMS sensitivity at the antenna and a frequency range from 100 kHz to over 250 MHz. The circuit requires no power . . . operates from the radiated transmitter signal. The magnetic base makes it ideal for measuring the relative power output of mobile rigs—just mount on the dash. Easy assembly and rugged construction.

Kit PM-2, 2 lbs. \$12.95

G Heathkit Solid-State "Tunnel Dipper"

• Tunnel diode oscillator—no tubes • Covers frequency range of 3 to 260 MHz • Gear-drive tuning • Durable epoxy-coated plug-in coils • Coils color-matched to dial scales • Built-in coil storage

Kit HM-10A, (less battery), 3 lbs. \$29.95

HM-10A SPECIFICATIONS—Frequency range: 3-260 MHz. Bands: 6. Temperature range: 0-120° F. Controls: Frequency, Off-Diode-Osc. switch, Sensitivity. Transistors: (1) 2N407 DC amplifier; (2) T1363 DC amplifier; (1) tunnel diode, oscillator; (1) crystal diode, rectifier; (1) silicon diode, voltage stabilizer. Meter: D'Arsonval type, 0-1 ma full scale. Power requirements: 1.5 volts @ 5 ma. Battery: 1 AA penlite cell (not included). Dimensions: 5⅞" L x 2⅜" W x 4⅞" H (cover closed).

H Heathkit Mobile PTT Mike

The GH-12A's high impedance ceramic element is well suited to the rugged work-out given to mobile equipment . . . it is virtually unaffected by the temperature extremes that sometimes occur in closed cars. The new deep green color styling matches both SB and HW Series equipment. Complete with cable, less connector.

Model GH-12A, 2 lbs. \$8.95

The Right Tools Make Kit Building Even Easier

A Heathkit GH-17A Soldering Iron

This Heathkit soldering iron is the perfect choice for kit building. Its light weight and good balance make it easy to handle, and the handy stand with metal cage keeps the iron safe and secure when not in use. Three ways safe . . . new three-wire line cord . . . isolation transformer operated . . . and the 25-watt GE midget iron runs on only 6 volts. Non-corroding 1/4" metal tip. Three heat ranges; low, medium and high, give versatile performance for all types of circuit work. Comes with a six foot cord and runs on 117 VAC.

Kit GH-17A, 5 lbs. \$14.95
 Replacement Heater Tips for GH-17A:
 GDP-317, 1/4" chisel, 1 lb. \$5.45
 GDP-327, 3/16" pyramid, 1 lb. \$5.45
 GDP-337, 3/16" chisel, 1 lb. \$5.45

B Weller W-PS 25-Watt Pencil Soldering Iron

Lightweight and convenient . . . an ideal kitbuilder's companion. Develops 860° heat fast, ready to go to work in seconds. U.L. and C.S.A. Approved.

Model GDP-207, 1 lb. \$4.95

C New Heath Solder/De-Solder Set

One of the most versatile and convenient tools the kitbuilder can buy. Solders, de-solders and strips wire, too. The pencil-type Ungar iron features a 40-watt heat cartridge with a 750° to 950° F. heat range, and non-corroding iron-clad gold-plated tip (both are replaceable). A patented heat sink makes the handle cool to the touch at all times. Also included is a unique de-solder squeeze-bulb with heat and solder-resistant nozzle that makes de-soldering connections a snap. A heated V-slot wire stripper is also provided.

Model GDP-108, 1 lb. \$9.95

D Vaco Hollow Shaft Nut Driver Set

A welcome addition to any kitbuilder's workbench. Seven drivers accommodate most commonly used nut sizes; 3/16", 1/4", 5/16", 11/32", 7/16" and 1/2". Plastic handles are color-coded for quick, easy identification. Convenient self-supporting rack included.

Model GDP-204, 3 lbs. \$6.95

E Speedex Wire & Cable Stripper

A rugged, dependable, precision-made tool that takes the guesswork and nicks out of wire stripping. No kit builder should be without one. Graduated jaws accept No. 10, 12, 14, 16 and 22 wire.

Model GDP-663, 2 lbs., mftrs. list \$9.95 only \$5.89

F Kit Builders Tool Set

Everything the novice needs to get started in an exciting and rewarding kit building hobby. Set includes combination wire stripper and diagonal side cutter; midget 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; radio solder, and information-packed "Kit-Builder's Guide."

Model GH-25, 4 lbs. \$19.95

G Z-Lyte Extension Lamp Kit

Light up your workbench with this convenient and versatile extension lamp kit. The extension arm comes already assembled. All you do is attach the socket, shade and cord . . . and you're ready to see your favorite kit building project in a new light. Lamp features a 45" reach and 360° sweep; vented shade, and movable base clamp. U.L. Approved. Incandescent bulb not included.

Kit GDP-202, 5 lbs. mftrs. list \$14.50 only \$11.95

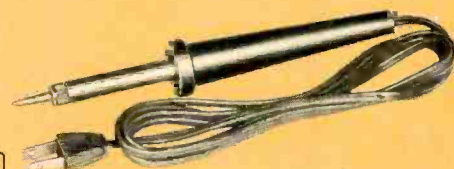
H Heathkit Motor Speed Control

Any home hobbyist will welcome this convenient device. Saves power, blades, bits, saws, etc. A feed back circuit in the Motor Speed Control lets you slow down a power tool while maintaining almost full torque. Thus, 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, 3 lbs. \$17.50



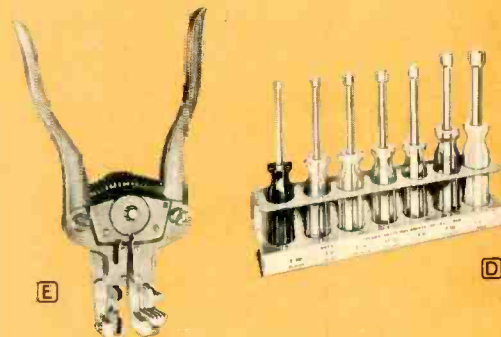
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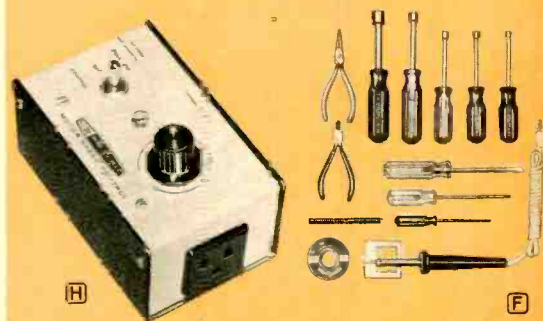


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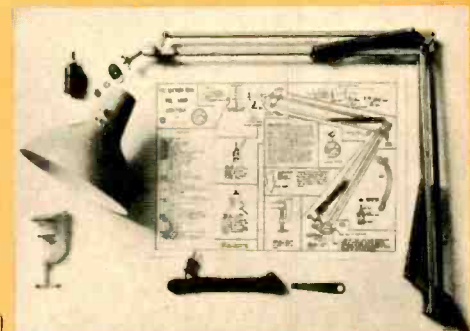
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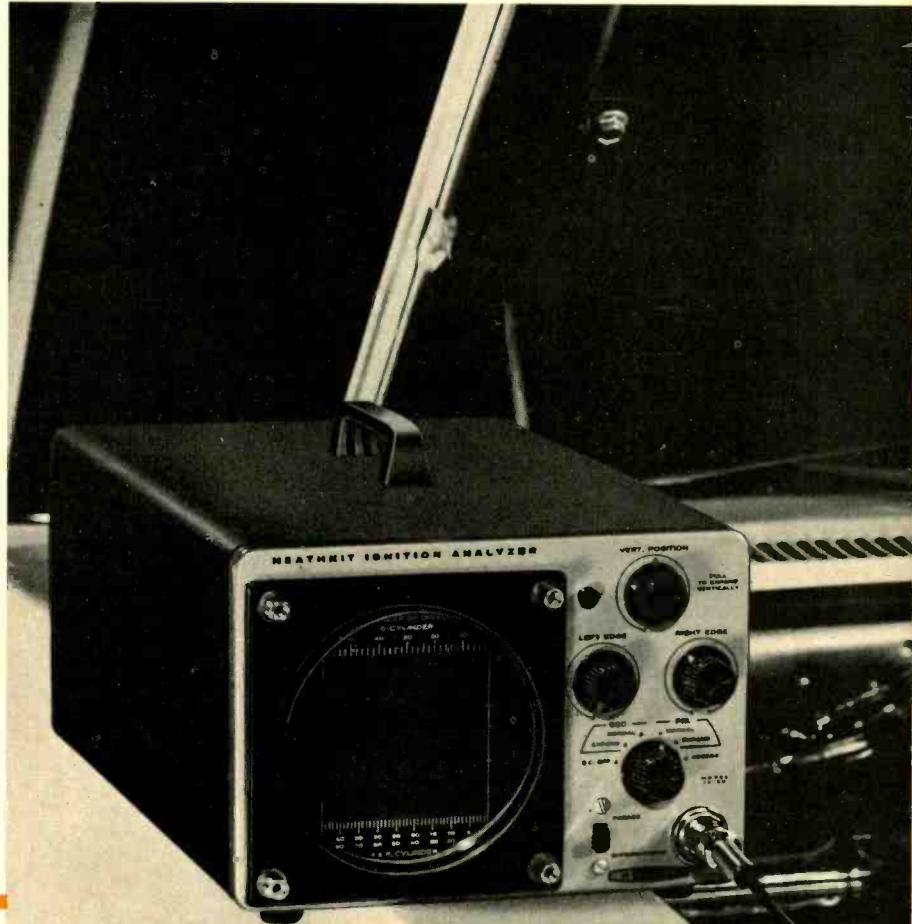


G

Choose Heathkit® Auto Accessories For Better Engine Performance



Kit ID-29
\$33.95



10-20
\$109.95

MI-18-2
with Case
\$32.95

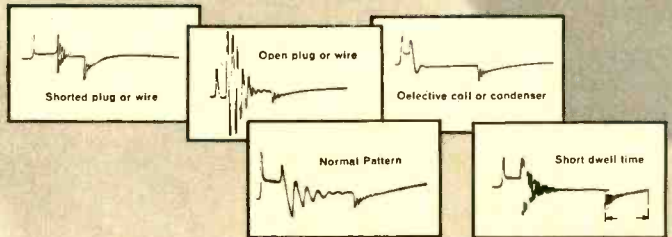


MI-18-1
Panel Mount
\$29.95



Dash-mounted, the MI-18 looks sharp, requires only a 3 1/4" hole, 2 1/4" deep.

Tell-tale Patterns Show Ignition System Condition



Heathkit Solid-State Auto Tune-Up Meter . . . Measures Dwell, RPM and DC Volts On 3, 4, 6 & 8 Cylinder 4-Cycle Engines . . . Only \$33.95

- Three automotive test instruments in one • Measures Dwell on all 4-cycle, 3, 4, 6 or 8 cylinder engines • Two RPM scales—0-1500 and 0-4500 revolutions
- Measures DC voltage from 0 to 15 volts • Dwell and VDC scales are direct reading • Uses only two leads • Running engine provides both signal and power . . . uses no batteries • Both Dwell & RPM measurements can be taken without reconnecting leads • Can be used on both 6 and 12 volt systems without switching or changing leads • No recalibration is necessary from day to day or engine to engine • Very stable all solid-state circuitry • 3% accuracy • Completely portable . . . handy for road testing . . . comes in its own carrying case that's unaffected by water, oil, gasoline and most acids
- Easy to build • Can be used with either positive or negative ground systems

The Most Value Ever Offered In A Tune-Up Meter. The new Heathkit ID-29 provides very accurate Dwell, RPM and DC Voltage measurement functions in a simple, compact, portable case . . . and it requires no batteries.

Amazing Versatility And Convenience. The new ID-29 connects directly to the coil primary for both Dwell and Tach measurements. For breaker point settings, just set the function switch to the Dwell position, and read Dwell angle directly from the big 4½" meter. To check RPM, turn the function switch to either the High (0-4500 RPM) or Low (0-1500 RPM) position, select the proper number of cylinders with the Cylinder switch and read

the meter. The unique solid-state circuit design of the new ID-29 eliminates troublesome extra leads, time-consuming lead changing when going from one function to another and best of all, there are no batteries to worry about . . . the two leads pick up both signal and power from the engine itself. And there's even a handy DC Voltmeter built-in . . . great for chasing down electrical system faults in a hurry. Can be used with either 6 or 12 volt systems, without switching or lead changing. And the new ID-29 doesn't require recalibration when changing from one car to another or from day to day either . . . two simple adjustments after assembly maintain the calibration for many months. The rugged plastic dark beige textured case with positive locking top has a built-in lead storage compartment and is resistant to virtually everything. Weighs only 2½ pounds for easy carrying.

Simple To Build. The ID-29 goes together fast . . . just one simple circuit board to build, chassis parts mounting, two simple calibration steps and you're done. Assembly time is about 5 hours. Get the most versatile Auto Tune-Up Meter on the market . . . order your ID-29 now.

Kit ID-29, 5 lbs., . . . \$33.95

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:** 10 mA approximate average current. **Meter:** 4½" x 1 mA (100 degree movement). **Accuracy:** ±3% of full scale. **Dimensions:** 8½" W x 4¼" H x 7¼" D (including handle). **Net weight:** 2½ lbs.

Diagnose Auto Ignition Problems Quickly, Efficiently With This Versatile Analyzer

- Spots ignition troubles—shows results of corrective action • Just flip a switch to select any of 4 different patterns without switching leads • Expand any view horizontally or vertically for a "closer look" • Easy to use—detailed instruction manuals provided for simple assembly and operation • Use on any internal combustion engine with conventional, non-transistor ignition system*

Helps Keep Your Car Running Smoothly . . . identifies shorted spark plugs, bad points, defective wiring, worn distributor parts, incorrect dwell time, coil and condenser problems, plus many more engine defects. Use it in the shop with its own built-in power supply, or "on-the-road" with an external DC to AC inverter.

Select 4 Different Patterns Without Switching Leads. A special switching system provides instant selection of primary and secondary patterns in either parade or super-imposed displays without the bother of lead switching. Expand the views for detailed analysis . . . 10 to 1 horizontally or 2 to 1 vertically. The trigger circuit provides the steady "locked-in" pattern display you need for convenience.

Easy To Build . . . Rugged Metal Housing. Goes together quickly and easily . . . no special skills or knowledge needed. And you enjoy the "do-it-yourself"

savings. Features a corrosion-resistant aluminum case with brushed aluminum front panel, and easy-to-clean enamel finish. Compact, too . . . measures 8" H x 9½" W x 16" D. Use on any internal combustion engine with a conventional, non-transistor ignition system.* For fast, easy tune-up and ignition system trouble-shooting, choose the IO-20.

Kit IO-20, 19 lbs., no money down . . . \$109.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IO-20 SPECIFICATIONS—Rpm Range: 400-5000 rpm. **Displays:** Secondary, Primary, Parade, Super-imposed. **Screen size:** 4½" diameter. **Dwell measurement:** 4, 6 & 8 cylinder calibration on face plate. **Pattern height:** Secondary circuit, approx. 1"; Primary circuit, 6 volt system ¾", 12 volt system 1". **Vertical expand ratio:** 2 to 1. **Horizontal expand ratio:** 10 to 1. **Cable length:** 12" pick-up clamp, ground and secondary clip leads extend 2" beyond pick-up clamp. **Power requirements:** 105-125 V, 50/60 Hz AC, 30 watts.

*It is impractical to portray the patterns produced by the many different ignition systems (transistor, SCR, Capacitor Discharge, Induction pick-up, etc.) currently used experimentally. In most cases the IO-20 will function satisfactorily and with a little experience the display will prove equally meaningful to the user as conventional systems. Heath Company can NOT supply advice on interpretation of such displays.

Heathkit Solid-State Tachometer . . .

For Cars, Boats, Motorcycles

- Unique inductive pickup allows operation with virtually any spark-type engine • Usable with almost any ignition system—conventional, magneto, capacitive-discharge, transistor • Two RPM ranges—0-6000 & 0-9000 • Temperature-compensated for ±5% accuracy from 0° to 120° F (±3% at calibration temp.) • Wide-angle 250° edge-lighted dial • Stainless steel hardware
- Chrome plated parts are heavy die-cast metal • Adjustable red line to remind you of top RPM limit • Can be wired so dial light will brighten & dim with panel lights • Non-scratch glass face—great for dune buggies & motorcycles • Splash-proof case—ideal for boat use • Can be panel mounted or installed in its own handsome black & chrome case • Fast enjoyable assembly—all components mount on unique circular circuit board that fits inside the case—only one unit to install

Kit MI-18-1, (For panel mounting), 3 lbs. . . . \$29.95
Kit MI-18-2, (includes mounting case & hardware), 3 lbs. . . . \$32.95

MI-18 SPECIFICATIONS—Trigger Sensitivity (Minimum Requirements). Pickup Coil: 25 mA peak, 5 uS rise time. **Tach Connection:** 30 volt negative pulse, 20 uS rise time. **Meter Range:** 0-6000 r/min. or 0-9000 r/min. **Engine Capability:** 1 to 6 cylinders, 2 cycles; 2 to 8 cylinders, 4 cycles. **Accuracy:** ±3% at calibrating temperature (when calibrated at full scale). ±5% from 0 degrees F. to +120 degrees F. **Power Requirements:** 10.5 to 17.5 volts DC. 25 mA at 12 volts DC. 125 mA with lamp. **Dimensions:** Model MI-18-1. 3¼" overall face diameter. Mounts in 3¼" hole. 2¼" overall case depth. Model MI-18-2. 3¼" overall face diameter. 4¼" high. 3" overall case depth. **Weight:** MI-18-1: 14 oz. MI-18-2: 17 oz.

Timing Light Kit . . . Adds More Versatility To The IO-20 Ignition Analyzer



ID-11
\$21.95

Especially Designed For Use With The IO-20. Produces an intense white light that shows timing marks even in bright sunlight. Features a speed range of 0-1250 flashes per minute (0-2500 rpm for current conventional 4-cycle engines). The long-life, hard-rubber pistol grip case comes complete with 10' of cable. Measures 6" H x 7½" L x 2" W.

Kit ID-11, 3 lbs. . . . \$21.95

Hanson # 519 Basic Tester Set For Car Tune-Up And Repair



GFP-83
\$12.95

Ideal For Do-It-Yourselfers & Professionals. Includes Model 1604 Remote Starter Switch with push button & long leads . . . Model 1605 Compression Tester that reads 0-300 lbs.; 15° offset to reach back cylinders . . . Model 1606 Vacuum/Fuel Pump Tester with 2½" 3-color dial, calibrated 0-30 inches for vacuum and 0-7 lbs. for pressure . . . Model 1603 Engine Timing Light with molded plastic case, long leads & rubber covered connectors.

GFP-83, 4 lbs. . . . \$12.95

New Heath VHF/FM Radiotelephone... Only \$499.95



Full Remote Control Capability At Lowest Cost

FCC Type-Accepted... Dual RF Receiver Circuitry... Six Channels... Crystal Filter & Discriminator... Owner Can Install When Ordered With Crystals

- New MWW-18 completely meets all FCC requirements for VHF/FM radiotelephones • State of the art design using all solid-state devices with tubes in transmitter output stage • Small size, light weight for versatile installation • Unique plug-in control head allows fast, low cost remote control • True 6-Channel capability lets you place any or all channels in either low or high band... eliminates wasting channels on high band Public Correspondence capability you may not need • A seventh Receive-only channel for monitoring ESSA weather broadcasts • Maximum legal 25 watt power output plus low power (1 watt) output for in-harbor use • Extremely low standby current drain • Modular circuit board construction, ingenious design and detailed service manual for fast, low cost maintenance • Quick-disconnect cables & mounting hardware permits easy removal • Designed to withstand rugged salt atmosphere... stainless steel hardware, heavy cadmium plated chassis, meets all EIA Standards for temperature and vibration • Factory assembled and tested • Complete with crystals for channels 6 & 16 (ship-to-ship safety & national calling channels) • Microphone, speaker & gimbal mount included • FCC type-accepted for private & commercial (party boat) use • Optional Remote Control, Handset & antennas available • Fast, easy owner installation when ordered with crystals installed for channels of your choice • The finest VHF/FM Radiotelephone available

Discover The Uncongested, Interference-Free Communications of the new VHF Marine Band... with the new Heath MWW-18 VHF/FM Radiotelephone. It's one of the few available that is type-accepted under the new FCC Narrow Band rules. Compare it to similar units... you'll see that the Heath Radiophone has more value built in.

True 6-Channel Capability. The VHF Marine Band is split into two sections—the Low Band & the High Band. Of 10 available channels on the High Band, 9 are for "Public Correspondence" use... marine radiotelephone to land telephone lines. Few boaters need more than one or two channels in this service... yet most other VHF/FM radiophones obligate half of their channels to the High Band... and thus cuts the real channel capacity in half. The Heath MWW-18 lets you decide in what band you want your channels. Put them all in Low Band... all in High Band... or split them between the two bands in the combination you wish. Heath gives you the choice. And the MWW-18 also includes a seventh receive-only channel for monitoring the VHF weather station broadcasts.

Full Remote Control Capability For Only \$19.95! The unique plug-in control head allows full remote control at a fraction of the cost of other radiophones. The Remote Accessory includes 15' of cable to connect the control head to the radiophone and all mounting hardware for either flush or universal gimbal mounting. Another Heath exclusive.

Owner Installation! Order your MWW-18 with up to four extra transmit and five extra receive channels (channels 6 & 16 are furnished) by specifying channel numbers. We install the crystals and do the tune-up required... all you have to do is install it with a recommended antenna (see price lines)—and save the cost of technician installation.

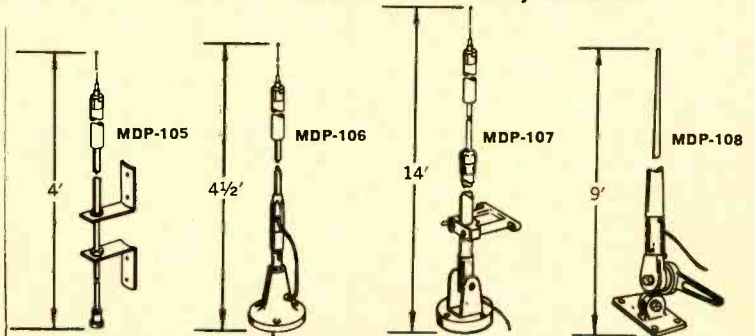
Maintenance—An Important Consideration. Although maintenance & performance checks are required by the FCC on all radiophones, a good design can cut owner costs considerably... and the MWW-18 is designed with this in mind. Nine of the eleven circuit boards can be removed without a soldering iron... and built-in test points on the circuit boards make checks fast and simple. A complete service manual is supplied to save you technician time and money.

Maximum Legal Power Output. The MWW-18 delivers a solid 25 watts output... the FCC-allowed maximum. You don't have to add expensive power-increasing devices to this radiophone. And a 1-watt output position on the function switch lets you conform to the latest rules for in-harbor power output.

- Assembled MWW-18 (with channels 6 & 16), 25 lbs. \$499.95
 - MWA-18-1, Remote Control Accessory Package, 6 lbs. \$19.95
 - MWA-18-2, Handset Accessory, 3 lbs. \$49.95
 - MDP-106, 4½' deck mt. tilt-over antenna w/20' coax. cable & BNC Connector, (3 dB gain), 4 lbs. \$29.95
 - MDP-105, 4' mast mt. antenna for sailboats w/75' coax. cable & BNC Connector, (3 dB gain), 3 lbs. \$24.95
 - MDP-107, 14' deck mt., fiberglass tilt-over mast antenna w/20' coax. cable & BNC Connector, (3 dB gain), 8 lbs. (REA or Mtr. Frt.)... \$59.95
 - MDP-108, 9' fiberglass whip 6 dB gain antenna, Lever-Action tilt-over type w/20' coax. cable, 4 lbs. (REA or Mtr. Frt.)... \$49.95
 - Weather (WX) Channel Receive only, 1 lb. \$8.50
 - Environmental Channel 15 receive only, 1 lb. \$8.50
 - Extra Transmit & Receive Crystals, pair, specify channel, 1 lb. ... \$17.00
- Add \$17.00 per additional channel for factory installed crystals (this permits owner installation of the radiophone).

MWW-18 SPECIFICATIONS—TRANSMITTER: Type: Hybrid, transistor and tube. Emission: 16F3 (±5 kHz deviation FM). Number of channels: 6. Frequency range: 156.275-157.425 MHz. Power output: High Power: 25 watts max; Low Power: 1 watt max. Modulation: Phase modulation ±5 kHz deviation. Modulation limiting: Automatic limiting meets all requirements of part 83 of FCC rules. Frequency accuracy: ±0.001% across temperature range without ovens. **RECEIVER:** Type: Single conversion, superheterodyne all solid state. Frequency range: Two bands with two front ends, 156.275-157.425 MHz and 161.600-162.550 MHz. IF Amplifier frequency: 10.7 MHz. Number of channels: 7. Method of frequency control: Third overtone crystals. Sensitivity: 0.35 uV or better for EIA usable sensitivity. Squelch: 0.2 uV or better for max. sensitivity. Selectivity: 15 kHz @ 6 dB 28.8 kHz @ 60 dB. Audio output: 2 watts for less than 10% distortion. **GENERAL—Size:** 4¼" H x 13" W x 15" D. (Installed in mtg. bracket.) Weight: 22½ lbs. Primary power: Voltage: 13.6 V DC nominal. Current: Receive only, squelched 60 mA; Transmit, high power, 10 amps. Antenna impedance: 50 ohms resistive. Temperature range: -30° C to +60° C (-22° F to +140° F). Methods of control: Removable plug-in control head for local or remote use. Transistor, diode and tube complement: 39 transistors; 45 diodes; 3 tubes.

