

HEATHKIT®

1968

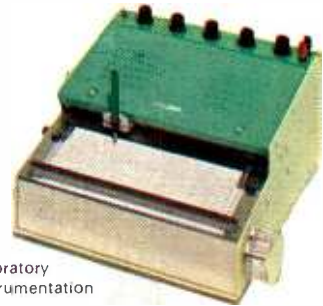
CATALOG 810/68R



shortwave radios



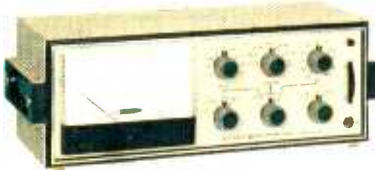
citizen's band radio



laboratory instrumentation



phonographs



test instruments



marine electronics



stereo/hi-fi



electronic organs



color television



music instrument amplifiers



photographic accessories



amateur radio

21st YEAR OF KIT LEADERSHIP

**OVER 300
ELECTRONIC KITS —
WORLD'S LARGEST SELECTION**



WELCOME TO THE WORLD OF HEATHKIT 1968

It is a pleasure to send you this new 1968 Heathkit catalog. It contains the complete line of Heathkit equipment...stereo/hi-fi, marine, amateur radio, educational, and test equipment, as well as those of more general interest such as color television, electronic organs, guitar amplifiers, portable TV's, radios, phonographs, shortwave, citizen's band 2-way radio, and model radio control.

Since 1947 we have been supplying kits to people who have a wide range of electronic experience, from novices who have never held a soldering iron in their hand to expert design engineers. The significant point is that we are confident that you, regardless of your experience, can successfully build a kit at home easily, quickly, with a minimum of effort and a maximum of savings and enjoyment.

The substantial savings...up to 50%...is only one of the reasons why people build kits. Kit building can be a hobby in itself that adds pleasure to your basic leisure hours' interest whether it be watching TV, listening to shortwave or good music. And, if you so desire, while building the kit you can learn the fundamentals of electronics or become familiar with the theory of such complex products as color television, just by reading the theory part of the manual.

If you would like additional technical information on any product, write for a schematic-specification sheet. For more general information on the hobby of kit-building, write for a copy of the "Kit-builder's Guide." They are yours for the asking. And if you have other questions or need guidance in which kit to choose, our staff of Technical Consultants is at your service.

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.

Why Do Millions Build Heathkit® Electronics?



Creative Fun And Unique Satisfaction

Building your own Heathkit provides a chance to create a useful, sophisticated product from your own effort . . . a chance to enjoy a fascinating hobby that's different from the everyday routine . . . a chance to have fun and relax—to forget daily problems. But the biggest thrill comes when you finish and turn it on. You experience that exhilarating sense of self-accomplishment . . . that feeling of personal victory when you've done something you doubted you could ever do.

Up to 50% Savings Over Factory-Built Versions

Besides the fun, building your own Heathkit is economical. It's like getting paid for the hours you spend enjoying your hobby. For example, when you build the TO-67 Transistor Organ, pg. 12 you "earn" as much as \$7 an hour when you consider the big savings.

A Finished Product With Superlative Performance

Over 300 years of accumulated kit engineering, the most experienced staff in the business, are brought to bear on design problems in all Heathkit product areas. And each product group has its own staff of engineering specialists who devote their entire efforts to bringing you the latest techniques and advances in the "state of the art".

In addition, each new kit design must survive several stages of rigid performance testing. These tests are your assurance that every Heathkit is "specification guaranteed". But don't take our word for it. Compare specifications. Read the reviews by respected electronics editors. Or ask any Heathkit owner . . . you'll find plenty of them around.

Direct Factory-To-You Delivery

Heath has an in-plant post office, plus a host of other reliable shipping services at its command to provide quick delivery right to your front door.

Liberal Credit Terms

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 \$25 to \$300 . . . 10% down and up to 18 months on orders over \$300 to \$500. See catalog order blank for details.

FREE Factory Consulting Service

Heath maintains a staff of expert technical correspondents to answer any question about selection, construction and use of your kit. And it costs you nothing. Just drop them a line. In addition, factory repair service facilities are at your command should you ever need it.

EXPORT MODELS AVAILABLE . . . on certain kits for 115/230 v. AC, 50-60 Hz operation. Watch for the "export" note below the price lines.

Retail Heathkit Electronic Centers

Equipped to serve you with a complete stock of Heathkit electronics, comprehensive service and parts facilities and famous-name accessories. Prices are slightly higher at stores to cover shipping charges and cost of local facilities.

Chicago, Illinois
3462-66 W. Devon Ave.
Phone: 583-3920
Denver, Colorado
2901 Sheridan Blvd.
Phone: 238-2348
Philadelphia, Pa.
6318 Roosevelt Blvd.
Phone: 288-0180
Cleveland, Ohio
5444 Pearl Road
Phone: 886-2590

Anaheim, California
330 E. Ball Road
Phone: 776-9420
Detroit, Michigan
18645 West 8 Mile Rd.
Phone: 535-6480
Rockville, Maryland
(Washington, D.C. area)
5542 Nicholson Lane
Phone: 942-4506

Los Angeles, California
2309 S. Flower Street
Phone: 749-0261
San Diego, California
1300 Market Street
Phone: 234-0293
New York, New York
35 W. 45th St.
Phone: 765-4590
Milwaukee, Wisconsin
5215 W. Fond du lac
Phone: 873-8250

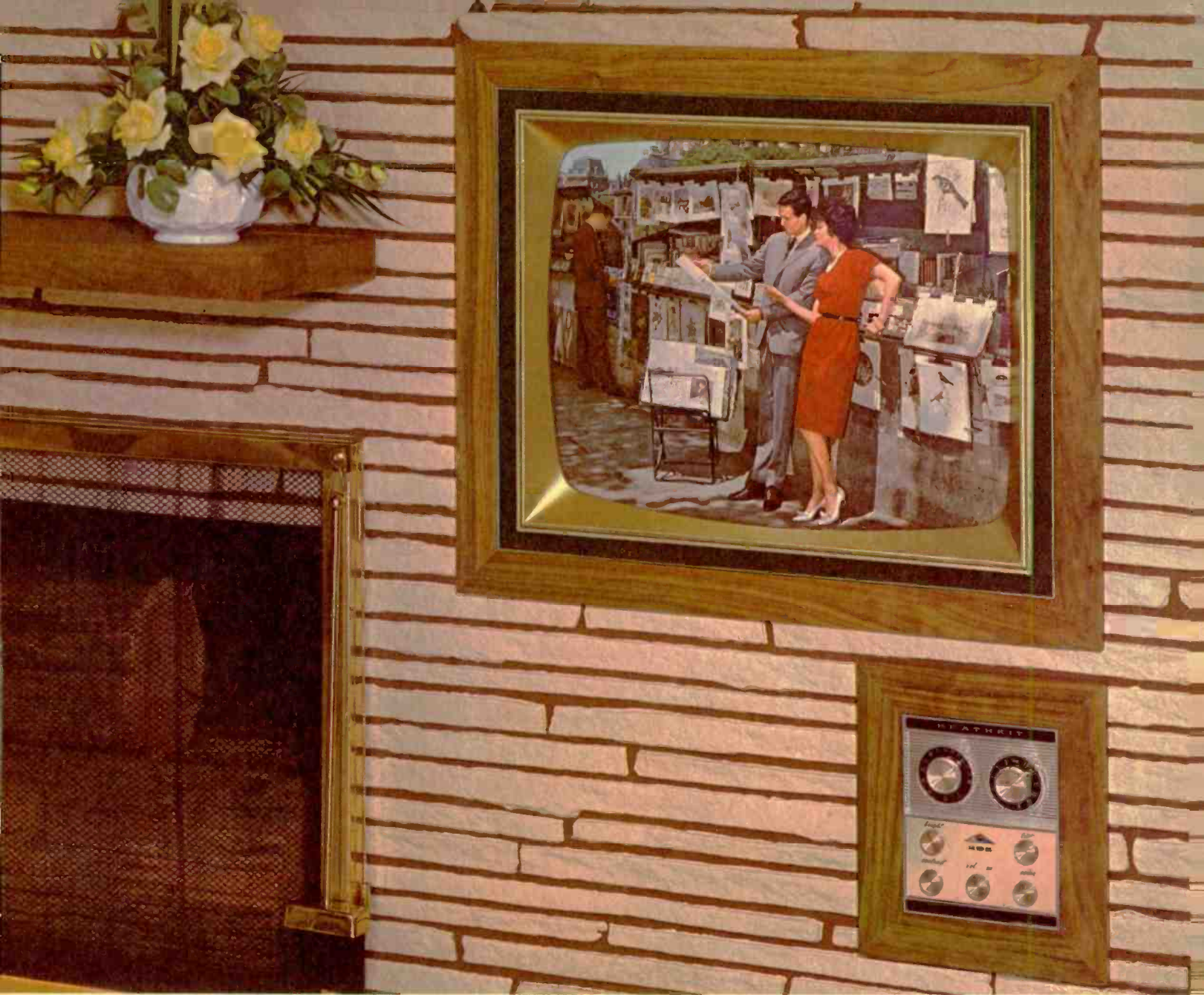
United Sound &
Television Co.
(three locations)
5036 Venice Blvd.
Los Angeles, California
Phone: 933-8141
&
2010 W. Lincoln Ave.
Anaheim, California
Phone: 535-2151
&
2218 E. Colorado Blvd.
Pasadena, California
Phone: 793-8141

Radio Electronics
374 Brannan Street
San Francisco, California
Phone: 392-0768
Southern Authorized
Factory Service
62 N.W. 27th Ave.
Miami, Florida
Phone: 635-5385

Park Armature Company
1218-30 Columbus Ave.
Boston, Mass.
Phone: 427-1950

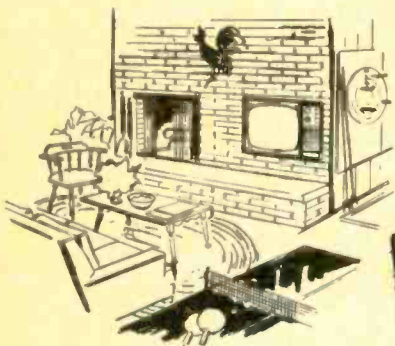
Scientific Radio-TV/Hi-Fi
4122 E. Madison St.
Seattle, Washington
Phone: 322-3215

All Heathkit Electronic Centers and Authorized Service Centers are units of Daystrom Products Corporation.



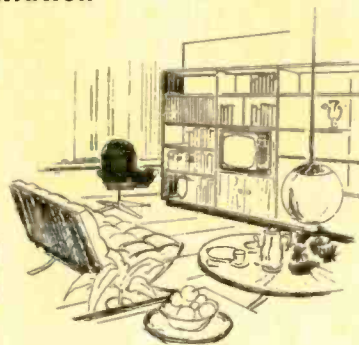
Deluxe Heathkit® "295" Color TV... \$479.95!

*Design Your Own
Custom Installation*



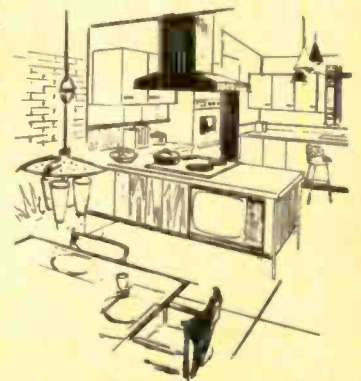
Recreation Room Wall

Close: Door



Book Shelves

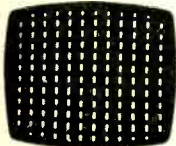
Kitchen-Dining Room
Pass-Thru Counter



Unique "State-Of-The-Art" Features Offer Hi-Fi Color And Sound . . . Choice Of Installation

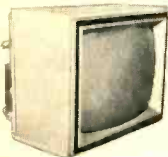
- Top quality American brand color tube with 295 sq. inch viewing area, and anti-glare safety glass • New improved phosphors for brighter, livelier colors • 27 tube, 10 diode, 1 transistor circuit • 25,000 volt regulated picture power • Automatic degaussing & mobile degaussing coil • Exclusive built-in 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 & long-life nickel silver 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 pre-built & aligned . . . build in 25 hours • Two VHF antenna inputs . . . 300 ohm & 75 ohm • Circuit breaker protection • 1-year warranty on picture tube, 90 days on all other parts • Tubes alone list over \$277

NOW ENJOY THE THRILLS AND DRAMA of the world of sports . . . your favorite TV shows . . . TV specials and spectaculars . . . even current news events, all in beautiful "true-to-life" color. See the vivid, bright colors of costumes and stage settings. Watch outdoor scenery come alive with all its breath-taking magnificence. See TV personalities as they actually look. See it all on the incomparable Heathkit "295" color TV. You enjoy brilliant, crystal-clear pictures with new improved phosphors for the industry's brightest, liveliest colors . . . clean, bold sound that will please the most discriminating ear . . . the same installation flexibility as a hi-fi component . . . plus the ability to adjust the viewing quality of the picture to what you like. You can't buy a better color TV. Here's why . . .



EXCLUSIVE FEATURES THAT CAN'T BE BOUGHT IN READY-MADE SETS AT ANY PRICE. Like built-in servicing aids, so you can perform the periodic convergence and color purity adjustments that are required on all color TV sets . . . without calling in a TV serviceman . . . without any technical skills or knowl-

edge. Just flip a switch on the built-in dot generator and a pattern appears on the screen. Simple step-by-step instructions and detailed color photos in the manual show you exactly what to look for, what to do and how to do it. Results? Beautifully clean and sharp color pictures day in and day out. And up to \$200 savings in service calls throughout the life of your set.



EXCLUSIVE HEATH MAGNA-SHIELD. This unique metal shield surrounds the entire picture tube to protect against stray magnetic fields and improve color purity. In addition, **Automatic Degaussing** "cleans" the picture everytime you turn the set on from a cold start. Also permits you to move the set about freely from room to room. The one-piece swing-out chassis speeds kit assembly, installation, and service.



CONVERGENCE CONTROL BOARD . . . for fast, easy dynamic convergence secondary adjustment anytime you decide they are needed. Mounts behind special "tilt-out" speaker grille section for easy access . . . no awkward reaching around the back of the set, or mirrors to set up.



UNIVERSAL MAIN CONTROL PANEL. Can be mounted at the bottom, top or right side of picture tube for more flexible in-wall installation.

YOUR CHOICE OF INSTALLATION. Mount in a wall, your own custom cabinet or Heath factory assembled and finished cabinets.



BUILD IN 25 HOURS! No special skills or knowledge needed. All critical circuits (VHF and UHF tuners, 3-stage IF assembly and high voltage power supply) are prebuilt, aligned and tested at the factory. The assembly manual guides you the rest of the way with simple, non-technical instructions and giant pictorials. You can't miss.

But Don't Take Our Word For It. Read What Experts And Owners Say About Heathkit Color TV—See Pg. 9!

Kit GR-295, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and special extended-range 6" x 9" speaker, 131 lbs. (REA or motor freight) . . . \$48 dn., as low as \$29 mo. . . . \$479.95

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. **Wall mounting:** 20" D x 21" H x 26" W inside. Control panel assembly, 6 1/2" W x 7 1/8" H x 7" D.

Heathkit—Pioneer And World Leader In Electronic Kits

Choose A Factory Assembled Cabinet



Contemporary Styled Walnut Cabinet \$62.95

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, no money dn., \$7 mo. . . . \$62.95



Deluxe Early American TV Cabinet \$99.95

Made of a special combination of veneers and solids . . . all beautifully finished in popular Salem-Maple. GR-295 speaker and convergence panel mount behind grille cloth on right side. Measures 19 1/4" D x 31" H x 36" W.

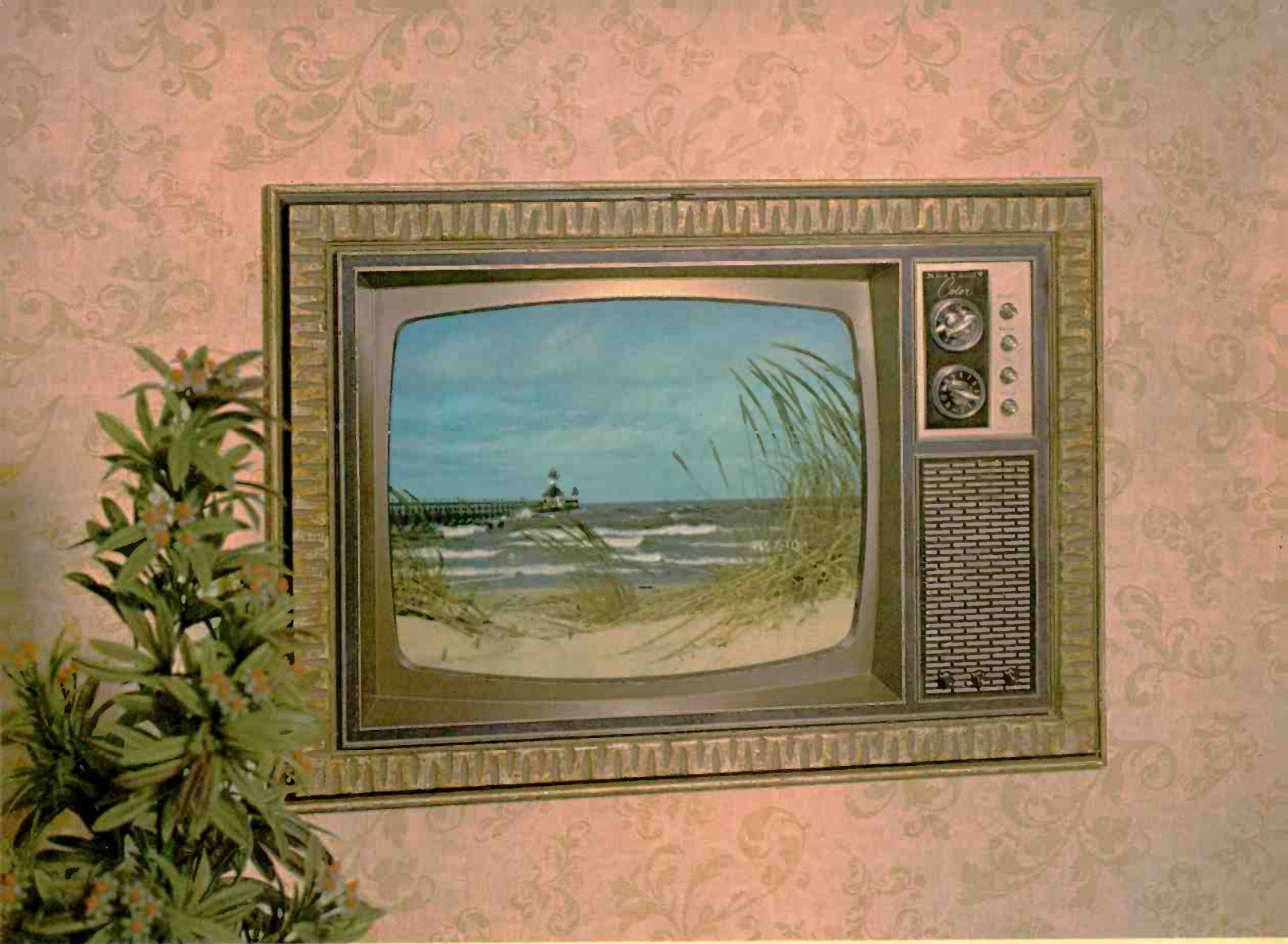
Assembled GRA-295-3, 67 lbs. . . Express or motor freight, no money dn., \$10 mo. . . . \$99.95



NEW! Mediterranean Oak Cabinet \$112.50

Factory assembled of selected furniture hardwoods, finished in luxurious oak; styled in newest Mediterranean motif. Statuary bronze trim handle. Overall dimensions 45 1/2" W x 20" D x 31" H.

Assembled GRA-295-4, 90 lbs. . . Express or motor freight, no money dn., \$11 mo. . . . \$112.50



Deluxe Heathkit® "227" Color TV...\$419.95!

Exciting Mediterranean Oak Cabinet... \$94.50

The exciting new styling sensation in fine cabinetry . . . Mediterranean. The design with a Spanish flair . . . striking, massive, handsome in any surroundings. The design that has received instant acceptance in Heathkit Color TV. Beautifully executed in selected hardwoods with a rich oak finish, accented by a sculptured bronze handle, complemented by the duo-tone, key-design grille cloth. And there's room behind the grille cloth for a second speaker for even better sound. Dimensions: 40" W x 19½" D x 29"H. Factory assembled.

Assembled GRA-227-2, 70 lbs...Express or motor freight, no money dn., \$10 mo. . \$94.50



**The Deluxe Heathkit "227" . . .
Exclusive Color TV Design Features And Versatility
In The Popular New Color Tube Size**



• 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 • 26 tube, 12 diode, 1 transistor circuit • 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 & long-life nickel-silver 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 • 1-year warranty on picture tube, 90 days on all other parts • Build in 25 hours.

THE NEW HEATHKIT "227" OFFERS EXCEPTIONAL VALUE . . . big screen size at lower cost. The rectangular color tube has 227 square inches of viewing area with stronger contrast and better viewing under normal home lighting conditions. And best of all, it costs less.

FAMOUS HEATHKIT EXCLUSIVES. Like the famous Heathkit "295" and "180" color TV's, the new Heathkit "227" features a built-in dot generator plus full color photos and simple instructions so you can set-up, converge and maintain the best color pictures at all times. Add to this the detailed trouble-shooting charts in the manual, and you put an end to costly TV service calls for periodic picture convergence and minor repairs.

CHOICE OF INSTALLATION. You can buy the chassis, tubes and face-mask—all in a single compact unit—for custom mounting in a wall or your own cabinet . . . required mounting dimensions, 19½" H x 28" W x 19" D. Or you can add either Heath factory assembled and finished contemporary or new Mediterranean Oak cabinet.

ADVANCED FEATURES INSURE PEAK PERFORMANCE. Like the new improved low voltage power supply that provides more B+

for better operation. And automatic degaussing that "cleans" and demagnetizes the set every time you turn it on from a "cold" start. This feature coupled with exclusive Heath Magna-Shield keeps the picture tube free from stray magnetic fields to give you the purest color possible. An automatic color control circuit and gated automatic gain control reduce color fade, and insure steady, jitter-free pictures. There's a 2-speed transistor UHF tuner for either fast station selection or fine tuning individual channels.

The deluxe VHF turret tuner has "memory" fine tuning so you don't have to readjust everytime you return to a channel. There are two VHF antenna inputs . . . a 300 ohm balance, or a 75 ohm coax to reduce interference in metropolitan or CATV areas. And there are two hi-fi sound outputs . . . a cathode-follower for play through your hi-fi system and an 8 ohm output for connection to the special limited-field 4" x 6" ohm speaker (included) that mounts on the right side of the one-piece face mask.

BUILD IN ONLY 25 HOURS. All critical circuits—VHF & UHF tuners, 3-stage, IF assembly and high voltage power supply—are pre-built, aligned and tested at the factory. And the vertical swing-out chassis makes for fast, easy servicing and installation. The dynamic convergence control board can be placed so that it is easily accessible anytime you wish to "touch-up" the picture.

Kit GR-227, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and 4" x 6" speaker, 114 lbs. . . . \$42 dn., as low as \$25 mo. . . . **\$419.95**

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: 26 tubes, 12 diodes, 1 transistor. 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. Wall mounting (Mask): 17-9/16" H. x 26-7/16" W. Chassis room: 19½" H x 28" W x 19" D. (This is with ¼" clearance on sides and the top).



New! Contemporary Walnut Cabinet
Factory assembled; fine hardwoods finished in rich walnut. Overall dimensions: 31¾" W x 29½" H x 19½" D.
Assembled GRA-227-1, 54 lbs. . . Express or motor freight, no money dn., \$6 mo. . . . **\$59.95**

NEW! Heathkit Color TV Remote Control



Now change VHF channels and turn your Heathkit color TV on and off from the comfort of your armchair with this new remote control kit. Features a handsome brown molded high impact plastic case with a patterned stainless steel sheath for added strength and beauty. The heavy-duty switch contacts are silver-plated to assure long life and trouble-free service. Its slim, compact size and feather weight fit comfortably in your hand for easy push-button operation. Use with Heathkit GR-25, GR-295, GR-180 and GR-227 color TV's. Includes flat 18' 3-wire cable. Build in an hour . . . just connect wire to remote control, and install motor to back of VHF tuner. Kit GRA-27, 4 lbs. . . . **\$19.95**

Deluxe Heathkit® "180" Color TV...\$359.95



Kit GR-180
\$359.95
 (less cabinet)

Now 3 Factory-Assembled Cabinets To Choose From... As Low As \$24.95



Contemporary Walnut Cabinet

Factory assembled of beautiful solids and veneers with an oil-rubbed walnut finish. The GR-180 speaker is mounted behind right side of one-piece picture-control panel mask. Measures a compact 18¼" D x 28¼" W 29" H.

Assembled GRA-180-1, 41 lbs. (REA or motor freight) no money dn., \$5 mo. \$49.95



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 one-piece face mask. Measures 18¼" D x 28¼" W x 31¼" H.

Assembled GRA-180-2, 48 lbs. (REA or motor freight) no money dn., \$8 mo. \$75.00



New Table Model TV Cabinet & Cart Buy Together & Save \$4.95!

Factory assembled walnut-grained vinyl-clad wood cabinet accommodates GR-180 chassis . . . measures 18½" H. x 27¾" W. x 19½" D. with rubber feet.

GRA-180-3, cab. only, 36 lbs. . .no money dn., \$5 mo. \$24.95
 Cart has "pale brass" nickel-plated rectangular tubing, walnut-finished woods and hardboard; top shelf 28½" x 16½", top shelf height 13". Heavy duty plated casters.
 GRA-180-4, cart only, 21 lbs. \$19.95
 GRS-180-5, cart & cab. combo, 57 lbs. . .no money dn., \$5 mo. \$39.95

The World Of Sports . . . Your Favorite Shows . . . Current Events . . . All Come Alive On The Heathkit "180" Color TV . . . At A New Lower Price

• Hi-fi 90° 180 sq. inch rectangular color tube with anti-glare safety glass • Rare earth phosphors plus smaller dot size for brighter, livelier colors and better picture definition • 27 tube, 10 diode, 1 transistor circuit • 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 • 3-stage IF strip reduces interference, improves reception • Hi-fi sound output • Circuit breaker protection • Vertical swing-out chassis for easier servicing & installation • 3-way installation . . . in a wall, custom cabinet or Heath cabinets • Assembles in just 25 hours . . . all critical circuits prewired and tested • 1-year warranty on picture tube, 90 days on all other parts • Tubes alone list over \$245

HAS SAME HIGH PERFORMANCE BUILT-IN SELF-SERVICING AIDS AS FAMOUS HEATHKIT GR-295 COLOR TV

Features the same built-in dot generator and color convergence board so you can converge and align the set for best color pictures at all times . . . eliminates costly TV service calls for simple adjustments and minor repairs. Simple, non-technical instructions and full color photos in the GR-180 manual show you exactly what to look for, what to do and how to do it. You enjoy beautifully clean and sharp color pictures every day . . . and up to \$200 savings in service calls.

And you can install it in a wall, any of the 3 Heath factory assembled cabinets, your own custom cabinet . . . even in an favorite old black & white TV cabinet. The chassis, picture tube and one-piece face mask (with speaker and controls) combine into a single compact unit.

Also features exclusive Heath Magna-Shield to keep out stray magnetic fields and improve color purity . . . automatic degaussing that "cleans" the picture every time you turn the set on from a cold start . . . "rare earth" phosphors, smaller dot size and 24,000 regulated picture power for livelier colors, sharpest picture definition . . . automatic color control and gated automatic gain control to reduce color fading and insure steady, jitter-free pictures even under adverse interference such as nearby aircraft traffic . . . Deluxe VHF turret tuner with "memory" fine tuning so you don't have to readjust every time you return to a channel . . . 2-speed transistor UHF tuner for either fast station selection or fine tuning individual channels . . . two hi-fi sound outputs—a cathode follower for play through your hi-fi system, plus a special contained field 4" x 6" speaker . . . two VHF antenna inputs—a 300 ohm balanced and a 75 ohm coax . . . one-piece swing-out chassis for easier assembly care and installation . . . and 25 hour kit assembly.

Kit GR-180, all parts including chassis, tubes, masks, UHF & VHF tuners, mounting kit and special limited-field 4" x 6" speaker, 102 lbs. (REA or motor frt.) . . . \$36 dn., as low as \$22 mo. \$359.95

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 14-82. Tube & Diode Complement: 27 tubes, 10 diodes, 1 transistor. 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. Wall mounting (mask): 15 $\frac{1}{4}$ " H x 24 $\frac{1}{4}$ " W. Chassis room: 17 $\frac{1}{2}$ " H x 26" W x 18" D. $\frac{1}{4}$ " clearance.

Read What The Owners And Experts Say

BRUCE BRIGDEN, CHERRYVALE, KANSAS: "I have read fine comments about your color TV sets in magazines and in your advertisements, but even those words of praise left me unprepared for the incredible quality of the pictures I am getting on my Heathkit GR-180."

LAWRENCE NORTUP, MINEVILLE, N.Y.: "Your estimate of construction time was most accurate and no difficulty in construction was encountered. The quality of the kit and cabinet are undoubtedly among the finest on the market today. The color quality and reception is the finest that I have seen in our area and the convergence adjustments were simple to perform. A friend, who is a TV serviceman, was so impressed that he may be ordering one in the near future."

GENE G. RANDOLPH, REDWOOD FALLS, MINN.: "Alignment was much easier and quicker than anticipated and the performance exceeded even what we've come to expect from Heath quality."

SYDNEY C. KERKSIS, ATLANTA, GEORGIA: "I have compared it with commercial sets of several makes, and insofar as color rendition, clarity, grey scale tracking and general performance it beats them all."

ALBERT T. CASE, SANTA BARBARA, CALIF.: ". . . it is working beautifully and giving a very clear and well colored picture in an area (mountainous) where the TV dealers shudder when anyone is interested in color TV."

DR. RICHARD L. DIXON, MEMPHIS, TENNESSEE: ". . . I can truthfully say I have never seen a color television receiver which measures up to the quality of your product. As a matter of fact, I had no idea that color television could look that good."

PHILIP A. SCANDURA, PHIL'S RADIO & TV CLINIC, HACKENSACK, N.J.: "Your engineers did an outstanding job in designing a set so easy to build, and which produces a picture quality superior to any commercially built set I have ever seen. What a thrill to find the set operating perfectly the first time I turned it on and adjusted the picture."

HUBERT LUCKETT, EXECUTIVE EDITOR, POPULAR SCIENCE MAGAZINE: "For those who tremble at the thought of tackling something so fantastically complicated, let me encourage you with a barrowed quote: 'The only thing you have to fear is fear itself.'"

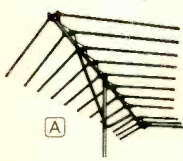
"The second most impressive thing about the kit is the instruction manual (the most impressive thing is the viewing quality of the color picture). If you can read and understand ordinary English, the manual is like having a master teacher at your elbow pointing out every step."

"—the circuitry, features and performance match or exceed those of sets selling at twice the price. Some of the features, such as the built-in servicing aids, can't be bought in ready-made sets at any price."

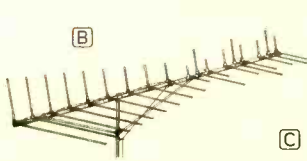
AUDIO MAGAZINE, MAY '66: ". . . sets similar in appearance seem to run around \$700, without the built-in service feature like the dot generator. Add to this the saving in service costs which the average set would require, since the builder would undoubtedly service his own set throughout its life, and the Heathkit GR-295 is a real bargain." "Besides that, it is capable of a great picture."

HIGH FIDELITY MAGAZINE, MAY '67 ISSUE: "Our verdict, by the way, is seconded by others who own big-name color sets and who have stared in amazement (and envy) at the pictures received on our own home-built Heathkit." "Reasons for this high performance? The circuit design, to begin with, uses many advanced and 'sophisticated' electronic techniques; the parts are of high quality and no scrimping or short-cuts have been taken in the chassis. The engineers at Heath, in fact, have leaned over to the side of the cautious so to speak, just to provide a wide margin for the varying ability of diverse kit-builders." "The sound is distinctly better than what you hear from most TV sets." ". . . the GR-295 boasts a very up-to-date color convergence circuit which not only makes for sharply defined, lifelike color images but permits the owner to initially adjust the set, and readjust it later if need be, without the use of instruments or test gear." ". . . the Heathkit set produces pictures that are as good as high-quality color film, or better."

Save On These Performance-Improving TV Accessories



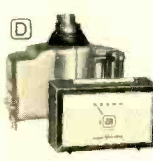
A JFD Log-Periodic LPV-11 VHF TV Antenna Receives color, B & W TV (Channels 2 thru 13) FM stereo up to 125 miles away. Gold bond anodized finish. 11 V-elements. GDP-124, 15 lbs. . . . (REA or motor freight only). Mfrs. list \$39.95 Only \$23.45



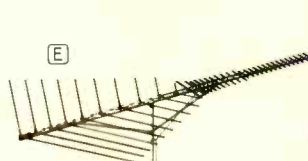
B Finco CS-V18 VHF-FM "Color Spectrum-Frequency Dependent" Antenna For Color and B&W TV, FM stereo or mono. 18 elements: nine driven, nine parasitic. Square boom, 180-7/8" long; turning radius 108". For extremely weak VHF signal areas. Model GDP-58, 15 lbs. (express or motor frt.) no money dn., \$5 mo. \$33.22



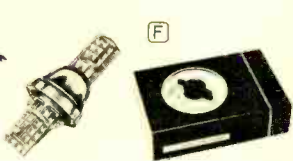
C Taco 4-Bay TV Bow-Tie UHF Antenna Open vee type with pivot mount for locking to existing mast. Heavy galvanized steel mesh screen reflector with 1" x 1 $\frac{1}{2}$ " squares for max. stability and long life. GDP-233, 5 lbs. Mfrs. list \$8.75 Only \$5.14



D Alliance Tenna-Rotor . . . Save \$16.50 Patented 5-wire bridge type circuit. Expanded meter scale. Rotates 360° either direction—instantly reversible. Magnetic brake. Life lubricated. Moisture sealed. 115 V AC, 60 Hz. GDP-214, 11 lbs. \$23.45



E Finco CS-D3 VHF-UHF-FM "Color Spectrum-Frequency Dependent" Antenna For Color and B&W TV, UHF or VHF, plus FM stereo or mono. 36 elements; 10 VHF-FM (nine driven, one parasitic), 26 UHF elements (ten driven, 16 parasitic). Square boom, 204 $\frac{1}{8}$ " long; turning radius 106". Includes behind-the-set line splitter. For very weak UHF and VHF signal areas. Model GDP-68, 14 lbs. (express or motor frt.) no money dn., \$5 mo. \$41.13



F Cornell-Dubilier Model AR-22R Automatic Antenna Rotator Positions antenna in 6° increments . . . just dial desired direction. 360° rotation in 45 seconds. Handles up to 150 lbs. Weatherproof. Precision ball-bearings and gears. Heavy-duty "Bell" casting rotor. Positive magnetic brake action. Permanently lubricated. Handsome vinyl-covered control only 6 $\frac{3}{4}$ " x 4 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ ". 3 guy wires. Requires 4-conductor cable. Operates on 117V AC, 50-60 Hz. Model GDP-37, 16 lbs. (express or motor frt. only) . . . no money dn., \$5 mo. \$32.83



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-104
\$119.95
(less battery pack)

Deluxe 12" Diagonal B & W Transistor Portable TV

Runs On Household Current 12 V. DC Or Optional Battery Pack For Play Anywhere Operation . . . Space-Age Integrated Circuit . . . Build In 12 Hours!

- 74 sq. inch (picture diagonal 12") 110° shell bond picture tube
- 36 transistor, 25 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 • Presassembled 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

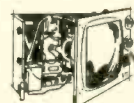
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amplifiers with superior gain and controlled bandwidth; deluxe VHF "memory" tuner; 2-speed UHF tuner for either fast channel selection or fine tuning each station; transformer and regulated power supply for drift-free power regardless of source; lighted 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-104, portable TV for 117 v. AC and 12 v. DC operation, 27 lbs. . . . no money dn., \$11 mo. . . . \$119.95
Kit GRA-104-1, rechargeable battery pack and Outdoor Sun shield, 9 lbs. . . . no money down, \$5 mo. . . . \$39.95
GRA-104-2, Outdoor Sun shield only, 1 lb. . . . \$1.95

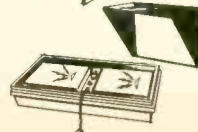
GR-104 SPECIFICATIONS: Picture Size: 74 sq. in. viewing area, picture diagonal 12". Deflection: Magnetic, 110 degrees, 20 mm neck. Focus: Electrostatic. Antenna Input Impedance: 300 ohm balanced. Tuning Range: VHF TV Channels 2 thru 13, UHF TV channels 14 thru 83. Picture IF Carrier: 45.75 MHz. Sound 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, 25 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 1/4" W, 9 1/2" 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

Heath Has The World's Largest Selection Of Electronic Kits



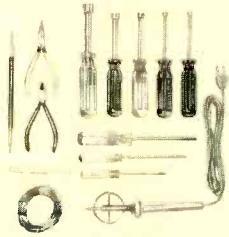
A GDP-166
\$7.95



B Kit GD-973A
\$17.50



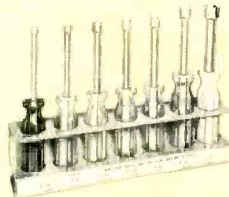
C GDP-663
\$5.89



D GH-25
\$16.95



E Kit GH-17
\$14.95

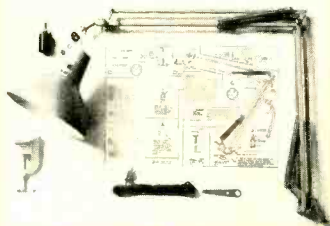


F GDP-204
\$6.42

G GDP-105
\$5.40



H GDP-202
\$9.95



I GDP-207
\$3.82



J GDP-217
\$10.76



K GDP-257
\$3.99



A Electric Light Dimmer

Dial the desired light in any room, from a soft candle glow to full illumination . . . for reading, watching TV, a party atmosphere, or relaxing. Save on light bills & bulbs. Continuously variable from "off" up to 500 watts. Also has separate switch to turn on and off at any pre-set light level. Replaces any 117 v. AC 2-way light switch. All solid-state circuit. Install in 3 minutes. 3-year warranty. 500 watt U.L. approved.
Model GDP-166, 1 lb. **\$7.95**

B Heathkit Motor Speed Control Adds Longer Life To Drills, Bits, Blades

- Silicon Controlled Rectifier with feedback circuit slows motor yet maintains high torque
- Use with drills, saws, food mixers, blenders, lathes, vibrators . . . any power tool with a universal AC-DC motor up to 15 amps . . . twice the current handling capability of others
- Adjustable control dials desired motor speed • Bore through the toughest steel or hardest wood without ruining a good blade or bit • Handsome black & beige aluminum cabinet
- Assembles in an hour or two • Not for AC induction motors.

Kit GD-973A, 3 lbs **\$17.50**

C SPEDEX Wire & Cable Stripper Model 766-1 . . . Save \$4.06!

- Simple to use—insert wire into jaws, squeeze handle and insulation comes off instantly
- Guaranteed jaws accept No. 10, 12, 14, 16, and 22 wire.

Model GDP-663, 2 lbs. . . Mfrs. list \$9.95 **Only \$5.89**

D Deluxe Tool Set . . . Use For Kit-Building Or Any Fix-It-Job

- Combination 4" wire stripper & diagonal sidecutter • 4 1/2" Midget longnose pliers (with plastic insulated handles); 3 screwdrivers with amber plastic handles (3/32", 1/8", 3/16")
- "Little Dandy" soldering iron (below) • 5 nut drivers 3/16", 1/4", 5/16", 3/8", 1/2") • Nut starter, soldering aid, radio solder, and "Kit-Builder's Guide" with soldering instructions.

Model GH-25, 4 lbs. **\$16.95**

E New Heathkit Soldering Iron Kit

Lightweight, easy-to-handle, ideal for kit-building or any tight soldering job. 6 volt, 25 watt GE midget iron with non-corroding 1/4" chisel tip included doesn't require frequent "tinning". 3 heat ranges . . . low for light soldering such as circuit boards, medium for normal wiring and high for heavy chassis soldering. Transformer-operated power supply. Excellent heat recovery time. Quick warm-up . . . iron is ready within 2 minutes. Protective metal cage. Unique lock-type holder secures iron in place . . . makes it a "third" hand when soldering phono plugs, connectors, etc. 6' heavy-duty cord. Operates on 117 v. AC, 50-60 Hz.
Kit GH-17, 5 lbs **\$14.95**
Replacement heater-tips for GH-17 or GH-52 . . . GDP-317, 1/4" chisel, 1 lb., \$3.99; GDP-327, 3/16" pyramid, 1 lb., \$3.99; GDP-337, 3/16" chisel, 1 lb., \$3.99

F Vaco S-700 Hollow Shaft Nut Driver Set . . . Time Saver

- 7 drivers—sizes: 3/16", 1/4", 5/16", 11/32", 3/8", 7/16", 1/2" • Hollow shafts for nut installation on switches, controls • Store in self supporting metal rack • Tough, color-coded plastic handles.

Model GDP-204, 3 lbs. **\$6.42**

G American Beauty 3110 "Little Dandy" Pencil Soldering Iron

Perfectly balanced, lightweight, easy to handle . . . ideal for kit building. Reaches working temperature 2 minutes after plug-in. 30-watt heating element. Iron-clad tip won't corrode, doesn't require frequent "tinning". Cool Tenite® grip handle won't roll. Not a "throw-away" iron . . . all major parts replaceable.
Model GDP-105, 1 lb. **\$5.40**

H Z-LYTE Extension Lamp Kit

Features 45" reach, 360° sweep, vented shade; clamps to desk or table. A snap to build . . . just attach socket, shade & cord . . . the precision spring-balanced extension arm is completely assembled. Takes about a half hour to finish. U.L. approved. Less incandescent bulb.
Kit GDP-202, 5 lbs. . . Mfrs. list \$14.50 **Only \$9.95**

I WELLER W-PS 25-Watt Pencil Soldering Iron

Perfect for kit-building, miniature soldering and production work. Tip develops 860 degrees maximum, brings work to higher temperature faster than most. Recommended by famous consumer product review magazine. 1/8" iron-clad screwdriver tip resists pitting . . . easy to clean. Cool, impact-resistant handle with 2-wire power cord. 117v. AC 60 Hz operation. Lightweight, easy to handle. U.L. and CSA approved.
Model GDP-207, 1 lb. **\$3.82**

J New! WELLER TCP-12 12 Volt "Pencil" Soldering Iron

Ideal for communications, marine, automotive and field use. Operates on any 12 v. battery, or 12-14 AC/DC power source. 700° F. 3/16" screwdriver tip. 30 watt heating element. Incorporates Weller patented "Curie point" tip temperature control. Cool, impact-resistant handle and reusable vinyl handle pouch. Includes 12 ft. power cord and battery clips.
Model GDP-217, 2 lbs. **\$10.76**

K New D8-141 SOCK-O-MATIC® . . . Four Wrenches In One

Takes the place of 4 different size socket wrenches . . . automatically fits any size hexagonal nut, screw or bolt within its 1/4" to 7/16" range (1/4", 5/16", 3/8", 7/16"). Ideal for kit-building or any do-it-yourself job. Excellent for hidden applications where a recess makes it impossible to see the nut, screw or bolt to be driven. Sturdy, easy-grip handle for positive socking action. Overall length 7 3/4". Diameter of end of barrel 5/8".
Model GDP-257, 1 lb. **\$3.99**

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 \$500 Savings

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 1/2', 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' - F₁ to C₅. Solo manual range 16', 8', 4', 5 1/2' - 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' - C₀ 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 a lustrous walnut finish . . . ready for the sub-assemblies as you complete them. Cabinet measures 40" H x 48" W x 25" D. A removable cheek block right of the lower manual accommodates the optional band box percussion accessory (see opposite page) . . . no need for added supports.

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 \$500 over the factory assembled version.

POWER REQUIREMENTS: 110-120 v. 60 Hz. 165 watts.

Kit TO-67, organ & matching bench, 265 lbs. . . Express or motor frt. \$200 dn., as low as \$29 mo. **\$995.00**

Self-Teacher Recorded Lessons . . . Save \$30!

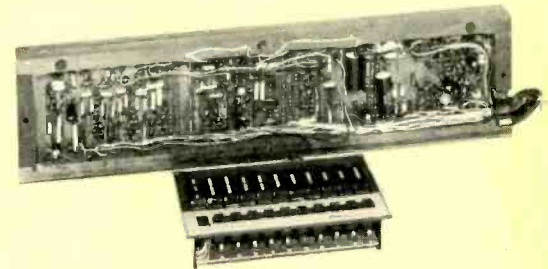
Complete 40-lesson course on four 12" LP records, plus music book with many old-time favorites. Provides firm basis of musical knowledge.

GDA-232-2, recorded lessons, 5 lbs. . . Mfrs. List \$50 **\$19.95**

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.

**Exclusive Thomas Band Box & Playmate
Add New Musical Variety**



**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, 8 lbs. . . no money dn., \$14 mo. **\$145.00**

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 new 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, \$5 mo. **\$35.00**



**New!
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., \$18 mo. **\$189.90**

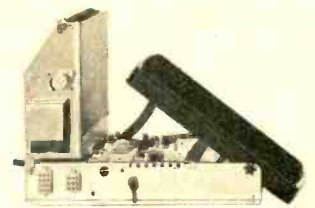
Attention Heathkit/Thomas Organ Owners. The playmate rhythm maker may be added to all previous and present Heathkit/Thomas electronic organs which have Band Box installed. No additional accessories are necessary to do this.

Deluxe Heathkit®/Thomas "Paramount" Transistor Theatre Organ And Band Box



TO-67
\$995⁰⁰

(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.



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.



Professional 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.

You Get Twice As Much For Your Budget With Heathkit

America's Lowest Cost Solid-State Organ



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-325B
\$394⁹⁰
(Not Including Band Box)

Save Up To \$205 By Building This 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 C₁ through C₂ • 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 41¼" H x 39¾" W x 21½" 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 . . . SAVE UP TO \$205. Takes no special skills or knowledge. Includes simple step-by-step instructions . . . genuine Thomas factory-fabricated 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 savings up to \$205 . . . America's best organ buy.

Kit GD-325B, organ & matching bench, 172 lbs. . . \$40 dn., as low as \$23 mo. (REA or motor freight only) . . . **\$394.90**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.



Add Percussion & Rhythm

Add 10 exciting percussion voices and 15 fascinating rhythms to any Heathkit/Thomas organ with optional Band Box & Playmate (prices and descriptions on page 12).

Self-Teacher Recorded Lessons . . . SAVE \$30!

Learn quickly and easily at your leisure with this 40-lesson course on four 12" LP records. Provides a firm basis of musical knowledge. Includes comprehensive music book with many favorites, and handsome gold-embossed white leatherette album.
GDA-232-2, recorded lessons, 5 lbs. . . Mfrs. List \$50 . . . Only **\$19.95**

Like To Hear It Perform? Then send for organ demonstration record. No. GDA-325-1 (7" - 33⅓ 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.



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!

Thomas Color-Glo Music Books For both Heathkit/Thomas TO-67 and GD-325B Color-Glo Organs

Color-Glo Music Book No. 2 . . . contains words, music and "color-coded" charts for 56 favorites . . . "Beautiful Brown Eyes," "Camptown Races," "Home On The Range," "Joy To The World," "Goodnight Ladies."
GDP-355, 1 lb. **\$2.50**

Color-Glo Music Book No. 3 . . . contains words, music and "color-coded" charts for 60 favorites . . . "Away In A Manger," "Bill Bailey," "Glow Worm," "How Dry I Am," "My Darling Clementine," etc.
GDP-365, 1 lb. **\$2.50**

Color-Glo Organ Course, Vol. 1 . . . contains sections on using Color-Glo, legato, stop tabs, manual balance control, percussion, plus 21 song favorites.
GDP-375, 1 lb. **\$2.50**

Color-Glo Organ Course, Vol. 2 . . . continues with sections on chords, scales, fingering, rhythm, plus 21 more song favorites . . . "Comin' Thru The Rye," "My Bonnie," "Down By The Riverside," etc.
GDP-385, 1 lb. **\$3.00**

Heathkit Step-By-Step Instructions And Big Fold-Out Pictorials Are Famous For Clarity And Simplicity

NEW! VOX *Jaguar*

Combo Organ By Heathkit®



TO-68
\$349⁹⁵

\$35 dn., as low as
\$21 mo.

- All solid-state circuit . . . 91 transistors & 14 diodes for cool, instant operation, long trouble-free life
- All genuine VOX factory-made parts
- Separate bass output gives brilliant "stereo" bass effect
- Four octave keyboard with 49 keys, range C₂ to C₆
- Flute, brass, bright and mellow tabs at 16', 8' & 4' pitch to create a variety of musical moods and effects
- Vibrato and Bass Chord tabs
- Reversible bass keys for full keyboard range or to play independent bass notes
- "Walking" bass provides octave lower to C₁
- Special Contour control lets you change tone of any or all voices
- Bass volume control
- Foot-operated expression pedal
- Heavy chrome-plated stand and waterproof carrying case
- Build in 35 hours with circuit board construction . . . factory assembled keyboard



Suitcase Portability . . . easily makes it to any scene. Includes organ case with waterproof cover, plus a separate carrying case for the stand and cables.

Now Save Up To \$150 On This World-Famous VOX Jaguar Combo Organ . . . Features Most Unique Sound, Brightness, Vibrato, "Stereo" Bass, Solid-State Circuitry And More For Complete Versatility

The Favorite Of Top Groups The World Over . . . the popular VOX "Jaguar" solid-state organ. Famous for its unique sound . . . the most distinctive sound of all the combo organs. You've heard it on many records and TV shows, in many movies. The secret? Each note is made up of a mixture of tones . . . gives it that "biting" sound that can be heard over drums and guitars. And now you can add this professional organ to your group at up to \$150 savings by building it yourself the Heathkit way.

"Pro" Features For Complete Playing Versatility. Features like a separate bass output that lets you connect the solo bass to a multi-channel or separate bass amplifier, thus creating a brilliant "stereo" effect . . . you hear the bass and treble keyboard sounds separately! Also allows you to emphasize or keep the bass constant with the bass volume control while changing the treble keyboard volume with the expression pedal. With the normal signal output, the expression pedal varies both the bass and treble keys. And the bass keys are reversible for either full keyboard range, or to play "walking bass", just as you would with organ bass pedals, with each bass note sounding as one clear tone. There's also a special "Contour" control to change the tonal quality of all or any of the voices. And the vibrato tab adds warmth and beauty to many of the selections you play.

More Voicing Features. There are Flute, Bright, Brass and Mellow tabs to create a wide variety of musical effects. With Flute you get a pure, wholesome sound. With the Bright tab, you produce both ends of the sound spectrum with amazing brilliance and clarity. With the Brass tab, the sound becomes brash and bold . . . ideal for rocking any scene. And with Mellow, the sound is homespun . . . soft and melodic for reminiscing. You can also mix the tabs for an endless variety of effects.

Assemble In Around 35 Hours with fast, easy circuit board construction. And you enjoy savings up to \$150. All parts are genuine VOX factory-fabricated parts. The keyboard, organ cabinet and stand come factory assembled. Also includes expression pedal, organ case with waterproof cover, plus separate carrying case for stand and cables.

Overall dimensions of organ fully assembled, ready for play . . . 34½" H. x 38½" W. x 22½" D. Play through the Heathkit TA-17 combo amplifier (next page) or any high quality amplifier with a bass channel. Power requirements: 117 v. AC and 240 v. AC, 50-60 Hz, 14 watts. Order this famous combo organ now!

Kit TO-68, 80 lbs. . . . \$35 dn., as low as \$21 mo. \$349.95



Fingertip Command Of All The Action with factory assembled keyboard with 49 keys, range C₂ to C₆ in 4 octaves. "Walking" bass provides another octave lower to C₁. All solid-state circuit for cool, instant operation, long trouble-free life.

"Reversible" Bass Keys for full keyboard range, or to play independent bass notes (walking bass) as you would with organ bass pedals.



6 Voicing Tabs . . . Flute, Bright, Brass & Mellow all at 4', 8' & 16' pitch, plus Vibrato and Bass Chord tabs to produce the most unique sound of all combo organs. Allows you to create a wide variety of musical effects.

Separate Bass Output to connect solo bass to a separate bass channel or amplifier, thus creating a brilliant "stereo" effect. Also allows you to emphasize or keep the bass constant with the bass volume control while changing the treble keyboard volume with the expression pedal.



Foot-Operated Expression Pedal included . . . permits you to vary both bass and treble keyboard volume when played through the normal signal output.

New Deluxe Heathkit® Solid-State Combo Amplifier & Matching 2-Way Speaker Systems Deliver a Solid 120 Watts EIA Music Power



Special Combination Offer!

Amplifier & Two Speaker Systems

Save \$20

Kit TAS-17-2

\$395⁰⁰



Speaker System

Kit TA-17-1

\$120⁰⁰ ea.

W red TAW-17-1

\$150⁰⁰ ea.

Amplifier

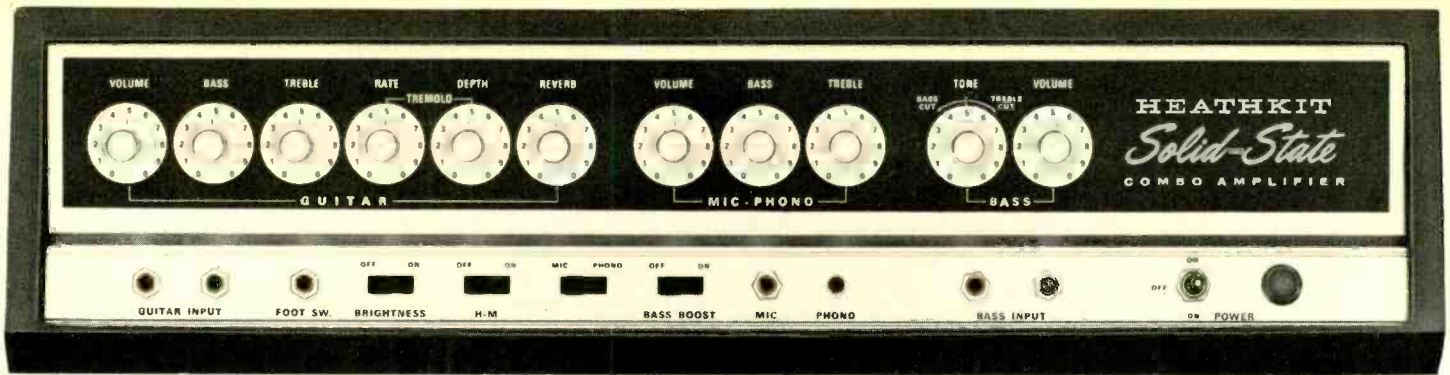
Kit TA-17

\$175⁰⁰

Wired TAW-17

\$275⁰⁰





Complete Control Of All The Action... all controls and inputs are easy to get at on the extruded brushed aluminum front panel

All The "Big Sound" Features Every Combo Wants . . .
Tremolo, Built-In "Fuzz", Brightness, Reverb . . .
Plus A Shattering 120 Watts Of Power.

Buy With Matching Speakers For Extra Savings!

- 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 ("fuzz") • 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 • "Piggyback" design with carrying handles for stacking and portability • Black vinyl-covered compressed-wood cabinet • Circuit breaker protection

AN INCREDIBLE 120 WATTS OF GUTSY MUSIC POWER. More than enough to rattle a discotheque, throb an auditorium, even fill a parking lot . . . more than enough "charged-up" sound for any scene any combo group makes. And it's versatile. You can play solo guitar through it. Or a bass guitar. Or a combo organ. Or an accordion. Singer's mike. Even a record changer or turntable. That's the professional new Heathkit solid-state combo amplifier . . . with all the features swingin' combos demand in an amp. It will deliver its 120 watts through two of the new matching Heathkit TA-17-1 2-way systems. Or a mighty 90 watts through one TA-17-1. And with its cool all-silicon transistor circuitry, there are no tubes to wear out or replace. Runs at maximum power without danger of input overload thanks to special volume control circuits in the guitar and bass channels. There's even circuit breaker protection, plus two large transistor heat sinks for prolonged periods of play. Hum is inaudible at any input setting due to a well filtered power supply.

COMPLETE CONTROLS ALL ON THE FRONT PANEL. There are three independent input channels . . . guitar, bass, and mic-phonograph . . . each with two inputs. Has variable reverb and tremolo for a variety of exciting sounds. A special brightness switch and separate bass and treble boost controls reproduce the whole spectrum of sound with amazing brilliance and clarity. There's even a built-in Harmonic Modifier ("fuzz") for that totally new tone effect. The bass channel has a special tone control for superior bass response with attenuation at either the bass or treble end.

"PIGGYBACK" DESIGN... The "piggyback" cabinet stacks neatly with the matching TA-17-1 speaker . . . has two carrying handles for easy portability. It's made of black vinyl-covered compressed wood . . . measures a compact 25 $\frac{7}{8}$ " W x 14 $\frac{1}{2}$ " D x 6 $\frac{3}{4}$ " H. There's a special "test-as-you-build" feature so you can check out the circuit before applying full power . . . prevents damaging components. Operates from 120 or 240 volts AC 50-60 Hz, 3 watts idling, 230 watts at full output.

BUY IN COMBINATION WITH MATCHING SPEAKERS FOR EXTRA SAVINGS! For peak performance, buy the TA-17 along with two TA-17-1 speakers . . . and save even more!

Kit TA-17, 44 lbs. . . no money dn., \$17 mo. . . . \$175.00
 Kit TAS-17-2, amplifier & two TA-17-1 speakers, 276 lbs.
 \$40 dn., as low as \$23 mo. . . . \$395.00
 Assembled TAW-17, 44 lbs. . . no money dn., \$26 mo. . . . \$275.00
 Assembled TAW-17-2, amplifier & two TAW-17-1 speakers (opposite)
 276 lbs. . . \$55 down, as low as \$32 mo. . . . \$545.00

New! Matching 2-Way Speaker System . . .

Buy A Pair With New Heathkit Combo Amplifier
For Best Performance, Extra Savings!

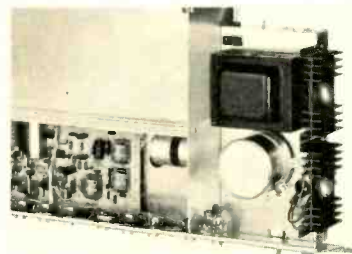
- Two specially-designed 12" woofers • Special horn driver for greater brilliance • Black vinyl-covered compressed wood cabinet with metal covered corners, handles and casters

BOASTS A UNIQUE HORN DRIVER UNIT to handle the highs with a superb brilliance that can't be matched by systems using woofers only. And the specially-designed 12" woofers, produce a solid low end. Each woofer features a 27 oz. magnet with a fiber-glass voice coil, treated cloth suspension system and epoxy cements . . . will safely handle 60 watts each! System impedance is 8 ohms. The specially engineered sealed cabinet is solidly constructed of a black vinyl-covered $\frac{3}{4}$ " compressed wood with metal corner protectors. Front is styled with an extruded aluminum frame and midnight blue grille cloth. Has handles and casters so it makes it easily to any scene. Measures 25 $\frac{7}{8}$ " W x 14 $\frac{1}{2}$ " D x 38" H, not including casters & handles.

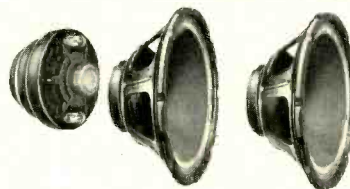
EASY TO BUILD . . . assembly takes only an hour or two—the cabinet is pre-assembled, just mount the speakers. And for maximum performance, maximum savings, mate a pair with the new Heathkit TA-17 Combo Amplifier. Order now.