VHF/FM Works With Smaller, Less Costly Antenna

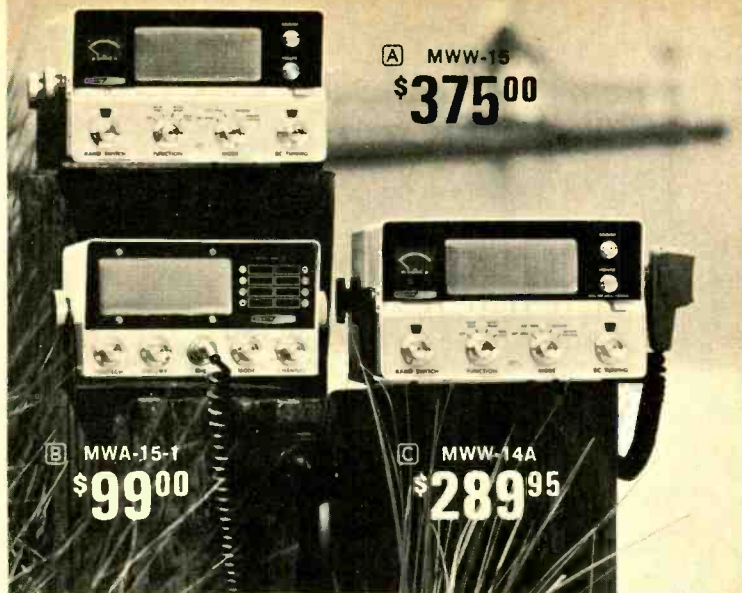


NEW MWW-18 TUNE-UP & SERVICE

... now available at selected RCA service centers. Call your local Heathkit Electronic Center, the Heath factory, or RCA Service Co. for the location nearest you.

Open Your Heath Account — No Money Down Up To \$300 — Up To 18 Months To Pay — See Order Blank For Details.

Heath Radiophones



(A) MWW-15
\$375⁰⁰

(B) MWA-15-1
\$99⁰⁰

(C) MWW-14A
\$289⁹⁵

(A) Heath 150-Watt Radiotelephones—Performance Plus

• 150 watt input • Very low current drain for a 150-watt 'phone
• 8 crystal-controlled channels • Covers 2-3 & 4-5 MHz marine bands • Tunes AM broadcast • Built-in 15 watt deck hailer • Full provisions for use with MWA-15-1 Remote Unit • High-performance solid state receiver with RF amplifier stage • Ceramic Transistors® for more selectivity • Built-in heavy duty power supply • FCC type-accepted for commercial (party boat) use & DOT approved • Completely assembled & tested • Owner's manual includes all information for installation & operation

Advanced Features Not Found On Many Other Radiotelephones—Never At Such A Low Cost . . . such as automatic noise limiting, variable squelch control, provisions for remote monitoring, panel meter for receive/transmit signal strength, separate antenna loading for maximum power on each channel, rust-proof exterior hardware, relays sealed against dust and corrosion, fungus-proof spray on components, capability of being installed at any angle, and an honest 80 watts output. And you can install this radiophone yourself! The owner's manual is complete in every respect. All FCC license information, and forms are included. Crystals for 2182 & 2638 kHz are included . . . specify additional channels (2 crystals/channel) . . . see listing below. Just have the final tune-up made by a 1st or 2nd class FCC licensed technician.

- Assembled MWW-15, 31 lbs. **\$375.00**
- Assembled MWW-15R, 41 lbs. 150 watt 'phone plus remote control. **\$474.00**
- Assembled MWA-15-1, Radiophone remote control unit, 10 lbs. **\$99.00**
- Extra transmit & receive crystals (specify), 1 lb. each **\$2.95**

MWW-15 SPECIFICATIONS—RECEIVER: Frequency range: Marine, 2-5 MHz; Broadcast, 540-1620 kHz. Sensitivity: (providing 10 dB S/N ratio or better) Marine channels, 2 microvolts; Broadcast, 10 microvolts. **Audio output:** 3 watts to internal speaker/provision for external speaker; 15 watts to PA "deck-call." **Transistor complement:** (1) 2N1526 R.F. Amplifier; (4) 2N1525 Marine Crystal Oscillator Mixer, 2nd I.F. & 3rd I.F.; (1) T1364 1st I.F.; (3) 2N1274 AGC Amplifier, 1st & 2nd Audio; (2) R265A (2N1039) Audio Output; (4) SP838, (2) Modulator—(2) Power Inverter; (11) Diodes. **TRANSMITTER:** Frequency range: 2-5 MHz marine bands. **RF input:** 150 watts. **RF Output:** 80 watts. **Transmitter tube complement:** (1) 12BY7 Colpitts Oscillator; (1) 6HF5 Power Amplifier. **Power requirements:** 12 volts DC. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit, 20 amps. **Dimensions:** 6½" H x 11¼" W x 17" D.

Heath 25 Watt Radiotelephone For Medium Range Craft

• Choose the complete MWW-13AS system for owner installation on outboards • Choose the MWW-13A for installation on any boat with FCC licensed technician checkout • Features 4 crystal-controlled transmit & receive channels • Covers 2-3 MHz marine bands • Exceptionally low current demands • Receives AM standard broadcast • Built-in heavy-duty solid-state power supply • FCC type accepted • Compact, factory assembled & ready to install • Supplied with crystals for 2182 kHz (calling & distress frequency) & 2638 kHz

- Assembled MWW-13AS, Complete system for do-it-yourself installation on outboard powered boats only, includes radiophone, antenna & instructions, 22 lbs. (Express or Motor Frt.) **\$189.95**
- Assembled MWW-13A, Radiophone for technician installation on any boat, 17 lbs. **\$164.95**
- MDP-93, 13' Fiberglass Antenna, 5 lbs.
- (Motor Freight or Express Only) **\$34.95**
- MDP-103, Swivel lay-down base mount, 2 lbs. **\$9.95**
- Extra transmit & receive crystals (specify) 1 lb. each **\$2.95**

MWW-13A SPECIFICATIONS—Frequency range: 2-3 MHz Broadcast: 550-1600 kHz. **Receiver sensitivity for 10 dB S/N ratio:** Marine—3 microvolts—Broadcast—10 microvolts. **Audio output:** 3 watts to internal speaker. **Transistor complement:** (1) 2N1526 Mixer; (1) 2N1525 Oscillator; (1) T1364 1st I.F.; (1) 2N1274 1st Audio; (3) 2N1039 Audio Driver & Power Converters; (2) 2N1525 2nd & 3rd I.F.'s; (2) 2N301 Audio Output Modulator; (6) diodes, AVC, overload, Squelch, Noise Limiter & Detector. **Transmitter RF input:** 25 watts. **RF Output:** 13 watts. **Transmitter tube complement:** (1) 6AK6 Oscillator; (2) 6AQ5 amp. **Power requirements:** 12 V DC; broadcast receiver only, .350 amps.; standby, 1.2 amps.; transmit, 5 amps. **Dimensions:** 4½" H x 8¼" W x 10½" D.

(B) Full Remote Control Operating Facilities For Heath Radiotelephones

• The smartest remote control to complement the bridge of any boat • Full remote control for MWW-14A or MWW-15 radiophones • Includes on/off, volume, squelch, mode switch, and channel selector • Telephone handset • Universal gimbal mounting bracket • Completely factory assembled with detailed installation/operating manual included • Styled to match MWW-14A & MWW-15 • Includes 25' of interconnecting cable with all connectors preassembled

Choose MWW-15R Or MWW-14AR For The Radiophone And Remote Combination . . . all channel switching provisions are factory installed and both units are ready to place in your boat. If you already own an MWW-14A or MWW-15, order MWA-15-1 . . . this includes the Remote, all necessary hardware (25' of cable with connectors assembled), plus channel switching drive motor and instructions for installation in your Heath radiophone. Assembled MWA-15-1, 10 lbs. **\$99.00**

(C) Heath MWW-14A . . . Unequalled Value & Performance In A 75 Watt Radiotelephone

• 6 crystal-controlled transmit and receive channels (2-5 MHz)
• Exceptionally low current demands for a 75-watt radiophone
• AM broadcast band tuning • 15 watt deck hailing capability
• Transistorized receiver • Factory assembled & tested • FCC type accepted for "party-boat" use and D.O.T. approved

Here Is A 75-Watt Input Radiotelephone That Brings Marine Electronics Up To Date. Compact size, modern solid-state circuitry, and a design "human engineered" for convenience have made the MWW-14A an outstanding example of modern marine electronics. Look over the styling . . . read the specifications. You'll agree the MWW-14A is your best buy in its power class.

Valuable Owner's Manual . . . gives full installation and operating instructions. Requires FCC licensed technician for tune-up. Crystals for 2182 & 2638 kHz included.

- Assembled MWW-14A, 30 lbs. **\$289.95**
- Assembled MWW-14AR, 41 lbs. . . 75-watt Radiophone plus remote control. **\$388.95**
- Extra transmit & receive crystals (specify), 1 lb. each **\$2.95**

MWW-14A SPECIFICATIONS—RECEIVER: Frequency range: Marine, 2-5 MHz. Broadcast, 540-1620 kHz. Sensitivity: (providing 10 dB S/N ratio or better) Marine channels, 2 microvolts; Broadcast, 10 microvolts. **TRANSMITTER:** Frequency range: 2-5 MHz marine bands. **Final power input:** 75 watts. **RF output:** 40 watts. **Power requirements:** 12 volts DC. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit, 16 amps. **Dimensions:** 6½" H x 11¼" W x 17" D.

18' Radiophone Antenna

Husky, 2-section fiberglass antenna. Bottom section 10' long, top 8' whip. Complete with lay-down swivel base & high-impact side-mount. MDP-13, 12 lbs., Express or Motor Freight Only. **\$59.95**

24' Marine Antenna

Ideal for use with MWW-15. 2-section fiberglass. Bottom section 13' long, top an 11' whip. Complete with lay-down swivel base & high-impact side-mount. MDP-74, 14 lbs., Express or Motor Freight Only. **\$69.95**



MWW-13A
\$164⁹⁵

NOTE: Latest FCC proposal on SSB implementation will permit above radiotelephones installed prior to Jan. 1, 1971 to be used until Jan. 1, 1977.

Heathkit® MR-18 Mariner Solid-State 4-Band Radio Direction Finder Tunes AM, CW, and SSB Stations



MR-18
\$124.95

MR-18 SPECIFICATIONS—Frequency range: Longwave band, 180 kHz to 420 kHz. Broadcast band, 540 kHz to 1610 kHz. Marine band, 1.6 MHz to 4.05 MHz. Shortwave band, 3.95 MHz to 11.5 MHz. Sensitivity (For 6 dB signal plus noise-to-noise ratio): Longwave band, 70 uV/meter. Broadcast band, 40 uV/meter. Marine band, 20 uV/meter. Shortwave band, 2 uV. Audio output power: 300 mW @ 10% maximum distortion. Speaker: 3x5" weather resistant. Direction Indicator: 6 1/2" diameter compass rose calibrated in 2 degree divisions. Null & tuning indicator: Sealed meter, 80 uA full scale. Antennas: Direction Finder: low impedance, balanced loop; rotates 365 degrees. Sense: whip antenna, extendable to 35". Image rejection: Longwave band, 6 dB; broadcast band, 50 dB; marine band, 40 dB; shortwave band, 25 dB. BFO (Beat Frequency Oscillator): 455 kHz. Power capabilities: 9.6 volts, 500 milliamperes-hour rechargeable nickel-cadmium battery. Battery drain: 50 mA @ 50 mW audio output level; 25 mA at no audio output. Dimensions: 11 3/4" W x 6 3/4" H x 9" D (add 1/2" to height when the mounting plate is to be included). Net weight: 10 lbs.

- Fast, accurate direction finding
- Built-in Sense Circuit eliminates 180 degree ambiguity
- Compass-Rose calibrated in 2° increments
- Reliable solid-state construction using modern Field Effect Transistors
- Low current drain
- 4 ceramic filters in IF for sharp selectivity and elimination of IF alignment
- Built-in product detector for SSB & CW reception as well as AM detector
- Built-in switchable Automatic Noise Limiter
- Extended frequency coverage from 180 kHz to 11.5 MHz in four bands
- RDF capability to 4 MHz
- Collapsible 35" whip antenna for Sensing & shortwave reception
- Rechargeable nickel-cadmium battery included
- Charges from 120/240 VAC or 13.5 VDC ship's power with built-in charger
- Up to 10 hours of continuous duty with a full charge
- Portable—includes carrying handle
- Snap-on mounting base
- Handsome white wrinkle finish with chrome, blue and black trim
- Easy to build in about 15 hours with circuit board-wiring harness construction

Fast, Accurate Direction Finding. Set the 6 1/2" Compass-Rose to your boat's magnetic heading, then turn the low impedance rod antenna to obtain a null indication on the sensitive Tune-Null meter . . . that's all there is to it. A Sensing circuit & sense antenna are also built-in to allow you to determine the location of unknown stations, and eliminate the 180 degree ambiguity common with many RDF's. For accuracy the compass rose is calibrated in 2 degree increments, and the Mariner has RDF capability up to 4 MHz for extra versatility.

Sensitive Solid-State Receiver. The new MR-18 covers 180 kHz to 11.5 MHz in four switch-selected bands for reception of medium and high frequency marine channels, standard broadcast, WWV & CHU time standards and much more. The use of modern Field Effect Transistors in the mixer, local oscillator and product detector make the new MR-18 a stable receiver & four state-of-the-art ceramic filters in the IF strip deliver sharp selectivity and eliminate IF alignment forever. The Mariner keeps you prepared for single sideband too . . . there's a built-in product detector for receiving SSB and CW, as well as standard AM. A switchable Automatic Noise Limiter is also included to limit annoying static and ignition noise.

Built For Rugged Shipboard Duty. The new Mariner operates from a rechargeable nickel-cadmium battery that's included with the kit and will run up to 10 hours on a full charge. The charging circuit is built-in, and permits charging the MR-18 from either 120 or 240 VAC and 13.5 VDC ship's power. A spring-return dial light switch limits battery drain. Construction is solid, with rigid chassis and side panels, modular snap-out circuit boards and a handy snap-on mounting base to secure the Mariner underway. The 3x5" weather resistant speaker delivers 300 mW of sound so it can be heard anywhere on board, and there's a headphone jack for private listening. The compact size (6 1/2" H x 11 3/4" W x 8 3/4" D) makes it easy to stow, and a built-in handle permits easy carrying. Styled in durable white wrinkle finish with marine black, blue and chrome accents.

Kit MR-18, 15 lbs., no money dn. \$124.95

Heathkit Solid-State MD-19 . . . Five New Functions For Your Boat . . . As Low As \$84.95

- Five different functions—Foghorn . . . Hailer . . . Boathorn . . . Listener . . . Intercom
- All solid-state construction for maximum reliability
- Powerful 30 watt amplifier
- Individual controls for both rate and duration of Foghorn
- Separate gain controls for both Listen and Hail functions
- Boathorn and Foghorn always at full volume
- Weather resistant horn included with kit
- Foghorn automatically returns to listen mode between blasts
- Addition of Remote Speaker Accessory gives communication between compartments on boat
- Operates on 12 VDC ship's power
- Comes with 20 feet of deck speaker cable and versatile gimbal mounting bracket
- Handsomely styled in marine blue and white
- Easy to assemble

Foghorn . . . automatically sounds low pitched foghorn blast required for power-driven vessels underway per Inland & International Rules of the Road. Rear panel rate and duration controls permit variation of the blast to suit local custom or personal preference. For maximum safety, the amplifier always delivers the full 30 watts in the foghorn mode to the special weatherproof, universal mounting horn that comes with the kit. **Hailer . . .** gives clear, understandable communication over a considerable distance and a separate front panel gain control lets you adjust volume to suit conditions.

Boathorn . . . depress the front panel spring-return switch and the MD-19 produces a typical boathorn blast at full volume.

Listener . . . detects and amplifies weak sounds and a separate gain control makes them clearly audible at the bridge. For extra safety, the MD-19 automatically returns to the Listen position regardless of function switch setting.

Intercom . . . can be used with up to two MDA-19-1 Remote Speakers . . . lets you communicate with other compartments on the boat.

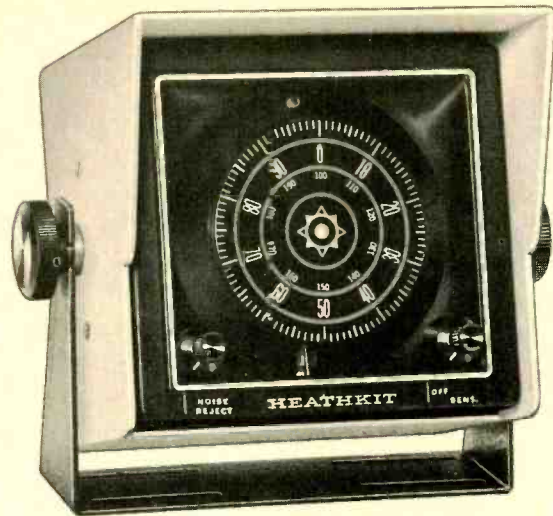
Handsomely styled in marine blue and white and operates from 12 VDC ship's power; positive or neg. gnd. Fast, easy circuit board-wiring harness construction. Put five new functions on your boat now . . . the Heathkit MD-19 way.

Kit MD-19, 16 lbs., no money dn. \$84.95
Kit MDA-19-1, Remote Speaker, 2 lbs. \$9.50



MD-19
\$84.95
(less remote)

MD-19 SPECIFICATIONS—Output power: 30 watts continuous. Boat horn frequency: Approximately 260 Hz. Foghorn frequency: Approximately 180 Hz. Foghorn rate: Approximately 2 to 90 seconds, variable. Foghorn duration: approximately 2 to 20 seconds, 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, 5 A maximum. Idle current: 750 mA or less. Dimensions: 4 3/4" H x 7 3/4" W x 7 1/4" D. Color: White wrinkle and dark blue. Net weight (including horn): 9 lbs. 9 oz.



Heathkit MI-19 Solid-State Depth Sounder With Exclusive Noise Rejection Circuitry

- All solid-state circuitry for maximum dependability and low current drain
- Measures depth down to 200 feet with 5% accuracy
- Exclusive Heath Noise Rejection Control allows user to operate MI-19 at full sensitivity without interference from engines
- Adjustable Sensitivity Control for maximum signal strength without echoes
- Calibrated dial is shielded from sunlight for easy reading
- Weather, salt, humidity and corrosion-resistant design
- Stainless steel hardware
- Completely waterproof transducer fitted with marine brass mounting hardware
- MI-19-1 supplied with thru-hull mounting transducer
- MI-19-2 comes with high-speed transom mount transducer
- Can be used for spotting schools of fish and charting bottom
- Operates from 12 VDC ship's power or external 12 VDC lantern battery
- Simple, enjoyable 8-10 hour assembly time

Add Safety & Convenience To Your Boat . . . with the new Heathkit MI-19 solid-state Depth Sounder. Probes down to 200 feet to determine safe depth, locate underwater obstacles, chart the bottom for terrain and vegetation, even spot fish. Check the features and specs . . . and be convinced that the new MI-19 is your best buy.

Advanced Solid-State Design With Exclusive Heath Noise Rejection Circuitry. The all solid-state circuit comes on instantly, and battery drain is minimum. Simple to operate—turn the unit on with the combination On-Off/Sensitivity Control, adjust Sensitivity for maximum signal return from bottom without echoes and read the flashing light on the sun-shielded dial. The exclusive Heath Noise Rejection control eliminates a once troublesome cause of erroneous readings—ignition noise . . . just turn the control to cancel it out. Other features include completely weatherproof design, 5% accuracy, choice of transducer mounts, waterproof Operation Manual giving many dial indications & their meaning, and fast, easy assembly. Put this remarkable new accessory on your boat today.

Kit MI-19-1, with thru-hull transducer, 6 lbs. \$79.95
 Kit MI-19-2, with high speed transom mount transducer, 8 lbs. \$79.95

MI-19-1 & 2 SPECIFICATIONS—Range: 0 to 200 feet on hard bottom. Sounding: Rate: 1440 per minute or 24 per second. Frequency: Approximately 200 kHz. Accuracy: Within 5% of actual depth. Depth indication: Neon lamp flashes at zero and again at the indicated depth from the object. Transducer: Barium titanate ceramic element encased in a watertight housing. Controls: Sensitivity, with on-off switch. Noise Rejection level. Transistor and diode complement: 9 transistors, 5 diodes. Power requirements: 80 to 100 milliamperes at 12 VDC. Dimensions: 7 1/4" W x 5 1/2" H x 5 3/4" D. Net weight: 4 1/2 lbs.

Kit MI-19-1 & 2
\$79.95
 ea.



MI-19-1 kit includes this Thru-Hull Mounting Transducer for permanent installation on larger displacement type craft.

MI-19-2 kit comes with this High Speed Transom Mount Transducer for temporary or permanent mounting on smaller boats & outboards.



A MP-14
\$99.95

A Heathkit MP-14 Inverter Delivers AC Power Anywhere

Delivers up to 500 watts intermittent, 400 watts continuous & adjustable AC voltage output is regulated at 60 Hz to operate high current, high wattage devices (operates anything in power rating except motor driven devices with high starting currents). Ideal for test & scientific equipment operation at remote locations. 12-14.5 VDC operation.

Kit MP-14, 29 lbs., no money dn. \$99.95

MP-14 SPECIFICATIONS—Input voltage: 12 to 14.5 v. DC two wire isolated from ground. Specification voltage: 13.0 v. DC. Input current: 4 ampere, no load; 40 ampere at 400 watt load. Allowable ambient temperature: 0°F. to 125°F. Efficiency: 80% (approx.). Output voltage: Switch selected—120, 135, 150, 165 & 180 v. AC. Output power: 400 watts continuous up to 100°F; 300 watts continuous up to 125°F.; 500 watts intermittent; 15 minutes "on"—15 minutes "off" at 100°F. max. Frequency: 60 Hz, adjustable. Frequency regulation: Load —1% no load to 400 watts; Input—2%, 12 to 14.5 v. DC; Temperature—3%, 0°F. to 125°F. Wave form: Square wave. Protective circuits: Input—50 ampere circuit breaker, DC polarity reversal diode. Size: 9 1/2" W. x 7 3/4" H. x 6 3/4" D.



B Kit MP-10
\$32.50

B Low Cost Heathkit Marine Power Inverter Gives Shoreside Power Afloat

- Converts 6 or 12 volt battery power to square wave 117 volts AC
- Delivers up to 175 watts continuous for small electric appliances
- All transistor circuit
- Two AC receptacles

A Compact Source Of Household Power For Small Appliances . . . such as electric razors, lamps, etc. Not recommended for tape recorders, record players, or compressor-type refrigerators, requiring high starting current or sine wave AC. Write for MP-10 applications bulletin.

Kit MP-10. . . 8 lbs. \$32.50

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



C Kit MI-25
\$42.50

C Heathkit Fuel Vapor Detector Provides Visible and Audible Warning

- New more dependable circuitry
- Fully transistorized
- Gives both visual and audible warning of combustible gas fumes
- Self-testing
- Built-in "Fail-Safe" provision—sounds alarm in the event of component failure
- Built-in relay circuits for control of bilge blower & additional warning devices
- Simple to build and install—from package to protection in 3 hours

The MI-25 has the sensitivity and reliability you need for long period dependability plus built-in fail-safe features. Meter shows "Safe-Dangerous-Explosive" and alarm sounds when fumes are present.

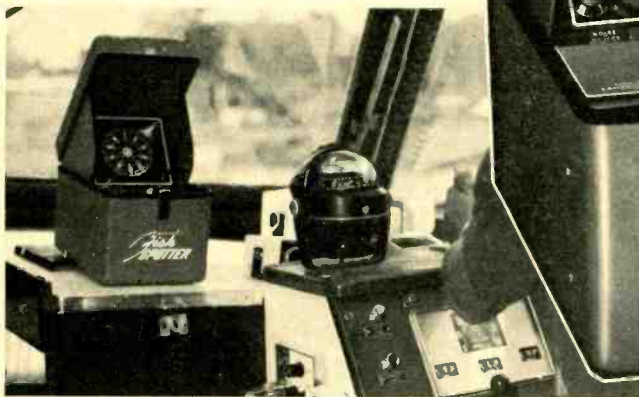
Kit MI-25, 3 lbs. . . no money dn. \$42.50

MI-25 SPECIFICATIONS—Voltage: 12 VDC, +10%. Current: 1.0 amp nominal. Panel size: 2-1/16" H x 5-11/16" 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. to +50° C. Audio alarm: 2500 Hz.