Kit TA-17-1, one speaker system, 116 lbs. . . no money down, \$12 mo. . . . \$120.00
 Assembled TAW-17-1, 116 lbs. . . no money dn., \$14 mo. . . . \$150.00
 Note: See TAS-17-2 combo amp price line for special combination savings.

Compare These Great Professional Amplifier Features!



Solid-State For Solid Sounds. The TA-17's cool all-silicon 21 transistor, 13 diode circuitry runs at maximum power without danger of input overload, thanks to special volume control circuits in the guitar and bass channels. Line circuit breaker, current limiting diodes, and two large transistor heat sinks insure protection during prolonged periods of play. You get instant maximum power with no tubes to wear out or replace.



Deluxe 2-Way, 3-Unit Speaker System

Special horn-driver adds unique bright sound to strings . . . brilliance unmatched by any other speaker system.

Two Heavy-Duty 12" Woofers . . . with extra power-handling capabilities to take the heavy sounds of bass guitars and combo organs.

Special Brightness Switch And Bass Boost on the TA-17 combo amp so you can reproduce both ends of the sound spectrum with amazing brilliance and clarity. Also has built-in switchable "fuzz".

Built-In Reverb, "Fuzz" And Tremolo so you can create a wild variety of exciting, dramatic sounds. Both the reverb and tremolo are variable, and can be controlled by a special "hands-free" dual on-off foot switch. And with the Harmonic Modifier ("fuzz"), you produce a totally new tonal effect.

Three Independent Input Channels . . . guitar, bass and a special mic-phonograph channel . . . each with two inputs. Will accommodate a wide variety of pickup devices, including high quality magnetic phonograph cartridges!



Mikes

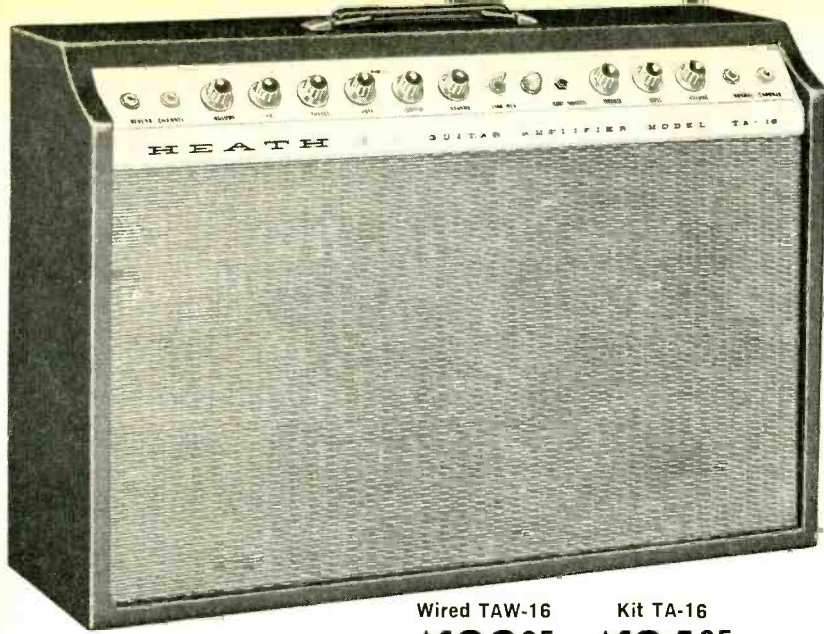


Bass



Lead

Use "No Money Down" Heath Time Pay—See Order Blank For Details



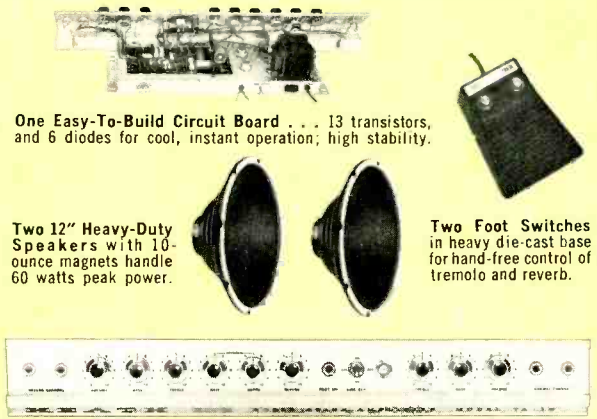
Wired TAW-16 Kit TA-16
\$199⁹⁵ **\$134⁹⁵**
\$19 mo. \$13 mo.

**Popular Heathkit Dual-Channel
 Solid-State 60 Watt Peak Power Amplifier . . .
 Now Available Kit Or Factory Assembled**

• 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

Compare To Amps Costing \$300 And More. Delivers the coolest 25 watts of EIA music power or 60 watts peak power you've ever heard . . . with a pure, robust sound that brings out the best in your instrument. And since it's all solid-state, there are no tubes to "melt" . . . you get peak performance at all times.

"Starmaker" Amplifier



One Easy-To-Build Circuit Board . . . 13 transistors, and 6 diodes for cool, instant operation, high stability.

Two 12" Heavy-Duty Speakers with 10-ounce magnets handle 60 watts peak power.

Two Foot Switches in heavy die-cast base for hand-free control of tremolo and reverb.

All The Features Guitarists Want Most In An Amplifier like two channels each with two inputs, plus separate volume, bass and treble controls. There's a normal channel for accompaniment, accordion, singer's microphone (not recommended for bass guitars) . . . the other channel has both variable reverb and tremolo for solo guitars. And a line bypass reversing switch eliminates hum.

Read What "Starmaker" Owners Say. Mr. Ted Deel, Marengo, Ohio ". . . have used it on several occasions as I play in a combo. I feel that the amp is comparable to some of the \$350-\$400 outfits I have tried out." Mr. C. J. Silveira, Concord, Calif.: "It performs as well as one which I purchased for my son at a cost of over \$300, and his does not have a reverb unit. Everything about the TA-16 from cabinet to output is much more than I expected at such a low price." Mr. H. A. Murray, White Plains, N.Y.: ". . . has all the features a guitarist can ask for and contains high quality components."

Now Choose Kit Or Factory-Built Models. With the TA-16 kit you enjoy maximum savings . . . takes only 8 to 10 hours to build. Or, if you prefer, choose the new completely assembled TAW-16. Either way, both units represent a remarkable value.

Kit TA-16, 52 lbs. (REA or Motor Freight), no money dn., \$13 mo. **\$134.95**
 Assembled TAW-16, 52 lbs. (REA or Motor Freight), no money dn., \$19 mo. . . . **\$199.95**



Was \$119.95
Now \$94⁵⁰
 (Including accessories shown opposite)
 \$10 mo.

A Was \$219.95
Now \$189⁹⁵
 (Including accessories shown opposite)
 \$18 mo.

B Was \$99.95
Now \$88⁵⁰
 (Including accessories shown opposite)
 \$9 mo.

A **Deluxe Harmony Model H78 Electric Guitar By Heathkit**
 • Double cutaway • Ultra-slim ovalled rosewood fingerboard with short 24 1/4" scale for easy play • Ultra-slim neck with adjustable Torque-Lok reinforcing rod • 3 pickups with individually adjustable pole-pieces under each string for balance & emphasis • Flat wound strings • 3 silent switches select 7 pickup combinations • 3 volume & 3 tone controls • Professional Bigsby vibrato tail-piece • Curly maple hollow body—15 3/4" x 40 1/2" x 2" thick—factory buffed & polished gleaming cherry red—lightly shaded
 Kit TG-46, 17 lbs. . . (REA or motor freight. Parcel Post to RFD and APO only) . . . no money dn., \$18 mo. Total list price \$331.50 . . . Only **\$189.95**

B **Harmony "Rocket" Model H56 Electric Guitar By Heathkit**
 • Single cutaway • Ultra-slim ebonyized fingerboard with 24 1/4" scale • Ultra-slim neck—adjustable steel rod reinforced • 2 pickups with individual adjustable pole-pieces under each string • Silent switch selects 3 pickup combinations • 2 volume & 2 tone controls • Harmony type "W" vibrato tailpiece • Laminated maple ultra-thin hollow body—15 3/4" x 40 1/2" x 2" thick—factory buffed & polished rich cherry lightly shaded
 Kit TG-36, 15 lbs. . . (REA or motor freight. Parcel Post to RFD and APO only) . . . no money dn., \$10 mo. Total list price \$160.50 . . . Only **\$94.50**

C **Harmony "Silhouette" Model H17 Electric Guitar By Heathkit**
 • Modified single cutaway—"free form" profile • 15 frets clear of body • Ultra-slim ebonyized fingerboard with 24 1/4" scale • Ultra-slim neck—adjustable steel rod reinforced • 2 pickups with individual adjustable pole-pieces under each string • 3-position switch selects either or both pickups • 2 volume & 2 tone controls • Harmony type "W" vibrato tailpiece • Hardwood solid body—12 3/4" x 36 3/4" x 1 1/2" thick—factory buffed & polished, gleaming cherry red
 Kit TG-26, 13 lbs. . . (REA or motor freight. Parcel Post to RFD and APO only) . . . no money dn., \$9 mo. Total list price \$147. . . . Only **\$88.50**

All Guitar Kits Include These Valuable Accessories



Worth \$19.50 to \$31.50 depending on model. Each guitar includes vinylized chipboard carrying case, deluxe red leather neck strap, connecting cord, tuning & instruction record & book, pick and Vu-Tuner.

VU-TUNER® Tuning Aid . . . a \$2 Value . . . included with each guitar kit. Provides visual indication for exact tuning. Resonant reed shows when 6th string is in tune. Other strings are tuned in unison with instructions.

Enjoy Your Kits Now — Pay Later — With A Heath Account

Solid-State For Solid Sounds



Now Available Kit Or Assembled . . .

NEW Low Cost Single-Channel Guitar Amplifier . . .

Features Tremolo, Reverb, 40 Watts Peak Power

- 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

Ideal For Beginning Guitarists, Yet Has Professional Features that give you top performance as your playing becomes more proficient. Start with its solid-state circuit. Runs cool and collected for a lifetime of trouble-free performance—no tubes to deteriorate. Comes on instantly—no waiting for warm-up. Delivers 20 watts EIA music power thru a 12" speaker for a solid robust sound. There are two inputs for lead guitars, accompaniment or singer's microphone. The special LDR tremolo circuit is adjustable in both rate and depth—lets you create a wide variety of effects. Also has variable reverb with a famous Hammond double spring delay unit. There's even a die-cast foot switch for hands-free control of both tremolo and reverb. And a line bypass reversing switch minimizes hum.

Complete Controls . . . all on the extruded aluminum front panel so they're easy to get at. Includes 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'll have full command of all the action. The chrome-plated knobs have black insets. And the cabinet is pre-assembled of 1/2" stock, covered with leather-textured black vinyl and black & white patterned grille cloth. Together they present a rich, modern appearance. Also features an easy-grip carrying handle. Measures a compact 19 3/4" W x 9" D x 21" H.

Choice Of Kit Or Factory Assembled. With the kit version, there's just one simple circuit board to wire, a few parts to mount on the chassis, and the speaker, controls and switches to install . . . finish in 8 to 10 hours. The assembled model is ready to go the moment you open the box. Get today's best value in a single-channel amp . . . with the Heathkit TA-27.

Kit TA-27, 40 lbs. . . no money dn., \$9 mo. \$89.95
 Assembled TAW-27, 40 lbs. . . no money dn., \$12 mo. \$129.95

Wired TAW-27

\$129⁹⁵

\$12 mo.

Kit TA-27

\$89⁹⁵

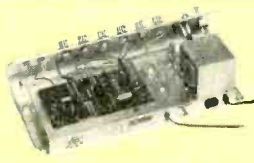
\$9 mo.



Two Foot Switches housed in heavy die-cast metal base for hands-free control of tremolo and reverb.

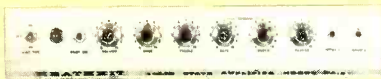


12" Special Design Speaker with heavy-duty 10 oz. ceramic magnet projects maximum power output.



Solid-State Circuitry for cool, instant operation and long life. Just one simple circuit board to build—11 transistors, 6 diodes.

Extruded Aluminum Control Panel for complete command of all functions. Chrome-plated knobs with black insets and black nomenclature.



ORDER BY PHONE DAY OR NIGHT

NEW! Heathkit Jr.® Solid-State Single-Channel Guitar Amplifier

. . . Variable Tremolo, 9 Watt Music Power . . .

A Great Bargain At Only \$29.95!

Perfect For That Youngster who's just starting to play guitar. Yet it delivers a full 9 watts of music power, 18 watts peak power through a specially-designed 8" speaker. Even has tremolo that's variable in both rate and depth so he can create a variety of effects. And its all-transistor circuit is rugged. With no tubes to wear out, it gives you top-notch performance from the day you first plug it in. Runs cool and comes on instantly, too, no waiting for warm-up. Also features two inputs to handle both solo and accompaniment guitars.

All Front-Panel Controls And Inputs for complete command of all the action. Besides the two inputs and separate "rate" and "depth" controls for tremolo, there are separate volume and tone controls, an on-off power switch, an on-indicator light.

Compact Cabinet Styling . . . Build In 5 Hours. The handsome red leather-textured cabinet with red, silver and black striped grille cloth measures only 13 1/2" W. x 5 7/8" D. x 14" H. Even has a collapsible handle for easy portability. Also has room in the back for storing the line cord, plus guitar cables. Kit construction takes around 5 hours . . . just one small circuit board to wire, install the 8" speaker, and install and connect the controls. An ideal beginner's kit for any youngster. Runs on 120/240 v. AC, 50-60 Hz.

And The Price? Only \$29.95. You won't find a comparable amp at this price anywhere in the marketplace.

Kit JK-37, 11 lbs. . . no money dn., \$5 mo. \$29.95



JK-37

\$29⁹⁵

\$5 mo.

- 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 13 1/2" W. x 5 7/8" D. x 14" H.

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 \$25 to \$300 . . . 10% down and up to 18 months on orders from \$300 to \$500. See Order Blank for details.

Pay Your Heath Account In 30 Days — No Carrying Charges



Swing To The Solid Sounds Of Stereo

With This 4-Speed Transistor Portable Phonograph . . . Build In 3-4 Hours

- Automatic or manual stereo and mono play of any size 16, 33 1/3, 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" x 6" 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 adaptor 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

GO "MOD"! GO STEREO with the new pleasure-packin' Heathkit GD-107 . . . a solid-state 4-speed portable phonograph featuring big-set sound and modern, compact styling. And, like its little brother the GD-16 mono portable, the new GD-107 makes an ideal birthday, graduation or Christmas gift for a teenager. Also makes an ideal second system for the rec room, patio . . . any room in the house.

RUNS COOL AND COLLECTED with an 8-transistor amplifier that delivers up to 1 1/2 watts per channel through each 4" x 6" speaker. There are 3 separate, front-panel controls . . . volume control, a tone control to accent the "high" or "low", 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 a dual stylus . . . diamond for LP's, sapphire for 78's.

"MOD" STYLING . . . EASY 3 OR 4 HOUR KIT ASSEMBLY. Housed in a sturdy preassembled, pressed wood cabinet covered with fashionable avocado green and ivory polyethylene. The speaker grilles are a brilliant sunfire red. Smart in any surroundings. Just one circuit board to wire, mount the speakers and plug in the preassembled changer . . . finish in one evening. And it's as easy to carry as a suitcase. Completely self-contained . . . all you add are records. Adapter spindle included. **Kit GD-107**, 24 lbs. . . (Express or motor frt.) no money dn., \$5 mo. \$49.95

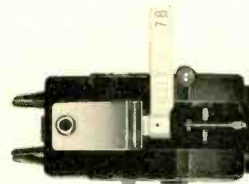
GD-107 SPECIFICATIONS—CHANGER: Type, Maestro Model 52-93. Speeds, 16, 33 1/3, 45, and 78 RPM. Record Sizes; 7", 10", and 12". Cartridge; Stereo ceramic. Stylus; 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **AMPLIFIER:** Power output, 3 watts, 1 1/2 watts per channel EIA music power. Frequency 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 8 1/2" D x 25 3/4" W. Power requirements; 120 V, 60 Hz AC, 15 watts.



4-Speed Automatic Changer handles a six-stack of stereo or mono records of the same size. Separate record size and speed selectors. Automatic shut-off after last record.



Solid-State Circuit . . . Build In 3 to 4 Hours. 8-transistor stereo amplifier delivers up to 3 watts of music power . . . runs cool and collected. Only one circuit board to wire, mount the speakers and plug in the preassembled changer . . . finish in 3 to 4 hours. Controls for volume, balance and tone.



Stereo Ceramic Cartridge with long-life diamond stylus for LP's and sapphire stylus for 78's. Comes already installed in changer tone arm.



Take It Where The Gang Goes . . . compact size and shape, easy-grip handle and fold-up changer for suitcase portability. Simple to carry from room to room, or house to house. Use on any 120 v. 60 hertz source.

Solid-State Portable Phonographs . . .

4-Speed Transistor Mono Portable Plays Anything From Bach to "Rock" . . . Build In 1 To 2 Hours

- Automatic monophonic play of 16, 33 1/3, 45 & 78 rpm records
- Plays stereo records monophonically, too, without damage • All solid-state circuitry for cool, instant operation • Ceramic cartridge with dual Sapphire styli for LP's or 78's • Compact size, light weight and easy-grip handle for portable convenience • Separate volume & tone controls • Operates on any 120 v. AC household source • Includes 4" x 6" speaker, 45 rpm adaptor spindle, and preassembled pressed wood cabinet covered with attractive, durable olive and ivory polyethylene • Easily assembles in just 1 to 2 hours

IDEAL FOR TEENS, YOUNG KIT-BUILDERS . . . makes a perfect birthday, graduation or Christmas gift. They'll enjoy having their own phonograph to play their favorite records, and to use whenever the gang gets together for parties or dancing (a good way to save wear and tear on your expensive stereo system). Carries like a small suitcase too . . . easy to move from room to room, or house to house.

BUILD IN 1 OR 2 HOURS. The changer and cabinet are preassembled . . . just wire one small circuit board, mount the 4" x 6" speaker and plug in two connectors from the changer. A wonderful way to

introduce any youngster to the fun of kit-building.

COOL, SOLID-STATE CIRCUITRY . . . 4 transistors and 1 diode for instant play—no tubes to warm-up or deteriorate. The changer handles a 6-stack of records of the same size, and automatically shuts itself off after the last record. Features separate size and speed selectors, plus on/off/reject switch. Includes a ceramic cartridge with dual Sapphire styli for LP's or 78's. Also has separate volume and tone controls for listening as you like it.

ATTRACTIVE OLIVE & IVORY CABINET . . . made of pressed wood with a rugged polyethylene covering. Changer folds up into a neat, compact case for easy carrying. And you can store 45 rpm records in the compartment under the changer. 45 rpm spindle included.

Kit GD-16, 25 lbs. . . no money dn., \$5 mo. **\$39.95**

GD-16 SPECIFICATIONS—CHANGER: Type, Maestro Model 52-79. Speeds, 16, 33 1/3, 45, and 78 RPM. Record Sizes; 7", 10", and 12". Cartridge, ceramic. Stylus, 0.7 mil sapphire for LP's, 3 mil sapphire for 78's. **AMPLIFIER:** Power output, 2 watts EIA music power. Frequency response; ±5 db 100 Hz to 10 kHz. Equalization, RIAA. Transistors and diodes; 2 2N3393, 1 2N2430, 1 2N2431, 1 silicon diode. Speaker; 4 x 6", 25 ohm voice coil. Controls; volume and tone. **GENERAL:** Dimensions; 14" H x 7 3/4" D x 20 1/2" W. Power Requirements; 120 v. 60 Hz AC, 15 watts.

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



GD-187
\$29.95

- Same high-quality Changer as used in new Heathkit GD-107 phonograph (above)
- Ideal for low-cost music systems and for replacement uses • Use with amplifiers with ceramic cartridge inputs • Instructions show how to use with magnetic cartridge inputs • Automatic or manual play of any size 78, 45, 33 1/3 and 16 rpm records • Separate record size and speed selectors • Handles a stack of six records of same size • Sonotone 24-TA ceramic cartridge has diamond stylus for LP's, sapphire for 78's • Cartridge comes wired for stereo, can be rewired for mono—output 0.26 volt (.5 meg. input) • 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 • Completely assembled

GD-187, 11 lbs. . . no money dn., \$5 mo. **\$29.95**



GD-107
\$49⁹⁵

Choice Of Stereo Or Mono



GD-16
\$39⁹⁵

Handy Household Servants

Save Time, Steps & Your Voice With A "Wireless" Intercom

- 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

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. . . no money down, \$5 mo. \$45.90
Kit GD-51A (one station), 5 lbs. \$22.95

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.

Heathkit Solid-State Indoor-Outdoor Intercom System

- Master unit handles up to 5 remote stations
- Ideal for home & small offices
- Weatherproof 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. . . no money down, \$5 mo. . . \$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).



GD-51A \$22.95
no money down, \$5 mo



All 3 Units
\$44.85
\$5 mo.

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
 - Preassembled, prealigned "front-end"
 - Handsome, rich walnut finish wood cabinet
 - Assembles in about 10 hours
- Ideal For Apartments, Family Room, Student Dorm . . . any place you want to add the beauty of FM stereo. Features same RF tuner and IF circuit used in Heathkit transistor stereo components to literally fill any room with truly deluxe hi-fi. Yet its compact size and shape require a minimum of space. Also has two 5 1/4" PM speakers, clutch-release volume control for independent or simultaneous audio adjustment of both channels, automatic frequency control and a luxurious walnut cabinet. Assembles in around 10 hours.

Kit GR-36, 17 lbs. . . no money down, \$7 mo. \$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 \$69.95
\$7 mo

GR-10
\$16.95



- Transformer operated
- Super-heterodyne circuit
- Vernier tuning

AM Table Radio . . . Ideal For Any Room In The House!

Features Superhet Circuit with automatic volume control and vernier tuning for smooth, easy station selection. Includes built-in antenna plus terminals for external antenna. Handsomely fashioned in ivory & beige plastic cabinet. Safe transformer operation. Add that extra radio now with this easy to build, top performer!

Kit GR-10, 7 lbs. \$16.95

GR-10 SPECIFICATIONS — Frequency coverage: 535-1620 kHz. IF frequency: 455 kHz. Power requirements: 105-125 volts AC 50/60 Hz. Speaker: 3" PM. Antenna: Built-in ferrite rod. Dimensions: 5" H x 10" W x 5" D.

GR-11
\$23.50



- Transformer operated
- Preassembled, pre-aligned tuning unit for easy assembly

FM Table Radio . . . Full Rich Sound, Modern Styling!

Add Superb FM Listening To Any Room with this compact, easy-to-build table radio! Five tubes function as seven in its safe, transformer operated circuit. Features line cord antenna for strong local station reception. All components are pre-tuned for fast assembly . . . goes together in only 4 hours. Handsome ivory & beige plastic cabinet!

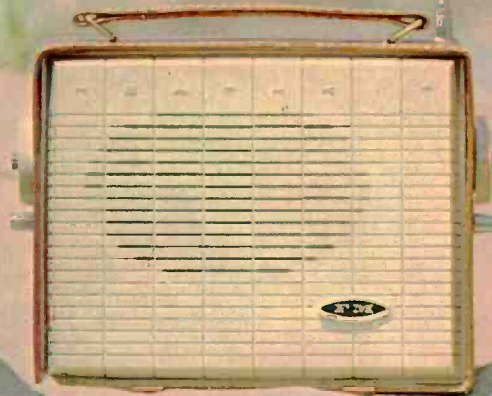
Kit GR-11, 7 lbs. \$23.50

GR-11 SPECIFICATIONS — Frequency coverage: 88-108 MHz. IF frequency: 10.7 MHz. Power requirements: 105-125 volts AC 50/60 Hz. Speaker: 3" PM. Antenna: Built-in line provision for external antenna. Dimensions: 5" H x 10" W x 5" D.

Portables A-Go-Go!



A GR-24
\$28²⁵



B GR-61
\$44⁹⁵



C GR-151A
\$20⁶⁵

A *Deluxe 6-Transistor AM Portable . . . Bold, Crisp Sound You Can't Get From Miniatures*

• 6 silicon transistor, 2 diode circuit gives 8 transistor performance • 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. . . no money dn., \$5 mo. \$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).

B *A Concerto At The Beach? Just Bring Along This Deluxe 10-Transistor FM Portable*

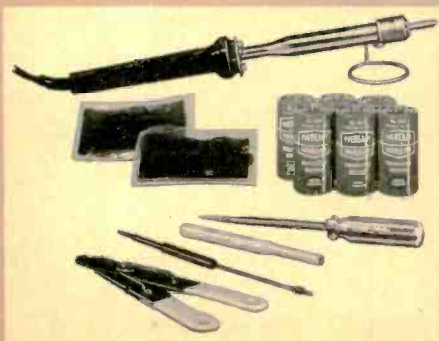
• 10 transistor, 2-diode circuit for instant operation, long trouble-free life • Large 4" x 6" PM speaker for hi-fi sound • Automatic Frequency Control for locked-in reception • Treble-cut tone control assures clear, balanced tone • Accurate vernier tuning • 34" telescopic antenna—headphone jack • Simple circuit board construction • Smart tan simulated leather case with curved beige plastic grille • Preassembled "front-end"

ENJOY CLASSICAL AND STANDARD FAVORITES at the beach, on a camping trip, or picnic . . . anywhere your travels take you. Enjoy the quiet, relaxing beauty of FM with this handsome, "go-anywhere" portable. Features 10 transistor, 2 diode circuit with 3 I.F. stages that deliver full fidelity and complete quieting . . . a push-pull output stage that drives the 4" x 6" PM speaker for low distortion and "console" sound . . . AFC for ease of tuning . . . a headphone jack for private listening or connection to your hi-fi system . . . and even external antenna connectors. Build in 4-6 hours.

Kit GR-61, 6 lbs. . . no money dn., \$5 mo. \$44.95

GR-61 SPECIFICATIONS—Tuning Range: 88 MHz to 108 MHz. IF frequency: 10.7 MHz. Audio Output: 250 milliwatts. Loudspeaker: 4" x 6" permanent magnet. Tone Control: Treble-cut. Batteries: 6 "C" flashlight cells (not included). Battery Life: 300 to 500 hours. Dimensions: 7 3/4" H x 10" L x 4" D (overall). Styling: Sun-tan simulated leather case, curved beige plastic grille.

C *Discover The Fun Of Kit-Building With The GR-151A Solid-State AM Portable . . . Includes FREE Tool Kit And Batteries*



• 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 • Includes FREE tool kit and six "C" cell batteries

INCLUDES EVERYTHING YOU NEED to build and play it. All parts mount on a clearly marked circuit board. Makes wiring fast and simple . . . you'll finish in just 4 to 6 hours. The "everyday-language" instructions guide you every step of the way . . . nothing is left to chance. There's even a section on the theory of radio for the interested novice.

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't resist keeping it for yourself.

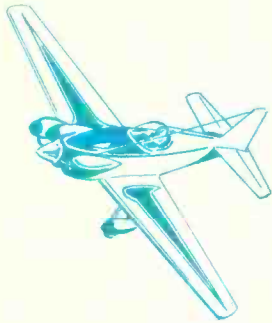
Kit GR-151A, Radlo, Tool Kit & Batteries, 5 lbs. \$20.65

5-Channel Digital Proportional R/C System

Now—For Radio-Control Modelers—The Heathkit Version Of The Famous Kraft System With Revolutionary Capacitor Servos— At Savings Of Over \$200!

• All solid-state system consists of transmitter, receiver, four servos and two rechargeable nickel cadmium battery packs • Easy ... fun to build, no special skills or knowledge needed

“Full House + 1” Operating Versatility. Designed by Kraft Systems, Inc. and put into kit form by Heath, this new R/C system now offers the most economical way to go “full house” on a complete digital proportional rig. This all solid-state system consists of a transmitter, receiver, four servos and two rechargeable nickel cadmium battery packs. Just 20 hours from parts to installation and you save over \$200!



Complete R/C System
transmitter, receiver,
4 servos, 2 nickel cadmium
battery packs
Save \$12.45
Kit GD-47

\$219⁹⁵

no money dn., \$21 mo.
AVAILABLE FEBRUARY

Kit GDA-47-1
Transmitter with
rechargeable battery

\$86⁵⁰

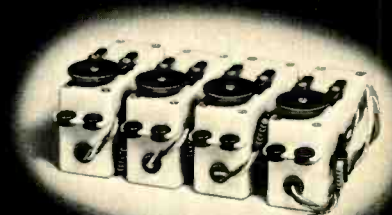
no money dn., \$9 mo.



Kit GDA-47-2
receiver only
\$49⁹⁵
\$5 mo.



Kit GDA-47-3
rechargeable receiver
battery pack
\$9⁹⁵



Kit GDA-47-4
servos (each)
\$21⁵⁰

**The Best News An R/C Modeler Can Get These Days Is That His Radio Equipment Can Cost Less . . .
That's What's Happening With The New Heathkit/Kraft Digital-5 Proportional System . . .
It's Got More Features, More Performance . . . And It Saves \$200 Or More!**

The New Heathkit Digital Proportional System offers the best of all R/C worlds . . . a "full house" of time-proven circuitry . . . rugged, reliable . . . proven in contests and months of sport flying . . . and you can build it, easily, quickly, and save \$200 or more.

Using digital techniques, the system provides 5 channels of simultaneous proportional control . . . 4 with trim adjustments. The transmitter radiates a train of 6 pulses, 5 are controlled by the two control sticks and a thumbwheel . . . the 6th is a reference point for the receiver. The receiver uses elaborate digital circuitry and noise-limiting to route the signals to the proper servos with interference-free operation assured.

The servos use a new variable capacitor feedback system to eliminate failures due to dirty wirewound elements, worn wipers or vibration. Each servo has three outputs . . . two are linear in simultaneously opposite directions . . . one is rotary for convenience in location. Put the new Heathkit R/C Proportional System to work for you . . . it's your best buy . . . and you save even more when you buy the system.

System Kit GD-47, transmitter, receiver, 4 servos, 2 nickel cadmium battery packs, all necessary cable and connectors. Specify frequency desired. (Available on 27 MHz only). . . 5 lbs., no money dn., \$21 mo. (Save \$12.45) **\$219.95**

**You're In Complete Command
With The New Heathkit/Kraft 5-Channel Digital Proportional Transmitter . . .
No Matter What The Range!**

- Factory assembled and tuned RF section assures peak performance, speeds kit assembly • 5 channels for complete command of 5 separate servos . . . all channels are trimmable • Out-of-sight control range • Antenna telescopes into case • True d'Arsonval meter shows relative power output and battery condition • Built-in battery charger with indicator light • Improved, rounded-edge case design • Choice of operating frequencies in 11 meter band (26.995, 27.045, 27.095, 27.145 and 27.195 MHz)

If You Can See It, You're In Command! With the new Heathkit R/C transmitter in your hand, you can be confident of complete control of your craft thanks to efficient circuitry that produces high output power (0.8 watt input, 0.4 watt output). And its 5 channels that use a fixed frame rate (rather than variable) produces 6 pulses instead of 5 for more reliable control of the 5th channel. Four of the channels have trimming adjustments conveniently beside and below each of the two sticks. The right stick controls elevator and ailerons; left stick controls rudder and throttle. The 5th channel is a thumb-type control centered below the two sticks.

Easy To Build, Easy To Use. The RF circuitry of the transmitter is already assembled and aligned to assure that your kit performs to the utmost. The 12 silicon transistor, 10 diode circuitry uses fiberglass boards for rugged reliability, Mylar and Tantalum capacitors in critical circuits. Powered by a 9.6v., 500 mah. nickel cadmium rechargeable battery; built-in battery charger . . . just plug the receiver battery into the transmitter and plug the transmitter into 110 VAC with the cords provided . . . the red indicator tells when batteries are being charged . . . the meter tells when transmitter battery needs charging . . . AC line isolation is provided during charge for shock protection (charges only when transmitter is "off"). Operates up to 5 hrs. per charge. Just pull up the 54" telescoping antenna, turn the switch on and you're in business . . . the Heathkit Transmitter fits easily in your hand (rounded edges on the blue anodized aluminum case for the natural hand curvature) . . . and it weighs only 2¾ lbs., measures just 6¾" H, 6¾" W, and 2⅝" deep.

Kit GDA-47-1, transmitter, battery, charging cord, (specify frequency), 3 lbs., no money dn., \$9 mo. **\$86.50**

**Put This Sensitive Solid-State 5-Channel Heathkit/Kraft Receiver In Your R/C Model For Long Distance Command. . .
Compact Fit-Anywhere Size . . . Weighs Just 5 oz.**

- Highly sensitive reception • Virtually immune to noise • Not affected by temperature variations • 5th channel for flaps, retractable gears, etc. • Impact resistant • Powered by nickel cadmium rechargeable battery • Operates up to 5 hours per charge • Choice of 5 operating frequencies in 11 meter band (26.995, 27.045, 27.095, 27.145, 27.195 MHz)

Out-Of-Sight Range, Interference-Free Reception. That's what you get with the new Heathkit R/C Receiver in your craft. The special circuitry uses 11 transistors, 5 SCS devices, and 7 diodes to produce this kind of performance. The decoder section uses Silicon Controlled Switch (SCS) shift logic plus noise limiting diode and integrator circuit to assure accurate routing of pulse information to the proper servo with elimination of virtually all noise-produced interference pulses.

Rugged Construction, Easy Alignment, Compact Installation. Inside the handsome blue anodized aluminum case of the new Heathkit R/C

receiver are 2 tough fiberglass circuit boards on which are mounted all the components of this superheterodyne circuit with 455 kHz IF. Power is supplied by a 4.8 V nickel cadmium rechargeable battery which has a 500 mah. (milliampere hours) rating; listed below as GDA-47-3. Although compact (just 2⅞" H, by 2¾" W, and 1⅝" D), the receiver is easy to assemble and alignment is accurate by tuning the coils for maximum output as indicated on the transmitter meter which is used for this purpose before it is installed in the transmitter.

Your Best Receiver Buy, Bar None. The Heathkit R/C receiver invites comparison for value. Special design, exceptional performance . . . and lowest price.

Kit GDA-47-2, receiver only (specify frequency), 3 lbs., no money dn., \$5 mo. **\$49.95**
Kit GDA-47-3, receiver battery pack only, shipping wt. 1 lb. **\$9.95**

**For Fast, Precise Response . . . The Unique New Heathkit/Kraft Variable Capacitor Servo . . .
Three Outputs, 3.5 Lb. Thrust, 2.5 Oz. Weight**

- Sealed variable capacitor feedback • Three outputs . . . two linear, bi-directional shafts plus rotary • Operates in any position • Midget size fits anywhere • Weighs just 2½ oz.

Control You Can Count On . . . that's the new Heathkit Capacitor Servo. Fast, exact, this new system responds when you want it, exactly as you want it, thanks to the new variable capacitor design. No more failure due to dirty feedback elements or vibration . . . no sliding contacts to corrode or shift, no wire to wear out . . . this electronic method of feedback is reliable and accurate . . . improves resolution since a capacitor provides infinite resolution compared to discrete steps in wirewound types of feedback.

Powerful, Versatile. Inside its small, tough nylon case is a powerhouse

. . . a full 3.5 lb. thrust delivered by its outputs . . . thrust that is usable in many different ways . . . two linear shafts that travel ⅝" in opposite directions simultaneously, plus a rotary output with over 100° of rotation . . . so useful that one servo can do several things at once. So compact (just 1⅞" H, 1⅝" W, 2⅞" L), it fits anywhere, in any position.

Easy to Build. Despite its small size, you'll find these new servos go together easily . . . the 9-transistor circuit mounts on a fiberglass circuit board . . . all nylon gears, shafts, and case fit together accurately, easily. All necessary cables, connectors, and grommets are included for each servo. Best of all is the money you save . . . for these sell for just a fraction of the usual price.

Kit GDA-47-4, one servo only, shipping wt. 1 lb. **\$21.50**

Go "Full House+1" at lowest cost. . . Go with Heathkit Proportional R/C

For Home Or Classroom Study



EF-1
Text & Chassis
\$8.95

EF-1-4
Text & Instrument
\$42.00

"How to Understand & Use Your Vacuum Tube Voltmeter"

Learn the theory, advantages and applications of the Vacuum Tube Voltmeter . . . use this Heath-kit 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. \$8.95
- Kit EF-1-3, Includes EF-1 and IM-11 VTVM, p. 69, 8 lbs. . . . no money dn., \$5 mo. . . . \$34.50
- Kit EF-1-4, Includes EF-1 and IM-13 VTVM, p. 70, 10 lbs. . . . no money dn., \$5 mo. . . . \$42.00
- Manuals Only For EF-1 (single copy) . . . \$5.00
- (10 or more copies) ea. \$3.00



EF-2
Text & Chassis
\$9.95

EF-2-3
Text & Instrument
\$69.95

"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. \$9.95
- Kit EF-2-3, includes EF-2 and IO-21 Oscilloscope, pg. 83, 16 lbs. . . . no money dn., \$7 mo. \$69.95
- Kit EF-2-4, includes EF-2 and IO-12 Oscilloscope, pg. 82, 28 lbs. . . . no money dn., \$9 mo. \$89.95
- Manuals only for EF-2 (single copy) . . . \$5.00
- (10 or more copies) ea. \$3.00



EF-3
Text & Chassis
\$11.95

EF-3-3
Text & Instrument
\$63.95

"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. \$11.95
- Kit EF-3-2, Includes EF-3 and IG-102 Signal Generator, pg. 75, 10 lbs. . . . no money dn., \$5 mo. \$39.95
- Kit EF-3-3, Includes EF-3 and IG-82, pg. 74, Sine-Square Generator, 18 lbs. . . . no money dn., \$7 mo. \$63.95
- Manuals only for EF-3, (single copy) . . . \$5.00
- (10 or more copies) ea. \$3.00



EK-1
\$19.95

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. \$19.95



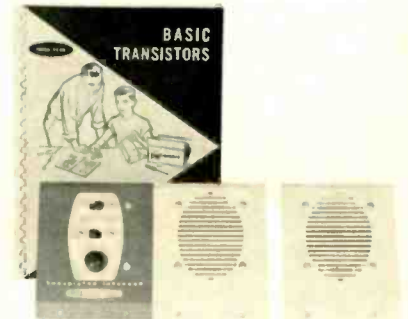
EK-2A
\$18.75
(less cabinet)

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. \$18.75
- Basic Radio Part II (EK-2B), 5 lbs. \$18.75
- AK-8, Cabinet for completed receiver, 3 lbs. \$3.95



EK-3
\$16.95

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. \$16.95

New Heathkit Jr.® Series

JK-17
\$19⁹⁵



NEW HEATHKIT JR.® Solid-State Portable

Phonograph . . . 4-Speed Mono Play . . .

Assemble In 1 To 2 Hours

- Plays 16, 33 $\frac{1}{3}$, 45 and 78 rpm mono records • Handles 7, 10 and 12" record sizes • Built-in 45 rpm adapter disc • Crystal cartridge with universal sapphire stylus for all types of records
- Solid-state circuit for cool, instant operation, long life • Suitcase style cabinet of durable wood and hardboard, covered with ivory & desert gold polyethylene • Detachable lid • Preassembled turntable mechanism . . . just one tiny circuit board to build . . . finish in 1 to 2 hours • 4" speaker • Steel top chassis plate

HERE'S THE PERFECT PHONOGRAPH FOR THE YOUNGSTER IN YOUR FAMILY. He'll have hours of fun listening to his favorite story albums and music. And since it takes only an hour or two to build, it's an ideal way to introduce him to the fun and satisfaction of kit-building. Also makes an ideal Christmas, birthday or graduation gift.

PLAYS ALL 4 SPEEDS of 7, 10 and 12" record sizes. The feather-weight tone arm features a crystal cartridge with a universal sapphire stylus. A special 45 rpm disc is built-into the turntable. Also features a record speed selector, and an on/off/volume control. The 4" speaker

delivers a rich, clear sound, and is protected against dust and damage by a special wire mesh grille cloth.

SUITCASE STYLE . . . RUGGED CONSTRUCTION, ATTRACTIVE STYLING. The lightweight cabinet is sturdily constructed of wood and hardboard covered with washable ivory & desert gold polyethylene . . . measures a compact 12 $\frac{7}{8}$ " W x 11 $\frac{1}{4}$ " D x 5 $\frac{3}{8}$ " H. And the lid detaches easily to save space on a bookshelf, table, etc. The steel chassis plate is a deep rich mocha brown with white trim . . . contrasts beautifully with the ivory turntable platter and tone arm. The platter has a special foam rubber rim to cushion and protect record grooves. And with the 4 transistor, 1 diode circuit, you're assured of long, trouble-free performance.

BUILD IN JUST 1 TO 2 HOURS. Just 17 parts to mount on a tiny circuit board, connect the leads from the preassembled tone arm and turntable mechanism, mount the speaker and install in the pre-assembled case . . . so easy a child can do it. All you add are the records.

Kit JK-17, 11 lbs. \$19.95

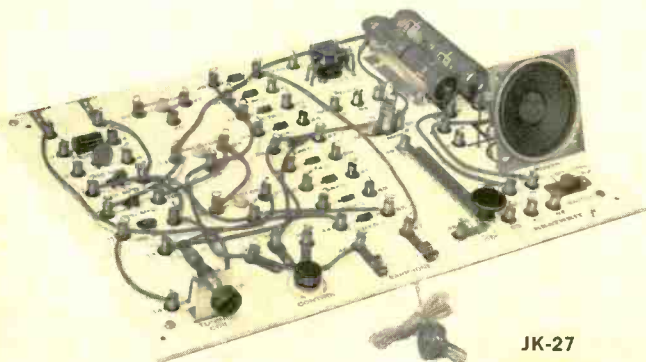
JK-17 SPECIFICATIONS—AMPLIFIER: Frequency Response: 80 Hz-10 kHz. Music Power Output: 600 Milliwatts EIA. Control: Off-On, Volume. Speaker: 4" 16 ohm Voice Coil. Transistor-Diode Complement: 2—2N3393, 1—S2090, 1—S2091, 1—Silicon Diode. **TURN-TABLE:** Type: 4 Speed Phonomotor. Speeds: 78, 45, 33 $\frac{1}{3}$ and 16 RPM. Record Sizes: 12", 10" and 7". Turntable Diameter: 8 $\frac{1}{2}$ ". Cartridge Type: Crystal. Stylus: Universal sapphire 0.7 to 3 mil for all records. **GENERAL:** Power Requirements: 117 VAC 60 Hz 14 watts. Size: 12 $\frac{7}{8}$ " W x 11 $\frac{1}{4}$ " D x 5 $\frac{3}{8}$ " H.

NEW HEATHKIT JR.® Electronic Workshop "19"

- Contains all materials & instructions for building 19 different electronic items • Fast, solderless spring-type connectors • Operates on safe, economical flashlight batteries (not included)

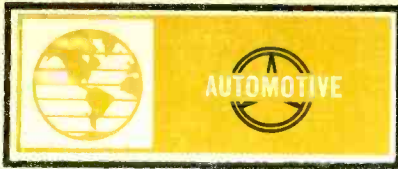
PERFECT FOR ANY YOUNGSTER WHO WANTS TO EXPLORE THE MYSTERIES OF ELECTRONICS. He'll have hours of fun experimenting with circuits that are safe, educational and really work! Contains cartoon-illustrated principles of operation and simple, non-technical instructions for building 19 different projects . . . 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. Solderless, spring-type connectors speed assembly, and can be used repeatedly for building favorite projects. Operates on safe C-size flashlight batteries (not included). Makes an ideal gift for any youngster at birthday, Christmas or graduation time.

Kit JK-27, 4 lbs. \$13.95

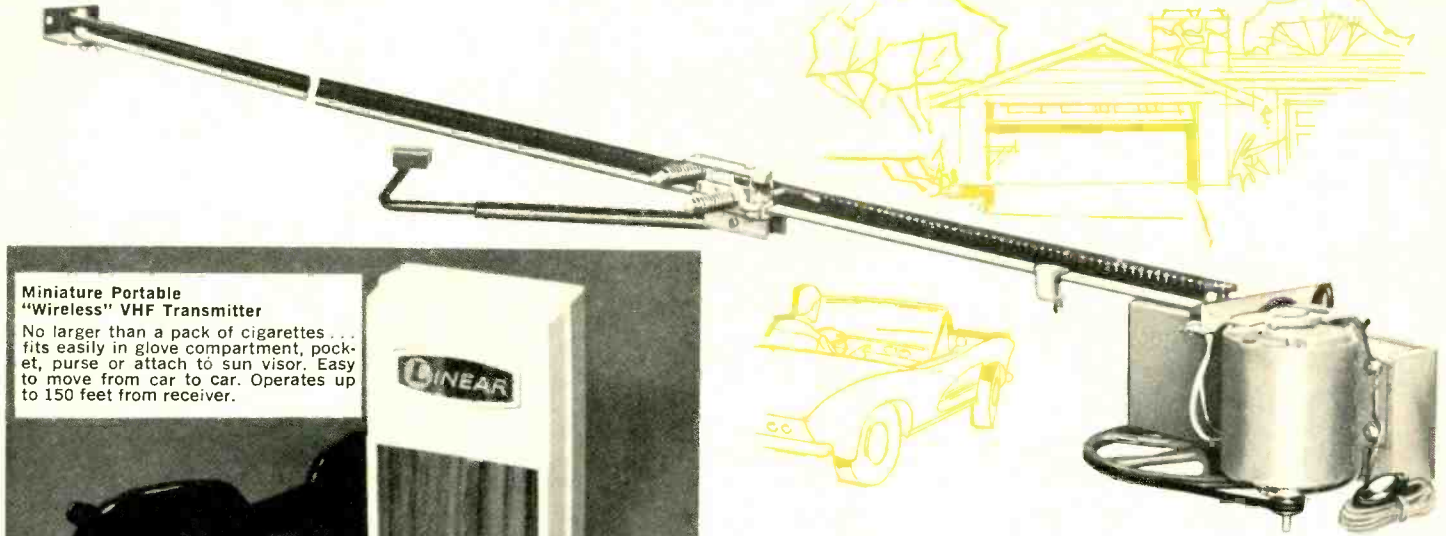


JK-27
\$13⁹⁵

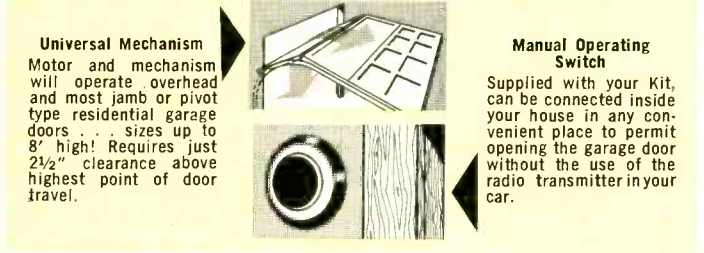
Look To Heath For The Newest, The Finest In Electronic Kits



Garage Door Opener

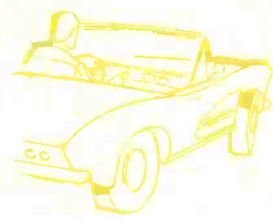


Miniature Portable "Wireless" VHF Transmitter
 No larger than a pack of cigarettes... fits easily in glove compartment, pocket, purse or attach to sun visor. Easy to move from car to car. Operates up to 150 feet from receiver.



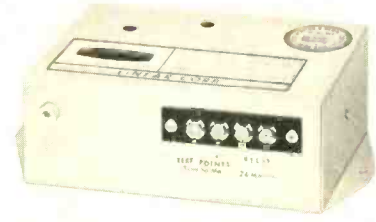
Universal Mechanism
 Motor and mechanism will operate overhead and most jamb or pivot type residential garage doors... sizes up to 8' high! Requires just 2 1/2" clearance above highest point of door travel.

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-177A
\$112.95



New Sensitive, Solid-State VHF Receiver
 Install in minutes in your garage. Operates on 250 to 300 megahertz... requires no license. Selectable tone coding prevents interference with similar neighborhood units. Compact 5 1/2" x 3 3/4" x 2" size.

Radio-Controlled Garage Door Opener Semi-Kit . . . Factory Assembled LINEAR® Solid-State Transmitter & Receiver

- New factory assembled solid-state VHF 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
- 5-year warranty on transmitter & receiver, 1-year unconditional
- 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 250 to 300 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.

VHF 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-177A, 66 lbs. (REA Express or Motor Frt. only), mechanism, (1) transmitter, (1) receiver... no money down, \$11 mo. **\$112.95**
 - GD-177B, 67 lbs. (REA Express or Motor Frt. only), mechanism, (2) transmitters, (1) receiver... no money down, \$12 mo. **\$124.95**
 - GDP-147, 2 lbs. (1) transmitter, (1) receiver... no money dn., \$5 mo. **\$49.95**
 - GDP-157, 2 lbs. (2) transmitters, (1) receiver... no money dn., \$7 mo. **\$64.95**
 - GDP-167, Transmitter only, 1 lb. **\$15.95**
- KIT MECHANISM SPECIFICATIONS:** 125" long x 8 5/8" high x 13" wide, 100# max. operating force. Operates overhead track and most jamb & pivot doors up to 8' high. 117 v. AC 1/4 H.P. motor. Fused.
- VHF TRANSMITTER SPECIFICATIONS:** Powered by standard 9-volt transistor type battery (Eveready No. 216 or equivalent). **RF Frequencies:** Approx. 250-300 MHz. **Operating Range:** Up to 150' from receiver (adjustable). **Useful Temperature Range:** -50° to +140° F. **Size:** 3 3/4" x 2 1/4" x 1 1/8". **Weight:** 5 ounces.
- VHF RECEIVER SPECIFICATIONS:** 105 to 140 v. AC 0.8 watts nominal. **RF Frequencies:** approx. 250-300 MHz. **Selectivity:** 4 MHz @ 500 uv. **Useful Temperature Range:** -50° to +140° F. **Size:** Approx. 5 1/2" x 3 3/4" x 2". **Power Requirements:** 105 to 140 volts 60 Hz 0.8 watt nominal. **Relay Voltage:** 24 volts NEC Class II circuit.

New Professional Shortwave Receiver



SB-310
\$249⁰⁰

(less speaker)
no money dn., \$23 mo.

Deluxe 10-Band Shortwave Listener's Receiver Slices Frequencies Down To The Last kHz . . . Famous Heathkit SB-Series Quality & Styling

• Covers six shortwave broadcast bands (49, 41, 31, 25, 19 & 16 meters) . . . 80, 40 & 20 meter amateur bands . . . 11 meter CB • 5 kHz crystal filter included for AM, SSB and CW listening • 11-tube circuit • Crystal-controlled front-end for same rate tuning on all bands • 1 kHz dial calibrations—100 kHz per dial revolution • Bandsread equal to 10 feet per MHz • Tuning dial to knob ratio 4 to 1 • 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

Our Finest Shortwave Receiver . . . The Superb New 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 bandsread 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 in shortwave listening, choose the new SB-310 receiver.

Kit SB-310 (less speaker), 24 lbs. . . no money dn., \$23 mo. . . . \$249.00
Kit SB-600, 8 ohms, 6" x 9" speaker, 5 lbs. . . . \$18.95
SBA-301-2, Optional deluxe CW filter for optimum CW (400 Hz @ 6 db down; 2 kHz max. @ 60 db down), 1 lb. . . . \$20.95
SBA-310-1, Optional SSB filter plus crystal for switch selection of USB & LSB (2.4 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., no money dn., \$5 mo. . . . \$39.95

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 $\pm 10\%$ line voltage variation. Sensitivity: Less than 0.3 μ v 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 $\frac{1}{2}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{8}$ " 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 card socket. Tube complement: 11 tubes (14 functions). Diode complement: 8.



GR-81
\$24⁹⁵
no money dn., \$5 mo.

Ideal For Beginning SWL's . . . Low Cost Shortwave Radio

• 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. . . no money dn., \$5 mo. . . . \$24.95

GR-81 SPECIFICATIONS—Frequency coverage: 140 kHz to 18 MHz on four bands. Tube complement: 12AT7 Detector/1st Audio, 50C5 Audio Output, 35W4 Rectifier. Power requirements: 105-125 V 50/60 Hz only, 30 watts. Fused. Controls: Main tuning (calibrated), Bandsread, Bandswitch, Regeneration, on/off volume. phone jack. Dimensions: 10" W x 7" H x 7" D.



GR-54
\$87⁹⁵

What In The World's Going On? You'll Know

For The Seasoned SWL . . . Deluxe 5-Band Shortwave Receiver . . . Includes FREE Antenna

SHORTWAVE 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
16 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.
13 M	20 MHz	Evening	South America
11 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.
		Evening	Amateur 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 cover 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" x 6" 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.,
\$9 mo. \$87.95

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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 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 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 ohm ext. speaker, or headphones (50 ohm to 10 K ohm). **Dimensions:** 14 1/4" W x 6 1/2" H x 10 1/8" D.



GD-396
\$3⁵⁰

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. \$3.50



GR-64
\$39⁹⁵

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. \$4.95



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 FREE with GR-54.
GRA-72, 2 lbs. \$1.45

GD-125
\$14⁹⁵



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 power supply.
Kit GD-125, 3 lbs. \$14.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

- 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

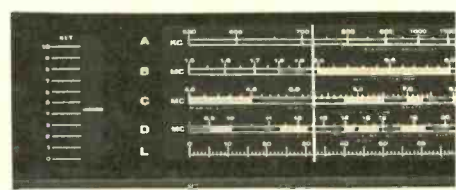
HEAR LIVE BROADCASTS FROM AROUND THE GLOBE . . . Hong Kong, Peru, France, Australia, England, Canada . . . hundreds of foreign countries. Listen to the drama of ship-to-shore broadcasts. Wonder at the machine-gun pace of a CW operator piercing the airwaves with an urgent message. Pick up the Voice of 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., \$5 mo. \$39.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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: 105-125 V 50/60 Hz AC, 30 watts. Dimensions: 13½" 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.



GR-43
\$139⁹⁵



**Now At A New Low Price . . . Deluxe 10-Band
AM/FM/Shortwave Transistor Portable**

- 10 bands tune Longwave, Standard Broadcast, FM and 2 MHz-22.5 MHz Shortwave Bands • 16 transistors, 6 diodes and 44 factory assembled and pretuned circuits • Two separate AM & FM tuners and IF strips • Two built-in antennas • Battery saver switch cuts current drain up to 35% • Rotating tuning dial • Dial light • Four simple controls for tuning, volume, tone, AFC and band switching • 4" x 6" PM speaker • Earphone & built-in jack • Optional converter/charger available • Time zone map & "listener's guide"

COMPLETE DELUXE LISTENING IN A COMPACT PORTABLE. With the GR-43 you get super-selective AM that brings you stations that you never knew existed before . . . super-sensitive FM that brings you the most beautiful music ever heard from any portable (the separate FM tuner and IF section are the same ones we use in our FM tuners) . . . seven bands of worldwide shortwave . . . plus a 150-400 kHz band for dropping in on aircraft beacon and marine weather broadcasts. If you never heard shortwave before, you're in for an exciting new listening adventure. You'll "visit" ships at sea, tune in on amateur radio operator conversations, and enjoy hundreds of intriguing foreign broadcasts.

SOLID-STATE FOR SOLID SOUND . . . 16 transistors, 6 diodes plus 44 factory-built & aligned RF circuits assure you of instant heat-free operation; peak performance at all times; plus easy 10-hour kit assembly. Two separate AM and FM tuners are factory-built, ready to install . . . no need to worry about delicate alignment.

FULL CONTROLS FOR COMPLETE OPERATING CONVENIENCE. For normal indoor listening, a Battery-Saver switch reduces battery drain up to 35% . . . yet delivers a healthy 500 milliwatts so there's no ear strain when listening outdoors. A 10-position selector drives the rotating turret dial so you can easily view any band. There's even a logging scale to help relocate unknown frequencies. Also has a Dial Light for nighttime use; AFC with on-off switch for drift-free FM; an 8½ revolution tuning knob to separate stations easily; and a combination on-off switch and tone control.

LARGE 4" x 6" PM SPEAKER . . . specially designed to match the cabinet's acoustics to put out a "big-set" sound. Or, if you prefer you can plug in the earphone (included) for private listening.

DELUXE STYLING MATCHES DELUXE PERFORMANCE. Makes a handsome companion with its jet black extruded aluminum front and

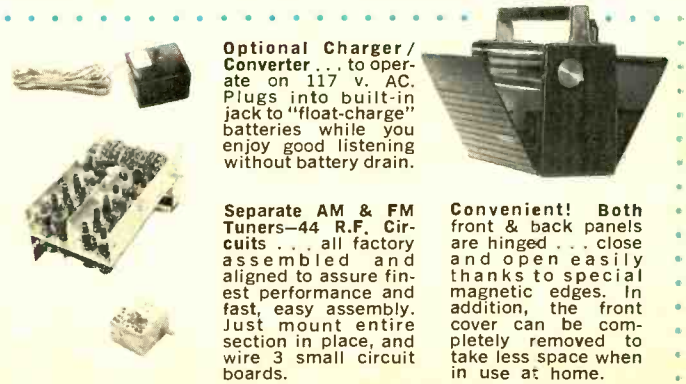
back panels, walnut-finished vinyl-covered end pieces and chrome-plated trim. Both panels are hinged . . . open and close effortlessly thanks to special magnetic latches. The front panel can be removed to take less space when used at home. A Listener's Guide with U.S. FM and worldwide shortwave frequencies, plus a special map for simple conversion of world time zones is included.

TWO BUILT-IN ANTENNAS . . . a large ferrite rod that's conveniently housed in the easy-carry handle receives AM and Longwave, and a 5' telescoping whip rotates for best FM and shortwave reception. Also has connectors for external antennas.

INEXPENSIVE FLASHLIGHT BATTERY POWER. 6 "D" cells power the radio and 1 "C" cell operates the dial light . . . batteries not included, but available anywhere. Also runs on 117 v. AC as it "float" charges its batteries with an optional converter/charger (see below). For the finest listening everywhere, take along the GR-43 . . . a better-than-ever buy at its new low price.

Kit GR-43, 19 lbs. . . no money dn., \$13 mo. . . . \$139.95
Model GRA-43-1, Converter/Charger for 117 v. 60 Hz AC, 1 lb. . . . \$6.95

GR-43 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: 1½ 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: 160 mw. Speaker: 4x6" oval; permanent magnet; 3.2 ohm voice coil. **Batteries:** 6 size D cells; 1 size C cell. **Dimensions:** 13½" W x 5½" D x 10½" H including handle.



Optional Charger/Converter . . . to operate on 117 v. AC. Plugs into built-in jack to "float-charge" batteries while you enjoy good listening without battery drain.

Separate AM & FM Tuners—44 R.F. Circuits . . . all factory assembled and aligned to assure finest performance and fast, easy assembly. Just mount entire section in place, and wire 3 small circuit boards.

Convenient! Both front & back panels are hinged . . . close and open easily thanks to special magnetic edges. In addition, the front cover can be completely removed to take less space when in use at home.

Improve Car Performance

Diagnose Auto Ignition Troubles Quickly And Easily With This Versatile Analyzer . . . Ideal For Car Buffs, Service Stations, School Auto Shops

- 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 superimposed 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 troubleshooting, choose the IO-20.

Kit IO-20, 18 lbs. . . no money down,
\$10 mo. **\$99.50**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

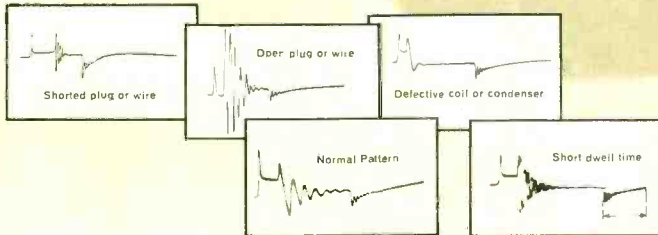
IO-20 SPECIFICATIONS—Rpm Range: 400-5000 rpm **Displays:** Secondary, Primary, Parade, Super-imposed. **Screen size:** 4½" diameter. **Dwell measurement:** 4, 6 & 8 cylinder calibration on face plate. **Pattern height:** Secondary circuit, approx. 1"; Primary circuit, 6 volt system ¼", 12 volt system 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.