Heathkit® Fish Spotter



Use it as a fish spotter



Or as an accurate depth sounder



New MI-29 Fish Spotter Delivers More Features At Less Cost

- All solid-state for minimum battery drain • Completely portable • Spots fish and reads depth down to 200 ft. • Exclusive Noise Rejection eliminates engine interference • Completely waterproof & buoyant

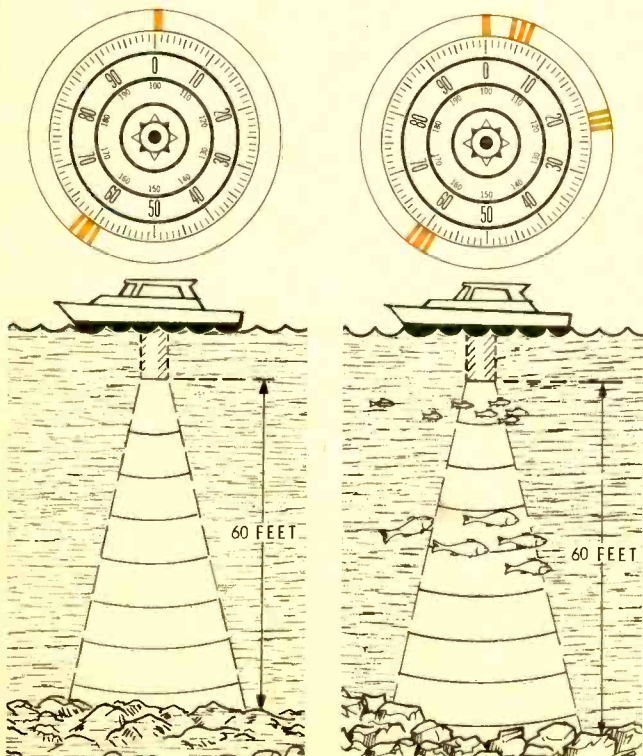


Portable Transducer Included. The MI-29 comes with this waterproof wide-angle transducer that attaches to the side or transom of your boat in seconds with large suction cups. 15' of transducer cable included.

Kit MI-29
\$89.95

Dial shown indicating depth and type at bottom (60' and rocky).

Dial shown indicating fish at two levels, plus bottom at 60'.



- Completely portable operation from two 6 VDC lantern type batteries • All solid-state design for light weight & low battery drain • Transducer sending pattern covers wider area . . . greatly increases area of water surveyed • Exclusive Heath Adjustable Noise Rejection Circuitry eliminates troublesome ignition noise • Adjustable Sensitivity Control for more accurate readings without echoes from bottom or vegetation • Completely waterproof and buoyant when case is closed to eliminate possibility of loss overboard • Non-Glare dial shielded from sun for easier reading • Small, portable transducer is fitted with suction cups for easy attachment to side or transom of boat • Can also be used for depth sounding down to 200 feet • Fast, easy assembly in 8 to 10 hours

An Invaluable Aid To Fisherman. The new Heathkit MI-29 solid-state Fish Spotter is a most versatile accessory for the ardent fisherman . . . spots schools and even individual fish . . . helps you determine the type of underwater terrain . . . aids you in finding layers of vegetation . . . even reads depth to 200 feet. Compare the MI-29 against similar units selling for up to three times its price! We think you'll find the Heathkit Fish Spotter a remarkable value.

Unique Features For Excellent Performance. Fishermen need a rugged, reliable, completely portable unit that's ready to go when they are . . . and the MI-29 fills the bill. The Fish Spotter is housed in a tough case designed to take rough conditions . . . it even floats! Runs on two readily available 6 VDC lantern batteries, and the solid-state circuit makes them last a long time . . . typical battery life is 80 hours. The exclusive Heath Noise Rejection Circuitry lets you attach the portable suction cup mounted transducer close to your engine, without having to worry about ignition noise showing up on the glare-free dial. And the adjustable Sensitivity Control lets you adjust for maximum signal return without multiple echoes for clear readings. The waterproof Operation Manual gives many dial indications & what they mean. With the Heathkit Fish Spotter, the fish don't have an advantage over you anymore—order yours now.

Kit MI-29, 9 lbs., with portable transducer. . . . **\$89.95**

MI-29 SPECIFICATIONS—Range: 0 to 200 feet on hard bottom. Sounding: Rate 1440 per minute or 24 per second. Frequency: Approximately 200 kHz. Accuracy: Within 5% of actual depth. Depth indication: Neon lamp flashes at zero and again at the indicated depth from the object. Transducer: Barium titanate ceramic element encased in a watertight housing. Controls: Sensitivity, with on-off switch, Noise Rejection level. Transistor and diode complement: 9 transistors, 5 diodes. Power requirements: 80 to 100 milliamperes at 12 VDC. Batteries: (2 required) (not supplied). 6V Lantern type NEDA #908 or 916, Burgess F4M, Eveready #409 or 509, Ray-O-Vac #941. Battery life: (nominal) 80 hours. Dimensions: 6 1/4" W x 7" H x 10 1/4" D. Net weight: 6 1/2 lbs.

Guitar Amplifiers

ELECTRONICS

Super-Power Solid-State 120-Watt Combo Amp . . . Built-In Harmonic Modifier, Tremolo & . . .

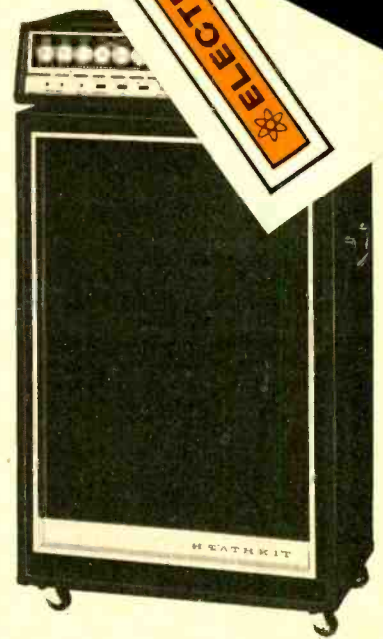
- Delivers 120 watts of EIA music power (240 watts peak power) into two TA-17-1 speakers (or other 4 ohm load), 90 watts into one TA-17-1 speaker (or other 8 ohm load) • Will drive any 4 to 16 ohm speaker combination • Cool all-silicon transistor circuitry • Built-in switchable Harmonic Modifier • Brightness switch for that brassy sound • Separate bass and treble boost • Tremolo variable in rate and depth • Dual spring-type variable reverb • Dual foot-switch for on-off control of tremolo and reverb • Independent 2 input guitar channel • Independent 2 input channel with special tone control for bass guitars, combo organs • Independent 2 input channel with bass & treble tone controls for microphones or phonographs • Special "test-as-you-build" feature to prevent damage to components • "Piggy-back" design with carrying handles for stacking and portability • Black vinyl-covered compressed-wood cabinet • Circuit breaker protection •

More Than Enough Scene-Shaking Sound To Take Out Any Gig, Large Or Small, Indoors Or Out. Delivers a whopping 120 watts through two Heathkit TA-17-1 speaker systems, or 90 watts through one TA-17-1. Runs at maximum power without danger of overload thanks to special volume control circuits in both guitar & bass channels. Versatile too . . . you can play guitar through it, or bass guitar, combo organ, accordion, singer's mike, even a record changer.

Kit TA-17, 44 lbs., amplifier only \$175.00

TA-17
\$175⁰⁰

TA-17-1
\$120⁰⁰



Matching 2-Way Speaker Systems . . . Two 12" Woofers . . . Horn Driver

- Two special-design 12" woofers with 27 oz. magnets, fiberglass voice coils • Special horn driver for greater brilliance • 8 ohm system impedance • Black vinyl-covered compressed wood cabinet with metal corners, extruded aluminum front frame, dark blue grille cloth • Carrying handles and casters • Size: 25 7/8" W x 14 1/2" D x 38" H

Kit TA-17-1, one speaker system, 116 lbs. \$120.00

Single Channel Guitar Amplifier With Variable Reverb & Tremolo

- 20 watts of EIA power, 40 watts peak • Variable tremolo • Variable reverb with Hammond double spring delay unit • Single channel with two inputs handles lead & solo guitars, singer's microphone • Special design heavy-duty 12" speaker • Two foot switches in heavy die-cast metal housing for hands-free control of tremolo and reverb • Line bypass reversing switch reduces hum • Simple circuit board construction • 11 transistor, 6 diode circuit with "Fail-Safe" complementary transistor output • Heavy-duty transformer operated power supply with circuit breaker protection for 120/240 v. AC 50-60 Hz • Leather textured, black vinyl covered wood cabinet • Extruded aluminum front panel with chrome-plated knobs

The TA-27 is ideal for the guitarist who expects a lot of himself, his equipment . . . and his money. It has plenty of power from its cool-running, instant-on solid-state circuitry. While performing, you can make a wide variety of effects by adjusting the LDR tremolo circuit in both rate and depth. A die-cast foot switch lets you control both the tremolo and reverb . . . hands free, and the variable reverb has the famous Hammond double spring delay unit. Hum is minimized by a line bypass reversing switch. All controls are on the extruded aluminum front panel . . . within easy reach. They include separate volume, bass and treble controls . . . tremolo rate and depth, reverb, on/off line reversing switch, panel light, foot switch jack and both inputs. You get an assembled cabinet of 1/2" stock covered with leather-textured black vinyl and a black and white patterned grille cloth. The cabinet has a carrying handle and measures 19 3/4" W x 9" D x 21" H.

Kit TA-27, 40 lbs. \$79.95



Kit TA-27
\$79⁹⁵

Heathkit 60-Watt Dual-Channel Guitar Amplifier With Two Special Design 12-Inch Speakers

- 25 watts EIA music power, 60 watts peak power—maximum power from Fail-Safe Complementary Transistor Output Circuit • Two channels—one normal for accompaniment, microphone, etc.—the other for special effects, lead and solo guitars, has reverb and tremolo • 2 inputs each channel • Variable Reverb uses Hammond double spring delay unit • Specially designed LDR Tremolo circuit is variable in both speed and depth • Line bypass reversing switch for hum reduction • 2 special design 12" heavy-duty ceramic magnet speakers • Two foot switches in heavy die cast housing for hands-free control of tremolo and reverb • One simple to build circuit board with 13 transistors and 6 diodes • Heavy-duty power transformer—120 v. or 240 v. AC 50/60 Hz • Leather-textured black vinyl covered cabinet of 3/4" stock . . . measures 28" W x 9" D x 19 3/4" H • Black and white patterned grille cloth • Extruded aluminum front panel with black nomenclature and chrome-plated knobs with black inserts

All The Features Guitarists Want Most In An Amplifier, at less than half the usual cost, Delivers the coolest 25 watts of EIA music power or 60 watts of peak power you've ever heard . . . with a pure, robust sound that brings out the natural tone of your instrument. And since it's all solid-state, there are no tubes to deteriorate or wear out—you get peak performance at all times. Two channel versatility too . . . the normal channel for accompaniment, accordion or singer's mike . . . the other channel for lead & solo guitars has variable reverb & tremolo.

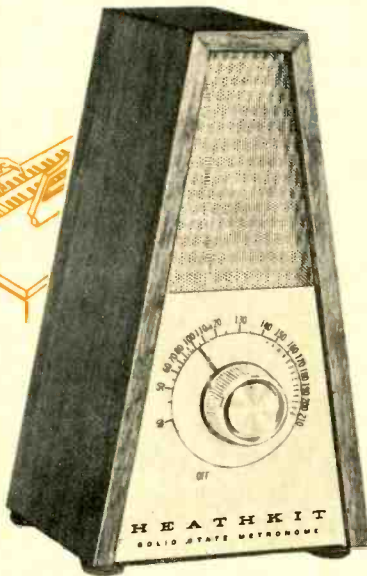
The TA-16 goes together easily, enjoyably in just 8-10 hours, thanks to the famous Heathkit manual with its giant fold-out pictorials and clear language. There's just one simple circuit board to wire, a few parts to mount on the chassis and the speakers, controls and switches to install. In just a few hours you'll have saved yourself about \$80 . . . and built one of the hottest guitar amplifiers on the market. Join the many other satisfied owners . . . order your TA-16 today.

Kit TA-16, 52 lbs. \$119.95



TA-16
\$119⁹⁵

Heathkit TD-17 Electronic Metronome . . . Solid-State Construction . . . High Accuracy



Kit TD-17
\$12.95

- Adjustable from 40 to 210 beats per minute • Very accurate • All solid-state construction for long, trouble-free life • Adjustable volume • Battery operated • Handsome cherry finish • Easy circuit board assembly

Now, In Answer To Many Requests, There's A Heathkit Electronic Metronome . . . the new TD-17. We were asked for a metronome that would be inexpensive enough for a student to use, yet accurate enough to please a professional musician. The new Heathkit TD-17 meets these requirements perfectly.

An Important Tempo-Teaching Aid. Beginning music students often have difficulty remembering what tempos are signified by such words as "Allegro," "Andante," etc. The use of the new TD-17 will help them by providing an audible, repeatable reference for all tempos, and make practice more enjoyable by giving them a "feel" for the speed of the music they are playing.

The Ideal Choice For Student Use. The Heathkit Electronic Metronome is very easy-to use . . . just set the tempo you desire on the large, easy-to-read dial and adjust the volume with the handy control on the back panel. For reference purposes, there's a chart on the bottom panel that converts tempos in different time signatures to beats per minute. The TD-17 is adjustable from 40 to 210 beats per minute and because it uses no wind-up spring mechanisms, its accuracy is both excellent and unchanging. Two 9 volt batteries in the all solid-state circuit last 300 hours and make battery changing a rare occurrence.

Simple, Fast Assembly. The new TD-17 goes together on one small circuit board. Construction time is about two hours. Finished in handsome cherry, the TD-17 will look right in any music room. Order yours now.

Kit TD-17, 2 lbs. **\$12.95**
Model GDA-48-1, 1 lb., battery for TD-17 (requires 2) ea. **\$1.30**

TD-17 SPECIFICATIONS—Range: Continuously variable from 40 to 210 beats per minute; calibrated in 5 beats per minute intervals. **Battery requirements:** 18 volts; two long life 9 volt batteries (NEDA #1602)—(batteries not supplied). **Battery life:** Approximately 300 hours. **Cabinet:** Cherry-finished birch solids and veneers. **Overall Dimensions:** 6 $\frac{3}{4}$ " H x 3 $\frac{3}{4}$ " W x 4" D. **Net weight (less batteries):** 11 oz.

120-Watt Super Power Solid-State Bass Amp . . .

Wide Range Controls . . . Heavy-Duty Speakers . . .

Low Cost . . . Optional Vinyl Cover



TA-38
\$185.00

Heathkit Distortion Booster

Add The "Mod" Sound To Your Guitar . . . with the Heathkit Distortion Booster. Just plug it in between your guitar & amplifier and you've got that unique sound. Housed in a convenient footswitch . . . just push the switch to add the distortion, push again to play it straight. Controls allow variation of tone & degree of distortion. Runs on 1.5 V AA penlight cell (not supplied).
Kit TA-28, 4 lbs. **\$17.95**



- All solid-state circuitry • 120 watts EIA music power output—240 watts peak power output • Extremely low IM and Harmonic Distortion • Full range Bass and Treble controls • Depth and Presence controls for a wide range of musical effects • Two 12" special design speakers with giant 3 pound 6 ounce magnets • Sealed sound chamber • Circuit-breaker protection • Line Reverse Switch for minimum hum • All front mounted controls and inputs • Handsome, rugged cabinet with built-in handles and ball-bearing casters for easy moving • Handy storage compartment with snap-off cover • 120 or 240 VAC operation • New Optional heavy duty vinyl cover for extra protection while moving

Solid-State Reliability. The 11 transistor, 11 diode circuit runs cool, eliminates frustrating tube failures . . . and puts out enough hard, crisp bass to shake any performance—120 watts EIA music power, 100 watts continuous, 240 watts peak. This one can take everything you can give it.

Full Range Control & Unlimited Versatility. The Bass, Treble, Volume, Depth, Presence, Power and Line Reverse Controls and two bass inputs are all front-panel mounted for convenience. The extremely wide range of the tone shaping controls can create a very wide range of tonal effects, and both bass inputs will accept virtually any instrument that produces bass frequencies . . . bass guitars, combo organs, even amplified brass and reeds.

Unequaled Sound. Two special design 12" speakers in a sealed sound chamber pack an incredible 6 $\frac{3}{4}$ lbs. of magnet assembly between them—they'll handle every watt the amp can deliver. Outstanding speaker & cabinet design combine to deliver a sound you couldn't find in another system near this price.

Easy Assembly. Just 12-15 hours of enjoyable construction and you have the wildest bass amp ever. Order yours now and make the other guys wonder why they spent all the money, but you have all the sound.

Kit TA-38, 130 lbs. **\$185.00**
Model TAA-38, protective vinyl cover, 5 lbs. **\$11.95**

Low Cost Solid-State Organ

FREE! Thomas 40 Lesson Self Teacher-Record Course When You Buy This Organ!

Sells For \$19.95, a fifty dollar value, and now it's yours FREE when you buy either TO-67 or GD-325D organs. Provides firm basis of musical knowledge. Includes four 33 1/3 RPM 12" records, comprehensive music book with many song favorites, gold-embossed white leatherette album. GDA-232-2, recorded lessons, 5 lbs., available separately . . . \$19.95

Add Musical Enjoyment To Your Home . . . With The Heathkit®/Thomas COLOR-GLO Organ

- Exclusive Thomas Color-Glo to start you playing instantly
- All genuine Thomas factory-fabricated components • 10 true organ voices • Variable repeat percussion. . . produces banjo, mandolin, balalaika effects • 13-note heel and toe bass pedals range C₂ through C₃ • 2 overhanging 37-note keyboards, range C₂ through C₃, each • 75 watt peak music power amplifier • 12" speaker • Vibrato • Manual balance control • Transistorized plug-in tone generators, the heart of the organ, warranted for 5 years • Fully transistorized for better tone, longer life, trouble-free operation • Handcrafted, handrubbed walnut cabinet and bench

DISCOVER THE FUN OF "LIVE" MUSIC IN YOUR HOME at lowest cost with this luxurious Heathkit/Thomas Color-Glo organ. Everyone from the children to Mom and Dad can join in building and playing this fine instrument . . . adds a new dimension to family living. And it provides a wholesome creative outlet that is unmatched in satisfaction. Adds life to parties . . . great for dancing or song fests when friends gather for an evening. Teens love the rhythm and bounce of its many musical effects. And there's no better way to relax after a hard day. But, best of all, you play complete songs the first time you try . . . with exclusive Thomas Color-Glo.

JUST MATCH UP THE COLORS AND LETTERS . . . it's easy. Switch on the Color-Glo key lights and you're ready to play. Each white key on the upper manual lights up with a letter. You simply match the letters on the music with the letters on the keys and play the melody. For harmony, there are 3 red keys, 3 black keys and 3 green keys on the lower keyboard. With your left hand, just press and hold the notes that match the background color in the Thomas Color-Glo music book included. To add the bass notes, press and hold the pedal that's marked with the same color as the harmony notes, changing to different colors with your foot as you change with your left hand. That's all there is to it. You play complete songs in minutes instead of months. The Color-Glo teacher is your secret.

TEN RICH ORGAN VOICES . . . trombone, flute, reed, oboe, cornet, violin, saxophone, horn, viola and diapason . . . all at the touch of a tab. You'll soon combine voices to produce dozens of other interesting musical effects. Also features repeat percussion to create banjo, mandolin and balalaika effects.

HANDSOME WALNUT CABINET & BENCH INCLUDED. Cabinet measures a space-saving 41 1/4" H x 39 3/4" W x 21 1/2" D. There's nothing to add, no extras to buy as with other organ kits . . . everything is included at one price.

BUILD IN 50 HOURS. Thousands of people have already experienced the thrill and unique personal satisfaction that comes from building this sophisticated, beautiful sounding musical instrument. It takes no special skills or knowledge . . . the world-famous Heathkit manual guides you every step of the way, with clear, simple instructions and large, fold-out drawings. Genuine Thomas factory-made parts . . . diagrammed, easy-to-wire circuit boards . . . factory-built cabinet that's ready for the sub-assemblies as you complete them. You even tune the organ with the pre-tuned tone generator using a simple counting method . . . no "musical ear" needed. And you enjoy very substantial savings over assembled versions. For sheer musical enjoyment, great satisfaction and kit-building fun, you just can't beat the Heathkit/Thomas Solid-State Electronic Organ.

Kit **GD-325D**, organ and matching bench, 172 lbs. . .
(REA or motor freight only) **\$449.95**
Export model available for 115-230 v. AC, 50-60 Hz; write for prices



5-Year Warranty!
The transistorized plug-in tone generator boards, the heart of the organ, are warranted for five years. You buy with confidence when you buy a Heathkit version of the Thomas Organ. Replacement upon prepaid return of undamaged board to the Heath Company.

GD-325D
\$449.95

(including bench and 40 lesson Self-Teacher-Record Course)



Keys Light Up To Show You Correct Notes And Chords. Just match up the colors with your left hand, the letters with your right . . . and you play complete songs with melody, harmony and bass . . . even if you've never played an organ before!

Multiply The Musical Capability of Your Heathkit/Thomas Organ . . .

with the optional Band Box and Playmate kits. The Band Box adds ten different percussion instruments to the music you play and the Playmate supplies fifteen different rhythms. Almost like having a full orchestra at your fingertips! See page 95 for details.



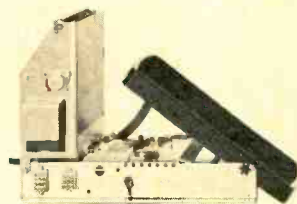
Like To Hear It Perform?

Then send for organ demonstration record. No. GDA-325-1 (7"-33 1/3 RPM). Listen to the beautiful voices, true organ tone and professional capabilities of this superb instrument. Use order blank in this catalog; and enclose 50c to cover postage and handling.

Deluxe Heathkit / Thomas "Paramount" Transistor Theatre Organ



TO-67
\$1,095⁰⁰
(without band box)



Two All-Transistor Amplifiers . . . one for the Leslie speaker system and the other for the main system . . . deliver a total of 200 watts of peak power. Run cool and collected for long, trouble-free life.



Horseshoe Console Plus Color-Glo Keys . . . a beautiful array of multi-colored stop tablets at your fingertips for convenient selection of all 19 organ voices . . . instant-play color-glo lighted keys.



Leslie Speaker System . . . consists of a stationary 8" cone speaker and 2-speed rotating directional baffle. Normal or Tremolo speed for the rich liquid beauty of a full theatre organ. Slow or Celeste speed for the rich "randomness" of liturgical music. "Stop" position for use as additional "Main" speaker system.

Boasts 19 Organ Voices, 200 Watts Peak Power, Chimes, Rotating Leslie Speaker, Horseshoe shaped Console, Plus a Host Of Other Professional Features At Up To \$400 Savings

FREE! Thomas 40 Lesson Self Teacher Record Course When You Buy This Organ!

Sells For \$19.95, a fifty dollar value, and now it's yours FREE when you buy either TO-67 or GD-325D organs. Provides firm basis of musical knowledge. Includes four 33 1/3 RPM 12" records, comprehensive music book with many song favorites, gold-embossed white leatherette album.

GDA-232-2, recorded lessons, 5 lbs., available separately . . . \$19.95

ALL GENUINE THOMAS FACTORY-FABRICATED COMPONENTS . . . DO-IT-YOURSELF HEATHKIT SAVINGS. Here is a truly sophisticated organ with a wide array of deluxe features to give professional playing versatility. Add to this its advanced transistor circuit, luxurious horseshoe console, rainbow of multi-colored voice tabs, and you have an outstanding instrument you'll be proud to have in your home. And Heathkit do-it-yourself assembly makes it possible for you to own this superb organ at cost far below its factory-built version.

15 MANUAL VOICES, 4 PEDAL VOICES . . . all at the flip of a tab. **SOLO:** Diapason 16', Bass Clarinet 16', Trumpet 16', English Horn 8', Oboe 8', Violin 8', Tibia 16', Tibia 8', Tibia 5 1/4', Tibia 4'. **ACCOMPANIMENT:** Diapason 8', Saxophone 8', French Horn 8', Oboe Horn 8', Cello 8'. **PEDAL:** Diapason 16', Major Flute 8', Bass Clarinet 8', String Bass 8'. And you'll soon learn voicing combinations to produce the sounds of the Spanish guitar, zither, bagpipes, calliope, etc. Plus other variations for every musical mood from rock & roll to classical, show tunes, even religious music.

EXCLUSIVE THOMAS COLOR-GLO key lights show you correct notes and chords. Just match up the colors with your left hand, the letters with your right . . . and you play *complete* songs instantly . . . even if you've never played an organ before.

200 WATTS PEAK POWER is produced by the all-transistor "stereo" system . . . no heat, hum or deterioration as with tube-types. And there are two separate amplifiers . . . one for the Leslie speaker system, the other for the main system.

TWO SEPARATE SPEAKER SYSTEMS . . . a built-in 2-speed rotating Leslie plus a main speaker system with two special 12" speakers. With the Leslie you can create the liquid tremolo beauty of a full theatre organ, or a rich randomness of sound suitable for religious selections. You can even add voicing variety by playing some voices through the Leslie system and others through the main speaker system.

"STEREO" SOUND . . . the Leslie speaker system can also provide a second standard channel with the press of a tab. The music from one manual is fed through the main system, while the music from the other manual is fed through the Leslie system . . . thus creating a rich "stereo" sound.

TWO 44-NOTE KEYBOARDS . . . both manuals tilt and overhang for easier playing. Accompaniment manual range 8'-F₄ to C₆. Solo manual range 16', 8', 4', 5 1/4' - F₁ to F₆.

28 NOTES OF ELECTRONIC CHIMES. Create dozens of chime variations . . . Flemish bells, carillon, etc.

SELECTIVE REPEAT PERCUSSION . . . to reproduce realistic xylophone, mandolin, and marimba sounds by creating a "strumming" effect. The continuously variable Repeat Rate Control lets you set exact speed.

13-NOTE HEEL AND TOE PEDALBOARD . . . exclusive Thomas Radial-Arc design lets you play the pedals more easily. Range 16' and 8'-C₆ to C₂.

SELECTIVE ATTACK PERCUSSION . . . press the tab and you get the crisp strike of a piano or the pluck of a guitar. And you can choose the family of voices you wish to percuss on either or both manuals.

MANUAL BALANCE . . . to adjust relative volume and accentuate either manual for solo work.

SUSTAIN ON KEYBOARD & PEDAL . . . lets the solo manual ring on after key is released. Just touch a tab to add the richness of "sustain" to pedal voices.

TIMBRE MELLOW . . . emphasize the warm character of orchestral voices on the upper manual at the flip of a tab.

VARIABLE VIBRATO . . . add expression and feeling to your music with the new switchable rate and depth of vibrato at the touch of a tab.

PEDAL PERCUSSION . . . provides emphatic attack and independent decay to the string bass voice.

PEDAL VOLUME . . . continuously variable so you add just the right amount of pedal volume to your music.

EXPRESSION PEDAL . . . use to create the phrasing, dynamics and balance suitable to any music.

STEREO HEADSET OUTLET . . . play anytime you wish without disturbing others.

REVERB . . . "expands" sound to add concert hall realism.

LUXURIOUS HARDWOOD CABINET AND BENCH . . . handcrafted and handrubbed with lustrous walnut finish . . . ready for the subassemblies as you complete them. Measures 46 3/4" H x 47 1/2" W x 23 3/4" D.

FAMOUS HEATH ENGINUITY MAKES ASSEMBLY EASY . . . simple step-by-step instructions and large diagrams and pictures guide you every step of the way . . . no special skills or knowledge needed. You even tune the organ yourself with a pretuned tone generator . . . no musical ear needed. Assembly time 80 to 100 hours, and you enjoy savings of over \$400 over the factory assembled version.

POWER REQUIREMENTS: 110-120 v. 60 Hz. 165 watts.

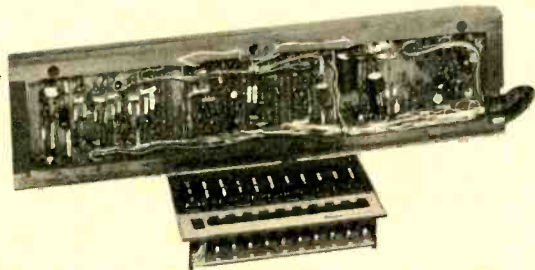
Kit TO-67, organ & matching bench, 265 lbs., Exp. or mtr. frt. . . \$1095.00

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

TOA-67-3, (7", 33 1/3 rpm demonstration record) ppd. 50c

Add New Musical Enjoyment To Your Heath Organ With The Thomas Band Box And Thomas Playmate Kits

Add The Full Orchestra Sound Of Band Box Percussion



With this easy-to-build, easy-to-play Thomas Band Box, you can add ten exciting instrumental voices . . . bass drums, brush & crash cymbals, clave, block, two different bongos, castanets, snare drum and drum roll . . . to the selections you play. Instantly, a simple melody sounds like a full orchestra. Play a Tango selection with an authentic gypsy castanet accompaniment, a tune from the Old West with the clop-clop of horse hoofs, or a heart-stirring march with the roll of the snare drums and crash of cymbals. One or all may be preselected to sound as you play the lower manual, pedals or both . . . or voices may be actuated manually at the touch of a button. Adjustable volume control to suit the music you play. Assembles and installs in 10-12 hours. Important: Instruction manual covers assembly of Band Box and installation into TO-67 organ only.

Kit TOA-67-1, 9 lbs. . . no money dn., \$160.00

Playmate Kit Creates Rhythms For Organ And Band Box



Adds any of these 15 different rhythms to the music you play . . . Waltz, Viennese Waltz, Jazz Waltz, Fox Trot 2/4, Boogie 6/8, Swing, Rock, Watusi, Samba, Beguine, Cha Cha, Rhumba, Tango, Bolero, Bossa Nova. With just a push of a button you apply rhythm to the organ lower manual and foot pedals only, to the Band Box only . . . or for maximum musical effect to the lower manual, foot pedals and Band Box together. Also features adjustable Tempo Control, flashing Downbeat Light, Downbeat Accent Button, and Touch Control which silences Band Box when organ's lower manual and foot pedals are not being played. Easy assembly and installation. For that full orchestra sound, add the Playmate to your Heathkit/Thomas organ now. The Band Box must be installed on the organ first.

Kit TOA-67-5, 6 lbs. . . no money dn., \$195.00

Attention Heathkit/Thomas Organ Owners! The Thomas Band Box may be added to all previous and present Heathkit/Thomas organ kits. Special drawer and slides are required for support (except with TO-67). Assembly manual covers installation into all model GD-232, GD-325 and GD-983 organs. TOA-67-2, 3 lbs. . . . Band Box drawer and slides, no money down, \$40.00

Attention Heathkit/Thomas Organ Owners. The Playmate rhythm maker may be added to all previous and present Heathkit/Thomas electronic organs which have Band Box installed. No additional accessories are necessary to do this.

With
"Snooze"
Alarm

GR-58
\$49⁹⁵



Heathkit GR-58 Solid-State AM-FM Clock Radio

• All solid-state circuitry for clean sound and instant operation • Listen to AM or FM • Automatic Gain Control for constant AM volume • Automatic Frequency Control for easy FM tuning • Telechron® Clock movement • "Snooze" Alarm turns radio on ten minutes before alarm sounds • Back-lighted clock dial can be read in dark • Built-in AM & FM antennas • Auxiliary AC socket controlled by clock—great for turning lights on and off, or perking coffee in the morning • Compact powder blue cabinet with color coordinated grille . . . or add your own personalized grille cloth • Easy to build circuit board construction • Heavy duty line cord accommodates high wattage appliances

Wake Up To Music & Fresh Coffee . . . the GR-58 makes it easy. Choose AM news . . . or the clear, bright sound of FM, with AFC for easy tuning. The clock controls the accessory AC socket, so you can have lights turned on or coffee perking. Order an easy way to get up . . . the Heathkit GR-58. Kit GR-58, 6 lbs. \$49.95

GR-58 SPECIFICATIONS—AM SECTION: Tuning Range: 535-1620 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: Better than 450 uv per meter for 20 dB signal-to-noise ratio. **FM SECTION:** Tuning Range: 88-108 MHz. Intermediate Frequency (IF): 10.7 MHz. Sensitivity: Better than 5 microvolts for 30 dB quieting. **GENERAL:** Speaker: 3" x 5" oval, 1 oz. permanent magnet, 40Ω voice coil. **Audio Output Power:** .8 watts. **Dimensions:** 5 1/4" high x 9 3/4" wide x 4 1/4" deep. **Weight:** 3 3/4 lbs. **Power Requirements:** 105-125 volts, 60 Hz only, 2 1/2 watts (clock only), 5 1/2 watts (maximum, radio on). **AC Socket Capacity:** 10 Amps. *Reg. T.M. of General Electric Co.

With
"Snooze"
Alarm

GR-38
\$32⁹⁵



NEW! Heathkit GR-38 Solid-State AM Clock Radio

• All solid-state design for remarkable performance and heat-free, trouble-free life • Automatic Gain Control keeps AM volume constant • "Snooze" alarm turns radio on ten minutes before alarm sounds • Dependable Telechron® clock movement • Back-lighted clock dial for easier reading in darkness • AM antenna built-in • Auxiliary AC socket on rear panel is controlled by clock—turns lights, coffee pot, etc., on in the morning • Designer-styled coral cabinet with matching grille cloth—or add your own personally styled grille • Easy, enjoyable circuit board construction

All Solid-State Construction . . . the 7 transistor, 3 diode circuit runs cool, virtually maintenance-free, and an extra untuned RF stage & built-in antenna pull those AM stations in from far and near. "Snooze" Alarm, AGC & handsome styling round out the picture of this top quality AM Clock Radio at low cost. Order yours now.

Kit GR-38, 6 lbs. \$32.95

GR-38 SPECIFICATIONS: Tuning Range: 535-1605 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: Better than 100 microvolts per meter for 10 dB signal-to-noise ratio or 280 microvolts/meter for 20 dB signal-to-noise ratio. **Audio Output Power:** 0.8 watt (800 milliwatts). **Speaker:** 3 x 5" oval, 1 oz. permanent magnet, 40 ohm voice coil. **Power Requirements:** 105-125 VAC, 60 Hz. **Clock only:** 2 1/2 watts. **Radio and clock:** 5 1/2 watts (no power to AC outlet). **Maximum Load at AC Outlet:** 10 amperes, 1200 watts maximum. **Dimensions:** 5 1/4" H x 9 3/4" W x 4 1/4" D. **Net Weight:** 3 1/2 lbs.

*Registered T.M. of General Electric Co.

GR-48
\$39⁹⁵



Heathkit GR-48 Solid-State AM-FM Table Radio

• Switch selection of AM or FM • All solid-state components for instant operation and long, trouble-free life • Automatic Frequency Control of FM for easy tuning • Constant AM volume with Automatic Gain Control • Built-in AM and FM antennas • Backlighted dial for easy reading at night • Attractive Avocado green cabinet with color coordinated grille cloth . . . or add your own personalized one • Simple, enjoyable circuit board construction

The Perfect Addition To Any Room In The House . . . choose the "pop" sound of AM or the lifelike reproduction of FM . . . the choice is at your fingertips. AFC on FM makes tuning weak stations easy, and AM volume is always constant, thanks to AGC. Built-in AM & FM antennas, backlighted dial and handsome designer styling make the GR-48 an enjoyable, attractive accessory in any room. Order yours now.

Kit GR-48, 5 lbs. \$39.95

GR-48 SPECIFICATIONS—AM SECTION: Tuning Range: 535-1620 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: Better than 450 uv per meter for 20 dB signal-to-noise ratio. **FM SECTION:** Tuning Range: 88-108 MHz. Intermediate Frequency (IF): 10.7 MHz. Sensitivity: Better than 5 microvolts for 30 dB quieting. **GENERAL:** Speaker: 3" x 5" oval, 1 oz. permanent magnet. 40Ω voice coil. **Audio Output Power:** .8 watts. **Dimensions:** 5 1/4" high x 9 3/4" wide x 4 1/4" deep. **Weight:** 3 3/4 lbs. **Power Requirements:** 105-125 volts, 50-60 Hz only, 3 watts.

GR-28
\$24⁹⁵



NEW! Heathkit GR-28 Solid-State AM Table Radio

• Seven transistor, three diode circuit for cool operation and top performance • Automatic Gain Control for constant AM volume • Excellent sensitivity • Full wave transformer power supply eliminates hum • Bright, clear sound from the 3 x 5" speaker • Designer styled in gold and brown—you can even add your own grille cloth • Fast, enjoyable assembly • An ideal "first kit"

Add The Sound Of Music To Any Room At Low Cost . . . perfect for the kitchen, patio, workshop or teenager's room. Automatic Gain Control keeps the volume constant for different AM stations, and the extra untuned RF stage and built-in ferrite rod antenna make distant stations sound local. Fast, enjoyable assembly make the GR-28 an ideal "first" kit. Order yours soon.

Kit GR-28, 5 lbs. \$24.95

GR-28 SPECIFICATIONS: Tuning Range: 535-1605 kHz. Intermediate Frequency (IF): 455 kHz. Sensitivity: Better than 100 uV/meter for 10 dB signal-to-noise ratio or 280 uV/meter for 20 dB signal-to-noise ratio. **Audio Output Power:** 0.8 watt (800 milliwatts). **Speaker:** 3 x 5" oval, 1 oz. permanent magnet, 40 ohm voice coil. **Power Requirements:** 105-125 VAC, 50-60 Hz, 3 watts. **Dimensions:** 5 1/4" H x 9 3/4" W x 4 1/4" D. **Net Weight:** 3 lbs.

Enjoy The Sound Of Stereo FM In Your Home

With This Deluxe Solid-State FM-FM Stereo Table Radio

• All transistor circuit for clean, natural sound—cool, instant operation • Automatic switching to stereo • Automatic stereo indicator light • Fixed Automatic Frequency Control for ease of tuning • Adjustable phase control for best stereo • Easy-to-read slide-rule dial • Tone control • Pre-assembled, prealigned "front-end" • Handsome, rich walnut finish wood cabinet • Assembles in about 10 hours

Kit GR-36, 17 lbs. \$69.95

GR-36 SPECIFICATIONS—Frequency coverage: 88 to 108 MHz. **Sensitivity*:** 5 microvolts. **Intermediate Frequency (IF):** 10.7 MHz. **Image Ratio*:** —45 dB. **Capture Ratio*:** 3 dB. **IF Rejection*:** —80 dB. **AFC Correction:** 150 kHz per volt. **AM Suppression*:** —40 dB. **Channel Separation:** 30 dB or more at 1000 Hz. **Antenna Input Impedance:** 300 ohms balanced. **Stereo Music Power Output:** 2 1/2 watts EIA. **Speakers:** Two 5 1/4" speakers, permanent-magnet type. **Power Supply:** Transformer operated. **Power Requirements:** 105-125 volts, 50/60 Hz, 6 watts. **Cabinet:** Wood, Walnut finish. **Dimensions:** 19" W x 9 1/4" H x 6 1/2" D.

*Rated by Institute of High Fidelity (IHF) standards



GR-36 \$69⁹⁵

Handy Household Helpers

GD-51A
\$24⁹⁵



- No connecting wires between units . . . just plug into nearest AC or DC outlet
- All transistor circuit — built-in power supply
- Choice of 2 operating frequencies
- Add as many units as you wish anytime
- 2-tone beige plastic cabinets
- Variable squelch to quiet background noise

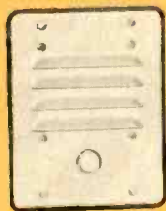
Save Time, Steps & Your Voice With A "Wireless" Intercom

Just Plug It In, Push The Press-To-Talk Bar to talk, release to listen. PTT bar has a spring-return to "listen" and a "dictate" hold position for keeping tabs on baby, or for predominately one-way transmissions. Saves you valuable steps and time . . . eliminates annoying shouting. Use any number anywhere, as long as they operate on same power line.

Kit GD-51-2 (pair), 10 lbs. \$48.50
Kit GD-51A (one station), 5 lbs. \$24.95
GD-51A SPECIFICATIONS—Power requirements: 105-125V. 50/60 Hz AC or DC. Standby power: 2.5 watts. Transmit frequency: 220 kHz & 180 kHz (switch selected). Size: 6 1/4" H x 8" W x 7 1/2" D.



All 3 Units
\$44⁸⁵



Heathkit Solid-State Indoor-Outdoor Intercom System

- Master unit handles up to 5 remote stations
- Ideal for home & small offices
- Weather-proof outdoor remote
- Powerful, one-watt output for crisp, clear communications
- Compact, designer-styled cabinets

Identify Callers Before You Open The Door . . . with the outdoor remote unit installed at your front entrance. It adds to your personal safety . . . especially late at night, or when your family is alone. You can place up to 5 remote stations anywhere around the house . . . outdoor units at both the front and back entrance . . . indoor units in the den, garage, or basement workshop. Here's real convenience to save you time and steps.

Private Calls Or Paging. The master unit features selective and all-call switches . . . talk to the office "steno", your son in the garage, or call the whole family to dinner. The all-transistor circuitry requires no warm-up time . . . your Heathkit Intercom will be ready and waiting for instant use.

Convenient Outdoor Remote features a weather-resistant aluminum grille, weatherproof seal, specially-coated speaker, doorbell button, and 50' of 2-wire cable.

Kit GD-121 Master Station, 6 lbs. \$29.95
Kit GD-131 Indoor Remote, 4 lbs. \$8.95
Kit GD-141 Outdoor Remote, 2 lbs. \$5.95

SPECIFICATIONS—Power requirements: 117 v ac 50/60 Hz 2.5 watts (idling), 3.5 watts (full output). Transistors: four 2N1274. Dimensions: 6 1/4" H x 8" W x 7 1/2" D (master), 5" H x 8" W x 6" D (indoor remote), 5 1/4" x 4 1/2" panel size (outdoor remote).

Unique Heathkit Home Protection System

Alerts Your Family To These Emergencies . . .

- Intrusion
- Freezing
- Rising Water
- Power Failure
- Smoke & Fire
- Thawing
- High Temperature
- Changing Temperature

Low Cost Protection. The Heathkit Home Protection System gives you that priceless peace of mind that comes from knowing that you have provided for the safety of your family and property in times of emergency. The easy-to-build solid-state units use very little power and incorporate "fail-safe" circuitry. Simple installation . . . just plug the units into the nearest AC outlet. The AC power line connects the units, and the system can be used over long distances if all units are on the same side of the AC line transformer. Since alarm signals will appear on all AC lines on the same side of the outdoor pole transformer, a community alarm system can be set up . . . your neighbor can keep watch over your property when you're gone. The unique signaling method, developed by Berkeley Scientific Laboratories, exclusively licensed to Heath, is virtually immune to random noise and signals generated by other devices. The system has almost limitless applications in homes, farms, industries . . . use as many units as you need and "customize" your installation.

GD-77 Receiver Alarm . . . designed for use with the Smoke Detector/Transmitter and Utility Transmitter. In case of emergency it sounds a high-pitched, very audible tone that will be heard anywhere in a normal size house . . . even while you're sleeping. Extra receivers may be added anywhere you want, or bells or buzzers may be plugged in to extend the audible range. The "fail-safe" circuit has a continuously charged nickel-cadmium battery that's automatically switched into the circuit & sounds the alarm if power fails; it also warns you if any of the other units malfunction or the receiver is accidentally disconnected.

GD-87 Smoke-Heat Detector/Transmitter . . . consists of a smoke detector, heat sensor and transmitter. When the smoke detector or heat sensor is activated, it generates a signal, triggering the Receiver Alarm. The sensitivity control can be adjusted to activate the circuit at very low smoke densities; the heat detector triggers automatically at 133°F. Its "fail-safe" circuit signals the receiver if a component should fail. The unit can be used by itself or external remote heat sensors can be added in any location.

GD-97 Utility Transmitter . . . accepts any type switch or sensor to detect any hazard you wish to guard against. Its transmitter actuates the Receiver Alarm. Your imagination is practically the only application limit. Any sensor that produces an open or closed circuit situation when actuated can be used. A heat sensor, magnetic reed and micro switch are available from the Heath Company which will suit many applications. The sensors may be used to act as alarms against heat & fire, intrusion, flood, or thawing or cooling in farming and food storage applications. Its "fail-safe" operation automatically generates a warning signal in the event of component failure. The indicator lamp lights when the unit is transmitting . . . an aid to localizing the problem area when more than one transmitter is used.

Kit GD-77, receiver-alarm, 4 lbs. \$39.95
Kit GD-87, smoke-heat det./trans., 4 lbs. \$49.95
Kit GD-97, utility det./trans., 2 lbs. \$34.95
GDA-97-1, miniature magnetic-reed switch for windows and doors, 1 lb. \$1.80
GDA-97-2, miniature micro switch for windows and doors, 1 lb. \$2.00
GDA-97-3, 133°F. heat sensing switch, 1 lb. \$2.25

Kit GD-77
\$39⁹⁵

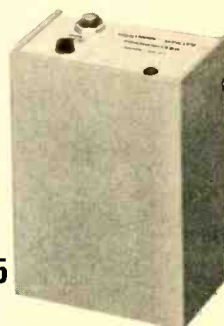


The Receiver Alarm of the Home Protection System is always ready to warn you of any emergency.



Kit GD-87
\$49⁹⁵

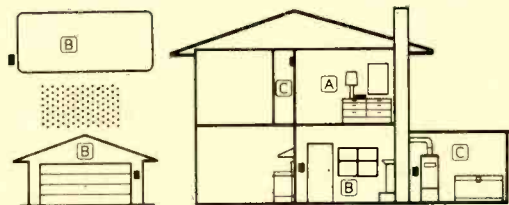
The Smoke-Heat Detector/Transmitter signals Receiver Alarm of fire & excess smoke.



Kit GD-97
\$34⁹⁵

The Utility Transmitter signals Receiver Alarm of intrusion, fire, flood and undesirable conditions.

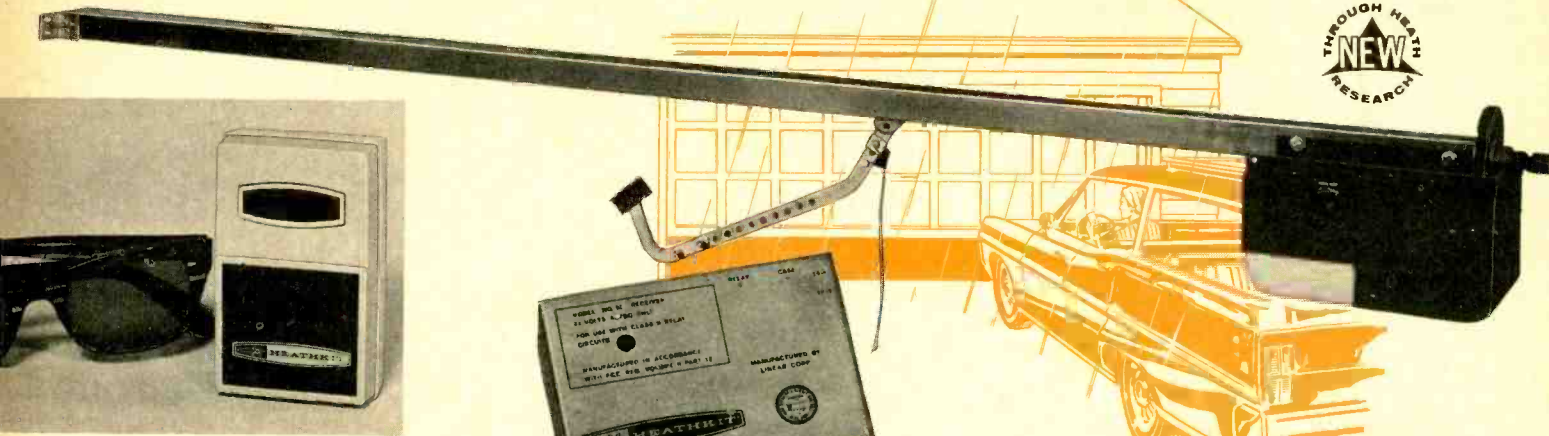
Installation Examples



Explanation of Diagram

- A Receiver Alarm in Master Bedroom
- B Utility Transmitters in Pool Area, Garage & Living Room
- C Smoke-Heat Detector/Transmitters in hallway near bedrooms and in Utility Rooms

All Kits On These 2 Pages Are Mailable



New Miniature Portable Transmitter

The size of a pack of cigarettes... fits pocket, purse, clips on sun visor. Operates up to 150' from garage door. Factory assembled, ready to use.

New Sensitive Solid-State UHF Receiver

Factory assembled and adjusted... takes just minutes to install. Has selectable tone coding to prevent interfering with similar neighborhood units. Operates on 290 to 320 MHz.

Kit Form Mechanism Assembled Transmitter & Receiver GD-209A

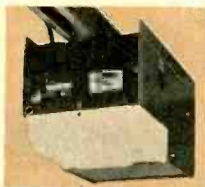
\$139⁹⁵

New Powerful Screw-Drive Mechanism

No question about power here... this opener has a big screw drive instead of chain; more reliable, no breakage due to load. It's quiet in operation and provides positive "locking" action. Adapts to any 7' overhead, jamb or pivot type residential garage door.

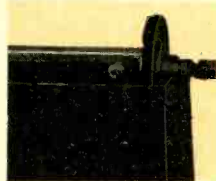
Automatic Garage Interior Light

When the door opens, the built-in light automatically turns on, stays on, long enough for you to enter your home. Handsome white plastic lens.



Safety Switched Friction Clutch

Adjustable friction clutch at end of screw drive permits setting to point where just a slight obstruction will activate the built-in safety switch to reverse door direction.



New Deluxe Radio-Controlled Screw-Drive Garage Door Opener Semi-Kit... Easy to Build, No Soldering... New Factory Assembled LINEAR® Solid-State Transmitter and Receiver

- New factory assembled UHF transmitter & receiver operates over -50° F to +140° F temperature range • Miniature portable "wireless" transmitter • Operates up to 150 feet • Powerful screw-drive mechanism—silent, reliable • Easy to build—all leads cut to length with connectors installed—just push on terminals, no soldering — Easy installation • Operates 7½' overhead track and jamb & pivot doors (with adaptor) • Positive "locking" action plus quick-release door arm • Safety clutch and reversing switch reverses door travel when obstructed • No FCC license required • No interference • Selectable tone coding prevents interference by similar neighborhood units

THE NEXT BEST THING TO A PERSONAL DOOR MAN. This new deluxe Heathkit radio-controlled garage door opener provides the comfort and convenience you want with the reliability and safety you need. Just a touch of the button on the "wireless" transmitter in your car and your garage door opens and the light turns on inside the garage. After you drive inside, another touch of the button and the door closes quietly, securely... and the light stays on long enough for you to enter your home. No more getting out in the bad weather to lift a heavy door, no more groping in the dark for the light switch... here is convenience and safety the whole family will appreciate.

RUGGED, SAFE CONSTRUCTION & LONG-TERM RELIABILITY.