IO-20
\$99.50

Tell-tale Patterns Show Ignition System Condition



Gilbert-Davis Basic Tester Set For Car Tune-Up And Repair

FAMOUS BRAND . . . TOP QUALITY. Ideal for do-it-yourselfers and professionals! Includes a Model 34 Remote Starter Switch with push button and extra long, neoprene insulated lead wires . . . Model 35 Compression Tester that reads 0-300 lbs. on 2½" dial—features short stem with 15° offset to reach back cylinders . . . Model 36 Vacuum/Fuel Pump Tester with 2½" 3-color dial—calibrated 0-30 inches for vacuum and 0-7 lbs. pressure . . . Model 37 Engine Timing Light with molded plastic case, long leads, and rubber covered connectors. Order yours now.
GFP-83, 4 lbs. **\$11.95**



ID-11
\$17.95

Timing Light Kit . . . Accessory To Heathkit Ignition Analyzer

CONVENIENT . . . EASY TO USE. Specially designed to assist your diagnosis. Simply plug into the IO-20 Ignition Analyzer (above). Produces an intense white light that shows timing marks on engine even in brightly-lighted areas. Features a speed range of 0-1250 flashes per minute (0-2500 rpm for 4-cycle engines of current conventional automobiles). 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. **\$17.95**

5-Watt CB Transceiver



OPERATES "FIXED" . . . with accessory AC power supply GWA-14-1. AC power switching is accomplished through the On-Off Volume control on the transceiver front panel. The GWA-14-1 serves as a handy desk-top base for the GW-14 transceiver, and provides all necessary power . . . requires only one plug-in connection.

Kit GWA-14-1, AC power supply, 5 lbs. \$14.95



6 To 12 Volt Converter For Mobile Transistor CB!

Converts 6 volts to 12 for "mobile" operation of GW-14 . . . or any other transistor device whose power requirement does not exceed 750 ma regulated (1 amp unregulated) @ 13 v. DC. Measures only 2 3/8" H. x 5 1/4" W. x 3 3/4" D. . . . fits neatly on the firewall of a VW, Porsche, any car with 6 v. DC neg. grd. system. Includes power cables.

Kit GWA-14-4, 3 lbs. \$14.95



Kit GW-14
Was \$89.95
Now Only
\$76⁹⁵
Wired GWW-14
\$124⁹⁵

Solid-State 5-Watt CB Transceiver . . . 23 Crystal Controlled Channels . . . New Low Kit Price . . .

And Now The Factory Assembled Model Is FCC Type Accepted

- 14 transistor, 6 diode circuitry for cool, instant operation, long trouble-free life, and low battery drain
- Provision for 23 crystal-controlled transmit & receive channels . . . low cost 23 channel crystal pack available
- Full 5 watt performance . . . a minimum of 3 watts RF output, plus 3 watts audio modulating power
- Only 2 3/8" H x 7" W x 10 1/2" D . . . ideal for car, boat, any mobile installation
- Front panel "S" meter indicates signal strength & relative power output . . . also aids in alignment
- Adjustable squelch control . . . eliminates all speaker hiss during standby
- Automatic noise limiter . . . minimizes noise from ignition systems, etc.
- Built-in PM speaker mounts on the left side to disperse sound to driver
- 1/2 uv sensitivity for 10 db signal plus noise to noise ratio
- Easy to build circuit board construction
- Gimbal mounting bracket for versatility of installation
- Attractive Turner Ceramic PTT mike
- Handsome die-cast, chrome-plated front panel with rust-resistant aluminum charcoal gray cabinet

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 3/8" 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. And now with its new low kit price, it's a better-than-ever buy.

FULL POWER FOR MAXIMUM DISTANCE. Boasts a minimum 3 watts RF output by means of a "twin-pi" matching network which increases efficiency and minimizes harmonic distortion . . . assures dependable communication over maximum range. Relay switching insures complete circuit isolation between transmitter and receiver sections to eliminate interaction problems.

EASY TO OPERATE . . . only 3 simple controls—off/on/volume control, adjustable squelch and lighted channel selector. An automatic noise limiter minimizes ignition system and motor noise.

CHOICE OF KIT OR FACTORY-BUILT VERSIONS. The kit takes only around 10 hours to build. All parts mount on a single circuit

board . . . reduces chance for wiring errors. And to facilitate servicing and trouble-shooting, the foil circuit pattern is screened on the top of the board . . . permits quick circuit tracing. Includes a smartly styled TURNER ceramic microphone, DC power cables and crystals for one channel (specify frequency). For 12 v. negative ground only. Operates on AC with accessory power supply, GWA-14-1, or on 6-volt sources with optional 6 to 12 v. converter GWA-14-4. Use must comply with Part 95, FCC regulations. Buy a pair and save 5%.

Kit GW-14, 8 lbs. . . no money dn., \$8 mo. Was \$89.95 . . . Now Only **\$76.95**

Assembled GWW-14, 8 lbs., no money dn., \$12 mo. **\$124.95**

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

Kit GWA-14-1, AC Power Supply, 5 lbs. **\$14.95**

Kit GWA-14-4, 6 to 12 v. DC converter, 3 lbs. **\$14.95**

GW-14 SPECIFICATIONS—RECEIVER SECTION: General description: 6-transistor superheterodyne circuit with RF amplifier, squelch, noise limiter, 23-channel crystal controlled tuning with tuning and relative signal strength indicator. 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 ohms 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 volt system (13.5 volts); receiver current drain, standby -120 ma; transmitter current drain—750 ma. **Dimensions:** 2 3/8" H x 7" W x 11" D.

Complete 23-Channel CB Crystal Pack . . . Only \$79.95!

A regular \$135.70 value! Includes transmit and receive crystals for all CB channels for complete GW-14 operation . . . a total of 46 crystals. For maximum versatility, this package is your best dollar value!

GWA-14-2, 1 lb. . . no money dn., \$8 mo. **\$79.95**

Crystals Only \$1.99 Each With Any Transceiver Order!

If you need more than 1 channel, order the extra crystals along with the GW-14 or any Heathkit transceiver for only \$1.99 . . . a 96c savings . . . regularly \$2.95 when ordered separately. Remember you need two crystals for each channel . . . one each for transmit and receive functions.

New Low Prices on Walkie-Talkie Kits

**NOW
FCC TYPE
ACCEPTED!**

Wired GRS-65A

\$99⁹⁵

no money dn., \$10 mo.



Now FCC Type-Accepted . . . Heath GRS-65A Factory Assembled 2-Watt Walkie-Talkie

- 9 silicon transistor, 2 diode circuit • \$20 rechargeable battery included • Crystal-controlled transmit & receive • Superhet receiver with RF stage • Adjustable squelch & automatic noise limiter • DOT approved • 2-tone green aluminum case • Factory assembled and tested

Operates Over Wide Temperature Range . . . tested at -30° F. and +150° F. Even works in steel buildings. Ideal for construction crews, factory & office, fishing, hunting, boating . . . hundreds of practical uses. Includes \$20 rechargeable battery for 8-hour use per charge . . . total life up to 5000 hours; 36" telescopic whip antenna, plus external antenna connectors; leather shoulder strap; elastic hand strap; and rustproof aluminum cabinet. Requires two crystals . . . only \$1.99 each when ordered with your GRS-65A (specify channel no.). Completely assembled, not a kit. Use must comply with Part 95, FCC Regulations. Optional 117 v. AC battery charger and car cigarette lighter charger cord for recharging while you operate from car's 12 v. system also available.

Assembled GRS-65A, less crystals and battery charger, 3 lbs., no money dn., \$10 mo. **\$99.95**
GRA-65-3, 117 v. AC battery charger plus cigarette lighter charging cord, 3 lbs. . . . **\$9.95**

GRS-65A SPECIFICATIONS—Receiver: single channel crystal controlled superheterodyne. Sensitivity: 1 uv for 10 db signal-to-noise ratio. Selectivity: 8 kHz at 6 db. Audio power output: 400 mw. Input to final stage: 2 watts. Transmitter frequency: Crystal-controlled. Battery: 500 mah rechargeable nickel cadmium, 8 hours use per charge. Battery life: 5000 hours normal use, 1500 minimum. Standby receiver drain: 13 ma. Dimensions: 8" x 3 1/8" x 1 1/8" D.

Now The Heathkit 1-Watt Walkie-Talkie Is A Better Buy Than Ever At This Lower Price

- Efficient 10-transistor, 2 diode circuit for dependable, trouble-free performance • Up to 3-mile inter-unit communications • Crystal-controlled transmit & receive • Adjustable squelch control & automatic noise limiter • \$20 rechargeable battery included • Built-in 117 v. AC battery charger • Sturdy, rustproof all-metal case • Simple to build & operate

Now Save \$5. Features superhet receiver with RF stage; adjustable squelch and automatic noise limiter; and all solid-state circuitry.

Includes \$20 Rechargeable Battery . . . lasts 1500 to 5000 hours. Recharge it from household 117 v. AC, or from your car's 12 v. battery with a special 6' cord that plugs into the cigarette lighter. Also has a built-in battery condition meter. Includes attractive 2 tone green rustproof metal case, 35" telescopic whip antenna, shoulder and elastic hand straps, power cords, earphone, FCC license pack and crystals (specify channel no.). Use must comply with Part 95, FCC regulations. Fast circuit board construction speeds assembly. Order a pair for extra savings. Kit GW-52A, 4 lbs. . . no money dn., \$7 mo. . . . **Now Only \$64.95**
Kit GW-52-2, (pair) 8 lbs. . . no money dn., \$11 mo. . . . **Now Only \$119.95**

GW-52A SPECIFICATIONS—Receiver: Single channel crystal controlled superheterodyne. Sensitivity: 1/2 microvolt for 10 db signal-to-noise ratio. Selectivity: 7 kHz at 6 db. Audio power output: 250 milliwatts. Transmitter: Input power to final stage: 1 watt nominal. Transmitter frequency: Crystal controlled (any one channel), 1 through 23). Modulation: High level AM limited to less than 100%. Controls: Off-On-Volume and Squelch. Push-to-talk switch on side of cabinet. Battery: 12.5 V. (500 mah rechargeable nickel cadmium; 12 hrs. use per charge). Battery life: 1500 hrs. min., 5000 hrs. likely in normal usage. Charging source: 117 VAC or 12 VDC. Total receiver current drain, standby: Approx. 13 milliamps. Total transmitter current drain: Approx. 140 milliamps. Antenna: 35" whip type, completely collapsible into cabinet, or external. Crystals: Subminiature, plug-in type tolerance .005%. Speaker-microphone: 2 1/2" round permanent magnet type. Earphone jack: Miniature-type (earphone supplied). Meter: Indicates battery condition. Cabinet dimensions: 10 1/16" H x 3 3/8" W x 1 1/16" D.

9-Transistor, 100 Milliwatt Walkie-Talkie . . . Operates Up To A Mile

- Anyone can use it—no license required • Hundreds of uses in business or leisure • Crystal-controlled transmitter & superheterodyne receiver • Built-in squelch & automatic noise limiter • Portable—battery powered • Up to 1 mile inter-unit operation . . . greater distances with Class "D" CB units • Rust-resistant aluminum case

Fills A Variety Of Communication Needs. And no license is required over the 26.97 MHz to 27.27 MHz frequency range when used in the manner prescribed in the FCC regulations, Part 15. However, the GW-21A may be used as a licensed CB unit as described in FCC regulations, Part 95. Includes 2-tone rustproof aluminum case, shoulder strap, crystals (specify channel no.), earphone for private listening. Simple circuit board assembly. Less battery.

Kit GW-21A, 3 lbs. . . no money down, \$5 mo. . . . **\$39.95**
Kit GW-21-2 (pair) 6 lbs. . . no money down, \$8 mo. . . . **\$74.95**
GWA-30, Battery Set (2), 1 lb. . . . **\$2.95**

GW-21A SPECIFICATIONS—Receiver: Crystal-controlled superheterodyne. Sensitivity: 1 uv for 10 db s/n ratio. Transmitter: Crystal-controlled, any channel 2 to 23 in 11 meter citizens band (unlicensed). RF Input Power: 100 milliwatt. Battery: 9 volt. Antenna: 35" whip. Circuit: 9 transistor, 2 diode. Dimensions: 8" H x 3 3/8" W x 1 1/8" D.

GW-52A

\$64⁹⁵

no money dn.,
\$7 mo.

(pair \$119.95)



GW-21A

\$39⁹⁵

no money down,
\$5 mo.

(pair \$74.95)

ORDER BY PHONE DAY OR NIGHT

5-Channel, 5-Watt CB Transceiver . . . Choice Of Fixed Or Mobile

A Host Of Operating Conveniences like 5 crystal-controlled transmit and receive channels . . . sensitive superhet receiver with RF stage . . . built-in squelch and automatic noise limiter . . . built-in speaker plus external connectors for adding an extra speaker if desired . . . relayless push-to-talk circuitry and rugged two-tone brown metal cabinet. Includes PTT microphone, power cable and crystals for one channel (specify frequency). Choose the AC model for "fixed", and the DC version for "mobile" operation. Choose them both and save an extra 5%. Use must comply with FCC regulations.

Kit GW-22A (117 v. AC), 13 lbs. . . no money dn., \$5 mo. . . . **\$47.95**
Kit GW-22D (6 or 12 v. DC), 13 lbs. . . no money dn., \$5 mo. . . . **\$49.95**

GENERAL DESCRIPTION—Receiver: 5-tube superheterodyne with RF stage, crystal-controlled, on up to 5 of the 23 channels as determined by the particular crystal(s) installed. Sensitivity: 1/2 microvolt for a 10 db signal-to-noise ratio. Transmitter: Power input to final RF amplifier, nominal 5 watts. Nominal power requirements: GW-22A—117 volts, 50/60 Hz AC, 50 watts; GW-22D—6 volts DC, 8.0 amperes; 12 volts DC, 4.5 amps. Dimensions: 9 1/4" D x 6 1/4" H x 9 1/2" W.



GW-22A
\$47⁹⁵

no money dn., \$5 mo.

Photo Darkroom Aids

**Don't Waste Paper To Get A Perfect Print!
Get The Right Exposure The First Time With
The FOTOVAL® Computer**

- Accurately & scientifically indicates correct exposure times & photographic paper grades
- Cuts darkroom time, reduces paper costs, speeds your enlarging
- Quickly produces correctly exposed prints everytime
- Gimbal mounting bracket allows installation in any position
- Completely safe lighted to permit easy darkroom reading of meter indications
- Simple to assemble and operate

NOW PRODUCE CORRECT ENLARGEMENTS EVERY TIME. No more long hours wasted in the darkroom. No more guessing which paper grade to use, or how long to expose each print. The unique Heath/Mitchell Fotoval darkroom computer analyzes any black and white negative, and *automatically* tells you the correct exposure time...computes negative contrast...tells you what paper grade to use. Guesswork is eliminated through accurate, electronic measurement.

MONITORS DARKROOM VARIABLES... LEAVES YOU FREE FOR CREATIVE WORK. With a unique 35 mm Test Negative, you predetermine accurate exposure for each type of paper stock or variable contrast filter you use. Once correct time is established, there's no need for test strips or wasted paper. Choose the desired paper tone & texture and insert the corresponding computer scale into the Fotoval. Place the negative you wish to print in the enlarger. With the Fotoval light-sensitive probe positioned on the desired detailed black, adjust the meter to full scale using the enlarging lens diaphragm. Then meter the most desirable highlight, and read the *exposure time and paper grade* (or filter) directly from the computer. Expose for the indicated time and develop. That's all there is to it.

EVEN LETS YOU PRINT NOW, DEVELOP LATER! Since all darkroom variables are held constant, you can store your prints for developing later. Or you can keep on making prints, while someone else, regardless of experience does the developing.

IDEAL FOR THE NOVICE AS WELL AS THE PROFESSIONAL. The easy operation of the Fotoval makes it simple for the beginner to experience remarkable results even if he's never attempted enlarging before. As easy to build as it is to use.

Kit PM-14, Fotoval & 35mm Calibration Negative, 8 lbs...
no money dn., \$9 mo. \$89.00
Optional test negative for 4" x 5" enlargers available. Order PMA-14-1, \$15.00 ppd.



35mm Calibration Negative Included
Helps you determine correct exposure time for each contrast grade of paper, and best choice for every negative. Once calibrations are made,

they are used for all future printing as long as the developing process stays the same.



Light-Sensitive Probe
Incorporates all important switching. Measures extremely small light areas when scanning negatives for desired shadows and highlights. Fits easily in your hand & easel corners. Magnetized base assures adhesion when placed on working surface.



PM-14
\$89⁰⁰
Kit PT-15
\$27⁹⁵
(Wired \$49.95)

Heathkit Photo Timer . . . Controls Exposure Time 0.1 to 99 Seconds . . . Available Kit Or Wired

- 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

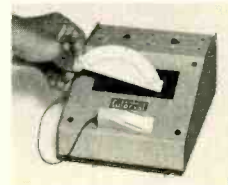
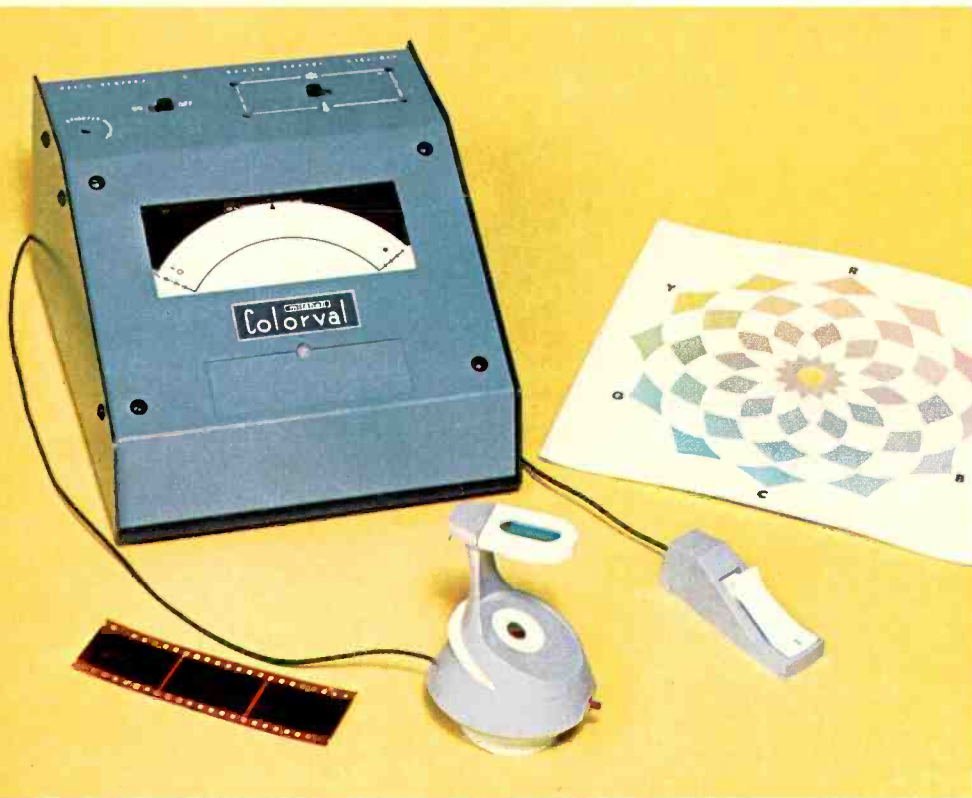
QUICK & SIMPLE TO USE! Just set the desired exposure time and push the "start" button. The PT-15 Photo Timer turns the enlarger on and the safelight off. At the end of the preselected interval, it automat-

ically 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. . . no money dn., \$5 mo. \$27.95
Assembled PTW-15, 4 lbs. no money dn., \$5 mo. (avail. Nov.). \$49.95

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 1/2" W x 6 1/2" D x 3 1/4" H overall.

NEW! Colorval Darkroom Computer



Unique Color Probe . . . helps you visually select the ideal printing filter combination. Features ball socket base for easy handling in any area of the enlarger easel . . . Scan Filter Pack to handle neutral highlights or flesh tones . . . adjustable brightness control . . . and a Neutral Reference Light switch. Operate with either hand.

Unique Mitchell Color Wheel . . . an orderly arrangement of color "errors" surrounding a true neutral area. For the first time you will know what it means in color printing terms, to be "too magenta" or "too cyan". A corresponding table quickly indicates what filter correction is needed to make a neutral print.

New Light - Sensitive Exposure Probe . . . Measures extremely small light areas when scanning negatives for desired shadows and highlights. Stores in front of Colorval cabinet . . . when removed meter panel lights automatically switch on. Features a mechanical shutter which keeps the photocell covered except when used on enlarging easel.

Exposure Scale to indicate proper contrast between highlights and shadows for both color and black & white printing.

Great News For Photographers! Now Make Beautiful COLOR PRINTS Everytime With The New Factory Assembled Heath / Mitchell COLORVAL Darkroom Computer

- Cuts darkroom time, reduces paper costs, speeds your enlarging • Fully assembled, ready to go to work the moment you open the carton • Accurately & scientifically indicates ideal filter combination and correct exposure time for printing color negatives • Also functions like the Fotoval in printing black & white negatives • Unique Color probe helps you to visually select ideal filter combination • Separate light-sensitive exposure probe • Same 35mm test negative as used with Fotoval for in depth testing of paper grades • Built-in line voltage regulator • Sturdy all-metal cabinet.

Now Reduce The High Cost Of Color Printing with the dramatic new Colorval Darkroom Computer. Here is the answer to your many requests for a color version of the famous Fotoval. And besides showing you how to produce beautiful color prints, the new Colorval can also be used for controlling black & white printing. We've even improved and simplified the black & white system to eliminate some of the testing before starting the actual picture making.

On To Faster, Better Color Printing. The Colorval is an aid to more efficient enlarging. The creativity is still left to you. Colorval is like a copilot . . . it will help analyze and remember pertinent facts, then present them to you each time a print is made. It will help you avoid errors. You'll produce fine professional prints consistently . . . without a "color cast", without guesswork, without wasting valuable time and paper. And it's so simple to use even a novice will experience amazing results the first time.

Unique Color Probe. The Colorval features a separate color probe which allows you to visually determine the ideal filter combination. A small area of the projected picture is studied in the color probe, and color balance is achieved when this selected area has been rendered neutral. It has a handy ball socket base so it can be used easily in any area of the projected negative on the enlarger easel. And you can operate it with either hand.

Scan Filter Pack. At the top of the color probe, there's a Scan Filter Pack. Light from the enlarger passes through the filter pack, and the orange colored mask in the negative is neutralized by using complementary filters. Additional filters are also placed in the scan filter pack to compensate for special characteristics of the film you're using, the material upon which you are going to print, and your enlarging and developing equipment. After the scan filter pack has been made correctly, a negative is placed in the enlarger. Then the color probe is adjusted so that the Reflected Spot—a reflection of the small area under study—can be seen in the small front-silvered mirror on the deck of the color probe. This light, having passed through the Scan Filter Pack, and then reflecting to your eye, will appear nearly white. The reflected

spot is compared with a Neutral Reference Light which surrounds the spot. The printing filter pack in the enlarger is adjusted until the spot and the reference are identical. The projected negative is now balanced or "tuned", and needs only to be adjusted in brightness before being printed.

Adjustable Neutral Reference Light. Since a color comparison is difficult to make when two lights are not of the same intensity, the brightness of the Neutral reference light is adjustable over a great range. This adjustment is made possible by a pair of polarizing filters, one fixed and the other rotated with the knurled brightness wheel projecting at the rear of the color probe. With a few minutes practice, you can distinguish changes in color density of .025 with ease.

Mitchell Color Wheel. This is an orderly arrangement of errors surrounding a truly neutral panel in the center. It is most useful when making trial prints on a color paper with unknown characteristics. By placing this wheel over a print which has a color cast, the cast can be seen in a selected neutral area, and compared with the various panels on the wheel. A corresponding table quickly indicates what filter correction is needed to make a neutral print.

Exposure Probe. This separate probe, like the one with the Fotoval, is used to measure extremely small light areas when scanning negatives for desired shadows and highlights. It features a highly light-sensitive photocell with a mechanical shutter that keeps the photocell covered, except when actually used on the enlarging easel. The exposure probe is stored on the front panel of the Colorval cabinet. When removed, the meter is automatically illuminated. This assures no stray light while the exposure is made.

35mm Fotoval Test Negative Included . . . for in-depth testing when you wish to accurately measure each package of paper, and apply the results to the final printing operation.

Distinguished Photo Journalist Bill Pierce Sums It Up. In the April 1967 issue of POPULAR PHOTOGRAPHY, Bill Pierce concluded: ". . . our own experience with a prototype Colorval leads us to believe that exceptionally accurate comparisons can be made and that it is capable of producing the first color print that is as accurately evaluated as those evaluated by machines that eliminate the human factor." ". . . the Colorval can predict a filter pack to within 5 CC of dead-on." "Unfortunately, many meters and analyzers on the market are geared to the needs of the photofinishing trade and either unsuited to the home darkroom, too complex to be handled by the home printer, or simply beyond his wallet. Here is a unit that sacrifices nothing in quality to deliver a small, reasonably priced unit compatible with the home darkroom." Order yours now.

Assembled PMW-17, 6 lbs. . . no money dn., \$12 mo. \$125.00

PMW-17 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 to 125 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.

Yachtsmen Who Know Quality Electronics Choose Heath Marine Radiotelephones



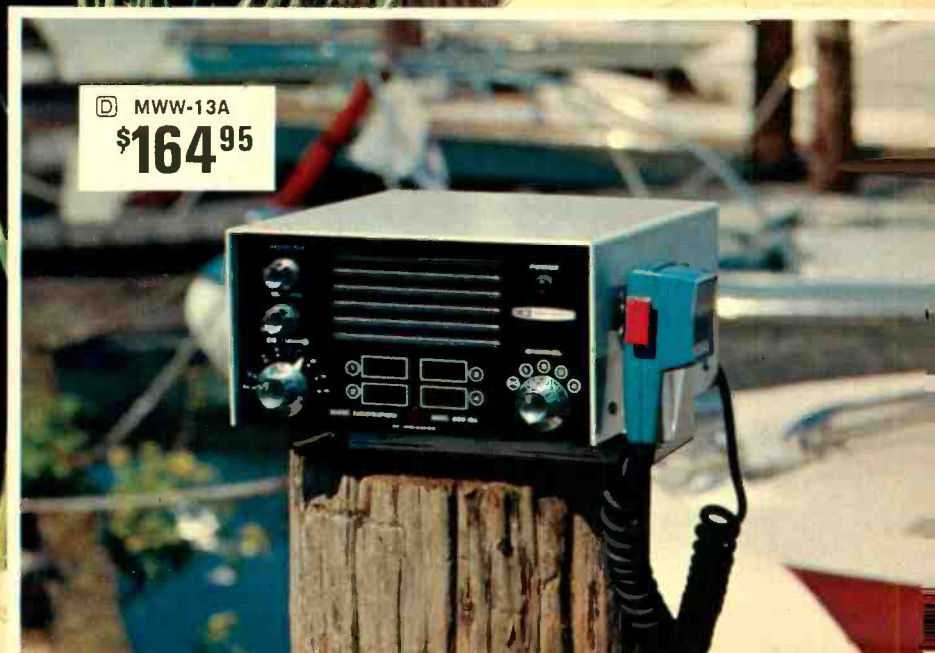
A MWW-15
\$375⁰⁰



B MWA-15-1
\$99⁰⁰



C MWW-14A
\$279⁹⁵



D MWW-13A
\$164⁹⁵

**A Heath 150-Watt Marine Radiophone
With Features, Performance, And Value
Surpassing Every Other Radiophone On The
Market**

• 150 watt power input • Exceptionally low current demands for a 150-watt radiophone • 8 crystal-controlled transmit & receive channels • Covers 2-3 and 4-5 MHz marine bands • Receives standard AM broadcast • Provisions for remote monitor speaker • 15-watt deck hailer capability • Full provisions for channel-switching remote control—see MWA-15-1 Remote Unit • High-performance all-transistor communications receiver with R.F. amplifier stage and "Local-Distance" switch • Ceramic Transfilters® for extra selectivity to reduce interference • Built-in heavy-duty solid-state power supply • FCC type—accepted for commercial (party boat) use and DOT approved • Completely assembled and tested and ready to install • Owner's manual gives all information for owner installation, technician tune-up, and complete, "plain-talk" operating instructions

COMPARE BEFORE YOU BUY! NEVER BEFORE HAVE BOAT OWNERS BEEN OFFERED SUCH A MODERN, DEPENDABLE RADIOTELEPHONE AT SUCH A LOW COST . . . with a combination of valued features often not found on other radiotelephones on the market. Important features such as: automatic noise limiting for more dependable communications during atmospheric static conditions, variable squelch control for receiver silencing, provisions for remote monitoring, a sensitive panel meter to indicate strength of transmitted and received signals, separate antenna loading on each channel for maximum power output on all channels, stainless steel exterior hardware, relays that are sealed against dust, moisture, and corrosion, tropical fungus proofing spray on components, full-control communications panel human-engineered for easy operating, panel lighting for nighttime operation, capability of being installed at any angle, and an honest 80 watts output.

BACKED BY THE WORLD'S LARGEST MANUFACTURER OF ELECTRONIC KITS FOR COMMUNICATIONS & INDUSTRY. You can install this radiotelephone yourself. It's factory assembled and ready to install, and you get full instructions with all FCC license information and forms included. Crystals for 2182 kHz (calling & distress) & 2638 kHz (ship to ship) are included—specify additional channels (2 crystals per 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. . . \$38 dn., as low as \$22 mo. . . **\$375.00**
Assembled MWW-15R, 41 lbs. 150 watt 'phone plus remote control . . . write for credit details. . . **\$474.00**
Assembled MWA-15-1, Radiophone remote control unit, 10 lbs. . . No money down, \$10 mo. . . **\$99.00**
Extra transmit & receive crystals (specify), 1 lb. . . **\$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: 6 1/2" H x 11 1/4" W x 17" D.

**B Remote Control Unit For Heath Radiotelephones
. . . 150-Watt MWW-15 and 75-Watt MWW-14A**

• Full remote control—ideal for flying bridge or cockpit installations • Gives on/off, volume, squelch, mode switch and channel selection control to "remote" location • Operates with MWW-15 & MWW-14A radiotelephones • Includes telephone-type handset • Gimbal mounting bracket • Completely factory assembled with detailed installation/operating manual—25 feet of interconnecting cable with all connectors preassembled

CHOOSE MWW-15R OR MWW-14AR FOR THE RADIOTELEPHONE AND REMOTE COMBINATION . . . all channel switching provisions are factory installed and both units are ready to place in your boat. If you already own a 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. . . no money dn., \$10 mo. . . **\$99.00**

**C Heath MWW-14A . . . Outstanding Value &
Features In A 75-Watt Marine Radiotelephone**

• Includes the outstanding features of the Heath MWW-15 150-watt radiotelephone in a medium-priced, 6-channel, 75-watt unit • Exceptionally low current demands for a 75-watt radiophone • AM broadcast band tuning • 15 watt deck hailing capability • Remote control capability with the MWA-15-1 • All-transistor receiver with RF stage for extra sensitivity • Heavy-duty solid-state power supply and modulator • FCC type accepted for "party boat" use and D.O.T. approved • Comprehensive manual for owner installation and FCC licensed technician checkout

STALWART SHIPMATE . . . that's the Heath factory assembled and tested MWW-14A. Deluxe features include receiver RF stage for greater sensitivity; ceramic Transfilters® that never need alignment, insure best selectivity; transistorized power supply for long life; adjustable squelch control and automatic noise limiter; and handsome rust-proof black & white aluminum cabinet. All circuitry is moisture-sealed. Includes owner's manual with full installation and operating instructions. Requires FCC licensed technician for tune-up. Crystals for 2182 & 2638 kHz included.

Assembled MWW-14A, 30 lbs., no money dn., \$26 mo. . . **\$279.95**
Assembled MWW-14AR, 41 lbs. . . 75-watt Radiophone plus Remote Control . . . \$38 dn., as low as \$23 mo. . . **\$378.95**
Extra transmit & receive crystals (specify), 1 lb. . . **each \$2.95**

MWW-14 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: 6 1/2" H x 11 1/4" W x 17" D.

**D Heath 25-Watt Radiotelephone
For Medium Cruising-Range Craft**

• A perfect radiotelephone for the small sailing auxiliary or power cruiser • Choose the complete MWW-13AS system for owner installation on outboards or small inboard cruisers • Choose MWW-13A for installation on any boat with FCC licensed technician checkout • Features 4 crystal-controlled transmit & receive channels • Covers 2-3 MHz marine band • Crystals for 2182 kHz (distress & calling) and 2638 kHz (ship to ship)—you specify additional channels (2 crystals per channel on MWW-13AS only @ \$2.95 per crystal . . . crystals factory installed on orders for MWW-13AS only) • Exceptionally low current demands • Receives AM standard broadcast • Solid-state power supply • FCC type accepted • Factory assembled & ready to install

PRACTICAL COMMUNICATIONS FOR MARINERS WITH SMALL CRAFT . . . compact, and ready to put on board, the MWW-13A is provided with a detailed owner's manual for installation and technician tuneup.

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.)

no money dn., \$18 mo. . . **\$189.95**
Assembled MWW-13A, Radiophone for technician installation on any boat, 17 lbs. . . no money down, \$16 mo. . . **\$164.95**
MDP-93, 13' Fiberglass Antenna, 5 lbs. . . (Motor Freight or Express only), no money dn., \$5 mo. . . **\$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. Transmitter RF input: 25 watts. RF Output: 13 RF 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: 4 1/2" H x 8 1/4" W x 10 1/2" D.

18' Radiophone Antenna

Husky, 2-section, fiberglass antenna. Bottom section 10' long, 1 1/2" diameter; contains loading coil. Top section is 8' whip. Chrome-plated brass studs. Complete with lay-down swivel base & high-impact plastic side-mount, ready to install.

MDP-13, 12 lbs., (Express or Motor Freight Only)
no money dn., \$6 mo. . . **\$59.95**

24' Marine Radiophone Antenna

Ideal for use with MWW-15. Husky, 2-section fiberglass. Bottom section 13' long, 1 1/2" dia., contains loading coil. Top, an 11' whip. Complete with lay-down swivel base & side mount. Ready to install.

MDP-74, 14 lbs. . . (Express or Motor Freight Only)
no money dn., \$7 mo. . . **\$69.95**

Choose Marine Electronics Backed By The



MD-24
\$79⁹⁵



MI-25
\$39⁹⁵



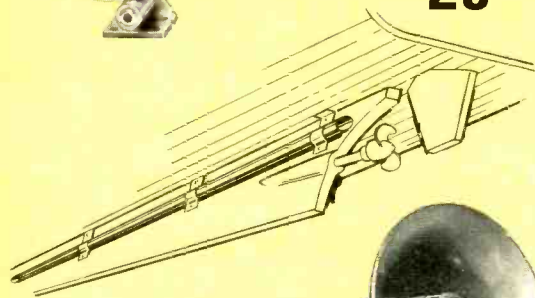
Kit MP-10
\$29⁹⁵

Wired MPW-10
\$39⁹⁵



MI-31A
\$24⁹⁵

MD-14
\$29⁹⁵



MDP-104
\$20²⁹



Heathkit Foghorn/Hailer/Boat Horn

• Powerful, dependable solid-state 30-watts peak power circuit • Instant operation—no waiting for warm-up • Just flip a switch to use as a foghorn, deck hailer, or boat horn • 10" weatherproof horn speaker with deck mounting • Gimbal mounting bracket on electronic unit • Fused for protection • Marine styled in black, gray, & white • Circuit board construction—electronically stable, even in weather extremes • Fast, easy to assemble

USE IT AS A FOGHORN . . . the electronically-timed tone sounds for six seconds, rests for twenty seconds, then automatically re-cycles.

USE IT AS A HAILER . . . projects your voice several hundred yards . . . variable gain . . . no garbling at higher talk powers.

USE IT AS A BOAT HORN . . . for a 30-watt peak power blast to effectively warn other craft, signal for bridge openings, etc.

Kit MD-24, Includes basic unit, plus PTT mike, & 10" deck speaker, 12 lbs. . . no money down, \$8 mo. \$79.95

MD-24 SPECIFICATIONS—Output power: 30 watts peak, 20 watts continuous. Fog horn sequence: 6 seconds on, 20 seconds off. Cable furnished: 20' speaker cable. Power requirements: 12 v. DC, 4.0 amps. Max. (horn sounding), less than 0.1 amp. no signal. Overall size: 4 7/8" H x 6 1/2" W x 6" D. Color styling: White, gray & black. Cabinet: Aluminum.

Heathkit Fuel Vapor Detector

• A "must" for power boats and auxiliaries • Stable, dependable silicon transistor circuitry • Built-in "fail-safe" provision—sounds alarm in event of component failure • Gives both visual and audible warning of combustible gas fumes • Self-testing • Built-in relay circuits for control of other warning devices

FIRE AT SEA! . . . YOUR MOST FEARSOME PERIL! . . . and you can't afford to overlook any precaution of safety feature. Here is a way to detect gasoline fumes before they build up to dangerous proportions. When you check out your completed MI-25, the sensitivity of this instrument will amaze you. Indicates "Safe-Dangerous-Explosive" and sounds a built-in audible alarm.

Kit MI-25, 3 lbs. . . no money down, \$5 mo. \$39.95

MI-25 SPECIFICATIONS—Voltage: 12 VDC, ±10%. Current: 1.0 amp nominal. Panel size: 2 1/8" H x 5 1/2" 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: -20° C to +80° C. Audio alarm: 2500 Hz.

Heathkit Marine Power Converter

• 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. . . no money down, \$5 mo. \$29.95
Assembled MPW-10. . . 8 lbs. . . no money down, \$5 mo. \$39.95

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.

All-Transistor Tachometer For Boat Or Car

• All-Transistor circuit for maximum versatility & accuracy (2%) • Operates on 6, 12, 24, or 32 V. DC systems • 2 switch-selected ranges • Lighted dial for easy night reading • Simple to build & install

HERE'S THE PERFECT, COMPACT "TACH" FOR THE OUTBOARD CRUISER OR SKI-TOW BOAT . . . Essential accessory for high performance auto engines. MI-31A operates with 1 to 6 cylinder 2 cycle and 1 to 16 cylinder 4 cycle engines. (Not transistorized ignitions.) Show 0 to 4000 and 0 to 8000 rpm. Option permits 0-2000 & 0-4000.

Kit MI-31A, 3 lbs., no money dn., \$5 mo. \$24.95

Marine Electrical Ground System

THE MOST FREQUENT CAUSE OF POOR RADIOTELEPHONE RANGE IS A POOR GROUND . . . MD-14 provides the FCC recommended grounding surface. Two heavy-gauge copper tubes, tapered at ends, require bolting (min. length 9', max. thick. 5") and 1 thru-hull fitting.

Kit MD-14, 20 lbs., (Motor Freight or Express only), no money dn., \$5 mo. . . \$29.95

University Deck Speaker

EXCELLENT DECK HAILER SPEAKER FOR MWW-15 & MWW-14A RADIOTELEPHONES . . . or for use as a deck monitor. Both the driver unit and horn are weatherproof and feature a marine gray finish which can be painted to match your boat's color scheme. The mounting bracket permits easy deck or bulkhead installation with "any angle" positioning. Specifications are well rated at 25 watts power rating, 8 ohms impedance and 200 to 13,000 Hz frequency response.

Model MDP-104, 7 lbs. . . mfrs. list \$34.50 . . . Net. \$20.29

World's Largest Manufacturer Of Electronic Kits

MI-11A
\$69⁹⁵



MR-21A
\$109⁹⁵



Heathkit MI-11A Depth Sounder *Sensitive, Accurate, & Dependable*

- Accurately readable to 1 foot divisions with 5% accuracy • Reaches down to 200 feet on hard bottoms • Sensitive all-transistor circuit—instant operation, reliable performance • Self-contained or boat battery powered for added convenience • Simple, stable circuit board construction • External power connection & switch on rear panel for easy access

SAFETY AND CONVENIENCE FOR THE YACHTSMAN . . . A "FUN" AID FOR THE FISHERMAN. There's no need to wonder about the depth of the water . . . there's no need to hunt "blindly" for schools of fish, when your boat is equipped with the Heathkit MI-11A Depth Sounder. It senses the depth with 5% accuracy on all readings—shoals or deep water. Probes down to 200 feet on hard bottoms, 100 feet on soft bottoms. You can spot your favorite fishing ground by "reading" the type of marine terrain from the quality of the return echos, or actually "see" schools of fish. The MI-11A is an invaluable aid for cruising rivers and inland waterways.

COMPARE WITH MORE COSTLY UNITS. The sensitive all-transistor circuit puts your MI-11A in operation instantly . . . keeps it operating season after season, faithfully, accurately—within 5% on all readings. And the internal-external battery switch permits easy selection of either self-contained or boat battery power . . . makes the MI-11A even more versatile. For portable use in small boats, say for fishing, use the 9 standard "C" cell batteries that provide self-contained power (batteries not included) and the convenient accessory transducer transom mount. For use on large craft, use the 12 volt ship power and mount the transducer through the hull in a convenient forward location. Your Heathkit Depth Sounder will add extra pleasure to boating at lowest cost. It may also reduce your insurance premiums.

ATTRACTIVE STYLING, EASY ASSEMBLY. The attractive nautical gray, blue, black, and white Heathkit "Sounder" goes together easily in just 4 to 6 hours. A favorite "first kit" for many. Order your MI-11A for more fun and for safety afloat.

Kit MI-11A, 8 lbs. . . no money dn., \$7 mo. **\$69.95**
Model MIA-11, Accessory transom transducer mount, 2 lbs. **\$8.95**

MI-11A SPECIFICATIONS—Dial: 0-200 feet in one foot divisions. **Range:** 0-200 feet on hard bottoms, 0-100 feet on soft bottoms. **Frequency:** 200 kHz. **Sounding rate:** 1440 soundings per minute, or 24 per second. **Accuracy:** Within 5% of actual depth. **Depth indication:** Neon lamp flashing at 0 feet and again at indicated depth. **Transducer:** Barium titanate ceramic element encased in waterproof housing with solid brass fittings, attached 15 foot length of 2 conductor shielded cable. May be mounted permanently to the hull or temporarily with a transom mount. **Controls:** Combined ON/OFF-Sensitivity. **Power supply:** 13.5 volts from nine self-contained size C flashlight cells, or external 12 volt battery. Flashlight cells are contained in three leakproof plastic housings. **Battery drain:** 100 milliamperes. **Average battery life:** Up to 25 hours intermittent operation. **Dimensions:** 7 1/4" W x 5 1/4" H x 7 1/2" D.

Heathkit Mariner® Radio Direction Finder *For Safe Sure Offshore Navigation*

- Use your "Mariner"® for easy, precise offshore navigating • Use it for entertainment listening on AM radio, or for monitoring the marine channels • Covers Beacon/Consolan, AM & Marine telephone bands • All-transistor circuitry for dependability, long life & low battery drain • Independent built-in battery power supply • Simple to build—complete with factory built & aligned "front-end" tuner and prewired component package

ACCURATE OFFSHORE NAVIGATION . . . as easy as reading a map. Your Mariner® is always ready to show you exactly where you are through accurate triangulation of radio bearings. Dependable over maximum distance of "ground-wave" radio signals—often several hundred miles, depending on geographical location. And the sensitive MR-21A circuits are especially designed for "pulling-in" weak signals . . . if the signals are there, you'll get them.

BEARINGS CAN BE TAKEN QUICKLY . . . a safety factor for getting a "fix" on distress signals, or for making a quick check in rough weather when all hands are busy. Mariner® resolves the time-consuming problem of the double null. The front panel "Sensitivity" control sharpens the accuracy of the tuning null. The built-in automatic gain control makes it a deep, distinct null. Then switching in the signal phasing "sense" circuit shows you which of the two is the correct null . . . the true bearing. That's all there is to it.

TRUE NAUTICAL STYLING AND ENGINEERING . . . The "Mariner's" power is self-contained—dependent of the boat's power plant for extra safety. A spring-return switch provides dial and meter lighting without putting a continuous load on the batteries. And Heath engineering has created efficient, sensitive circuitry, so that battery life is as high as 1000 hours . . . usually a full season's use. Your "Mariner" is designed with you in mind. The styling is modern featuring a rust-resistant aluminum cabinet, marine-styled in black, white, gray, and blue "baked-on" enamels . . . a handsome addition to any boat.

Order this performance proved and value leader for your boat now.
Kit MR-21A, 13 lbs. . . no money down, \$11 mo. **\$109.95**

MR-21A SPECIFICATIONS—Beacon band: 188 to 410 kHz. **Broadcast band:** 535 to 1620 kHz. **Marine band:** 1650 to 3450 kHz. **Sensitivity for 6 DB signal-to-noise ratio:** BC band, 40 uv/meter; Beacon band, 70 uv/meter; Marine band, 20 uv/meter. **Normal bearing accuracy:** ±3°. **BFO:** 455 kHz, switch-selected. **Speaker:** 4" x 6" weather-proofed. **Power requirements:** 9 volts from 6 standard size "D" flashlight batteries. **Battery drain:** 90 ma @ 350 mw max. output level. **Battery life:** 500-1000 hours. **Dial light:** Spring-return switch operated. **Null & Tuning indicator:** 0-1 ma meter. **Transistors:** (1) 2N409 Sense amplifier; (1) T1363 RF amp.; (1) 4JX-1D925 Oscillator; (1) 2N1526 mixer; (5) 2N1274 AGC amp., audio amp., audio output, & BFO oscillator; (2) T1364 1st & 2nd I.F.; (1) crystal diode detector. **Dimensions:** 10" H x 10" W x 8 1/2" D, including base and loop.

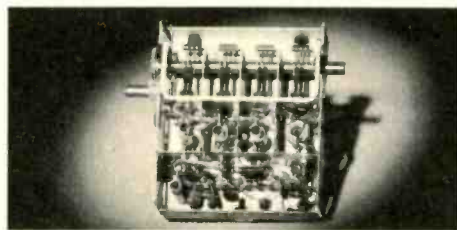


Advanced Features!

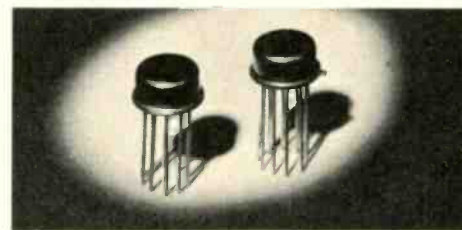
- 69 silicon transistors, 43 diodes, 2 IC's
- 150 Watts dynamic music power @ ± 1 db from 6 to 50,000 Hz • Stereo threshold control for automatic switching to stereo and mono • Automatic noise-operated FM squelch circuit • Adjustable Phase Control • Automatic stereo indicator light • Stereo only switch 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

- 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.

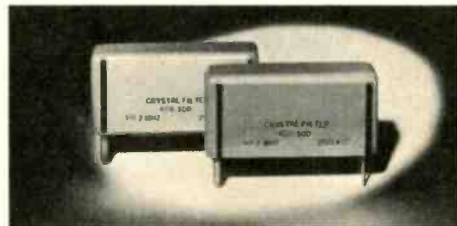
World's Most Deluxe Stereo



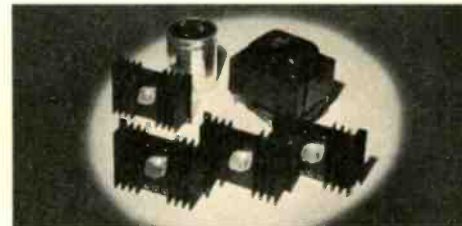
Field Effect Transistor (FET) FM Tuner . . . completely assembled and shielded. A cascode 2-stage FET RF amplifier and an FET mixer provide high overload capability, excellent cross modulation and image rejection. A 4-gang variable capacitor and 6 tuned circuits assure ultimate sensitivity and selectivity under the most adverse conditions.



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



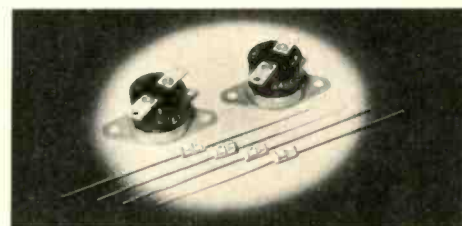
Crystal Filters. Two are used in the IF amplifier section to replace the usual transformers. They provide an ideally shaped IF bandpass which offers adjacent channel selectivity not possible with conventional IF transformers. And no alignment is ever required.



150 Watts Dynamic Music Power . . . 75 watts per channel, 50 watts continuous power per channel. Made possible by 4 conservatively rated, individually heat-sinked and protected output transistors powered by a giant-sized power transformer and filter capacitor.



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



Positive Circuit Protection. 4 Zener diodes and 2 thermal circuit breakers protect the driver and output transistors from overloads and short circuits of any duration. A special Hi-Temp indicator shows when thermal breakers have opened.



"Black Magic" Panel Lighting

Even when not in use, the new Heathkit AR-15 remains quiet and well-mannered . . . its majestic midnight face unmarred by any dial or scale markings. And when you're ready for the finest in stereo listening, a simple touch of the power switch and presto! . . . the "black magic" panel lights up with an extended slide-rule dial for easy tuning, and immediate identification of all controls. The "black magic" is in the unique tinted acrylic "dual-panel" design.

Receiver... Now Available Kit Or Assembled

EXPERTS AGREE A NEW HIGH IN ADVANCED PERFORMANCE

Julian Hirsch, Noted Audio Critic, Said In The May '67 Issue Of Hi-Fi/Stereo Review: "Heath in their literature 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. In most respects, it is superior to any manufactured receiver we have tested, and in several respects its FM tuner outperforms any other we know of."

"The FM tuner's front end uses field-effect transistors (FET's) for high sensitivity and freedom from cross-modulation. The FM i.f. amplifier is unique and marks the first use of integrated circuits in a kit receiver. Each IC, about the size of a transistor, contains ten transistors, seven diodes and eleven resistors. Instead of the usual i.f. transformers, which require periodic alignment and have less-than-ideal response characteristics, the Heath AR-15 uses two crystal-lattice filters. Though costly, these have a virtually ideal flat-topped response characteristic, with extremely steep skirts which offer a degree of adjacent channel selectivity unobtainable with conventional i.f. transformers."

"This is the most sensitive FM tuner we have ever tested, and it has by far the best limiting characteristic. Its IHF sensitivity was 1.45 microvolts and limiting was complete at about 2 microvolts. We could not find any stations that did not limit fully, with silent backgrounds. We were also able to receive stereo broadcasts from a distance of 70 miles, only 200 kHz from a powerful local station, without interference, a feat not matched by any other tuner in our experience."

"We found the Heath AR-15 a very easy receiver to use and to listen to. Its enormous reserves of clean power make for effortless listening at any level, and the FM tuner brought in more listenable FM broadcasts (as many as fifteen to twenty on a single sweep of the dial) than we had realized existed in our area."

"We know of only a few amplifiers that can match or surpass the AR-15 in power or ultra-low distortion, and most of them cost considerably more than the entire AR-15 receiver. No other tuner we have used can compare with it in sensitivity. Considering these facts, the AR-15 is a remarkable value in kit form. 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."

C. G. McProud, Editor and Publisher Of Audio Magazine, Said In The May Issue: ". . . the entire unit performs considerably better than the published specifications." "The amplifier provides a continuous average

power of slightly better than 60 watts per channel with both channels operating into 8-ohm loads and distortion measuring 0.3 percent; with 4 and 16 ohm loads, the output at the same distortion measured 54 and 47 watts, respectively. At 50 watts output, distortion is less than 0.2 percent at 1000 Hz, and less than 0.5 percent from 8 Hz to 40 kHz; at the 1-watt level, THD is less than 0.1 percent at 1000 kHz, and less than 0.25 percent from 8 Hz to 27 kHz. At full output, IM distortion is less than 0.5 percent, and at 1 watt is only 0.15 percent."

- Assembled ARW-15, (less cabinet), 34 lbs. . . . \$499.50
- \$50 dn., as low as \$30 mo. \$329.95
- Kit AR-15, (less cabinet), 34 lbs. . . \$33 dn., \$28 mo. \$19.95
- Assembled AE-16, 10 lbs., optional walnut cabinet.

Important: The AR-15 is exempt from any Special System Discount.

AR-15 SPECIFICATIONS—AMPLIFIER SECTION: Dynamic Power Output Per Channel (Music Power Rating): 8 ohm load; 75 watts. Continuous Power Output, Per Channel*: 8 ohm load; 50 watts. Power Bandwidth For Constant 0.5% Total Harmonic Distortion*: 6 Hz to 30 kHz. Frequency Response (1 watt level): ±1 db, 6 Hz to 50 kHz. ±3 db, 4 Hz to 80 kHz. Harmonic Distortion: Less than 0.5% from 20 Hz to 20 kHz at 50 watts output. Less than 0.2% at 1,000 Hz with 50 watts output. Less than 0.2% at 1,000 Hz with 1 watt output. Intermodulation Distortion (60 Hz: 6,000 Hz = 4:1): Less than 0.5% with 50 watts output. Less than 0.2% with 1 watt output. Damping Factor: 45. Input sensitivity: PHONO; 2.2 millivolts (overload 155 mv). TAPE; 200 millivolts (overload 4.5v). AUX; 200 millivolts (overload 4.5v). Hum & Noise: Volume control at minimum position; —80 db. PHONO; (10 millivolt reference); —60 db. TAPE & AUX. (200 millivolt reference); —65 db. Channel Separation: PHONO; 45 db. TAPE & AUX.; 55 db. Output Impedance (each channel): 4, 8 & 16 ohms. Tape Output Impedance: 100 ohms. Input Impedance: PHONO; 51 K ohm (**RIAA equalized). AUX., TAPE & TAPE MON.; 100 K ohm. Tape Output: 0.17 volt. **FM SECTION (Monophonic):** Tuning Range: 88 to 108 MHz. Intermediate Frequency: 10.7 MHz. Frequency Response: ±1 db, 20 Hz to 15 kHz. Antenna: Balanced input for external 300 ohm antenna, unbalanced, 75 ohm. Volume Sensitivity: Below measurable level. Selectivity: 70 db*. Image Rejection: 90 db. IF Rejection: 90 db minimum*. Capture Ratio: 1.5 db*. AM Suppression: 50 db*. Harmonic Distortion: 0.5% or less*. Intermodulation Distortion: 0.5% or less*. Hum & Noise: 65 db*. Sensitivity: 1.8 uv*. Spurious Rejection: 100 db*. **FM SECTION (Stereo-phonics):** Channel Separation: 40 db or greater. Frequency Response: ±1 db, 20 Hz to 15 kHz. Harmonic Distortion: Less than 1% at 1,000 Hz with 100% modulation. 19 & 38 kHz Suppression: 55 db or greater. SCA Suppression: 50 db. **AM SECTION:** Tuning Range: 535 to 1620 kHz. Intermediate Frequency: 455 kHz. Sensitivity: 12 microvolts at 1,000 kHz. AM Antenna: Built-in rod type, connections for external antenna. Image Rejection: 60 db at 600 kHz. 40 db at 1,400 kHz. IF Rejection: 70 db at 1,000 kHz. Harmonic Distortion: Less than 1.5% at 400 Hz, 90% modulation. Hum & Noise: 45 db. **GENERAL: Transistor & Diode Complement:** 69 transistors, 43 diodes & 2 integrated circuits. Front Panel Controls & Switches: AM & FM Tuning; 535 to 1620 Hz and 88 to 108 MHz. SOURCE Switch; PHONO, AM, FM, TAPE & AUX. Dual Tandem VOLUME Control; Dual Tandem BASS Control; provides 15 db boost and 17 db cut at 20 Hz. Dual Tandem TREBLE Control; provides 15 db boost and 15 db cut at 20 kHz. The Bass and Treble controls can be disabled for FLAT frequency response. BALANCE Control. SPEAKERS Switch. POWER Switch. MODE Switch. TAPE MON. Switch. FM Switch. NOISE FILTER Switch. LOUDNESS Switch. PHASE Control. SQUELCH Control. STEREO THRESH (Threshold) Control. L & R AUX. Controls. AM-FM Level Controls. PHONO Level Controls. TAPE Level Controls. TAPE MONITOR Level Controls. SEP ADJ (Separation Adjust) Control. 19 kHz Test-Adjust Switch. SIGNAL Meter V, R, Normal Switch. **AC Outlet Sockets:** Accessory outlets, rear chassis apron, one switched (350 watts maximum), and two unswitched (350 watts maximum). **Power Requirements:** 105-125 or 210-250 volt 50/60 Hz AC. Dimensions: Overall, 16 1/4" wide x 4 3/4" high x 14 1/2" deep. *Rated IHF (Institute of High Fidelity) Standards. **RIAA (Record Industry Association of America).



Money-Saving Solid-State



AR-13A
\$189⁹⁵



AJ-33A
\$99⁹⁵

AA-22
\$99⁹⁵



Stereo... Praise Winners



All-Transistor 66-Watt AM/FM Stereo Receiver . . . Just Add Speakers And Enjoy!

- 46 transistor, 17 diode circuitry for cool, instant, economical operation and the crisp, natural beauty of "transistor sound"
- Compact, yet houses two 33-watt power amplifiers . . . two preamplifiers . . . and wide-band AM/FM/FM Stereo tuner • Built-in stereo demodulator . . . automatically switches to stereo
- Built-in stereo indicator light • Filtered outputs for direct, "beat-free" stereo recording • Provides 66 watts IHF music power, 40 watts rms from 15 to 30,000 Hz • Luxurious walnut cabinet styled in Heathkit low-silhouette motif • Preassembled, prealigned "front-end" and AM-FM I.F. strip aid construction

CRITICS ACCLAIM. Electronics World Magazine, after testing the AR-13A, concluded; "Despite its low price, it is one of the best stereo receivers we have tested, and is comparable to many manufactured units costing twice as much". Julian Hirsch, Hi-Fi Stereo Review reported: "Unlike many transistor amplifiers, the AR-13A has low IM distortion at low power levels . . . The AR-13A has a remarkably flat power response . . . Hum and noise were inaudible . . . The FM tuner proved to be quite sensitive . . . drift is negligible . . . The FM stereo channel separation is excellent . . . It is one of the finest integrated stereo receivers I have seen, comparable to many factory-wired tuners costing far more."

DELUXE FEATURES ADD CONVENIENCE, IMPROVED PERFORMANCE. When stereo is broadcast, you don't lift a finger. The built-in stereo adaptor automatically switches in, and a stereo indicator lights. The tape recorder outputs are filtered, so there's no undesirable beats when you want to tape a broadcast. In addition, a local distance switch assures optimum performance at all signal levels . . . a squelch control hushes between station noise when tuning . . . a husky transformer power supply delivers full power at all frequencies . . . and the tuning meter, flywheel dials, and lighted AM & FM slide-rule dials permit precision tuning. There are dual-tandem controls for simultaneous adjustment of volume, bass and treble in both channels. Three stereo inputs—mag. phono plus two auxiliary. The AM tuner

boasts a high gain RF stage and High-Q rod antenna. And the FM tuner has built-in line cord antenna for local signal pickup, plus external antenna connectors for distant stations.

HANDSOME WALNUT CABINET INCLUDED with extruded gold anodized aluminum front panel. And the hinged lower front panel protects the secondary controls from accidental changes.

SAVE AN EXTRA 5% . . . order with a pair of speakers plus any changer or turntable, and take the special Heathkit 5% system discount. See ppg. 46 & 47 for details.