The giant 8½' long screw mechanism coupled with the husky ¼ HP motor give many years of dependable operation. The built-in safety switch and slip clutch act together to instantly reverse the door should it meet the smallest obstruction... "safety-engineered" for children, pets, toys, etc. And there's no need to worry about snow or ice build-up causing the door to reverse... the built-in Snow Safety takes over a short distance from the floor to compensate for this.

VIRTUALLY MAINTENANCE-FREE.

Because of the unique screw-drive design, there are no chains to stretch, break or be oiled... no sprockets to wear. The screw itself is kept clean automatically as it turns, and the motor never needs oil. Internal electrical safeties & limit switches assure instant response to every situation.

EASY TO BUILD AND INSTALL. Second only to its impressive operation is the ease with which this mechanism assembles. You'll

build it in one evening... with no soldering! Every lead is cut to length and connectors are factory installed at each end. All you do is mount the mechanical and electrical parts and interconnect them by pushing the various leads on the connecting terminals. Simple and fast. And you'll find installation easy to complete the next morning... adjustable mounting bracket and universal hanger straps are included. Once the unit is installed, just mount the door bracket and the quick-release door arm, install the push-button switch at the house entrance to the garage, adjust the travel-limit cams with the special tool provided and your deluxe Heathkit garage door opener is ready to use.

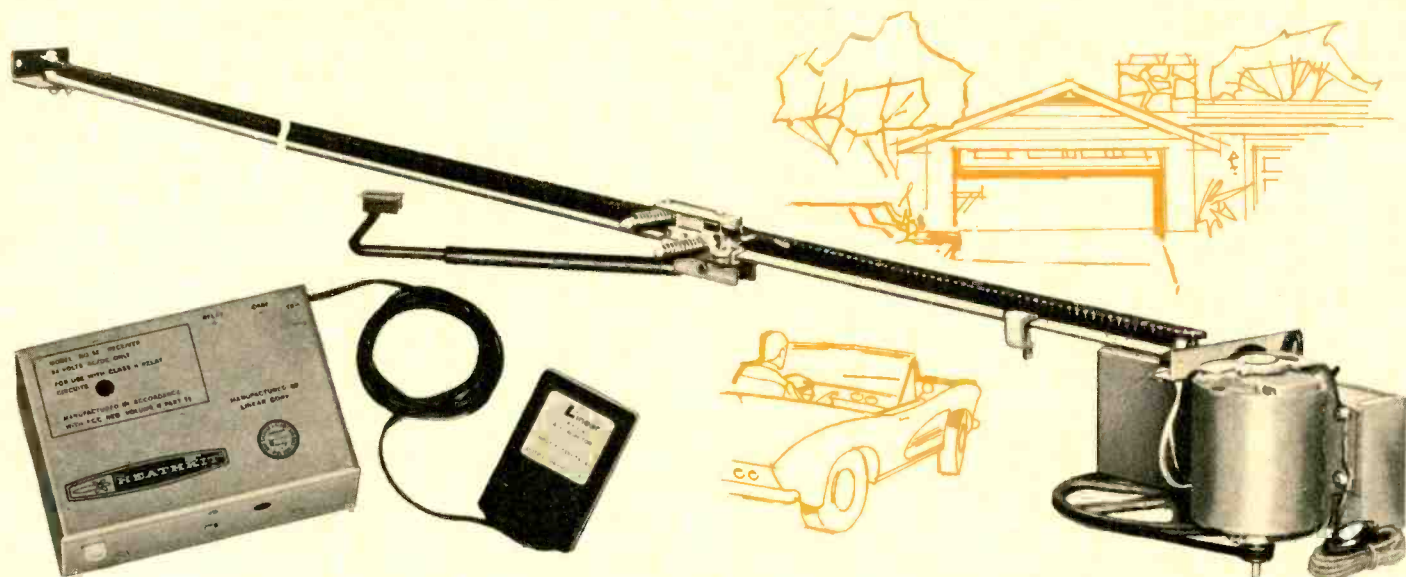
YOUR PERSONAL ELECTRONIC KEY. The system is designed to operate with the UHF transmitters and receiver listed below on frequencies from 290 to 320 MHz at 5 MHz channel spacing, modulated with a tone of 12 to 23 kHz with 1 kHz channel spacing to prevent any interference. All electronics are factory assembled and aligned, ready to use. Optional methods of operation are the pushbutton included, or you may devise your own key actuated driveway switch. **YOU'LL WONDER HOW YOU EVER GOT ALONG WITHOUT IT.** Put this most convenient household device to work for you... order yours now.

- GD-209A, 66 lbs., mechanism, 1 transmitter, 1 receiver... **\$139.95**
- GD-209B, 66 lbs., mechanism, 2 transmitters, 1 receiver... **\$149.95**
- Kit GDA-209-1, mechanism only, 65 lbs... **\$99.95**
- Kit GDA-209-2, adaptor arm for use with jamb and pivot type solid doors without track, 3 lbs... **\$7.95**
- GDP-99, 1 lb., 1 transmitter... **\$15.95**
- GDP-119, 2 lbs., 1 transmitter, 1 receiver... **\$44.95**
- GDP-129, 2 lbs., 2 transmitters, 1 receiver... **\$59.95**

KIT MECHANISM SPECIFICATIONS: 120" long x 12" high x 9" wide. Operates all residential type 7½' high overhead doors, single or double type (also jamb and pivot types without tracks when GDA-209-2 adaptor is used). 117 VAC, ¼ HP, capacitor run, 1500 rpm motor, circuit breaker protected. **Control:** Transmitter-receiver, wall-mounted push-button switch, or custom switches (key type, etc). **Open and Close Time:** Approximately 11 seconds. **Safety:** Door travel reverses, returns to full open position, and stops if obstructed while closing. **Mounting Clearance:** 3" above highest point of door travel. **Safety Lamp:** 75 watt max., automatically turns on when mechanism is activated. Delay circuit keeps lamp on for approximately 90 seconds after motor stops.

UHF TRANSMITTER SPECIFICATIONS: Powered by standard 9-volt transistor type battery (Eveready No. 216 or equivalent). **R. F. Frequencies:** 290 to 320 MHz modulated with 12 to 23 kHz. **Range:** Up to 150' from receiver (adjustable). **Size:** 3¼" x 2¼" x 1⅞". **Weight:** 5 oz. **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 modulated with 12 to 23 kHz. **Size:** 4½" x 3¼" x 1⅞". **Useful Temperature Range:** -50°F to +140°F.

Heathkit® Garage Door Openers



New Sensitive Solid-State UHF Receiver

Install in minutes in your garage. Operates on 290 to 320 megahertz . . . requires no license. Selectable tone coding prevents interference with similar neighborhood units. Factory Assembled.

Universal Mechanism
Motor and mechanism will operate overhead and most jamb or pivot type residential garage doors . . . sizes up to 8' high! Requires just 2½" clearance above highest point of door travel.

Manual Operating Switch
Supplied with your Kit, can be connected inside your house in any convenient place to permit opening the garage door without the use of the radio transmitter in your car.



Kit Form Mechanism Assembled Transmitter & Receiver
GD-179A

\$119.95

New Miniature Portable Transmitter

No larger than a pack of cigarettes . . . fits easily in glove compartment, pocket, purse or attach to sun visor. Operates up to 150 feet from receiver. Factory Assembled.

Radio-Controlled Chain-Drive Garage Door Opener Semi-Kit . . .

New Factory Assembled LINEAR® Solid-State Transmitter & Receiver

- New factory assembled UHF transmitter & receiver operates over entire -50° F to +140° F temperature range
- Miniature portable "wireless" transmitter
- Operates up to 150 feet with no CB interference
- Easy one-man installation
- Operates overhead track, and most jamb & pivot doors up to 8' high
- Foolproof safety device automatically disengages door when obstructed
- No FCC license required—complies with FCC regulations
- Won't interfere with aircraft radio frequencies
- Selectable tone coding prevents interference with similar neighborhood units

OPEN AND CLOSE YOUR GARAGE DOOR FROM THE COMFORT OF YOUR CAR. With just a touch of a button on "wireless" transmitter your garage door opens and the light goes on. Another touch of the button once you're safely inside, and the garage door closes automatically, securely. No more struggling with that heavy, awkward door. No more fumbling around in the dark for the garage light. A time delay on the mechanism-operated light allows plenty of time to enter the house, or switch on the main lights . . . what could be more safe or simple. Convenient during bad weather or late at night. Especially convenient for Mom.

SELECTABLE TONE CODING . . . YOUR PERSONAL KEY. The system is designed for use on 290 to 320 MHz, and selectable tone coding prevents interference from similar neighborhood units. And a foolproof safety device on the mechanism automatically disengages the door when obstructed . . . no chance of injury or damage to tiny tots or household articles. Release pressure is adjustable in both "up" and "down" directions. You build only the mechanism, quickly and easily . . . may be purchased separately for push-button operation from house or garage. A spring-loaded connecting arm assures a tight weather seal . . . keeps out rain and snow. And the automatic light feature may be extended to control driveway, patio, breezeway lights, etc.

UHF TRANSMITTER & RECEIVER FACTORY-BUILT. The transmitter operates up to 150 feet from the receiver. And both units feature solid-state circuitry for reliable performance over the wide temperature range of -50° F. to +140° F. The transmitter, no larger than a pack of cigarettes, offers portable convenience. Just clip to car's sun visor, or store in glove compartment, your pocket or purse. And since it's wireless, there's no cumbersome permanent mounting . . . makes it easy to use from car to car. Operates on self-contained battery power . . . eliminates any car battery drain. The receiver takes only a few minutes to install in your garage. No license is required. Start enjoying the labor-saving convenience of Heathkit garage door opener . . . order yours now!

- GD-179A, 63 lbs., mechanism, 1 transmitter, 1 receiver **\$119.95**
- GD-179B, 63 lbs., mechanism, 2 transmitters, 1 receiver **\$129.95**
- GDA-20-3, 61 lbs., mechanism only **\$74.95**
- GDP-149, 2 lbs., 1 transmitter, 1 receiver **\$49.95**
- GDP-159, 2 lbs., 2 transmitters, 1 receiver **\$59.95**
- GDP-99, 1 lb., transmitter only **\$15.95**

KIT MECHANISM SPECIFICATIONS: 125" L x 8½" H x 13" W, 100 # max. operating force. Operates overhead track and most jamb & pivot doors up to 8' high. 117 v. AC ¼ H.P. motor. Fused.

UHF TRANSMITTER SPECIFICATIONS: Powered by standard 9-volt transistor type battery (Eveready No. 216 or equivalent). **RF Frequencies:** Approx. 290-320 MHz modulated with 12 to 23 kHz. **Operating Range:** Up to 150' from receiver (adjustable). **Useful Temperature Range:** -50° to +140° F. **Size:** 3¼" x 2¼" x 1½". **Weight:** 5 ounces.

UHF RECEIVER SPECIFICATIONS: **RF Frequencies:** Approx. 290-320 MHz modulated with 12 to 23 kHz. **Useful Temperature Range:** -50° to +140° F. **Size:** Approx. 4½" x 3¼" x 1½". **Power Requirements:** 117 VAC, 60 Hz.

All Items On These 2 Pages Mailable Except GD-209A, -209B, -179A, -179B, GDA-209-1 & GDA-20-3 Shipped REA Or Motor Freight

Heath/Mitchell Darkroom

NEW FOTOVAL® II Darkroom Computer Converts To Color Work Too



Kit PM-18 Wired PMW-18
\$65⁰⁰ **\$92⁰⁰**

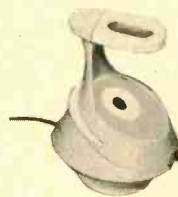
- Produces beautiful black and white prints every time • Saves darkroom time, cuts paper costs, speeds enlarging • Automatically determines paper grade and exposure time • Line voltage electronically regulated for greater accuracy • So simple to use and calibrate that a beginner can experience exceptional results the first time • Manual includes comprehensive instructions for producing special effects prints and prints from thin or very contrasty negatives • Supplied with special 35mm test negative for in-depth testing of paper grades • Fast, inexpensive conversion to complete color capability with the accessory Color Probe Kit • Simple, enjoyable construction with the famous Heathkit manual

The New Heath/Mitchell Fotoval II Darkroom Computer is a fast, low cost way to make ideal black and white enlargements . . . simply, efficiently . . . each and every time you use it. Guesswork about paper grade and exposure time is eliminated and time, money and paper wasting test strips are a thing of the past.

Monitors Darkroom Variables . . . Leaves You Free For Creative Work. Following the simple step by step instructions in the comprehensive manual, each of your paper contrast grades is accurately tested and its particular printing characteristics are "memorized" by the computer. When you print a negative, just use the built-in Exposure Probe to monitor the negative contrast range . . . then read the correct paper grade (or filter) and exposure time directly from the illuminated scale. The Fotoval II Computer will handle most of the density extremes encountered in amateur work. When the Exposure Probe is replaced on the front of the cabinet, the panel light automatically goes out—and you're ready to make an excellent black and white print . . . without guessing about exposure or paper grade . . . without wasting a lot of valuable time in the darkroom. And you can even print now, develop later, by using the computer to determine the best paper grade and optimum exposure time.

Ideal For The Amateur Darkroom. The Fotoval II Computer is so simple to use that even a novice will produce excellent prints the first time. And a 35mm test negative is supplied which allows in-depth testing of all paper grades. A section of the manual is devoted to other uses for the Fotoval II Computer . . . variable contrast papers and filters, special effects, small prints, extreme enlargements and more.

Kit PM-18, 7 lbs., no money dn. **\$65.00**
 Assembled PMW-18, 7 lbs., no money dn. **\$92.00**



New Color Conversion Probe

Converts the FOTOVAL® II Darkroom Computer to a color computer identical to the new Colorval II® Computer described on the following page. Probe controls include lamp on-off switch and brightness control.

Model PMA-18-1, 2 lbs. **\$46.00**

Easy, Accurate Exposure Control With The Heathkit Photo Timer . . . 0.1 Second to 99 Seconds Range . . . All Electronic Circuitry

- Controls exposure time of all printing operations—contact or enlarging • Two switch-selected ranges . . . up to 99 seconds in 1 second steps or 9.9 seconds in 0.1 second steps . . . permits accurate resetting of any interval • Repeatability accurate to within 2% on all settings • Two AC outlets . . . enlarger & safelight • All-electronic circuitry . . . no gear drive mechanisms to wear out as with "clock-motor" devices • Enlarger may be turned on or off manually with Time-Focus rocker switch • Install on wall, place upright or face up on working surface • Styled to match Heath/Mitchell Fotoval® Computer • Easy to assemble and use

QUICK & SIMPLE TO USE! Just set the desired exposure time and push the "start" button. The PT-15 Photo Timer turns the enlarger on and the safelight off. At the end of the preselected interval, it automatically turns the enlarger off, and the safelight on. To quickly expose more than 1 print, just push the "start" button to repeat the cycle . . . every exposure will be accurate within 2% of the first interval. A spring-return "stop" switch halts exposure process, if you decide the time interval is incorrect.

Kit PT-15, 4 lbs. **\$29.95**

PT-15 SPECIFICATIONS—Timed cycle: x1.0 Range: 1 to 99 seconds in 1-second steps. x0.1 Range: 0.1 to 9.9 seconds in 0.1-second steps. **AC outlets:** Enlarger and safelight; each outlet provides 105-125 v. AC @ 350 watts maximum (3 amperes). **Accuracy:** Actual timed cycle will be within 5% of time selected. **Repeatability:** All timed cycles at one selected setting within 2% of each other. **Switches:** 0-90 seconds, in 10-second steps; 0-9 seconds, in 1 second steps; start pushbutton; Time-Focus; Stop; Range, x1.0 & x0.1; On-Off. **Controls:** x1.0 calibration; x0.1 calibration; sensitivity. **Regulation:** Internal circuits regulated at 150 volts DC by an OA2 regulator tube. **Power requirements:** 105-125 v. AC, 50/60 Hz, 6 watts. **Dimensions:** 6 1/4" W x 6 1/2" D x 3 1/4" H overall.



Kit PT-15
\$29⁹⁵

Aids For The Photographer



Kit PM-17A \$89⁹⁵

Introducing The Colorval® II Computer New, Improved Features . . . At A Low, Low Price!

Improved Color Probe With Intensified Reflected Spot. The Colorval® II Computer features a separate color probe. Enlarger light passing through the scan pack on top of the probe is adjusted so that the Reflected Spot—a reflection of the small area under study—is seen in the small mirror on the probe. This spot—now 10-times brighter than before—appears nearly white, and is compared to the adjustable Neutral Reference Light which surrounds it. When the selected area under study has been rendered neutral by visually adjusting the enlarger printing filter pack you have analyzed your negative. Handy ball socket base of color probe lets you use it with either hand anywhere on the easel.

New Permanent Universal Scan Filter. You assemble it to match your own enlarger. And, once assembled, you never have to change it for complete color analysis with a given film type. If another film type is used, you simply assemble another scan filter . . . which also remains permanent.

Exclusive New Visual Color-Integrating Scrambler . . . gives you the option of either spot-reading or integrating your color negatives *visually* . . . resulting in optimum color balance in color prints.

Precision Exposure Probe . . . accurately measures minute light areas when scanning negatives for desired shadows and highlights.

New Simplified Testing System For Greater Accuracy. A whole new, simplified, extremely accurate testing system using a special new Gray Card with 50% reflectance, test negatives and special filter mosaics, results in absolute identification of specific printing paper characteristics. No other color analyzer—at any price—offers this exclusive facility!

All of These Improvements are yours in the new PM-17A at no increase in cost!

ATTENTION PM-17 AND PMW-17 COLORVAL® OWNERS: A conversion package, which converts your Colorval to the new PM-17A Colorval II is yours for the asking. Write for yours today. It's free!

Kit PM-17A (includes Mitchell Color Wheel and 35 mm black & white test negative), 6 lbs. \$89.95
Optional B&W test negative for 4 x 5" enlargers:

PMA-14-1 \$15.00 ppd.

PM-17A SPECIFICATIONS—Front panel controls: Channel selector switch; On-Off switch. Color probe controls: Lamp On-Off switch; Brightness control. Exposure probe control: Shutter. Power requirements: 105-125 or 210-250 volts AC, 50/60 Hz, 15 watts max. Cabinet dimensions: 7 1/4" W x 4 1/2" H x 8 1/2" D. Net weight: 4 1/2 lbs.

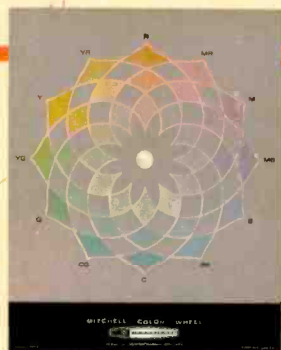
The new Mitchell Color Wheel System is *both* a versatile color print analyzer-for the amateur and a professional color standard of great accuracy. For The Beginner. Following the simple step-by-step manual, you make an excellent color print. The filter pack which made this print stays in your enlarger . . . just print all negatives on this batch of paper using it. You have matched your type of color negative film to the paper, and all of your prints will be great . . . without a large investment or a lot of filter changes. Exposure is calculated with a simple scale in the manual based on the inverse law. That's the system . . . and it works.

Professionals can use the Color Wheel to make that initial fine print required to calibrate their own color analyzers. Prints then produced can be checked by comparison for color accuracy and any color cast can be pinpointed quickly and accurately.

Amateur Or Professional, you'll want this remarkable new system in your darkroom. Order yours now.

Model PD-48, 1 lb. \$4.95

**NEW! A Color
Print Analyzer
AND A Professional
Color Standard
For Only \$4.95!**



Put Color Processing in Your Darkroom For Under \$20.00 . . . With The New Heath/Mitchell Color Canoe



- Produces the same high quality color prints as processors costing hundreds of dollars
- Simple, 1 piece stainless steel functional design
- Very small—easy to move, clean and store
- Chemicals never touch the operator's hands
- Self-leveling
- Uses no more chemicals than other processors
- No electrical power
- Develops print face up—you can see what's happening
- Can be used for B&W, Type R color and film (color, B&W, litho, etc.)
- Produces completely even development consistently
- Comes in 8x10", 11x14" and 16x20" sizes

At Last, A Color Processor That You Can Afford. The Heath/Mitchell Color Canoe produces the same high quality color prints that you get from any other processor . . . but it does it in a way that can only be called unique . . . and at low cost.

Here's How It Works. The print is presoaked in a tray filled with water of the correct developing temperature. Then the print is put face up in the bottom of the Color Canoe, which is floated in the water filled tray. The first solution is poured into the Canoe and forms a long, narrow "puddle"; the temperature is correct due to the heat transfer of the stainless steel construction of the Canoe. First one side of the Canoe is lifted, then the other—the print passes through the "puddle", which is kept level by simple gravity. This rolling action evenly distributes the chemicals over the face of the print. The result is a color print comparable to any processed by other means, and in the same amount of time too. Other benefits . . . the Canoe is small and space saving . . . requires no electrical connections . . . has no parts to wear out . . . is easy to clean . . . and is foolproof.

The Heath/Mitchell Color Canoe . . . a simple, space saving, time saving way to put complete color capability into your darkroom . . . at a cost that makes sending out your color work expensive by comparison.

PD-18, 8 x 10", 4 lbs. \$19.95
PD-28, 11 x 14", 6 lbs. \$26.95
PD-38, 16 x 20", 9 lbs. . . no money dn. \$39.95

NEW! Heathkit Jr. JK-18 Electronic Workshop "35" . . . Features 35 Easy-To-Build, Educational Experiments

- 35 fun-to-build, fun-to-use experiments teach basic electronic circuits • All solid-state components for long life • Safe—battery operated • Spring terminal connections eliminate all soldering . . . permit easy reassembly of any circuit
- Builds radios, transmitters, alarms & many more circuits • Simple instructions any youngster can follow • High quality parts used throughout • Parts store inside carton between experiments

Explore The Exciting World Of Solid-State Electronics . . . with the new Heathkit Jr. JK-18. While building the 35 different circuits, the youngsters will have hours of fun, learning about & using the basic components of modern electronics . . . transistors, capacitors, resistors, loudspeakers . . . discovering useful knowledge of how modern circuits actually work. Connections are solderless spring-terminal type, and the circuits run on four inexpensive & safe "D" cells (not supplied). All construction projects begin with a simple explanation of what the circuit does and how it is used. Then, using a large, detailed pictorial & famous Heathkit instructions, the circuit is built. When finished, the new circuit is tested and used. A large schematic diagram is furnished for each experiment and includes a simple but complete explanation of what each part does. Each part is identified by a drawing and its schematic equivalent as used in circuit diagrams so the builder learns to read schematics while experimenting. As new parts are used, they are identified in the same way, and a short explanation of its function is given.

Thirty-Five Different Experiments . . . the new JK-18 builds all of these fascinating circuits: Code Flasher, Continuity Tester, Battery Tester, Diode Tester, Transistor Tester, Rain Alarm, Timing Relay, Listening Device, Public Address Amplifier, Intercom, Voice Relay, Earphone Code Oscillator, Loudspeaker Code Oscillator, Flasher, Experimental Multivibrator, Electronic Organ, Burglar Alarm, Metronome, Siren, Light Meter, Light Sensing Alarm, Target "Hit" Alarm, Light Dependent Flasher, Light Dependent Oscillator, Sound Level Meter, Two, Three & Four-Transistor Radios, Automatic (Light Dependent) Radio, Field Strength Indicator, Code Transmitter, Voice Transmitter, Capacity Relay, Wheatstone Bridge, Capacity Bridge. Help a youngster discover the world of electronics . . . order the new JK-18 now.

Kit JK-18, 10 lbs. \$19.95



New
Kit JK-18
\$19.95



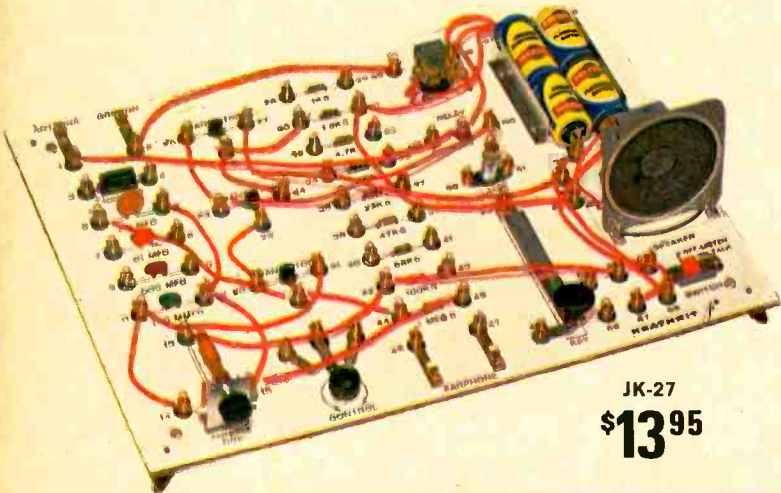
Heathkit Jr.® Electronic Workshop "19" . . . Builds 19 Different Educational Electronic Circuits That Are Safe, Fun And Really Work

Takes The Mystery Out Of Electronics . . . makes electronics easy to understand. The JK-27 contains cartoon-illustrated principles of operation and simple, non-technical instructions for building 19 different projects that make electronic circuits easy to understand and shows how each part works in a circuit and its electronic symbol. Youngsters not only have fun building electronic projects that really work, but they become familiar with the language and principles of electronics.

Easy Assembly . . . spring-type connectors mount with a screw and nut . . . no soldering required . . . pre-cut and pre-stripped connecting wires snap in place and connectors can be used over for favorite projects. Safe, economical . . . operates on four C-size flashlight batteries (not included).

Build 19 Different Projects . . . code flasher, burglar alarm, public address system, 5 different transistor radios, electronic timer, TV silencer, electric eye, metronome, code transmitter, voice transmitter, electronic flasher, intercom, audio signal injector, capacity & voice operated relays. Makes an ideal gift for any youngster.

Kit JK-27, 4 lbs. \$13.95



JK-27
\$13.95



Kit JK-37 9-Watt Solid-State Single-Channel Guitar Amplifier

\$29.95

- 7 transistor, 3 diode circuit for cool, instant operation . . . peak performance at all times . . . long, trouble-free life • 9 watts EIA music power, 18 watts peak power • Tremolo variable in rate and depth for a variety of effects • Two inputs for solo guitars • Volume and tone controls • All front-panel mounted controls and inputs • Carrying handle for easy portability • Red cabinet with red, silver & black striped grille cloth measures a compact 13½" W x 5⅞" D x 14" H

Perfect For That Youngster Just Starting To Play Guitar. Delivers a full 9 watts of music power, 18 watts peak power through a specially designed 8" speaker. Even has variable rate and depth tremolo so he can create a wide variety of effects. All controls are front panel mounted for complete command of all the action. Measures a compact 13½" W x 5⅞" D x 14" H and has a storage area in back. Goes together in only 5 hours. Runs on 120/240 VAC, 50-60 Hz.

Kit JK-37, 14 lbs. \$29.95

"Story Hour" Phonograph 4-Speed Monophonic

Kit JK-17
\$21.95

- Plays 16, 33⅓, 45 and 78 rpm • Takes 7, 10 & 12" mono records • Built-in 45 rpm adapter • Crystal cartridge with universal sapphire stylus for all types of records • Solid-State circuit for cool, instant operation, long life • 4" speaker • Steel top chassis plate • Tone arm locks in place



The first sounds this durable little phonograph makes will be like magic to your child, especially if you build it together. What a thrill for him to see it come to life! You can build it in an evening. Turntable mechanism comes preassembled; you build one small circuit board. Phonograph is protected by a tough case of wood and hardboard; detachable lid snaps securely in place. The ivory & desert gold polyethylene covering wipes clean.

Kit JK-17, 11 lbs. \$21.95

JK-17 SPECIFICATIONS—AMPLIFIER: Frequency Response: 80 Hz-10 kHz. Music Power Output: 600 Milliwatts EIA. Control: Off-On, Volume. Speaker: 4", 16 ohm Voice Coil. **TRANSISTOR-DIODE COMPLEMENT:** 4 transistors, 1-Silicon Diode. **TURNTABLE:** Type: 4 Speed Phonomotor. Turntable Diameter: 8⅞". Cartridge Type: Crystal. Stylus: Universal sapphire 0.7 to 3 mil for all records. **GENERAL:** Power Requirements: 117 VAC 60 Hz 14 watts. Size: 12⅞" W x 11⅞" D x 5⅞" H.

Heathkit® Portables

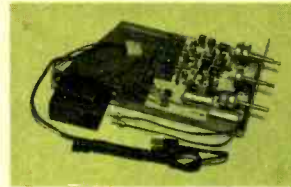
PORTABLE LISTENING HOBBY



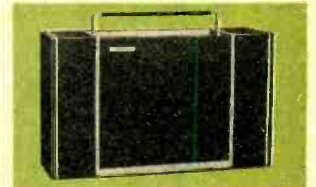
Kit GD-109
\$74.95



Two swing-out, detachable, full-range speakers.



Compact 18-watt amplifier—easy to build.



Changer tilts down for play, up for carry.

New Heathkit Portable Stereo Phono . . . 18 Watts . . . Deluxe Changer . . . Full-Range Speakers

- Automatic 4-speed changer • 16-transistor, 8-diode circuit • 18 watts music power, 9 watts per channel • Ceramic stereo cartridge with 30 dB separation • Dual diamond/sapphire styli for LP & 78 RPM • Low 3½ gram stylus pressure for longer record life • Swing-out or detachable, high compliance 4½" speaker systems on 5' cords • 45 RPM adapter • Volume, tone & balance controls • Tilt-down changer • Factory built speaker enclosures and changer cabinet • Yellow-gold & brown durable plastic coated covering over wood

Here's Proof That Portable Phonographs Can Sound Great . . . the Heathkit GD-109 plainly shows this. The sound that comes charging out of this portable stereo is amazing . . . sound that's much like that from quality stereo components, yet it costs no more than ordinary phonos.

The GD-109 Was Built For Top-Performance. It has 16 transistors and 8 diodes in its all solid-state circuitry, and you can depend on them for long life and cool operation. The GD-109 amplifier puts out 9 watts per channel . . . enough to assure adequate volume and reserve power. Both the amplifier and the pick-up cartridge have frequency responses that let you hear more of the audible spectrum than you would expect from such a low-priced stereo. Two 4½" high compliance speakers reproduce a wider frequency range, for their size, than any other singles or 2-ways we examined when choosing the parts.

A Versatile Unit With Handsome Styling. Although it's in a portable case, the GD-109 can be set up like the expensive component systems. The changer tilts down for play or up for dust-free storage. The speaker enclosures snap away from the cabinet and swing out. Then each can be lifted off and placed up to 5' away from the changer for better stereo separation. The GD-109 cabinet covering has a texture like leather. High wear areas are covered with durable, plastic coated cloth.

So Simple A Youngster Can Build It. It will take you only one or two pleasant evening sessions (about 5-7 hours) to build your GD-109. The speaker enclosures and the changer cabinet come assembled. You simply mount the speakers behind the grilles and wire them. All amplifier components mount on one easy to build circuit board.

Years Of Pleasant Listening . . . Order your GD-109 today, and begin a lasting listening experience.

Kit GD-109, 38 lbs. **\$74.95**

GD-109 SPECIFICATIONS—CHANGER: Type: Maestro Model 55. Speeds: 16, 33½, 45, & 78 RPM. Record sizes: 7", 10" & 12". Cartridge: Stereo ceramic. Stylus: 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **AMPLIFIER:** Power output: 18 watts, 9 watts per channel. EIA music power. Frequency response: ±3 dB, 30 Hz to 15 kHz. Equalization: RIAA. Transistors: (10) 2N3393, (4) X29A829, (4) TA2911. Diodes: (4) MZ2360, (2) MZ2362, (4) Silicon diodes. Controls: Volume, tone and balance. **Speakers:** Two 4½" full range, high compliance with 8 ohm voice coils. **GENERAL: Dimensions:** Overall, 14½" H x 7½" D x 24-5/16" W. Speaker only, 14½" H x 4½" D x 7½" W. **Power requirements:** 120 V, 60 Hz AC 25 watts.

Suitcase Portability Lets You Enjoy The Solid-Sound Of Stereo Anywhere . . . On This 4-Speed Transistor Portable Phonograph . . . Build In 3-4 Hours

- Automatic or manual stereo and mono play of any size 16, 33½, 45 & 78 rpm records • All solid-state circuit for cool, instant operation and long, trouble-free life • Ceramic cartridge with dual Diamond/Sapphire styli for LP's or 78's • Fold-up changer and easy-grip handle for portability • Volume, Stereo Balance and Tone controls • Twin 4"x6" speakers and "in-depth" cabinet design for crisp highs and deep bass others can't match • Safe, "shockproof" operation • Plays on any 120 v. 60 hertz source • 45 rpm adapter spindle • Preassembled, pressed wood cabinet covered in handsome avocado green and ivory polyethylene with red speaker grilles • Builds easily in just 3 to 4 hours

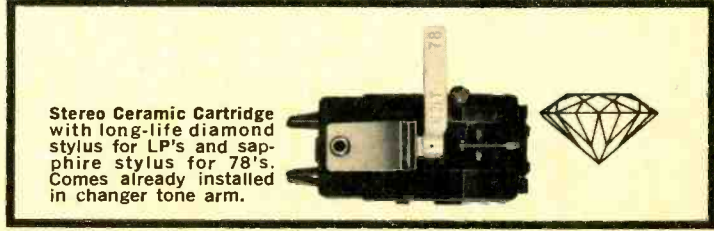
RUNS COOL AND COLLECTED with an 8-transistor amplifier that delivers up to 1½ watts per channel through 4" x 6" speaker. There are 3 separate, front-panel controls . . . volume control, a tone control to accent the "highs" or "lows," and a balance control for equal sound levels. The automatic changer plays all sizes, all speeds—stereo or mono, then shuts itself off automatically. And the ceramic cartridge features dual styli . . . diamond for LP's, sapphire for 78's.

Kit GD-107, 29 lbs. **\$54.95**
no money dn

GD-107 SPECIFICATIONS—CHANGER: Type, Maestro Model 52-93. Speeds, 16, 33½, 45, and 78 RPM. Record Sizes: 7", 10", and 12". Cartridge: Stereo ceramic. Stylus; 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **AMPLIFIER:** Power output, 3 watts, 1½ watts per channel EIA music power. Frequency response; ±5 dB 100 Hz to 10 kHz. Equalization; RIAA. Transistors and Diodes; 4 2N3393, 2 2N2430, 2 2N2431, 1 silicon diode. Speakers; 2 4" x 6", 25 ohm voice coils. Controls; volume, tone, and balance. **GENERAL: Dimensions;** 15" H x 8½" D x 25¼" W. Power requirements; 120 V, 60 Hz AC, 15 watts.



GD-107
\$54.95



Stereo Ceramic Cartridge with long-life diamond stylus for LP's and sapphire stylus for 78's. Comes already installed in changer tone arm.

 **PORTABLE LISTENING HOBBY**



Quality Portables For AM, FM, & Shortwave

A New Heathkit AM-FM Solid-State Portable . . .

Performance That Others Can't Match

- 12 transistor, 7 diode circuit for peak performance • Pre-aligned AM-FM front end like those used in Heath high fidelity tuners • 3 IF stages on FM for amazing 5 uV sensitivity • Big 4" x 6" oval speaker for lifelike sound • Easier tuning slide-rule dial • Tone Control • Built-in AM rod antenna • Telescoping whip antenna for FM • Automatic Frequency Control on FM • Amplified AGC on AM • Built-in external earphone jack and earphone • Rich brown simulated leather case • Circuit board construction for fast, easy assembly • Optional converter/charger

EVERYTHING YOU COULD ASK FOR IN A PORTABLE . . . light-weight, rugged, reliable performance . . . that's what you get from the GR-17. AM or FM at the flick of a switch, anywhere, anytime . . . and what reception! The big 1/2" diameter ferrite rod antenna pulls in AM stations that other portables can't get and the three tuned AM transformers and amplified AGC provide clear, stable listening. The FM section features a collapsible 34" whip antenna, three IF stages and 5 uV sensitivity for sharp, accurate FM reception over distances not possible even with other full-size portables. And the AFC keeps that station locked in for pleasurable drift-free listening.

HEATH ENGINEERS CARE ABOUT SOUND. The audio output to

the big 4" x 6" speaker is 350 milliwatts—enough to fill your campsite or your room at home. And a common problem of other portables has been eliminated too, as the batteries go, so does your sound. Not with this one—a Zener diode biased IF strip keeps the gain constant down to minimum usable voltage. Won't eat its own weight in batteries every week either . . . runs 200-300 hours on six "D" cells (not supplied). Batteries last longer with the optional charger/converter.

EASY TO OWN, EASY TO BUILD. The GR-17's low price and high quality components make it an outstanding value, and the all solid-state, circuit board construction combined with the famous Heathkit manual makes this portable easy and fun to build. Order one now, for the greatest sound around.

Kit GR-17, 5 lbs., no money dn., \$43.95
Model GRA-43-1, Converter/Charger for 117 v. 60 Hz AC, 1 lb. \$6.95

GR-17 SPECIFICATIONS—AM SECTION: Tuning Range: 535 kHz-1620 kHz. **Intermediate frequency (IF):** 455 kHz. **Sensitivity:** 200 microvolts per meter for 20 dB signal-to-noise ratio. **FM SECTION: Tuning range:** 88-108 MHz. **Intermediate frequency (IF):** 10.7 MHz. **Sensitivity:** Better than 5 microvolts for 30 dB quieting. **GENERAL: Speaker:** 4" x 6" oval, permanent magnet, 16 ohm voice coil. **Audio output:** 350 mW. **Batteries:** Six 1 1/2 volt "D" cells (not supplied). **Approximate battery life:** 200 to 300 hours at normal listening levels. **Current drain:** Idling current; AM—approximately 15 mA. FM—approximately 18 mA. Normal listening level; AM—approximately 22 mA. FM—approximately 25 mA. Full volume; AM and FM—approximately 70 mA. **Dimensions:** 8 3/4" W x 6 3/4" H x 4" D. **Net weight:** 4 3/4 lbs. (with batteries).

B Deluxe 6-Transistor AM Portable . . .

Bold, Crisp Sound You Can't Get From Miniatures

- 6 silicon transistor, 2 diode circuit • Large 4" x 6" permanent magnet oval speaker for "big-set" sound • Easy-to-read slide-rule dial • "Thumb-touch" controls • Vernier tuning • Tuned RF stage & double-tuned I.F. stage for greater sensitivity & selectivity • Big 1/2" diameter built-in rod antenna for distant station reception • Handsome black simulated leather case • Fast, single circuit board construction

MAKES DISTANT STATIONS SOUND LOCAL . . . makes everything sound better. Goes where you go to keep you posted on the latest news, weather, ball scores . . . entertains with music. Its push-pull audio output stage puts out a husky 250 milliwatts for a clean, robust sound . . . even when battery voltage runs low. Its big 1/2" diameter ferrite rod antenna picks up stations miniatures can't get. Has a tuned

RF stage with 3-gang tuning capacitor and double-tuned IF stage for extra sensitivity and selectivity.

COSTS ONLY 1/10th AS MUCH AS MINIATURES TO OPERATE! Uses 6 long-lasting, inexpensive size "D" flashlight batteries (not included) . . . protected against corrosion by a plastic holder.

MAKES A HANDSOME COMPANION with its black simulated leather case, chrome-finished frame and anodized aluminum grille. You'll find station tuning quick and easy . . . with two "thumb-touch" controls and a slide-rule dial. Easy to carry, too. Build in 4-6 hours.

Kit GR-24, 5 lbs. \$28.25

GR-24 SPECIFICATIONS—Tuning range: 535-1620 kHz. **IF frequency:** 455 kHz. **Sensitivity:** 50 uv/m for 10 dB signal-to-noise ratio at 50 mw output. **Audio output:** 250 mw @ 10% distortion. **Speaker:** 4" x 6" oval permanent magnet type. **Batteries:** 6 "D" flashlight cells. **Current drain:** No signal: 11 ma; 50 mw audio output: 41 ma. **Dimensions:** 3 3/4" D x 8 3/4" W x 7" H (overall).

C Heathkit Deluxe 10-Band AM/FM/Shortwave Transistor Portable . . . Handsome, Versatile, Powerful

- 10 bands tune Longwave, Standard Broadcast, FM and 2 MHz—22.5 MHz Shortwave Bands—listen to ships at sea, "ham" radio operators, marine & aircraft reports and hundreds of exciting foreign stations • 16 transistors, 6 diodes and 44 factory assembled, pretuned circuits for easy, enjoyable construction • Takes only about 10 hours to build • Two separate AM & FM tuners and IF strips • Two built-in antennas—a large ferrite rod conveniently housed in the handle for AM & Longwave, and a 5' telescoping whip for FM & Shortwave • Battery saver switch cuts current drain up to 35% • Lighted, rotating tuning dial • Logging scale helps relocate unknown frequencies • Four simple controls for tuning, volume, tone, AFC and band switching • Audio output circuit delivers husky 500 milliwatts into the 4" x 6" oval speaker for solid, room filling sound • Earphone & built-in jack for private listening • Deluxe styled in jet black extruded aluminum front & back panels, walnut-finished vinyl covered end pieces and chrome plated trim • Both panels hinged for easy access—magnetic latches • Inexpensive battery power • Optional converter/charger available—float charges batteries while running on 117 VAC house current • Time zone map & "Listener's Guide" included

LISTEN IN ON THE WORLD . . . WITH THE GR-43A. Ten bands let you hear AM, the clear bright music on FM or the fascinating sounds of an action-filled world on the shortwave bands. The all solid-state circuitry and built-in antennas for AM/Longwave and FM/Shortwave pull in stations from across the city or around the world with equal clarity. The 16-transistor, 6-diode circuit goes together easily on three circuit boards in about ten hours, and to make assembly even more enjoyable, there are 44 factory assembled & tuned circuits. Start tuning in on the world . . . with the handsome, portable GR-43A.

Kit GR-43A, 19 lbs. . . no money dn. \$159.95
Model GRA-43-1, Converter/Charger for 117 v. 60 Hz AC, 1 lb. \$6.95

GR-43A SPECIFICATIONS—AM SECTION: Tuning range: Longwave—150-400 kHz. Broadcast—550-1600 kHz. Shortwave—2-4 MHz; 4-9 MHz; 31 M—9.2-10.2 MHz; 25 M—11.2-12.4 MHz; 19 M—14.5-16.1 MHz; 16 M—16.8-18.8 MHz; 13 M—20.2-22.4 MHz. **Sensitivity:** At external antenna input for a 10 dB signal-plus-noise to noise ratio. Long Wave—12 uv; Broadcast—10 uv; 2-4 MHz—5 uv; 4-9 MHz—3 uv; 31 M—3 uv; 25 M—2 uv; 19 M—2 uv; 16 M—2 uv; 13 M—2 uv. **Intermediate frequency (IF):** 455 kHz. **FM SECTION: Tuning range:** 88-108 MHz. **Sensitivity:** 1 1/2 uv for 20 dB of quieting; 2 uv for 30 dB of quieting; 3 uv for 40 dB of quieting. **Intermediate frequency (IF):** 10.7 MHz. **GENERAL: Audio output:** Normal: 500 mw; Battery Saver: 150 mw. **Speaker:** 4" x 6" oval; permanent magnet; 3.2 ohm voice coil. **Batteries:** 6 size D cells, 1 size C cell. (not supplied). **Dimensions:** 13 1/2" W x 5 1/4" D x 10 1/4" H including handle.

D Discover The Fun Of Kit-Building

With The GR-151B Solid-State AM Portable . . .

- 6 transistor, 3 diode circuit for cool, instant operation, and long, dependable life • Large 4" x 6" permanent magnet speaker insures crystal-clear tone • Rugged simulated tan leather case • Prealigned coil and I.F. transformers insure top performance • Fast, stable circuit board construction

DELIVERS A BIG-SET SOUND from its large 4" x 6" speaker. A 6 transistor, 3 diode superhet circuit provides extra power and range . . . a built-in ferrite rod antenna picks up distant stations with ease . . . and its smart tan leather-type case will stand up under rugged wear. Makes an ideal gift for any occasion . . . if you can resist keeping it for yourself.

Kit GR-151B, 5 lbs. \$19.95



New Heathkit GR-78 Tunes From 190 kHz to 30 MHz In Six Bands . . . Solid-State Design . . . Rechargeable Nickel-Cadmium Battery Operation For Portable Convenience

• Receives from 190 kHz to 30 MHz in 6 switch-selected bands • Advanced circuit design using 11 transistors, 5 FET's and 7 diodes provides excellent stability and sensitivity • Four ceramic IF filters give sharp selectivity and eliminate IF alignment forever • Double conversion superhet circuit above 18 MHz for excellent image rejection • Built-in 500 kHz crystal calibrator • Bandspread tuning can be calibrated for either amateur radio or shortwave broadcast bands • Relative signal strength meter • Switchable Automatic Noise Limiter • Switchable Automatic Volume Control • Switch-selected AM, CW or SSB tuning • Receive/Standby switch and receiver muting connection for ham operation • External antenna jack • Headphone jack • Spring-loaded dial light switch limits current drain • Operates from built-in rechargeable nickel-cadmium battery • Charges from 120 VAC or 12 to 15 VDC with internal charging circuit • 240 VAC wiring option • Modular construction uses plug-in Switchboards® and wiring harness for fast, enjoyable assembly • Handsome Heathkit styling in durable charcoal wrinkle finish with gray, black & chrome accents

A Highly Versatile General Coverage Receiver . . . for Shortwave Listeners who appreciate solid tuning . . . for hams who want a standby receiver they can depend on . . . for travelers and the "portable people" who want a radio that's ready to go when they are. The new Heathkit GR-78 fills all these needs and many more—here's why.

190 kHz to 30 MHz Coverage In Six Switch-Selected Bands . . . hear intriguing foreign broadcasts, ships at sea, ham operators and your own local AM stations at the turn of a knob. The Bandspread Tuning makes it easy to separate closely spaced stations and it can be calibrated for either the shortwave broadcast or amateur bands. Select either AM or CW/SSB reception at a touch of the rocker-type switch. The switchable Automatic Noise Limiter cuts out annoying noise & static and makes your station easier to listen to, and to keep volume constant there's a switchable Automatic Volume Control. The SWL's will like the built-in Relative Signal Strength meter and external antenna connection, and hams will appreciate the receive/standby switch, muting

connection, headphone jack and built-in 500 kHz crystal calibrator. For the "portable people" there's 300 milliwatts of sound—enough for any beach party or rec room . . . and portable convenience—runs on its own rechargeable nickel-cadmium battery with built-in charger and has a built-in carrying handle and whip antenna. And the sharp Heath low profile styling in charcoal wrinkle finish has black, gray & chrome accents.

Advanced Solid-State Design And Easy Assembly. The new GR-78 incorporates modern Field Effect Transistors to give it exceptional stability and sensitivity and contribute to its remarkable performance. Four ceramic IF filters deliver sharp selectivity and eliminate IF alignment forever. Four of the six circuit boards are the modular plug-in Switchboards® to speed the assembly and make maintenance easier. For the finest general coverage receiver you can buy, pick the GR-78 now. **Kit GR-78, 14 lbs. \$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*:** AM: (Low End): Band A, 10 µV; Band B, C & E 3 µV; Band D, 2 µV; Band F, 2 µV. (High End): Band A, 3 µV; Band B, 1 µV; Band C, 0.6 µV; Band D & F, 0.3 µV; Band E, 0.2 µV; CW/SSB: (Low End): Band A, 6 µV; Band B, D & F, 2 µV; Band C, 1.5 µV; Band E, 3 µV; (High End): Band A, 2 µV; Band B, 0.7 µV; Band C, 0.4 µV; Band D, E & F, 0.2 µV. **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. **Panel controls:** Bandspread; AF Gain-Off; RF Gain; Panel light; RCV-STBY; CAL; AM-CW/SSB; AVC-MVC; ANL-OFF; Bandswitch; Main Tuning. **Rear panel:** Muting; External Antenna; 12 VDC Receptacle; 120 VAC Receptacle; Phone Jack. **Overall size:** 6 1/4" H x 11 1/2" W x 9" D. **Net weight:** 11 lbs. *Signal level for 10 dB signal + noise/noise ratio.

Heathkit SB-310 Professional Shortwave Receiver . . . Tunes Six Shortwave Broadcast Bands . . . Three Amateur Bands . . . CB Band . . . Optional SBA-310-3 Kit Replaces 11 Meter CB With 13 & 15 Meter Bands

• Covers six shortwave broadcast bands (49, 41, 31, 25, 19 & 16 meters) . . . 80, 40 & 20 meters amateur bands . . . 11 meter CB • 5 kHz crystal filter included for AM, SSB and CW listening • 10-tube circuit • Crystal-controlled front-end for same rate tuning on all bands • 1 kHz dial calibrations—100 kHz per dial revolution • Separate RF and AF gain controls • Pre-built & Aligned LMO • Product detector for SSB • Automatic Noise Limiter • Calibrated "S" meter • Headphone jack • "Hi-Fi" output for connection to external audio system • "Sub-pack" packaging for fast, easy assembly • World Radio-TV handbook included • Optional SBA-310-3 Kit adds 13 & 15 Meter Coverage in place of 11 meter CB

Our Finest Shortwave Receiver . . . The Superb SB-310! Designed for the "professional" shortwave listener who wants a communications-quality receiver without a budget-breaking price. Features selectivity that slices stations down to the last kHz . . . no more guessing station identities . . . you return to the *exact* frequency every time. And it boasts sensitivity that pulls in weak stations with amazing clarity and sensitivity . . . makes DX-ing a breeze. Your experienced hand will appreciate the "solid" feel of the non-backlash vernier dial. And it's rock-stable . . . no annoying drift.

10 Switch-Selected Bands. 49, 41, 31, 25, 19 and 16 meter shortwave . . . 11 meter CB . . . and 80, 40 & 20 meter amateur bands. And to receive AM, CW and SSB with crystal-clear fidelity, a 5 kHz crystal filter is included. For optimum CW and switch-selected upper and lower sideband coverage, optional narrower bandwidth filters are also available—see price lines.

Famous Heathkit SB-Series Features Insure Finest Listening. Features like a crystal-controlled front-end for same tuning rate on all bands . . . true linear tuning with 1 kHz dial calibrations (100 kHz per dial revolution) and a bandspread equal to 10 feet per MHz . . . tuning dial to knob ratio of approximately 4 to 1 . . . built-in switch-selected automatic noise limiter . . . prebuilt & aligned Linear Master Oscillator (LMO) for good "solid" tuning

. . . separate RF and AF gain controls . . . calibrated "S" meter . . . switch-selected mode switch . . . separate diode (AM) and product (SSB, CW) detectors . . . built-in 100 kHz crystal calibrator . . . headphone jack for DX-ing. "Sub-pack" packaging for easy 20-hour kit assembly . . . modern "low-boy" styling. Requires only a VTVM for final alignment. For a matching speaker, choose the SB-600. For the finest shortwave listening, choose the SB-310 receiver.