Kit AR-13A, 35 lbs. . . no money dn., \$18 mo. \$189.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AR-13A SPECIFICATIONS—Recommended system mates: Speaker systems AS-153, AS-163, AS-173, AS-183 p. 62-63; AS-16, p. 61; AS-15, pg. 64; AS-10 or AS-37, pg. 61, 64. All changers, ppg. 58, 59, 60. **AMPLIFIER: Power output per channel (Heath Rating):** 20 watts/8 ohm load, 13.5 watts/16 ohm load, 9 watts/4 ohm load. (IHF Music Power Output): 33 watts/8 ohm load, 18 watts/16 ohm load, 12 watts/4 ohm load @ 0.7% THD, 1 kHz. **Frequency response:** ±1 db from 15 Hz to 30 kHz @ rated output; ±3 db from 10 Hz to 60 kHz @ rated output. **Harmonic distortion (at rated output):** Less than 1% @ 20 Hz; less than 0.3% @ 1 kHz; less than 1% @ 20 kHz. **Intermodulation distortion (at rated output):** Less than 1%, 60 & 6,000 Hz signal mixed 4:1. **Hum & noise:** Mag. phono, 50 db below rated output; Aux. inputs, 65 db below rated output. **Channel separation:** 40 db @ 20 kHz, 60 db @ 1 kHz, 40 db @ 20 Hz. **Input sensitivity: (for 20 watts output per channel, 8 ohm load):** Mag. phono, 6 mV; Aux. 1, .25 v; Aux. 2, .25 v. **Input impedance:** Mag. phono, 35 K ohm; Aux. 1, 100 K ohm; Aux. 2, 100 K ohm. **Outputs:** 4, 8 & 16 ohm and low impedance tape recorder outputs. **Contents:** 5-position Selector; 3-position Mode; Dual Tandem Volume; Bass & Treble Controls; Balance Control; Phase Switch; Input Level Controls (all inputs except Aux. 2); Push-Pull ON/OFF Switch. **FM: Tuning range:** 88 MHz to 108 MHz. **IF frequency:** 10.7 MHz. **Frequency response:** ±3 db, 20 to 15,000 Hz. **Capture ratio:** 3 db. **Antenna:** 300 ohm balanced (internal for local reception). **Quieting sensitivity:** 1½ uv for 20 db of quieting, 2 uv for 30 db of quieting. **Bandwidth:** 325 kHz @ 6 db down with 1000 uv input. **Image rejection:** 35 db. **IF rejection:** 70 db. **AM suppression:** 35 db. **Harmonic distortion:** Less than 1%. **STEREO MULTIPLEX:** **Bandpass:** ±¼ db, 50 to 53,000 Hz. **Channel separation:** (SCA Filter Off) 30 db, 50 to 2,000 Hz. 25 db at 10 kHz. **19 kHz Suppression:** 45 db down from rated output at 1 kHz. **SCA Rejection:** 35 db down from rated output. **AM Tuning Range:** 535 to 1620 kHz. **IF frequency:** 455 kHz. **Sensitivity:** 30 uv @ 600 kHz; 9 uv @ 1000 kHz. **Bandwidth:** 8 kHz @ 6 db down. **Image rejection:** 40 db @ 600 kHz. **IF rejection:** 55 db @ 1000 kHz. **Harmonic distortion:** Less than 2% with 1000 uv input; 400 Hz with 30% modulation. **Hum & noise:** 40 db. **Overall dimensions:** 17" L x 5½" H x 16" D. **Power requirements:** 105-125 volts, 50-60 Hz AC, 30 watts idling, 110 watts max.

All-Transistor AM/FM Stereo Tuner . . .

Sleek, Silhouette Styling,

State-Of-The-Art Performance

- 23-transistor, 8-diode circuitry • Built-in stereo demodulator
- AFC for drift-free reception • Stereo indicator light • Filtered stereo outputs • Stereo phase control for maximum separation, minimum distortion • Luxurious walnut cabinet included • Matches AA-22 amplifier

RADIO-ELECTRONICS MAGAZINE ON THE AJ-33A: "Compared with other tuners the Heath AJ-33A gives the impression that it will get any station that can possibly be pulled in. Dead fringe areas prove to be not so dead as other tuners would have us believe! The quality is indistinguishable from high quality record reproduction."

AND THE AJ-33A HAS DELUXE FEATURES. Features like drift-free FM; and AGC for even, steady volume regardless of signal strength; adjustable FM squelch that eliminates between-station noise when tuning; a Stereo Phase control for best separation; filtered outputs for direct beat-free recording; voltage-regulated power supply for high stability; an automatic stereo indicator light; and a tuning meter, lighted slide-rule dial and flywheel for precision tuning. The FM "front-end" and AM-FM I.F. circuit are prebuilt and aligned to speed assembly, assure peak performance. And all secondary controls are concealed under the hinged lower front panel to avoid accidental changes. Includes walnut cabinet with extruded brushed gold-anodized aluminum front panel . . . enhances any surroundings.

Kit AJ-33A, 16 lbs. . . no money down, \$10 mo. \$99.95

AJ-33A SPECIFICATIONS—**FM SECTION:** Tuning range: 88 to 108 MHz. Intermediate frequency: 10.7 MHz. **Antenna:** 300 ohm balanced or built-in line type. **Output impedance (Emitter follower):** Variable to 3000 ohms. **Output voltage:** 1.5 volts. **Quieting sensitivity:** 2 uv for 20 db; 3 uv for 30 db. **Audio frequency response:** 20-15,000 Hertz ±3 db. **Harmonic distortion:** Less than 1%. **Image rejection:** 35 db. **Capture ratio:** 3 db. **AM suppression:** 35 db. **Hum & noise:** 50 db. **MULTIPLEX SECTION:** **Converter bandpass:** ±¼ db 50 to 53,000 Hz. **Channel separation:** 30 db from 50 to 2 kHz and 25 db at 10 kHz. **AM SECTION:** Tuning range: 535 to 1620 kHz. Intermediate frequency: 455 kHz. **Usable sensitivity:** 8 uv @ 1000 kHz. **Antenna:** Built-in rod with provision for external straight wire. **Output voltage:** 0.25 V. with 90% modulation. **Image rejection:** 40 db @ 600 kHz. **Harmonic distortion:** Less than 2% (30% mod. @ 1 mv input). **Hum & noise:** 40 db. **GENERAL SPECIFICATIONS:** Tuning indicator: Meter. **Controls:** Tuning; Right Channel level; Left Channel level; FM squelch; Stereo converter—balance, separation and phase. **Switches:** Mode, AFC, Noise filter, SCA filter, local-distance. **Transistors & diodes:** 23 transistors, 8 diodes. **Power supply:** Transformer operated, full wave rectifier. **Power requirements:** 105-125 volts, 50/60 Hertz, 7 watts. **Dimensions:** 15¼" W x 3¼" H x 11½" D.

Matching 66-Watt Transistor Stereo Amplifier

. . . Versatile Performer, Easy To Own

- 20-transistor, 10-diode circuit • Delivers a full 66 watts of IHF Music Power • Wide-range response ±1 db, 15Hz to 30 kHz
- Less than 1% distortion • 5 stereo inputs for any program source • Concealed secondary controls behind hinged lower front panel • Low-silhouette styling • Handsome preassembled walnut cabinet • Perfect match to Heathkit AJ-33A Tuner

AA-22 OWNER, JOHN LIBENOW, LOS ANGELES, CALIF. WRITES: "Its construction details, its excellent chassis layout, its good looks, and wonderful performance (as well as versatility and ease of operation) have left me little more to desire."

HANDLES ANY PROGRAM SOURCE . . . accepts stereo mag. phono, stereo-mono tuners, stereo tape recorders and two auxiliary sources. Controls include 5-position source switch, 3-position mode switch, dual tandem bass, treble and volume controls and a push-push on/off switch. The hinged lower front panel conceals secondary controls such as the input level controls, balance control and speaker phase switch. Includes walnut cabinet with extruded aluminum front panel. Mate it with the AJ-33A tuner (opposite). They'll look great, sound great . . . especially in your living room.

Kit AA-22, 22 lbs. . . no money dn., \$10 mo. \$99.95
Export model available for 115/230 VAC, 50-60 Hz, write for prices.

AA-22 SPECIFICATIONS—Recommended system mates: Speakers: AS-16, p. 61; AS-15, pg. 64; AS-10 & AS-37, pg. 61, 64; AS-183, AS-173, AS-163, AS-153 & AS-133, pg. 62, 63; all changers and turntables, ppg. 58, 59, 60. **Simultaneous power output per channel (Heath Rating):** 20 watts/8 ohm load, 13 watts/16 ohm load, 9 watts/4 ohm load. (IHF Music power output) 33 watts/8 ohm load, 18 watts/16 ohm load, 16 watts/4 ohm load @ 0.7% THD, 1 kHz. **Power response:** ±1 db from 15 Hz to 30 kHz @ rated output. ±3 db from 10 Hz to 60 kHz @ rated output. **Harmonic distortion: (at rated output):** Less than 1% @ 20 Hz, 0.3% @ 1 kHz, 1% @ 20 kHz. **Intermodulation distortion: (at rated output)** Less than 1%. 60 and 6,000 Hz signal mixed 4:1. **Hum and noise:** Mag. phono, 50 db below rated output. Aux. inputs, 65 db below rated output. **Channel separation:** 40 db @ 20 Hz, 60 db @ 1 kHz, 40 db @ 20 Hz. **Input sensitivity: (for 20 watts output per channel, 8-ohm load)** Mag. phono, 6 mv; Tuner 250 mv; Tape Recorder 250 mv; Aux. 1, 250 mv; Aux. 2, 250 mv. **Input impedance:** Mag. phono, 35 K ohm; Tuner, 100 K ohm; Tape Recorder, 100 K ohm; Aux. 1, 100 K ohm; Aux. 2, 100 K ohm. **Outputs:** 4, 8 and 16 ohm and tape recorder outputs. **Controls:** 5-position selector switch, 3-position mode switch, dual tandem volume, bass and treble controls, phase switch, input level controls, push-on push-off switch. **Semi-conductor complement:** 20 transistors, 10 diodes. **Power requirements:** 105-125 volts, 50-60 Hz AC, 25 watts idling, no signal; 105 watts, full power output @ 120 volts with no load on AC receptacles. **Power outlets:** 2 AC receptacles, 1 switched, 1 unswitched. **Dimensions:** 15¼" W x 3¼" H x 11½" D.

Order A Stereo System—Save 5%

Recommended Stereo Systems

Versatile Mid-Priced Stereo System



ADP-46 Garrard 40 MK II Stereo Record Changer with choice of 1c cartridge, below, \$44.51 plus ADA-67-1 base \$4.50

1c Cartridge Offer!
limit one per turntable order

Empire 808
Reg. \$19.95

Shure M44-7
Reg. \$19.95

Specify Heath Model No. — See p. 61

Heathkit AJ-14 Transistor FM/FM Stereo Tuner, pg. 48, \$52.95 plus matching AE-25 walnut cabinet, \$7.95



Heathkit AA-14 Transistor 30-Watt Stereo Amplifier, pg. 48, \$62.95, plus matching AE-25 walnut cabinet \$7.95

Heathkit AS-16 2-Way Acoustic Suspension Speaker Systems, Pg. 61 \$49.95 each



Complete System Kit HFS-84
Reg. \$280.71
Save 5% \$ 14.04
You Pay Only \$266.67

Save On This Low-Cost Stereo System!

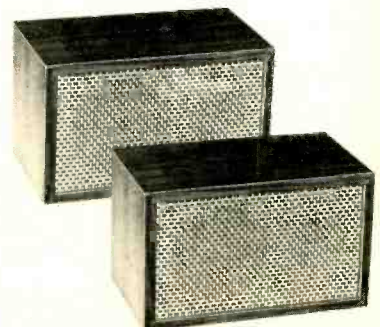


GD-187 Maestro 4-speed Stereo Record Changer with Diamond stylus, pg. 20 \$29.95



Heathkit AR-17 FM Stereo Receiver, page 50, \$72.95 plus matching AE-25 walnut cabinet, \$7.95

Heathkit AS-81W Miniature Hi-Fi 2-Way Speaker Systems with walnut cabinets, pg. 65, \$19.95 each



Complete System Kit HFS-89
Reg. \$150.75
Save 5% \$ 7.53
You Pay Only \$143.22

HOW TO SELECT A GOOD STEREO SYSTEM

- 1. Choose Components Rather Than Self-Contained Consoles.** Unlike ordinary radios & phonographs, a component is like a doctor's prescription. Everything that goes into it is specified clearly. Each Heathkit component is especially designed to offer highest performance (performance specifications are listed below each hi-fi component described in this catalog). It's like buying *a la carte* instead of the complete main course. There's no compromising. You specify exactly what you want.
- 2. Select Components That Fit The Room.** Besides their superior performance, another big advantage of separate components is that they never dominate their surroundings. They are readily adaptable to any room plan. They can be placed on shelves or in bookcases, arranged on room dividers, and mounted in the wall.
If you're an apartment dweller, there's a wide array of compact Heathkit tuners, amplifiers, and speakers designed for limited-space areas. Their big sound performance belies their size. And there are larger, more powerful Heathkit components that provide the necessary robust sound for spacious surroundings such as large living rooms, etc.
- 3. Choose Components That Match.** Not only in styling, but performance. For example, it would be unsatisfactory to buy a 100-watt (50 watts per channel) stereo amplifier such as the Heathkit AA-21D,












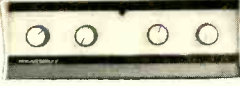

pg. 51, and connect to speakers that are only capable of reproducing 10 watts per channel. Just remember that a music system is only as good as its weakest link.

- 4. Select A System That Fits Your Budget.** Heath offers a selection of components to fit any budget, any listening taste. Above and on the opposite page are a number of recommended Heath stereo systems. If none of these fits your needs, then simply make up your own system—just include any combination of music source (tuner, record player, tape recorder), amplifier, and speaker or speaker system—and deduct 5% from the total cost. The only Heathkit audio component *not* eligible for discount is the AR-15 stereo receiver.

- 5. Use The Planning Guide, Or Ask Us.** The planning guide on the opposite page is designed to help you choose an appropriate hi-fi system for your particular needs. We have grouped the separate components according to price, styling and performance. If you have questions concerning these systems or other possible combinations, just write Technical Correspondents: Heath Company. We'll be more than happy to help. Choose your system wisely. Choose from Heath . . . the world's most complete line of stereo/hi-fi kits.

Planning Guide To A Custom Stereo System

These are some of the most compatible hi-fi combinations—matched in appearance, performance, and price—choose one to match your budget, or plan your own variation.

RECORD PLAYERS (or Tape Recorder)	TUNERS AND AMPLIFIERS	SPEAKER SYSTEMS OR SPEAKERS ² (ORDER 2 FOR STEREO)	
TOP OF THE LINE STEREO			
ADP-47 ADP-67 ADP-55 ADP-116 ADP-37 ADP-57 (AD-16)	 AR-15 SOLID-STATE AM/FM/FM STEREO RECEIVER	AS-17 or AS-15 or AS-10	AS-27 or AS-183 or AS-173
	 AR-13A AM, FM STEREO RECEIVER	AS-17 or AS-15 or AS-10	AS-27 or AS-183 or AS-173 or AS-163 or AS-153
	  AJ-43D AM, FM STEREO TUNER AA-21D AMPLIFIER	AS-15 or AS-17	AS-27 or AS-183 or AS-173
	  AJ-33A AM, FM STEREO TUNER AA-22 AMPLIFIER	AS-17 or AS-15 or AS-10	AS-27 or AS-183 or AS-173 or AS-163 or AS-153
MEDIUM PRICED STEREO			
ADP-37 ADP-67 ADP-147 ADP-77 ADP-46 (AD-16)	 AR-14 FM STEREO RECEIVER	AS-17 or AS-15 or AS-16 or AS-37 or AS-81 or AS-41	AS-27 or AS-183 or AS-173 or AS-163 or AS-153 or AS-133
	  AJ-14 FM, FM STEREO TUNER AA-14 AMPLIFIER		
LOW COST STEREO			
ADP-147 ADP-77 ADP-46	 AR-17 FM STEREO RECEIVER	AS-10 or AS-37 or AS-81	AS-163 or AS-133 or AS-123
MONO SYSTEMS			
ADP-147 ADP-77 ADP-46	 AJ-53 AM TUNER	AS-10 or AS-37	AS-173 or AS-163 or AS-153
	 AA-23 HIGH POWER AMP		
	 and/or AJ-63 FM TUNER	AS-10 AS-41	AS-153 or AS-133 or AS-123

- NOTES: 1. AA-21D will operate directly from tape head. All other amplifiers require tape head preamps.
 2. Individual speakers must be provided with suitable acoustic enclosures.
 3. All interconnecting cables provided except speaker wire.
 4. Tuners are not needed for playback of only records or tapes. Amplifiers shown are complete.

America's Best Solid-State Stereo Values

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 $3\frac{7}{8}$ " 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

Low Cost Transistor FM Stereo Tuner . . . Build in 4 To 6 Hours . . . Amazing Value

- 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 • Preamplified, preassembled "front-end" tuner & one-circuit board for fast, simple assembly • Install any of 3 ways . . . wall, custom or either Heath cabinet

QUICK, LOW COST RECIPE FOR TRANSISTOR SOUND. Just one package of high quality AJ-14 parts . . . easily prepared in 4 to 6 hours. Results? Cool, natural sound.

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.

CHOICE OF 3-WAY INSTALLATION. Compact . . . $11\frac{3}{4}$ " W. x $2\frac{7}{8}$ " H. x $9\frac{3}{4}$ " D . . . mounts easily in a wall, your own cabinet or either Heath preassembled cabinets. Handsome extruded anodized aluminum front panel. Team it with the AA-14 amplifier.

Kit AJ-14, 6 lbs. . . (less cabinet for custom mounting) . . . no money down, \$6 mo. \$52.95
 Model AE-35, 4 lbs., beige metal cabinet \$3.50
 Model AE-25, 4 lbs. . . genuine walnut veneer cabinet \$7.95
 Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AJ-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.) Dimensions: With Walnut Cabinet $12\frac{1}{2}$ " W x $3\frac{1}{2}$ " H x $9\frac{3}{4}$ " D. Custom mounting dimensions: Horizontal or vertical, cutout required $11\frac{3}{4}$ " x $2\frac{7}{8}$ ", depth required from front of mounting surface $9\frac{3}{4}$ ".

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.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION. Measures only $3\frac{7}{8}$ " 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.

SAVE AN EXTRA 5% . . . order with speakers plus any turntable, and take the special Heath 5% stereo system discount from the total. See ppg. 46 & 47 for details.

Kit AR-14, 18 lbs., less cabinet for custom mounting . . . no money down, \$11 mo. \$109.95
 Model AE-55, 6 lbs., walnut veneer cabinet \$9.95
 Model AE-65, 6 lbs., beige steel cabinet \$3.95
 Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AR-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 61, 62, 63 & 64, except AS-10; all changers & turntables, ppg. 58, 59 & 60. **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): .5% or less @ 1000 Hz; 1% or less @ 20 & 20,000 Hz. Intermodulation distortion (at rated output): Less than 1% (60 & 60,000 Hz, 4:1). Phono equalization: RIAA. 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: Fuse AC Power Socket; Switched & Unswitched. Speaker Terminal Blocks; One Left & One Right Speaker Ground Terminals; 1; Triple Phone Sockets. Power requirement: 105-125 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 $3\frac{7}{8}$ " H x $12\frac{1}{2}$ " D. Mounting position: Horizontal or Vertical; cutout required $15\frac{1}{4}$ " x $3\frac{1}{2}$ "; Depth required from front of mounting surface $11\frac{3}{4}$ ". 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.

Matching 30-Watt Transistor Stereo Amplifier . . . Wide 15-50,000 Hz Response

- 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

DELIVER A COOL 30 WATTS IHF MUSIC POWER (20 watts RMS) at ± 1 db over the wide 15 to 50,000 Hz range . . . thanks to a generous power supply design. A new transformerless complementary output circuit insures minimum phase shift and low distortion.

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.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION. Measures $9\frac{3}{4}$ " D. x $2\frac{7}{8}$ " H. x $11\frac{3}{4}$ " W . . . ideal for installing in a wall, your own cabinet or either Heath preassembled cabinet (below).

Kit AA-14, 11 lbs. . . (less cabinet for custom mounting) . . . no money down, \$7 mo. \$62.95
 Model AE-35, 4 lbs. . . beige metal cabinet \$3.50
 Model AE-25, 4 lbs. . . genuine walnut veneer cabinet \$7.95
 Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 61, 62, 63 & 64, except AS-10U; all changers & turntables ppg. 58, 59 & 60. **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:** 105-125 volts, 50/60 Hz; 20 watts idling; 60 watts full output; (No load on AC power socket). **Dimensions:** With walnut cabinet $12\frac{1}{2}$ " W x $3\frac{1}{2}$ " H x $9\frac{3}{4}$ " D. **Custom mounting dimensions:** Horizontal or vertical; cutout required $11\frac{3}{4}$ " x $2\frac{7}{8}$ ", depth required from front of mounting surface $10\frac{3}{4}$ ".



AR-14
\$109⁹⁵
 (less cabinet)



AJ-14
\$52⁹⁵
 (less cabinet)



AA-14
\$62⁹⁵
 (less cabinet)

Matched Solid-State Stereo



AR-17
\$72⁹⁵

(less cabinet)
no money dn., \$8 mo.



AR-27
\$49⁹⁵

(less cabinet)
no money down, \$5 mo.

ORDER BY PHONE DAY OR NIGHT

Now You Can Own An All-Transistor FM Stereo Receiver With State-Of-The-Art Features For Under \$75 . . . The New Heathkit AR-17

- 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.

An Unbeatable Value. Now, at this low cost, everyone can enjoy the beauty of FM and FM stereo. And what sounds . . . clean, crisp, natural, as only modern solid-state circuitry can make it. Easy to build in just 15 hours . . . all critical parts are factory aligned, so only a few simple adjustments are needed after the kit is assembled.

Engineering Know-How And Advanced Circuitry . . . 28 transistors and 7 diodes, provide long life, low heat, freedom from hum and trouble-free service. The amplifier has a frequency response of ± 1 db from 25 to 35,000 Hz at full power output. The transformerless audio output circuit insures minimum phase shift, wide response, and low distortion. Advanced design and conservative rating on the output transistors eliminate the problem of severe transistor damage when the output terminals are accidentally shorted.

Features Found On The More Expensive Receivers. A 6-position source switch, handles your records, tuner or tapes . . . stereo or mono. Flywheel tuning for smooth, easy station selection and a phase control lets you adjust for optimum stereo reception. Tandem tone control provides smooth sound tailored to the listeners taste. A clutched volume control allows simultaneous or independent level adjustments for each channel. There's even a stereo indicator lamp to show when an FM stereo signal is being received.

Bookshelf Size . . . 3 Way Installation. Measures 10 $\frac{3}{8}$ " D. x 3" H. x 12" W. Ideal for custom installations or either Heath preassembled cabinet. Operates on domestic 117 v. AC, 50-60 Hz, or on 210-240 v. AC, 50-60 Hz for use overseas.

Kit AR-17, 10 lbs. . . (less cabinet for custom mounting) . . . no money dn., \$8 mo. **\$72.95**
Model AE-35, 4 lbs., beige metal cabinet. **\$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet. **\$7.95**

AR-17 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 & 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 $\frac{1}{4}$ " x 2 $\frac{1}{2}$ " cutout, 10" D. from front mounting surface. Net weight: 9 lbs.

*Rated IHF (Institute of High Fidelity) Standards.

High Quality Reception At Astonishingly Low Cost . . . The New 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 FM Monophonic Receiver At This Modest Price. Contains all solid-state circuitry for the finest in FM listening enjoyment . . . cool, clean natural sounds. Easy to assemble . . . a fun-filled 8 hours and you're ready to plug it in for years of trouble-free service. All critical parts, including the preassembled FM tuner have been aligned at the factory, so only a few simple adjustments are needed after the kit is completed . . . and these can be made without using instruments.

Designed For Years Of Service Free Operation. 13 transistors and 6 diodes provide high quality reception with high-fidelity sound reproduction. The amplifier has a frequency response of ± 1 db from 25 to 60,000 Hz at full power output. The transformerless audio output circuit insures minimum phase shift, wide response, and low distortion. The use of a conservative rated output circuit eliminates the problem of transistor damage due to accidental shorts. And the all transistor construction gives long life, low heat, and freedom from hum.

Simple And Fun To Use. The mode of operation is selected by the source switch on the front panel. Tone, volume and tuning controls are also located on the front panel. The phono and auxiliary input connectors are located on the rear panel. And the AR-27 features flywheel tuning for smooth action and easy station selection.

Compact Size . . . 3 Way Installation. Bookshelf size, measures 10 $\frac{3}{8}$ " D. x 3" H. x 12" W. . . . for installation versatility.

You can install it in a wall, your own custom cabinet, or either pre-assembled Heath cabinet. Operates on 117 V. AC, 50-60 Hz, or on 210-240 V. AC, 50-60 Hz for use overseas.

Kit AR-27, 9 lbs. . . (less cabinet for custom mounting) . . . no money down, \$5 mo. **\$49.95**
Model AE-35, 4 lbs., beige metal cabinet. **\$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet. **\$7.95**

AR-27 SPECIFICATIONS—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: —50 db, 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: —35 db*. IF rejection: —80 db*. Separation: 30 db @ 1000 Hz. **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 $\frac{1}{4}$ " x 2 $\frac{1}{2}$ " cutout, 10" deep from front mounting surface.

*Rated IHF (Institute of High Fidelity) Standards.

Matched Solid-State Separates



AJ-43D
\$114⁹⁵

(less cabinet)
 no money down, \$11 mo.



AA-21D
\$139⁹⁵

(less cabinet)
 no money down,
 \$13 mo.

Deluxe Solid State AM/FM Stereo Tuner . . . Hyper-Sensitive Reception . . . Choice of 3-Way Installation

- 25-transistor, 9-diode circuit for pure, natural "transistor sound," heat-free operation • AM/FM stereo tuning • Automatic stereo switching
- Automatic stereo indicator light • Filtered outputs for direct, beat-free recording • Separate AM & FM tuning meters • Stereo phase control for maximum separation, minimum distortion • Automatic Gain Control for even, steady volume • Versatile installation . . . choose unit without a cabinet, or with either walnut wood cabinet or tan vinyl-clad steel cabinet

Whatever Your Listening Pleasure . . . pop music on AM, the classics on FM, the realism of FM Stereo . . . they are all reproduced in their full natural beauty through a dimension that only transistors can create. Add cool, instant operation that's free of hum and microphonics . . . and a front-end that eagerly hunts stations far and near . . . and you have the AJ-43D.

A Host Of High Performance Features. Besides those listed above, there's automatic switching to stereo . . . you don't lift a finger. An automatic stereo indicator that lights when stereo is received. An automatic frequency control to assure positive tuning. Plus emitter-follower output stages that eliminates high frequency cable losses . . . lighted slide-rule dial and heavy flywheels for easy, accurate tuning . . . transformer-operated power supply with silicon diode rectifiers for long life, dependability and freedom from heat.

Choice Of 3-Way Installation. Installs just about anywhere . . . in a wall, your own custom cabinet or in either Heath walnut-finished or tan vinyl-clad steel cabinets. The "front-end" and 4-stage FM I.F. section are factory-built and aligned to speed assembly . . . requires *no* special skills or knowledge.

- Kit AJ-43D, 15 lbs. . . less cabinet for custom mounting
 no money down, \$11 mo. \$114.95
- Model AE-11, 8 lbs. . . luxurious walnut wood cabinet. . . . \$12.95
- Model AE-15, 8 lbs. . . tan vinyl-clad steel cabinet. . . . \$6.95

AJ-43D SPECIFICATIONS—FM SECTION (Monaural Only): Tuning range: 88 to 108 MHz. Intermediate frequency: 10.7 MHz. Antenna: 300 ohms balanced, internal line antenna provided. **Quieting sensitivity:** [400 Hz, 100% mod.] 1.5 uv for 20 db of quieting; 2 uv for 30 db of quieting; 3 uv for full quieting, 40 db. **Image rejection:** 35 db. **IF rejection:** 75 db. **Capture ratio:** 3 db. **AM suppression:** 35 db. **Bandwidth (Complete Tuner):** 325 kHz at 6 db down, 1000 uv input. **Detector bandwidth (Peak-to-Peak):** 600 kHz. **Harmonic distortion:** Less than 1% (IHF). **Hum & noise:** (Complete tuner) 55 db below full quieting (IHF). **Output impedance:** (Emitter Follower) Variable to 3000 ohms. **Output voltage:** 1 V. @ 1000 uv, 400 Hz 100% mod. **FM STEREO CONVERTER SECTION:** Converter bandpass: 50 Hz to 53,000 Hz $\pm 1/2$ db. **Channel separation:** 35 db @ 50 Hz to 2,000 Hz; 30 db @ 10,000 Hz; 20 db @ 15,000 Hz. **19 kHz suppression:** 50 db down. **38 kHz suppression:** 45 db down. **SCA rejection:** 30 db min. 64 kHz to 70 kHz. **Hum & noise:** 55 db down. **Output voltage:** 1 V. @ 100 uv input, 400 Hz, 100% mod. **Output impedance:** (Emitter Follower) Variable to 3000 ohms each channel. **AM SECTION:** Tuning range: 535 to 1620 kHz. **Intermediate frequency (IF):** 455 kHz. **Sensitivity:** 600 kHz, 7 uv for 10 db S/N; 1000 kHz 4 uv for 10 db S/N; 1400 kHz 3 uv for 10 db S/N. **Antenna:** Built-in rod with provisions for external straight wire. **Image rejection:** 50 db at 600 kHz; 70 db at 1400 kHz. **IF rejection:** 55 db at 600 kHz; 65 db at 1400 kHz. **10 kHz rejection:** 40 db. **Harmonic distortion:** Less than 2%. **Hum & noise:** 30 db below 30% mod. **Output impedance:** (Normal) Variable to 3000 ohms; (Aux.) Variable to 4000 ohms. **Output voltage:** 1 volt nominal. **Dimensions:** 15 1/2" W x 5 1/4" H x 14 1/4" D.