- Kit SB-310 (less speaker), 24 lbs. **\$259.00**
- Kit SB-600, 8 ohms, 6" x 9" speaker, 5 lbs. **\$19.95**
- SBA-301-2, Optional deluxe CW filter for optimum CW (400 Hz @ 6 db down; 2 kHz max. @ 60 db down). 1 lb. **\$21.95**
- SBA-310-1, Optional SSB filter plus crystal for switch selection of USB & LSB (2.1 kHz @ 6 db down; 7 kHz max. @ 60 db down). 1 lb. **\$23.95**
- SBA-310-2, Optional deluxe SSB filter plus crystal for switch-selection of USB & LSB (2.1 kHz @ 6 db down; 5 kHz max. @ 60 db down). Provides best SSB selectivity for maximum adjacent signal rejection. 1 lb. **\$39.95**
- SBA-310-3, optional 13 & 15 M modification kit, 1 lb. **\$9.95**

SB-310 SPECIFICATIONS—Frequency range (Megahertz): 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, 26.9 to 27.4. **Intermediate frequency (IF):** 3.395 MHz. **Frequency stability:** Less than 100 Hz drift per hr. after 20 min. warmup under normal ambient conditions. Less than 100 Hz drift for ±10% line voltage variation. **Sensitivity:** Less than 0.3 µV for 10 db signal-plus-noise to noise ratio for SSB operation. **Selectivity:** AM, 5.0 kHz @ 6 db down; 15 kHz max. @ 60 db down (crystal filter supplied). CW, 400 Hz @ 6 db down; 2.0 kHz max. @ 60 db down (crystal filter available as an accessory). SSB, 2.1 kHz @ 6 db down; 5.0 kHz max. @ 60 db down (deluxe SSB crystal filter available as an accessory), or 2.4 kHz @ 6 db down; 7.0 kHz max. @ 60 db down (regular SSB crystal filter available as an accessory). **Image rejection:** 60 dB or better. **Dial accuracy:** ELECTRICAL: Within 400 Hz on all bands, after calibration at nearest 100 kHz point. VISUAL: Within 200 Hz on all bands. **Calibration:** Every 100 kHz. **Dial backlash:** No more than 50 Hz. **Antenna input impedance:** 50 ohms, nominal unbalanced. **Audio output impedance:** "Hi-Fi" cathode follower output, 1000 ohms. Matching speaker, 8 ohms. Matching headphones, high impedance. **Audio output power:** 1 watt with less than 8% distortion. **Power requirements:** 105-125 or 210-250 V AC, 50-60 Hz, 50 watts. **Cabinet dimensions:** 14 1/4" W x 6 1/4" H x 13 3/8" D. **Net weight:** 17 lbs. **External connections:** Front panel: phones. Rear Apron: antenna, mute 500 ohm audio output, speaker 8 ohm, hi-fi output, 1 spare socket, line cord socket. **Tube complement:** 11 tubes (14 functions). **Diode complement:** 8.

With Heathkit® Shortwave Receivers



Kit GR-78
\$129⁹⁵



Standby Ham Receiver



SWL Receiver



SB-310
\$259⁰⁰
(less speaker)



GR-81
\$29⁹⁵

Low Cost Starter Kit For Beginning SWL's

- Covers 150 kHz to 18 MHz in 4 bands • Transformer operated power supply • Built-in speaker & headphone jack, metal cabinet • Easy to build—from parts to listening in 6 hours

Brings You International Stations . . . amateur radio bands . . . marine & aircraft broadcasts . . . government stations . . . and entertaining AM listening. Simple 3-tube regenerative circuit assembles easily in 6 hours . . . an ideal project for the beginner in radio and electronics! Features provisions for long & short antennas, "shock-free" transformer-operated power supply, headphone jack for private listening, built-in speaker, front-panel controls and green & beige metal cabinet.

Kit GR-81, 12 lbs. \$29.95

GR-81 SPECIFICATIONS—Frequency coverage: 140 kHz to 18 MHz on four bands. Tube complement: 12A7 Detector/1st Audio, 50C5 Audio Output, 35W4 Rectifier. Power requirements: 105-125 V 50/60 Hz only, 30 watts. Fused. Controls: Main tuning (calibrated), Bandspread, Bandswitch, Regeneration, on/off volume, phone jack. Dimensions: 10" W x 7" H x 7" D.



GR-54
\$89⁹⁵

What In The World's Going On? You'll Know

For the Seasoned SWL . . . Deluxe 5-Band Shortwave Receiver . . . Includes Long-wire Antenna

SHORT WAVE RECEPTION GUIDE

BAND	FREQUENCY	TIME	ZONE
80 M	3.5 MHz	All day	U.S. Amateur & Marine
49 M	6 MHz	Evening	Latin America and Europe
40 M	7 MHz	Late afternoon, Evening	Europe
40 M	7 MHz	Morning	U. S. Amateur
31 M	9 MHz	Morning	Asia and Australia
31 M	9 MHz	Afternoon	Europe and Africa
31 M	9 MHz	Evening	Europe and Latin America
25 M	11 MHz	Morning	Asia and Australia
25 M	11 MHz	Evening	Latin America
20 M	14 MHz	Late morning, Afternoon	U.S. & Foreign, Amateur
19 M	15 MHz	Late morning, Afternoon	Europe and North America
19 M	15 MHz	Evening	North and Latin America
16 M	17 MHz	Afternoon	Europe
13 M	17 MHz	All day	U.S.
13 M	17 MHz	Evening	South America
13 M	20 MHz	Afternoon	Europe
13 M	20 MHz	All day	U.S.
11 M	20 MHz	Evening	South America
10 M	27 MHz	All day	Local Citizen's Band
10 M	28 MHz	Morning	Europe
10 M	28 MHz	All day	Central America & U.S. Amateur
		Evening	Asia

These reception conditions prevail in the spring and fall of the year. They are also subject to varying atmospheric conditions, sun spot activities, and to some extent, weather conditions. In the winter, reception generally will be best on the lower frequency bands. In summer, reception will be better on higher frequency bands.

- 5 bands . . . 3 shortwave bands covers 2 MHz to 30 MHz, plus 550 kHz to 1550 kHz AM broadcast band & 180 kHz to 420 kHz aeronautical & radio navigation band • Tuned RF stage for greater sensitivity • Crystal filter for sharp selectivity • Separate product detector for efficient SSB & CW reception • Switchable upper or lower sideband mode position • Built-in relative signal strength indicator • Electrical bandspread tuning • 6 tube-6 diode superhet circuit plus 2 silicon diode rectifiers • Built-in code practice monitor plus code key jack • Automatic noise limiter, automatic volume control & antenna trimmer control • "Velvet-touch" 16 revolution main tuning • Built-in 4" x 6" PM speaker • Built-in AM antenna plus external antenna terminals • Standard jack accepts headphones or external speaker • Safe transformer-operated power supply • Sleek low-boy styling—Charcoal gray metal cabinet • Antenna included

COMPARE TO SETS COSTING \$150 AND MORE. You'll find that the GR-54 has features found only on more expensive receivers. Features that will be especially appreciated by the avid shortwave listener. Features like a tuned RF stage for added amplification and image rejection . . . a crystal filter for extra-sharp selectivity . . . a diode detector for AM plus a separate product detector for efficient SSB and CW listening. And to eliminate "trial & error" SSB listening there's a switchable BFO control. Just switch to either upper or lower sideband positions, and adjust the bandspread tuning control. There's even a 180 kHz to 420 kHz band for tuning aeronautical weather broadcasts.

CONTROLS FOR ALL FUNCTIONS. Like the separate level controls for audio volume and RF amplifier gain, an antenna trimmer for peak reception, band selector switch, bandspread tuning knob & scale, mode selector, main tuning, automatic noise limiter,

and automatic volume control for steady volume while tuning.

CONSIDERING HAM RADIO? With the GR-54 you can take that important step toward this fascinating hobby by developing your CW keying technique with the code practice monitor. Just connect your key to the terminals on the back, tune in a weak AM station, turn on the BFO, and listen to your code through the built-in 4"x6" speaker. **BUILD IN ONLY 12 TO 15 HOURS.** You even assemble and align the "front-end" with or without instruments . . . and get factory-built results. Thanks to a unique bandswitch assembly, you align the coils with the alignment tool provided, and use the signal strength meter for adjustment readings. Doing the front-end assembly yourself is one of the reasons we can offer this unit at such a low price.

As for appearance, judge for yourself. Wouldn't it make a handsome addition to your den or living room?

Kit GR-54, 25 lbs. . . no money dn . . . \$89.95

GR-54 SPECIFICATIONS—Frequency Coverage: Band A 180 kHz to 420 kHz; Band B 550 kHz to 1550 kHz; Band C 2 MHz to 5 MHz; Band D 5 MHz to 12.5 MHz; Band E 12.5 MHz to 30 MHz. **Sensitivity:** AM: Band A 1.6 uv; Band B 8 uv; Band C 1 uv; Band D 1.2 uv; Band E 0.6 uv. **SSB/CW:** Band A 0.7 uv; Band C 0.4 uv; Band D 0.5 uv; Band E 4 uv. **Signal Level** for 10 db, signal plus noise to noise ratio. **Selectivity:** Crystal filter; 3 kHz minimum at -6 db; 7.5 kHz maximum at -20 db. **Intermediate frequency:** 1682 kHz. **Antenna Input impedance:** 50 ohms nominal-phone connector. **Power requirements:** 120/240 volts 50/60 Hz AC, 45 watts. **Controls:** Bandspread, AF Gain/off-on switch; RF gain; Ant. trim; Mode switch; Band switch; Main tuning; AVC switch; ANL switch; OPR switch; Meter adjust. **Audio output impedance:** 8 ohms nominal. **Meter:** Indicates relative signal strength. **Speaker:** Built-in 4" x 6" permanent magnet. **Standard jack:** Accepts 8 ohms ext. speaker, or headphones (50 ohm to 10 K ohm). **Dimensions:** 14 1/2" W x 6-5/16" H x 10-15/16" D.



GD-396
\$4⁵⁰

Superex Shortwave Headphones

FOR DX-ING, PRIVATE LISTENING! Use with all Heathkit shortwave (except GR-43) and amateur radio receivers. Features single lead convenience, vinyl-clad headband (1 1/8" wide), dual coils, Alnico V magnets, 2000 ohm impedance. Not a kit.
GD-396, 1 lb. \$4.50



With A Heathkit® Shortwave Radio



Journey To Exciting New Worlds With This Low Cost 4-Band Receiver



SWL Station Guide

LATEST WORLD RADIO TV HANDBOOK! Lists AM, FM, TV and Shortwave stations . . . includes call signs, frequencies, transmitter power, address for QSL cards, program details, broadcast times, etc. 300 pages.

GDP-315, 2 lbs. \$6.95



Long-Wire Shortwave Antenna

INCLUDES 75' LONG-WIRE ANTENNA, 30' lead-in wire, porcelain insulators and grounding hardware with complete instructions. Use with any shortwave receiver. Included with GR-54.

GRA-72, 2 lbs. \$2.00

GD-125
\$14.95



Improve Shortwave Reception With a "Q" Multiplier!

COMPACT "LOW-BOY" STYLING! Attractive charcoal cabinet with gray front panel . . . matches GR-64 SWL receiver (above). Ideal for use with GR-64 or similar receivers with IF circuits from 450 to 500 kHz. Creates extra-sharp selectivity through an effective "Q" of 4000, and provides a notch for adjacent signal attenuation. Includes built-in 120/240 VAC power supply. Kit GD-125, 3 lbs. \$14.95

- 4 bands—3 shortwave bands cover 1 MHz to 30 MHz, plus 550 kHz to 1620 kHz AM broadcast band • Built-in 5" permanent magnet speaker for a big, bold sound • Illuminated 7" slide-rule dial with extra logging scale • Easy to read lighted bandspread tuning dial for precise station selection • Relative signal strength indicator aids pin-point station tuning • 4-tube superhet circuit plus two silicon diode rectifiers • Variable BFO control for code transmissions • Built-in external antenna connections • Built-in AM rod antenna • Fast, simple circuit board construction assures stability • Handsome "low-boy" styling—charcoal gray cabinet, black front panel, and green & white band markings • Headphone jack for private listening

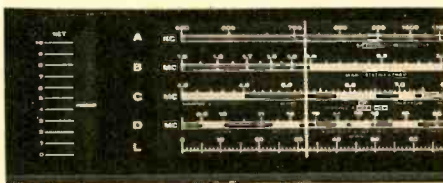
HEAR LIVE BROADCASTS FROM AROUND THE GLOBE . . . Hong Kong, Peru, France, Australia, England, Canada . . . hundreds of foreign countries. Listen to the drama of ship-to-shore broadcasts. Wonder at the machine-gun pace of a CW operator piercing the airwaves with an urgent message. Pick up the Voice of America, Radio Moscow, famous foreign radio personalities. Enjoy the "round-table" conversations of ham operators. Then come home again, and enjoy local news, weather and sports on the popular AM band. Hear it all . . . and much more . . . on this one, low cost receiver.

HIGH PERFORMANCE FEATURES. A high voltage, transformer-operated power supply insures peak receiver efficiency. A BFO control "unscrambles" code transmissions. A "velvet-touch" 16 revolution tuning knob provides smooth, accurate station selection. And electrical bandspread tuning separates frequencies to pin-point close-together stations. There's even a headphone jack for private listening. The back panel has terminals for an external antenna, a Q-multiplier input and a noise limiter on/off switch. And a relative signal strength meter aids tuning.

MODERN "LOW-BOY" STYLING. Includes a charcoal gray metal cabinet with black front panel and green and white band markings. Makes an ideal present for any youngster. Kit assembly is easy, too . . . with fast circuit board construction . . . finish in 8 to 10 hours.

Kit GR-64, 15 lbs. . . no money dn. \$42.50

GR-64 SPECIFICATIONS—Frequency range: 550 kHz to 30 MHz in four bands. Controls: General coverage tuning, Bandspread tuning, Bandswitch, Noise Limiter—ON/OFF, Phone-Standby-CW switch, BFO control. Audio Gain, AC-ON/OFF, Headphone jack, Q-multiplier input. Power requirements: 120/240 VAC, 50/60 Hz, 30 watts. Dimensions: 13 1/2" W x 6" H x 9" D.



Lighted Bandspread And Dial Calibration . . . 7" slide-rule dial covers 550 kHz to 30 MHz in four bands. Bandspread tuning helps pinpoint frequencies.

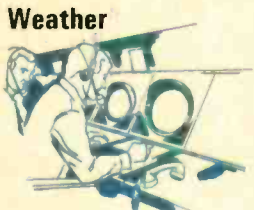


High Voltage, Transformer-Operated Power Supply. Provides peak receiver efficiency, safe "shock-free" operation.

All Kits On These 2 Pages Are Mailable



Police



Weather



Fire



Kit GR-88
\$49⁹⁵

Neat front panel layout . . . whip antenna, volume, squelch & tuning controls plus crystal switch. Note the convenient handle that doubles as a stand.



Kit GR-98
\$49⁹⁵

Heathkit GR-88 Solid-State VHF-FM Monitor Receiver . . . Tunes Police, Fire, Marine & Weather Broadcasts

- Receives both narrow and wide band FM signals • 152-174 MHz coverage
- Highly sensitive • Very selective • Six-to-one vernier tuning control plus single channel crystal control • Noise-operated squelch control quiets background noise • All solid-state construction for long, trouble-free life
- Portable—battery operated • Convenient carrying handle doubles as a stand • Built-in whip antenna • Built-in external antenna jack for fixed station installation • Accessory AC power supply available • Rugged brown leatherette case • Easy assembly with a factory assembled and aligned tuner and circuit board construction

Full Coverage With Maximum Operating Convenience . . . the new GR-88 receives both narrow & wide band FM from 152-174 MHz and the 6-to-1 vernier tuning control means easier tuning of those closely spaced stations. For anyone who wants to monitor one channel almost continuously, there's a one-channel crystal control feature . . . plug in the crystal of your choice, tune to the approximate frequency and flip the front panel switch to "Xtal"—you're on channel immediately. An adjustable squelch control quiets background noise, and the 40 kHz selectivity, 2.0 uV sensitivity and built-in whip antenna make weak stations sound local. External antenna jack, easy conversion from fixed to portable use and handsome, rugged styling make the GR-88 your best value in a VHF-FM monitor. Order yours now.

Kit GR-88, 5 lbs., no money dn. . . . \$49.95

GR-88 SPECIFICATIONS—Tuning range: 152-174 MHz. Antenna input: 50-75 ohms. Sensitivity: 2.0 uV or less for 20 dB quieting. IF Frequency: 10.7 MHz. IF Selectivity: ±40 kHz @ 6 dB down. Image rejection: 40dB 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 volt "C" cells, not supplied. Dimensions: 8 3/4" W x 7 1/2" H x 3 1/2" D. Net weight: 3 lbs. without batteries.

Heathkit GR-98 Solid-State Aircraft Monitor Receiver . . . 108-136 MHz Coverage

- Tunes the complete Aircraft Band—108 to 136 MHz • All solid-state circuitry • Completely portable • Built-in whip antenna • Handsomely styled, rugged brown leatherette case with tilt-stand/carrying handle combination
- Excellent sensitivity and selectivity • Vernier tuning • Adjustable squelch control • Single channel crystal-control feature • Built-in external antenna jack • Accessory AC power supply available • Fast, enjoyable assembly with circuit board construction and factory assembled and aligned tuner

Complete Aircraft Band Coverage . . . tunes from 108-136 MHz . . . lets you hear private, commercial aircraft and control towers. Vernier tuning makes it easy to sort out closely spaced stations, and the adjustable squelch control eliminates background noise. For tower and ground crew personnel, pilots and their families etc., there's a single-channel crystal control feature that puts you on frequency just by tuning to the approximate frequency and flipping the front panel switch to "Xtal". 1.5 uV sensitivity, 40 kHz selectivity and built-in whip antenna make pulling in those distant stations easy. External antenna jack, tilt-stand/handle and optional AC power supply make conversion to fixed station use easy. Send for your GR-98 now.

Kit GR-98, 5 lbs., no money dn. . . . \$49.95

GR-98 SPECIFICATIONS—Tuning range: 108-136 MHz. Antenna input: 50 to 75 ohms. Sensitivity: 1.5 uV 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 milliwatts at less than 10% distortion. Speakers: 3" round, 24 ohm, 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 volt size "C" cells (not included). Dimensions: 8 3/4" W x 7 1/2" H x 3 1/2" D. Net weight: 3 lbs. without batteries.

Add This Low Cost AC Power Supply To Your Monitor Receiver

For permanent fixed station installation of your new GR-88 or GR-98, you'll want this convenient AC power supply. Goes together fast and mounts right inside the case of your Monitor Receiver. Save your batteries for portable operation . . . order your GRA-88-1 now.

Kit GRA-88-1, 1 lb. . . . \$7.95

Kit GRA-88-1
\$7⁹⁵



Heathkit® Metal Locator

OUTDOOR HOBBIES



Kit GD-48
\$69⁹⁵
 (less battery)

Heathkit GD-48 Solid-State Metal Locator
 . . . Dozens Of Uses Around The Home . . .
**Construction Sites . . . For Treasure Hunters,
 Beachcombers, Hobbyists**

- All solid-state circuitry with 8 transistors and 1 diode for long trouble-free life, low current drain and rugged reliability • Convenient battery operation for complete portability • Very light weight—weighs just 3 lbs. • High sensitivity from the induction balance circuitry • Adjustable sensitivity control
- Built-in speaker and amplifier audibly signals presence of buried metal
- Front panel meter gives visual indication • Built-in headphone jack allows use of headphones to eliminate background noise • Telescoping shaft and swivel search head permit adjustment for varying surface conditions • Solid construction • Simple circuit board assembly with the famous Heathkit manual

Versatile, Professional Metal Detecting At Lowest Possible Cost. The new Heathkit GD-48 is designed to perform sensitive, accurate metal detecting functions comparable with other detectors selling for two to three times the cost. Whether you are an amateur weekend hobbyist or a professional treasure hunter, the new GD-48 will fit your requirements perfectly. Here's why . . .

Advanced Solid-State Design. Heath engineers chose to use a type of detection circuitry not usually found in low and medium-priced metal locators . . . the induction balance system. Many locators use a beat frequency system, and the user must depend on hearing a frequency change in the constant tone he hears. With the induction balance system used in the GD-48, there is no tone until a metal object enters the field of the search coils and upsets the balance between them. This unbalanced condition in the search coils results in a small signal which is amplified and coupled to the built-in speaker, producing a loud, piercing tone which increases or decreases in volume as you get closer or farther away from the metal object. The built-in front panel meter gives a more accurate indication when the application requires a higher sensitivity. And the front panel headphone jack lets you eliminate bothersome background noise through the use of earphones. The handy off/on-sensitivity control lets you adjust the GD-48 to detect very small objects or larger



Hobbyists



Professional



At Home

ones at varying depths. The Heathkit Metal Locator is so sensitive that it will detect a metal object as small as a dime buried up to half a foot underground, and has a maximum range of about six feet for larger pieces. The all solid-state circuitry contributes to the very light weight and portability of the GD-48 and gives reliable operation with minimum battery drain. Typical battery life is about 80 hours.

Easy And Fun To Use. The new Heathkit GD-48 Metal Locator is very simple to use . . . just turn it on, adjust the height of the search head and walk slowly over the ground you wish to check. It's designed to have virtually perfect balance in your hand. Dozens of uses . . . hunting through ghost towns or abandoned farms . . . finding buried treasure or Indian relics . . . looking for lost jewelry and coins on beaches . . . locating old property markers . . . buried pipes and conduits.

Simple To Build. The circuit goes together on just two small circuit boards, and point to point wiring is kept to a minimum. The search head comes with both coils already accurately aligned and cemented in place. After construction there are only two quick adjustments to make . . . and you're ready. Construction time is around 6-8 hours. Been trying to find a good locator? Look no further . . . the new Heathkit GD-48 is here. Order yours now.

- Kit GD-48, Metal Locator only, 4 lbs., no money dn. **\$69.95**
- GDA-48-1, 9 volt battery, 1 lb. **\$1.30**
- GD-396, Headphones, 2000 ohm (Superex), 1 lb. **\$4.50**

GD-48 SPECIFICATIONS—Sensitivity: Detects dime-size metal at a depth of 6". Detects quarter-size piece at a depth of 7½". Detects 5" square aluminum at a depth of 20". **Maximum metal depth for detection:** 6 feet. **Frequency:** Search oscillator, 100 kHz; modulation, 650 Hz. **Dimensions:** Coil housing, 10½"; height (extended), 36"; height (collapsed), 26". **Power source:** 9 volt battery (NEDA #1602 or equivalent) (not supplied). **Battery life:** 80 hours approx. **Net weight:** 3 lbs.

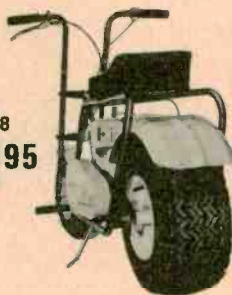
Open Your Heath Account — No Money Down Up To \$300 — Up To 18 Months To Pay — See Order Blank For Details.

Go Places... On The Heathkit "Boonie-Bike"... The All-Season Trail And Snow Bike



Kit GT-18
\$199⁹⁵

(less ski,
horn, lights
& special muffler)



New Horn & Lights Accessory Kit Makes The "Boonie-Bike" Even More Versatile

The new Horn & Lights Kit is the fast, low cost way to add the extra safety & convenience to your GT-18 that night travel demands.

A powerful 5 3/4" sealed-beam headlamp in a chrome housing has both High & Low beams for safety, and On/Off and High/Low switches are mounted on top of the lamp for easy accessibility. The 3 3/4" taillight/stoptlight in a chrome housing means maximum visibility and uses a standard automotive bulb for easy replacement. The 4" chrome plated horn is triggered by a button on the handlebars. All cables are held neatly in place by a spiral wrap. The battery holder matches the GT-18, & details in the manual aid in procuring the recommended battery locally. An inexpensive Charger Kit is also available to keep your battery in peak operating condition always.

Kit GTA-18-2, Horn & Lights Accessory,
10 lbs. (less battery) **\$29.95**
Assembled GTA-18-3 Battery Charger,
3 lbs. **\$6.95**



New Spark-Arresting Muffler For Safe Travel In Wooded Areas

For those planning to travel in forests and wooded areas, Heath now offers this U.S. Department of Agriculture approved Spark-Arresting Muffler. Specifically designed for 5 HP Briggs & Stratton engines, the muffler is chrome plated & easy to install. Play it safe... don't take a chance on starting a forest fire... order yours now.

GTA-18-4, 4 lbs. **\$9.95**

Discover The Exciting World Of The Boondocks . . . With The Amazing Heathkit "Boonie-Bike"

• More versatile than other trail bikes at twice the price • Rugged, reliable transportation over virtually any kind of terrain • Famous Briggs & Stratton 5 Hp, 4 cycle engine • 2 speed, chain drive transmission • Automatic centrifugal clutch • Hand operated Bendix rear brake for greater stopping ability • Welded tubular steel frame • Front and rear steel fenders for safe, dry riding • Twist grip throttle • Spring loaded front suspension • Tubeless tires—giant 18x8.50x8 rear tire for amazing traction • Extra large cushioned seat • Optional Ski Accessory quickly converts the bike for use on snow • Add the optional horn & lights kit for even greater versatility • Semi-kit for easy one-evening assembly with the famous Heathkit manual

Welcome To The World Of The Boondocks . . . remote backwoods areas . . . rough country roads . . . isolated lakes and streams . . . and a world more. It's all waiting for you when you have the unique Heathkit GT-18. It's larger & huskier than a mini-bike . . . smaller, lighter & substantially more powerful than a motorcycle-type trail bike . . . and it has the agility, stability, traction and sheer guts of a mountain goat. It's the new "Boonie-Bike" and it's the only way to go when the going gets rough.

Solid, Heavy-Duty Construction. Mounted on the rigid tubular steel frame is a 5 HP, 4-cycle Briggs & Stratton engine that gives extraordinary power to the 116 lb. "Boonie-Bike". The 3-quart tank lets you run up to 60 miles before refueling, and 6 3/4" of ground clearance and a welded steel skid pan give worry-free running over territory that would ruin many other bikes. **The Widest Wheel In Trail Bikes.** Both tires come premounted & inflated and are top quality name brand tubeless types. The giant rear tire is the big secret behind the GT-18's fantastic performance . . . it's a whopping 18 x 8.50 x 8" . . . and it delivers real traction in mud, sand, gravel, snow, tall weeds and rough underbrush. For even greater versatility, add the ski that snaps on in seconds without tools and lets you go in snow . . . and the new horn & lights and recharging kits that permit night use.

Go! A flip of the shift lever mounted in front of the large, comfortable seat and you're on the way. Select low gear for hills and rough country, high for relatively flat terrain and speeds up to 30 mph. The big 5" Bendix drum-type rear brake is there when you need it for safe, sure stops. **Family Fun.** Take the GT-18 camping, hunting . . . to the summer cottage or mountain retreat. It fits easily in car trunks. So easy to ride anyone can master it with a few minutes instruction. So much fun you'll be looking for reasons to ride it. Order yours now . . . and go places.

Kit GT-18, Trail Bike, 140 lbs., no money dn. **\$199.95**
Model GTA-18-1, Ski Accessory, 12 lbs. **\$19.95**
Kit GTA-18-2, Horn & Lights Accessory, 10 lbs.,
(less battery) **\$29.95**
Model GTA-18-3, Battery Charger Accessory, 3 lbs. **\$6.95**

GT-18 SPECIFICATIONS—Engine: Briggs & Stratton 5 h.p. 4 cycle. Clutch: Centrifugal. Crankcase oil capacity: 1 1/4 pt. Transmission: 2 speed. Weight: Net 116 lbs. Speed range: Hi 0-30 mph, Lo 0-15 mph. Gear Ratio: Lo Speed 15 to 1; Hi Speed 7.5 to 1. Load capacity: 400 lbs. Gas tank capacity: 3 Qt. (U.S.) Gas consumption: Approx. 2 hrs. per tank (approx. 60 miles). Approx. 80 mpg. Brake: Bendix 5" internal expanding. Front suspension: Spring loaded front suspension. Rear tire: Size 18x8.50-8; Tubeless 18" diam., 8.5 width, 8" rim. Front tire size: 5.30x4.50-6. Color: Blue & White. Dimensions: Length (overall): 59", with ski, 70". Width (at handlebars): 24 1/2". Hgt.: (at handlebars): 35 1/2", (at seat): 25 1/2". Wheel base: 42". Ground clearance: 6 3/4".



For R/C Modeling at Low Cost, Build The Heathkit GD-19 5-Channel Digital Proportional System Only \$219.95

Smaller, Lighter Receiver Kraft Control Sticks
3 Choices of Bands . . . 27, 53, or 72 MHz
Only \$219.95 with four servos

- Powerful transmitter has preassembled, prealigned RF circuitry • New Kraft control sticks with thumb lever coarse adjustment plus Trim Controls that do not change stick centering • Easily reversed servo travel • Switch-locked transmitter prevents accidental turn-on • Collapsible antenna • New flat-pack rechargeable nickel-cadmium transmitter & receiver batteries • New 2.3 oz. miniature receiver features space-age ceramic filters in the IF for high selectivity, extra reliability and no IF alignment ever • Unaffected by noise or temperature variation • Exclusive Heath space and weight-saving military-type terminal blocks • High reliability variable-capacitor servos for extended life • Two linear outputs (one with vertical tabs) plus rotary • Choice of five operating frequencies in each of three bands—27, 53 or 72 MHz • Buy the complete system kit (supplied with a soldering iron) or buy components separately—new receiver is fully compatible with previous Heathkit GD-47 R/C System

Control You Can Count On . . . that's the new Heathkit GD-19. The new slim line transmitter case has a high output, preassembled & prealigned RF circuit for a sure signal. New Kraft sticks deliver precise control and servo travel and operational mode are easily changed. Built-in circuit charges both receiver & transmitter flat-pack nickel-cadmium batteries with one cord. The new miniaturized receiver in a virtually indestructible nylon case fits almost anywhere, and three ceramic IF filters increase selectivity and eliminate IF alignment. A double-tuned front end, RF amplifier and dual AGC combine to give interference free reception too. Four versatile, high reliability variable capacitor servos, exclusive Heath terminal blocks, 16 oz. flying weight, choice of bands and fast, enjoyable assembly round out the picture of the most advanced R/C system ever produced. Experience a new high in R/C modeling . . . order your GD-19 now.

System Kit GD-19, all system parts; specify freq. desired; 11 lbs. \$219.95
Kit GDA-19-1, transmitter, battery, charging cord; specify freq., 5 lbs. \$86.50
Kit GDA-19-2, receiver only; specify freq., 1 lb. \$49.95
Kit GDA-19-3, receiver battery pack only, 1 lb. \$9.95
Kit GDA-19-4, one servo only, 1 lb. \$21.50

Model GDP-59, 1 lb., Soldering Iron . . . \$7.95

**SMALLER LIGHTER
RECEIVER**



The new Heathkit GDA-19-2 receiver combines famous Heath engineering with extremely small size & weight to deliver unmatched performance & reliability. First, there's ceramic filters for increased selectivity, extra reliability and elimination of alignment forever. Then there's the very small size—the measurements speak for themselves . . . you can put this receiver places others won't fit. No extra weight to carry either—flying weight of receiver and new flat pack battery is only 6.2 oz. Highly sensitive, immune to noise, and unaffected by temperature changes too. Housed in a virtually indestructible, impact resistant nylon case. And the new GDA-19-2 is available on five frequencies in any one of three different bands.

GD-19 SPECIFICATIONS—TRANSMITTER—RF Carrier frequency: 1 channel, crystal controlled on 27, 53 or 72 MHz bands (see list below). **Frequency stability:** Within $\pm .005\%$ on 27 MHz, $\pm .002\%$ on 53 and 72 MHz bands. **Temperature:** 0° to $+160^\circ$ F. **RF Output circuit:** Pi-network. **Modulation:** On-off carrier keying. **Approximate current drain:** 100mA on all bands. **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 120 V. power line. **Dimensions:** $6\frac{1}{4}''$ H x $6\frac{1}{4}''$ W x $2\text{-}7\frac{1}{16}''$ D. **Net weight:** $2\frac{3}{4}$ lbs. with battery. **RECEIVER—Received frequency:** 1 channel, crystal controlled on 27, 53 or 72 MHz bands (see list below). **Frequency stability:** $.003\%$ on 27 MHz, $.002\%$ on 53 and 72 MHz bands. **Temperature range:** 0° to $+160^\circ$ F. **Sensitivity:** 5 μ V or better. **Selectivity:** 6 dB down at ± 4.0 kHz, 30 dB down at ± 9.0 kHz. **Approximate current drain:** 6 mA. **Intermediate frequency:** 453 kHz. **Power supply:** Nickel-cadmium battery (Heath GDA-19-3 battery pack); +2.4 V and 4.8 V outputs. Rechargeable simultaneously with the transmitter batteries at 35 to 40 mA from 120 V. power line. **Controls:** On-Off switch. **Dimensions:** $2\frac{5}{32}''$ H x $2''$ W x $2\text{-}7\frac{1}{32}''$ D. **Net receiver weight:** 2.3 oz. **RECEIVER BATTERY—Type:** Rechargeable nickel-cadmium. **Voltage:** +2.4 V and +4.8 V outputs. **Current rating:** 500 mA hours. **Dimensions:** $\frac{5}{8}''$ H x $2\frac{1}{2}''$ W x $2\frac{1}{8}''$ D. **Net weight:** 3.9 oz. **SERVO—Input signal:** Pulse: 1-2 milliseconds wide; 4 volts peak-to-peak. **Thrust:** 3.25 lbs. minimum. **Transit time for $\frac{3}{8}''$ travel:** 0.7 seconds. **Linear output travel:** $\frac{5}{8}''$ end-to-end. **Rotary output travel:** Over 100° rotation (end-to-end). **Temperature range:** 0° to $+160^\circ$ F. **Power (Battery) requirements:** Idling current, 2 mA; stall current, 350 mA; no-load running current, 80 mA typical. **Total gear train backlash:** Less than .002". **Mechanical output:** (1) rotary arm, (1) rotary wheel, (2) linear arms. **Position accuracy:** $\pm 0.5\%$. **Dimensions:** $1\frac{3}{4}''$ H x $1\frac{5}{16}''$ W x $3\text{-}1\frac{1}{16}''$ L. (Length includes mounting ears, height includes linear arms). **Net weight:** 2.5 oz. **GENERAL SPECIFICATIONS—Complete Airborne System Weight:** 16.6 oz. (1 receiver, 1 receiver battery, 1 switch, & 4 servos). **Total Flying Time:** 4 hours minimum (with batteries fully charged). **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)—72.080, 72.240, 72.400, 72.960 & 75.640. (NOTE: An amateur radio operator's license is required for 6 meter operation. Class C Citizen's band license required for 27 and 72 MHz.)



GD-69
\$19.95

New Heathkit GD-69 "Thumb Tach" . . . Measures RPM On Any Model Engine

- All solid-state design • Minimum current drain gives long battery life • 0-5000 RPM range for idle adjustments . . . 0-25,000 RPM for top end readings • Zener diode regulated meter circuit and precision switching resistors keep "Thumb Tach" accurate even with aging battery • Dozens of uses—needle valve adjustments . . . differences in glow plug performance . . . select gear trains & props . . . indicates power loss from aging or worn engine . . . peak engine for changes in RPM you can't hear

The New Heathkit GD-69 is the most versatile, valuable R/C accessory you can own. Raise your engine performance now . . . order your new "Thumb Tach".

Kit GD-69, 1 lb. \$19.95

GD-69 SPECIFICATIONS—Range: 0-5000 RPM & 0-25,000 RPM. **Light intensity:** Dusk to bright sunlight. **Pulse ratio:** 1, 2, or 3 input pulses per RPM. **Battery requirements:** 9 V. NEDA #1604 (not supplied). **Finish:** Blue wrinkle. **Accuracy:** 3%. **Dimensions:** $1\text{-}17\frac{3}{32}''$ H x $2\frac{1}{2}''$ W x $5\frac{1}{4}''$ L. **Temperature range:** 0° to 160° F. **Net weight:** 10 oz. less battery.

Join America's



The Lowest Cost R/C Rig ... Heathkit® GD-57 3-Channels with 2 Servos ... Only \$129.95

• Powerful transmitter has preassembled, prealigned RF circuitry • Trim Controls don't change stick centering • Switch-locked transmitter prevents accidental turn-on • Collapsible antenna • New flat-pack rechargeable nickel-cadmium transmitter and receiver batteries • New 2 oz. miniature receiver features space-age ceramic filters in the IF for greater selectivity, extra reliability and elimination of IF alignment • Immune to noise and temperature variation • Exclusive Heath space and weight saving military-type connectors • High reliability variable-capacitor servos • Easily reversed servo travel • Two linear outputs (one with vertical tabs) plus rotary • Choice of five operating frequencies in each of three bands ... 27, 53 or 72 MHz • Buy the complete system kit (supplied with a soldering iron) or buy components separately ... new receiver fully compatible with Heath GD-19 and GD-47 Systems • The ideal system for the Heath GD-101 R/C Car • 72 MHz for planes only

The Most Value And Performance Ever Offered In A 3-Channel Rig. The new Heathkit GD-57 is specifically designed and engineered to deliver the most R/C capability you can get anywhere in a 3-channel rig ... and at an unbelievably low cost. As a starter kit for the newcomer to R/C modeling it has no equal ... as a high performance rig for cars, boats, small planes or gliders the new GD-57 is alone in the field. Here's why ...

Powerful Transmitter gives you a full 500 mW input for out-of-sight range, and the factory assembled and aligned RF section speeds assembly and insures top performance. Positive control is assured because trim controls leave sticks always centered, and for operating convenience, servo travel can be reversed quickly and easily at the transmitter. For extra safety at crowded meets and races, the transmitter is switch-locked.

New Miniature Receiver measures a compact 1-5/32" H x 1-3/16" W x 2-9/32" L ... fits practically anywhere. And for added safety, it's housed in a virtually indestructible nylon case. Advanced ceramic filters in the IF strip deliver very sharp selectivity and never need alignment. A double-tuned front end, RF amplifier and dual AGC combine to give interference-free reception and high immunity to noise. The temperature compensated circuitry assures you of being able to run your model under any weather conditions. The new flat pack receiver battery is a high reliability rechargeable nickel-cadmium type, and gives you up to four full hours of R/C fun on a single charge.

Complete With 2 High Resolution Variable Capacitor Servos. Each servo has two linear outputs (one with vertical tabs) and a rotary output for positive, fast control of virtually any model function. The small, compact size makes installation schemes almost endless, and the servos are housed in a tough nylon case built to take rugged service.

The Entire System For Only \$129.95! The lowest cost 3-channel rig on the market. The GD-57 comes complete with everything you need to put your model under radio control ... transmitter & receiver including

rechargeable nickel-cadmium batteries for both, two servos, all plugs, connectors, cables, a charging cord ... even a soldering iron to assemble the kit. And the famous Heathkit manual makes it easy ... clear, simple instructions guide you every step, and giant fold-out pictorials show location of every single part. Total assembly time is only about 22 hours. **On The Road, In The Water Or Air ...** the new Heathkit GD-57 is the 3-channel rig to go with. Order yours now.

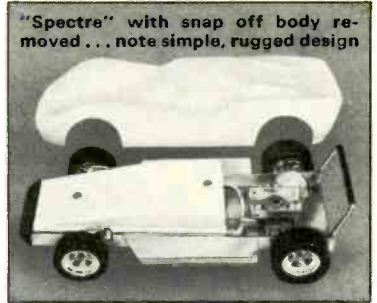
- System Kit GD-57**, (includes transmitter, receiver, batteries, 2 servos, charging cord and switches and free soldering iron) all system parts; specify freq. (Note: 72 MHz for R/C planes only) 11 lbs. **\$129.95**
Kit GDA-57-1, transmitter, battery, charging cord; specify freq. desired, 5 lbs. **\$54.95**
Kit GDA-57-2, receiver only, specify freq., 1 lb. **\$34.95**
Kit GDA-19-3, receiver battery pack only, 1 lb. **\$9.95**
Kit GDA-19-4, one servo only, 1 lb. **\$21.50**

GDA-57-1 SPECIFICATIONS—TRANSMITTER—RF Carrier frequency: One frequency, crystal-controlled on 27 MHz, 53 MHz or 72 MHz. **Frequency stability:** Within $\pm 0.005\%$ on 27 MHz band. Within $\pm 0.002\%$ on 53 and 72 MHz bands. **Operating temperature:** 0 degrees to +160 degrees F. **RF Input power:** 500 mW. **Modulation:** On-Off carrier keying. **Approximate current drain:** 100 mA on all bands. **Controls:** Three channels; two with trim. **Power supply:** Internal 9.6 volt nickel-cadmium battery. Rechargeable simultaneously with receiver battery at 40 to 50 mA from 120 volt power line. **Dimensions:** 6 1/2" H x 6 1/8" W x 2-1/16" D. **Net weight, with battery:** 2 lbs.

GDA-57-2 SPECIFICATIONS—RECEIVER—RF Carrier frequency: One frequency crystal-controlled on 27 MHz, 53 MHz or 72 MHz. **Frequency stability:** 0.003% on 27 MHz band; 0.002% on 53 and 72 MHz bands. **Operating temperature range:** 0 degrees to +160 degrees F. **Sensitivity:** 5 μ V. **Selectivity:** 6 dB down at ± 4.0 kHz, 30 dB down at ± 9.0 kHz. **Approximate current drain:** 6 mA. **Intermediate frequency:** 453 kHz. **Power supply:** Heath GDA-19-3 Battery Pack. **Dimensions:** 1 1/8" H x 1-3/16" W x 2-7/32" L. **Net receiver weight:** 2.0 Oz. **Servo channels:** 3.

GDA-19-3 SPECIFICATIONS—RECEIVER BATTERY—Type: Nickel-cadmium. Rechargeable simultaneously with the transmitter battery at 40 to 50 mA from the 120 volt power line. **Voltage:** +2.4 V and +4.8 V outputs. **Current rating:** 500 mA hours. **Dimensions:** 3/8" H x 2 1/8" W x 2 1/8" D. **Net weight:** 3.9 oz. **GDA-19-4 SPECIFICATIONS—SERVO—Input signal:** Pulse: 1 to 2 milliseconds wide; 4 volts peak-to-peak. **Thrust:** 3 lbs. minimum. **Transit time for 3/4" travel:** 0.7 seconds. **Linear Output travel:** 3/8" end-to-end, 1/2" nominal. **Rotary output travel:** 0 degrees to +100 degrees. **Power (battery) requirements:** Idling Current: 2 mA. **Stall Current:** 350 mA. **No Load Running Current:** 80 mA typical. **Total gear train backlash:** Less than 0.002". **Mechanical output:** 1-rotary arm., 1-rotary wheel, 2-linear arms. **Mechanical output accuracy:** $\pm 0.5\%$. **Dimensions:** 1 3/8" H x 15/16" W x 3-1/16" L. (Length includes mounting ears. Height includes linear arms.) **Net weight:** 2.5 oz. **GENERAL—Complete system weight:** 12.0 oz. (1 Receiver, 1 Receiver Battery, 1 switch and 2 Servos). **Total operating time (between charges):** Four hours minimum (with batteries fully charged). **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)—72.080, 72.240, 72.400, 72.560 & 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.]

Newest R/C Hobby



"Spectre" with snap off body removed... note simple, rugged design

Heathkit® "Spectre" R/C Car... Only \$49.95

- The only really complete R/C car kit on the market • Sharp 1/8-scale GT-styled body made from virtually indestructible high impact plastic
- Accepts any .15 to .23 cubic inch R/C engine and any proportional R/C system
- Rugged chrome-plated steel chassis • Independent front wheel suspension with adjustable toe-in and caster for truly high performance handling
- Adjustable centrifugal clutch • Live rear axle • Specially formulated rubber tires for greater traction and road-holding
- Only 2 servos required to operate steering, brake and throttle • Chrome-plated high impact nylon "mag" type wheels
- Runs at scale speeds up to 200 mph • "Sidewinder"-type engine mounting • Exclusive Heath molded plastic radio equipment case fits inside body to keep R/C gear clean and safe
- Kit comes with body, chassis, 4 oz. fuel tank and tubing, radio equipment case and protective foam pads, wheels & tires, gears, axles, all servo linkages and mounting tape, all necessary hardware, decals, numbers and comprehensive manual

Join The Most Exciting Hobby In America... building and racing radio-controlled Grand Prix cars. Feel the tense excitement as a dozen cars slam into the "s" turns of a Le Mans or Riverside styled course... the gripping near-panic as you thread your car through the pack around the tight turns and hills of a Mille Miglia or Watkins Glen course... the surge of excitement at racing your car at scale speeds up to 200 mph. Thousands of experienced R/C modelers and novices alike share this kind of thrill-packed experience and you can too... with the new Heathkit "Spectre" radio-controlled car.

Designed To Win! The new Heathkit R/C car is a newcomer to the market, but it is no stranger on a race course. The "Spectre" has been extensively tested and refined under actual race conditions, and can be credited with starting the trend toward "sidewinder" designs. In a recent midwest meet, a "Spectre" prototype running the Heath GD-57 R/C System and GDA-101-1 Veco .19 engine took four out of five 1st places... the only top spot it missed was a "standing still" event, the Con-course, because it didn't have a finished body on it.

On The Move, Nothing Can Touch It. The design of the "Spectre" is unique among R/C cars. The one piece chrome plated steel chassis gives the car a true frame, resulting in tracking and handling like a real Grand Prix machine. Adjustable caster and toe-in allow you to trim the car for optimum performance. Specially formulated rubber wheels and inde-

pendent front suspension give the "Spectre" traction to take curves at speeds that would put other cars off the track. The 5.5:1 gearing has been selected to provide maximum torque at all speeds.

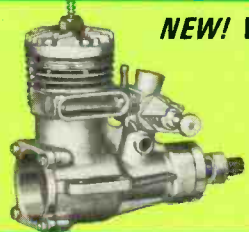
A Simple, Common-Sense Design. The new "Spectre" will not only outperform all other R/C cars on the market... it will outlast them as well. Simple, common-sense design is evident throughout... a virtually indestructible high-impact plastic body that snaps on instead of bolting on... simple coil springs for suspension in place of fragile piano wire "A" arms or torsion bars... a dirtproof, oilproof box inside the car to protect your R/C gear... tires that actually lock onto the "mag"-type wheels... husky, straightforward gear design instead of a fragile shift-able transmission... locking hardware used throughout to insure that the car stays together. The design is simple... reliable... and it works — better than any other R/C car made.

The Only Truly Complete Car Kit Available. The "Spectre" includes everything you need for a complete car except the engine and R/C gear... body, chassis, wheels & tires, fuel tank & tubing, radio equipment case & protective foam, gears, axles, servo linkages & mounting tape, all hardware, decals, numbers and a comprehensive manual. Body is of high-impact white Cyclocac®, suitable for the finish of your choice.

Get On The Track With A Winner... the new Heathkit "Spectre". Order yours now.

Kit GD-101, R/C car only, 12 lbs. \$49.95
Assembled GDA-101-1, Veco .19 R/C engine, 1 lb. \$19.95

GD-101 SPECIFICATIONS — GENERAL — Chassis: 16 gauge chrome plated steel. **Body:** GT-Sports, 1/8 scale, high-impact plastic. **Drive:** Gear driven, live rear axle. **Gear ratio:** 5.5:1. **Clutch:** 1" centrifugal type, adjustable. **Brake:** Neoprene-cork shoe. **Suspension:** Front coil spring. **Front tire:** 3" x 1.125". **Rear tire:** 3.250" x 1.375". **Weight:** 6 lbs. 6 oz. (approximately) without radio equipment. **Engine Requirement:** .15 to .23 cubic inches (2.5 to 3.5 cubic centimeters) displacement, R/C throttle glow plug model airplane engine. **Fuel tank capacity:** 4 ounces. **Approximate running time (1 tank of fuel):** 15 to 30 minutes, depending on average running speed. **Speed:** 0 to 25 mph. (0 to 200 mph scale). **CAR DIMENSIONS — Wheelbase:** 12". **Track (front):** 7 1/8". **Track (rear):** 7 1/4". **Length:** 19 1/4". **Height (body):** 5". **Width (body):** 8 7/8". **Ground clearance:** 3/8".



NEW! Veco .19 R/C Engine... The Ideal Power Plant For The New "Spectre"

Assembled
GDA-101-1
\$19.95

The New Veco .19 Engine is especially suited for the new Heathkit R/C Car and delivers maximum performance under all conditions. Two air mixture adjustments are provided for precise metering of fuel permitting reliable low speed idle, essential for R/C Car operation. Engine is supplied completely assembled with glow plug, throttle linkage is simple, light and neat for maximum installation versatility and easy maintenance.

Assembled GDA-101-1, 1 lb. \$19.95
GDA-101-1 SPECIFICATIONS — Bore: 0.634 in. **Stroke:** 0.633 in. **Displacement:** 0.199 cu. in. **Compression ratio:** 8:1. **Power:** 0.45 BHP @ 12,500 RPM. **Net weight:** 7 1/2 oz.

HEATH WORLDWIDE



UNITED STATES

For your convenience Heath Company offers two methods of purchasing in the United States.

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Direct factory purchase enables us to offer top quality at the lowest possible prices. All prices are Mail Order, Net F.O.B. Benton Harbor, Michigan and apply to United States and Possessions only. Prices herein effective August 15, 1970. All prices and specifications subject to change without notice.

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Complete display, demonstration, personal assistance and immediate delivery are available through Heathkit Electronic Centers. The local selling price includes freight from factory (not included in direct mail prices) plus a small amount to cover expenses of the local store operation.

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Phone: 414-873-8250

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Phone: 612-938-6371

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Phone: 215-288-0180

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Los Angeles area
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Atlanta, Georgia

San Francisco area
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• HEATH SERVICE

Regardless of what method you use to purchase, both Heath Company and Electronic Center personnel stand ready to give you any needed assistance in technical advice, parts replacement or service. You can be assured that any unit you purchase will give you years of pleasurable use.

OVERSEAS

wherever you are in the free world, Heath equipment sales and service are available nearby

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Benton Harbor, Mich gan 49022/Plant Location: St. Joseph, Michigan

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