Matching Deluxe 100-Watt All-Transistor Stereo Amplifier . . . Uncompromising Transistor Power At Your Fingertips

- 26-transistor, 10-diode circuitry for smooth, uncompromising power response . . . 13 to 25,000 Hz ± 1 db at 35 watts rms per channel (50 watts IHF music power) • Concert hall realism, cool instant operation, complete freedom from microphonics • Encapsulated, epoxy-covered modules for fast, simple assembly • Versatile installation . . . choose unit without a cabinet, or with either a walnut wood or tan vinyl-clad steel cabinet . . . matches AJ-43D

Power As You Like It . . . As Music Demands . . . from the delicate pianissimo to resounding fortissimo . . . for the most inefficient speakers . . . solid power, uncompromising . . . instantly ready from the AA-21D . . . first in transistor stereo amplifiers . . . finest in value.

Complete Controls. On the front panel, those you use most often . . . 5-position source switch, 5-position mode switch, dual-concentric volume control, dual-concentric bass and treble controls. Concealed but accessible behind the hinged lower panel . . . tape-monitor input switch, speaker phase reversal switch, loudness switch (converts volume control to loudness control for compensated low volume levels), plus controls for all inputs.

Complete Inputs And Outputs . . . inputs for tapehead, magnetic phono, tuner, stereo tuner, tape monitor, and auxiliary . . . outputs for 4, 8, and 16 ohm speakers plus tape recorder . . . all on the rear chassis panel.

Advanced Circuitry. Transformerless output circuit and multiple feedback loops assure fine fidelity, low distortion, minimum phase shift. Easy to build with preamp components encapsulated in 6 epoxy-covered modules.

Bring Years Of Naturally Better Music To Your Home . . . order the AA-21D. It does wonders for all music.

- Kit AA-21D, 23 lbs. . . less cabinet for custom mounting
 no money down, \$13 mo. \$139.95
- Export model available for 115/230 VAC, 50-60, Hz; write for prices.
- Model AE-11, 8 lbs. . . walnut wood cabinet. . . . \$12.95
- Model AE-15, 8 lbs. . . tan vinyl-clad steel cabinet. . . . \$6.95

AA-21D SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Separate Speaker, AS-183 pg. 62. Speaker Systems, AS-16 & AS-10 pg. 61; AS-37, AS-15 pg. 64. All changers & turntables, ppg. 58-60. **Power output per channel:** (Heath Rating) 35 watts/8 ohm load, 26 watts/16 ohm load, 18 watts/4 ohm load; (IHF music power output) 50 watts/8 ohm load, 34 watts/16 ohm load, 25 watts/4 ohm load @ 0.7% THD, 1 kHz. **Frequency response:** ± 1 db from 13 Hz to 25 Hz @ rated output; ± 3 db from 8 Hz to 40 Hz @ rated output. **Harmonic distortion (At rated output):** Less than 1% @ 20 Hz, 0.5% @ 1 kHz, 2.0% @ 20 kHz. **Intermodulation distortion (At rated output):** Less than 1%, 60 & 6,000 Hz signal mixed 4:1. **Hum & noise:** Tapehead, 40 db below rated output; Mag. phono, 45 db below rated output; Aux. inputs, 60 db below rated output; Tape monitor, 70 db below rated output. **Channel separation:** 40 db min. @ 20 kHz 55 db min. @ 1 kHz 50 db min. @ 20 kHz. **Input sensitivity:** (For 35 watts output per channel, 8 ohm load) Tapehead, 2 mv, Mag. phono, 3 mv; Tuner, 250 mv; FM Stereo, 250 mv; Aux., 250 mv; Tape Monitor, 0.6 V. **Input impedance:** Tapehead, 60 k ohm; Mag. phono, 30 k ohm; Tuner, 100 k ohm; FM Stereo, 100 k ohm; Aux., 100 k ohm; Tape monitor, 47 k ohm. **Outputs:** 4, 8 or 16 ohms and low impedance tape recorder outputs. **Controls:** 5-pos. Selector (dual concentric), 5-pos. Mode switch, dual-concentric Volume, Bass & Treble controls, Tape monitor sw., Loudness sw., Phase sw., Input level controls (all inputs except Tape Head & Tape Monitor inputs), Push-Push on/off switch. **Semiconductor complement:** 26 Transistors, 10 diodes. **Power requirements:** 105-125 volts, 50-60 Hz AC. 35 watts idling, no signal; 200 watts, full power out, @ 120 volts with no load on AC receptacles. **Power outlets:** 2 AC receptacles, 1 switched, 1 unswitched. **Dimensions:** 15 1/2" W x 5 1/4" H x 14" D.



Budget-Saver "Tube-Type" Hi-Fi

A AJ-13
\$47⁰⁰



B AA-32
\$39⁹⁵



C AJ-53
\$26⁵⁰



D AA-13
\$29⁹⁵



E AJ-63
\$37⁵⁰



F AA-23
\$42⁹⁵



A High Performance FM Stereo Tuner . . . Handsome Decorator Styling . . .

- Built-in FM stereo circuitry • FM stereo indicator light • Automatic Frequency Control snaps-in stations . . . eliminates drift
- Preassembled, prealigned "front-end" assures top performance, fast, easy construction • Mocha brown, beige & black color styling . . . matches AA-32 amplifier opposite

MAXIMUM PERFORMANCE WITH MINIMUM ADJUSTMENTS. Just 3 simple controls to operate . . . On/Off-FM-Stereo selector, a tuning control and AFC On-Off switch. What could be simpler? And yet, you enjoy features like the automatic frequency control that locks in all stations for clean, drift-free reception . . . stereo indicator light that silently signals when stereo is broadcast . . . edge-lighted slide-rule dial for fast, easy station selection . . . smooth flywheel tuning . . . filtered outputs for stereo tape recording . . . plus point-to-point wiring and a preassembled, prealigned "front-end" for fast kit assembly—takes just a few relaxing evenings.

YOU'LL LIKE THE MODERN COLOR STYLING, TOO. Mocha brown, all-steel cabinet with a neutral beige front panel and black trim accents . . . blends with any decor, traditional or modern.

SETTLE BACK, RELAX AND LISTEN. The sound's superb . . . the operation simple . . . the styling attractive . . . the savings great.

Kit AJ-13, 14 lbs. . . no money dn., \$5 mo. **\$47.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AJ-13 SPECIFICATIONS—Tuning range: 88 to 108 MHz. Intermediate frequency: 10.7 MHz. Quieting sensitivity: 2½ uv for 20 db of quieting; 3½ uv for 30 db of quieting. Audio frequency response: Mono—±1 db from 20 to 20,000 Hz. Stereo—±2 db from 50 to 15,000 Hz. Antenna: Balanced input for external 30 ohm antenna. Channel separation: 25 db or more at 1000 Hz. Front panel controls: Tuning selector switch, power off-FM-stereo; AFC switch, off-on. Dimensions: Overall: 13½" W x 4¾" H x 9½" D.

C Enjoy Hi-Fi AM With This Low Cost Tuner

- Sensitive superhet circuit with tuned RF stage • Fidelity switch to choose normal or maximum bandwidth • Built-in transformer operated power supply with silicon rectifier for safety and long life • 10 kHz whistle filter • Voltage doubler detector for lowest distortion • Mocha brown, beige & black styling matches AA-13 & AA-23 amplifiers

OTHER HIGH PERFORMANCE FEATURES include a full-wave voltage doubler detector for lowest distortion . . . built-in, high gain ferrite antenna . . . heavy, die-cast flywheel tuning . . . easy-to-read, lighted slide-rule dial . . . and simple point-to-point wiring for fast assembly. Has two outputs . . . a "variable" cathode follower for use with power amps, and a "fixed" for preamps.

Kit AJ-53, 11 lbs. . . no money dn., \$5 mo. **\$26.50**

AJ-53 SPECIFICATIONS—Tuning range: 550 kHz to 1600 kHz. Intermediate frequency: 455 kHz. Sensitivity (for 20 db quieting IHF standards): 1000 kHz—25 uv. IF bandwidth (6 db down): NORMAL—7 kHz; MAXIMUM—16 kHz. Output impedance (cathode follower): 5000 ohms. Input signal for 1 volt output: 7 uv—30% mod. 1000 kHz. Image ratio: 1000 kHz—57 db. Harmonic distortion (750 uv 95% mod.): Less than 2%. Hum and noise (5000 uv—30% mod.): 36 db. IF rejection: 1000 kHz—69 db. Tube complement: 2—6BA6, RF amplifier—IF amplifier, 1—6BE6, Oscillator-Mixer, 1—12AU7, AF Amplifier-Cathode Follower, 2—Crystal Diodes. Audio Detector, 1—Silicon Diode, Rectifier (Power Supply), 2—No. 47 Pilot Lamps (Dial Illumination). Power supply: Transformer operated (fused). Power requirements: 117 V AC, 50/60 Hertz at 19 watts. Dimensions: Overall—including cabinet & feet, 4¾" H x 13¼" W x 5½" D.

E Versatile FM Monophonic Tuner

- 5-tube circuit—9-tube function • Rich mocha brown & beige color styling with black trim • Automatic Frequency Control for drift-free reception • Easy to build with factory assembled "front-end" tuner, prealigned IF transformers & encapsulated circuit module • Matches AA-13 & AA-23 amplifiers in styling & performance

OTHER FEATURES include a limiter-ratio detector for stable, broadband FM . . . cathode follower output that minimizes hum pickup and high frequency cable losses—allows installation with virtually any system . . . safe transformer power supply with silicon-diode rectifier . . . large, easy-to-read slide rule dial . . . and fast, easy kit assembly.

Kit AJ-63, 10 lbs. . . no money dn., \$5 mo. **\$37.50**

AJ-63 SPECIFICATIONS—Tuning range: 88 to 108 MHz. Quieting sensitivity: 2.5 uv for 20 db of quieting; 3.5 uv for 30 db of quieting; 25 uv for maximum quieting (38 db). IF frequency: 10.7 MHz. Image ratio: 40 db. AFC correction factor: 75 kHz per volt. AM suppression: 25 db. Frequency response: ±2 db, 20-20,000 Hz. Harmonic distortion: Less than 1.5%, 1100 uv, 400 Hz 100% modulation. Intermodulation distortion: Less than 1%, 60 Hz and 6 kHz, mixed 4:1 1100 uv, 30% modulation. Antenna: 300 ohms unbalanced. Output impedance: 600 ohms (cathode follower). Output voltage: Nominal .5 volt (with 30% modulation, 20 uv signal). Power requirements: 105-125 volts, 50/60 Hertz AC at 30 watts. Overall dimension: 4¾" H x 13¾" W x 7" D.

B Matching 20-Watt Stereo Amplifier . . . Operates With Magnetic & Ceramic Cartridges

- Four stereo inputs . . . magnetic & ceramic cartridges, tuner & auxiliary sources • Furnishes 20 watts IHF music power • Full-range controls . . . found only on more expensive equipment • Hand-somely styled in mocha brown and beige with black trim • Easy to build . . . goes from parts to performance in a few evenings

PLENTY OF VERSATILITY . . . plenty of clean, undistorted power. A full 16 watts continuous 20 watts music power from 30 to 30,000 Hz at ±1 db. Four stereo inputs handle magnetic phono and ceramic phono cartridges, tuner & auxiliary sources.

FULL RANGE CONTROLS. The dual-concentric volume control allows adjustment of both channels individually or simultaneously . . . a mono/stereo switch for mode selection . . . a pair of full-range tandem-type tone controls permit simultaneous bass and treble adjustment on both channels . . . and a power on-off switch.

TWO PUSH-PULL POWER OUTPUT STAGES, plus 2 four-stage preamps highlight the 7-tube amplifying circuit. The power supply is a completely transformer-operated, full-wave doubler silicon-diode circuit.

GOES FROM PARTS TO POWER in just a few evenings with simple-to-follow instructions, and easy point-to-point wiring.

START NOW . . . add a top notch stereo system at low cost . . . with both the AA-32 amplifier and matching AJ-13 tuner.

Kit AA-32, 16 lbs. . . no money dn., \$5 mo. **\$39.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-32 SPECIFICATIONS—Recommended system mates: Speakers: AS-163, pg. 62. AS-133, AS-123, pg. 63. Speaker Systems: AS-37, AS-81, pg. 64. Changers & turntables, ppg. 58-60. 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. Dimensions: 13½" W x 4¾" H x 9¾" D.

D Low Cost 16-Watt Monophonic Amplifier

- Patented Heath Ultra-Linear® circuit • Music Power rated at 16 watts • 30 to 15,000 Hz response ± 1 db at full rated output • Separate bass & treble controls • 3 inputs for any program source • Easy to build • Mocha brown & beige color styling with black trim . . . matches AJ-63 and AJ-53 tuners

COMPARE THESE ADDITIONAL FEATURES. The patented Ultra-Linear output circuit for full-range sound with low distortion and noise . . . EL-84 output tubes and specially-designed output transformer with taps for 4, 8 and 16 ohm speakers . . . and filament balance control that virtually eliminates AC hum.

Kit AA-13, 17 lbs. . . no money dn., \$5 mo. **\$29.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-13 SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Speakers: AS-37, pg. 64; AS-10, pg. 61. All turntables, ppg. 58-60. Power output: 14 watts Heath Hi-Fi Rating; 16 watts IHF Music Power Output (2% THD, 1 kHz). Frequency response: ±1 db 30-15,000 Hz, 14 watts output. Harmonic distortion: Less than 2%, 30 Hz to 15 kHz, at 14 watts output. Intermodulation distortion: 2% or less at 14 watts output using 60 and 6000 Hz signals, 4:1. Hum & noise: Mag. phono input, 50 db below 14 watts; Tuner and crystal phono, 60 db below 14 watts. Input sensitivity: For 14 watts output; mag. phono, 0.004 v at 1 kHz crystal phono, 0.2 v; tuner 0.25 v, with tone controls flat. Output: 4, 8 and 16 ohms. Damping factor: 10:1. Controls: 3-position function selector switch, bass and treble tone controls, volume control. Power requirements: 117 v. 50-60 Hertz, 55 watts. Dimensions: 5" H x 13½" W x 10½" D.

F Matching 30-Watt Mono Amplifier

- Hi-Fi rated at 25 watts continuous, 30 watts IHF music power • 4 front-panel selected inputs • Power response ± 1 db from 30 to 15,000 Hz • Separate bass & treble controls • Ideal for limited-space installations • Mocha brown & beige color styling with black trim . . . matches AJ-63 & AJ-53 tuners

USE FOR HI-FI SYSTEM OR PUBLIC ADDRESS APPLICATIONS. Features 4 separate inputs for microphone, mag. phono crystal or ceramic phono cartridge and an auxiliary source.

Kit AA-23, 20 lbs. . . no money dn., \$5 mo. **\$42.95**

AA-23 SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Speakers: AS-10 pg. 61; AS-37, pg. 64; AS-173, AS-183, AS-163, pg. 62. All changers & turntables, ppg. 58-60. Power output: 25 watts Heath hi-fi rating; 30 watts IHF music power rating (0.7% THD @ 1 kHz). Frequency response: ±1 db, 30 Hz to 15 kHz at 25 watts output. Harmonic distortion: Less than 2%, 30 Hz to 15 kHz at 25 watts output, and less than 0.7% at 1 kHz at 25 watts output. Intermodulation distortion: Less than 2% at 25 watts using 60 Hz and 6000 Hz signals 4:1. Hum & noise: Microphone, —60 db or better; Mag. Phono, —53 db or better; Xtal Phono, —55 db or better; Auxiliary, —60 db or better. Input sensitivity: For 25 watts output with tone controls flat; Microphone, 9 mv; Mag. phono, 5 mv (at 1 kHz); Xtal Phono, 120 mv; Auxiliary, 200 mv. Outputs: 4, 8, and 16 ohms. Damping factor: 9. Controls: 4-position selector switch, volume control, bass control and treble control with on/off switch. Power requirements: 105-125 volts, 50-60 Hz, 120-135 watts. Power outlets: 1 AC receptacle, unswitched. Indicator: Neon pilot light. Dimensions: 13½" W x 5" H x 9½" D.

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, plus shipping charges only if item can be mailed Parcel Post (see Rate information, opposite page).



2. BY TELEPHONE ... ANYTIME DAY OR NIGHT

Days 8 a.m. to 4:30 p.m. Michigan Time. Call Area 616, 983-3961 for personal service.

Nights 4:30 p.m. to 8 a.m. Michigan Time. Call Area 616, 983-3921, and our Electronic Secretary will record your order. After 8 p.m. (your time) you can call from anywhere in the Continental U.S. (except Hawaii and Alaska) for \$1 or less.



3. VISIT OUR FACTORY 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.

Important "Hints" on Shipping

See the opposite page for shipping rates and details...and mark the appropriate square on the order blank. This, along with your knowledge of delivery conditions in your area, will help you make the best selection.

Ship To Another Address? If you wish us to send your order to another address, be sure to fill out section 2 of the order blank.

If Your Order Goes REA Express Or Motor Freight... do not send shipping charges. They will be collected by the REA or carrier at the time of delivery. If the REA express office is located in a town or state other than your home address, then fill out section 3 of the order blank.

Methods of Payment

Check the appropriate square for whichever method you choose.

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 \$25 to \$300. 10% down and up to 18 months to pay on orders from \$300.01 to \$500. Larger down payments reduce monthly payments and carrying charges.

To Make "Add-On" Purchases. See back side of order blank.

Attention 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. 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.

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.

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.

EASY PAYMENT CHART

Unpaid Balance	Carrying Charge	Up to 12 Monthly Payments*	Unpaid Balance	Carrying Charge	Up to 12 Monthly Payments*	*All monthly payments are for the amount shown; last payment is for the odd amount remaining due.
Up to \$20.00	\$ 2.00	\$ 5.00	\$250.01-260	\$26.00	\$24.00	
\$20.01-30	3.00	5.00	260.01-270	27.00	25.00	
30.01-40	4.00	5.00	270.01-280	28.00	26.00	Up to 18 Months
40.01-50	5.00	5.00	280.01-290	29.00	27.00	Carrying Charge
50.01-60	6.00	6.00	290.01-300	30.00	28.00	Monthly Payment*
60.01-70	7.00	7.00	300.01-310	31.00	29.00	\$46.50
70.01-80	8.00	8.00	310.01-320	32.00	30.00	48.00
80.01-90	9.00	9.00	320.01-330	33.00	31.00	49.50
90.01-100	10.00	10.00	330.01-340	34.00	32.00	51.00
100.01-110	11.00	11.00	340.01-350	35.00	33.00	52.50
110.01-120	12.00	11.00	350.01-360	36.00	34.00	54.00
120.01-130	13.00	12.00	360.01-370	37.00	35.00	55.50
130.01-140	14.00	13.00	370.01-380	38.00	36.00	57.00
140.01-150	15.00	14.00	380.01-390	39.00	37.00	58.50
150.01-160	16.00	15.00	390.01-400	40.00	38.00	60.00
160.01-170	17.00	16.00	400.01-410	41.00	39.00	61.50
170.01-180	18.00	17.00	410.01-420	42.00	40.00	63.00
180.01-190	19.00	18.00	420.01-430	43.00	41.00	64.50
190.01-200	20.00	19.00	430.01-440	44.00	42.00	66.00
200.01-210	21.00	20.00	440.01-450	45.00	43.00	67.50
210.01-220	22.00	21.00	450.01-460	46.00	44.00	69.00
220.01-230	23.00	22.00	460.01-470	47.00	45.00	70.50
230.01-240	24.00	22.00	470.01-480	48.00	46.00	72.00
240.01-250	25.00	23.00	480.01-490	49.00	47.00	73.50
			490.01-500	50.00	48.00	75.00

How To Figure Shipping Costs

ZONE CHART

Now 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.

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	370-385.	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

C.O.D. Fees In Addition To Postage

Up to \$10.00	60 cents
\$10.01 to \$25.00	70 cents
\$25.01 to \$50.00	80 cents
\$50.01 to \$100.00	90 cents
\$100.01 to \$200.00	\$1.00

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.

Postal Regulations . . . limit parcel post shipments to 25 pounds to zones 3 to 8, and 40 pounds to zones 1 and 2. **EXCEPTION:** Shipments up to 70 pounds will still be accepted to RFD addresses, and to APO numbers.

Important: Figure postage separately for each kit ordered and remit full amount. When we can combine packages to save you money, the difference will be refunded to you.

PARCEL POST RATE TABLE

Ship. Wt.	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
2 lbs.	\$0.50	\$0.50	\$0.55	\$0.60	\$0.70	\$0.75	\$0.80
3 lbs.	.55	.60	.65	.75	.85	.95	1.05
4 lbs.	.60	.65	.75	.85	1.00	1.10	1.25
5 lbs.	.65	.70	.80	.95	1.10	1.30	1.45
6 lbs.	.70	.80	.90	1.05	1.25	1.45	1.65
7 lbs.	.80	.85	1.00	1.15	1.40	1.60	1.85
8 lbs.	.85	.90	1.05	1.30	1.50	1.75	2.00
9 lbs.	.90	.95	1.15	1.40	1.65	1.90	2.20
10 lbs.	.95	1.05	1.20	1.50	1.75	2.10	2.40
11 lbs.	1.00	1.10	1.30	1.60	1.90	2.25	2.60
12 lbs.	1.05	1.15	1.35	1.70	2.00	2.40	2.75
13 lbs.	1.10	1.20	1.45	1.80	2.10	2.55	2.95
14 lbs.	1.15	1.30	1.50	1.90	2.25	2.70	3.10
15 lbs.	1.20	1.35	1.60	2.00	2.35	2.85	3.30
16 lbs.	1.25	1.40	1.65	2.10	2.45	3.00	3.45
17 lbs.	1.30	1.45	1.75	2.20	2.60	3.15	3.65
18 lbs.	1.35	1.50	1.80	2.30	2.70	3.30	3.80
19 lbs.	1.40	1.60	1.90	2.40	2.85	3.45	4.00
20 lbs.	1.40	1.65	1.95	2.50	2.95	3.60	4.15
21 lbs.	1.45	1.70	2.05	2.60	3.05	3.75	4.35
22 lbs.	1.50	1.75	2.10	2.65	3.15	3.90	4.50
23 lbs.	1.55	1.80	2.15	2.75	3.30	4.05	4.65
24 lbs.	1.60	1.85	2.20	2.85	3.40	4.15	4.85

Ship. Wt.	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
25 lbs.	\$1.60	\$1.90	\$2.30	\$2.90	\$3.50	\$4.30	\$5.00
26 lbs.	1.65	1.95	2.35	3.00	3.60	4.45	5.20
27 lbs.	1.70	1.95	2.40	3.10	3.70	4.60	5.35
28 lbs.	1.75	2.00	2.50	3.20	3.85	4.75	5.50
29 lbs.	1.80	2.05	2.55	3.25	3.95	4.85	5.70
30 lbs.	1.80	2.10	2.60	3.35	4.05	5.00	5.85
31 lbs.	1.85	2.15	2.65	3.45	4.15	5.15	6.05
32 lbs.	1.90	2.20	2.75	3.50	4.25	5.30	6.20
33 lbs.	1.95	2.25	2.80	3.60	4.40	5.45	6.35
34 lbs.	1.95	2.30	2.85	3.70	4.50	5.55	6.55
35 lbs.	2.00	2.35	2.90	3.75	4.60	5.70	6.70
36 lbs.	2.05	2.40	3.00	3.85	4.70	5.85	6.90
37 lbs.	2.10	2.45	3.05	3.95	4.80	6.00	7.05
38 lbs.	2.15	2.50	3.10	4.05	4.95	6.15	7.20
39 lbs.	2.15	2.55	3.20	4.10	5.05	6.25	7.40
40 lbs.	2.20	2.60	3.25	4.20	5.15	6.40	7.55
45 lbs.	2.40	2.80	3.55	4.60	5.70	7.10	8.35
50 lbs.	2.60	3.05	3.90	5.05	6.25	7.80	9.15
55 lbs.	2.75	3.30	4.20	5.45	6.80	8.45	9.95
60 lbs.	2.90	3.50	4.50	5.85	7.35	9.10	10.75
65 lbs.	3.05	3.75	4.80	6.25	7.90	9.75	11.55
70 lbs.	3.25	4.00	5.10	6.65	8.45	10.40	12.35

Note: These parcel post rates were in effect at the time of printing. They are based upon July 1, 1967 postage rates.

Rates on this page were in effect when this catalog was published. They are subject to change without notice.

INSURED PARCEL POST (Add to Postage)

(Figure charges on each kit individually)

Liability:	Fee
\$0.01 to \$15	\$0.20
\$15.01 to \$5030
\$50.01 to \$10040
\$100.01 to \$15050
\$150.01 to \$20060

Liability for insured mail is limited to \$200.

*REA EXPRESS & MOTOR FREIGHT INSTRUCTIONS

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.

C.O.D. PARCEL POST

Up to \$10.00	60 cents
\$10.01 to \$25.00	70 cents
\$25.01 to \$50.00	80 cents
\$50.01 to \$100.00	90 cents
\$100.01 to \$200.00	\$1.00

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.

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.



Famous-Name Tape Recorders

SONY 230 Solid-State Stereo Portable Tape Recorder

FEATURES A BUILT-IN STEREO CONTROL CENTER with complete input and switching facilities for connecting FM tuner, magnetic phonograph, TV or tape recorder. Records and plays 4-track stereo and mono at 7½, 3¾ and 1½ ips through its own 20-watt stereo amplifier. Additional features include dual, lid-integrated full-range speakers which may be separated up to 15 ft. for best stereo; retractomatic pinch roller for unequalled threading ease; automatic sentinel end-of-reel shut off; digital tape counter; two VU meters; tone control; stereo headset jack; left, right and stereo speaker modes; and two F-45 dynamic cardioid microphones.

Model GDP-267, 34 lbs. . . no money dn., \$21 mo. **\$219.50**
GDP-267 SPECIFICATIONS—Tape Speeds: 7½, 3¾ & 1½ ips. Frequency Response: 30 to 18,000 Hz @ 7½ ips, 30 to 12,000 Hz @ 3¾ ips; 30 to 6,000 Hz @ 1½ ips. Flutter & Wow: less than 0.1% @ 7½ ips, less than 0.15% @ 3¾ ips; less than 0.2% @ 1½ ips. Signal To Noise Ratio: 50 db or better. Power Output: 20 watts music power. Level Indication: 2 VU meters. Input Provision: Tuner/Aux —2, Magnetic Phono —2, Microphone —2. Output Provisions: External Speaker —2, Line output —2, Stereo headphone —1, Aux. —1. Dimensions: 17" W x 9½" H x 14" D. Power Requirements: 50 watts, 117 v. 60 Hz.

Sony Solid-State Stereorecorder 250-A

ADVANCED FEATURES FOR COMPLETE OPERATING VERSATILITY. 4-Track Stereo And Mono record and playback at 7½ and 3¾ ips. Solid-State Circuitry . . . assures cool, instant operation. Includes recording amplifiers and playback preamplifiers. FM Stereo Inputs . . . for recording FM stereo "off the air." Dynamically Balanced Capstan Flywheel . . . advanced "rim drive"—eliminates belts, assures smooth operation. Automatic Sentinel Shut-Off Switch . . . sensing mechanism turns off power at end of reel. Automatic Tape Lifter . . . protects head from wear during fast forward and rewind. Pause Control And Digital Tape Counter . . . for precise editing, cueing and tape indexing. Other features include two VU meters for accurate level indications; single knob for simple control of all functions; full 7" reel capacity; vertical or horizontal position operation; and attractive walnut case-cabinet.

Model GDP-174A, 23 lbs. . . no money down, \$12 mo. **\$129.50**
GDP-174A SPECIFICATIONS—Power requirements: 115 volts, 60 Hz (50 Hz optional). Tape speeds: 7½ and 3¾ ips. Flutter & wow: 0.19% @ 7½ ips; 0.25% @ 3¾ ips. Frequency response: 50-14,000 Hz @ 7½ ips. Signal to noise ratio: 50 db or more. Level indication: 2 VU meters. Inputs: Microphone and line per channel. Outputs: High level line per channel. Dimensions: 14½" W x 6½" D x 9" H.

Concord 776 Auto-Reverse Solid-State Stereo Tape Recorder

ENJOY UP TO 6 HOURS OF CONTINUOUS PLAY with this new Concord recorder . . . records and plays in both directions, reel turnover and rethreading are eliminated. Records and plays 4-track mono or stereo at 7½ or 3¾ ips through its 15-watt amplifier. Features vertical or horizontal operation; manual reversing at any point, sound-with-sound recording, two VU meters; two tone controls; cue button; four flux-field heads; monitor position; matched hi-fi speakers with solid wood bookshelf enclosures that detach for optimum stereo separation; outputs for headphones, extension speakers and connection with external amplifiers; input jacks for direct recording from radio or other audio equipment; automatic shut off after play; plus solid mahogany wood cabinet. Includes two dynamic cardioid microphones with stands, 2 recording patch cords, 1 empty 7" reel.

Model GDP-237, 45 lbs. . . no money dn., \$25 mo. **\$269.50**
GDP-237 SPECIFICATIONS—Tape Speeds: 7½ & 3¾ ips. Frequency Response: At 7½ ips 30-20,000 Hz at 3¾ ips, 50-15,000 Hz at ±3 db. Wow and Flutter: Less than 0.15% @ 7½ ips, less than 0.18% @ 3¾ ips. Signal-to-Noise Ratio: Better than 50 db. Level indication: 2 VU meters. Input Provisions: Microphone and high impedance. Output Provisions: 8-ohm stereo headphones, 8 ohm extension speaker, high impedance for external amplifier. Dimensions: 13" H x 20" L x 6½" D plus speakers (6½" x 6½" x 10" H).

Concord 776-D Auto-Reverse Solid-State Stereo Tape Deck

RECORDS AND PLAYS IN BOTH DIRECTIONS for up to 6 hours of uninterrupted listening pleasure . . . tapes can be replayed without rethreading. Automatic record and playback of 4-track stereo and mono tapes at 7½ and 3¾ ips. All solid-state preamplifiers. Automatic shut-off at end of reel. Also features separate tone controls of each channel; cue button; four exclusive flux field heads; stereo-mono selector switch; two VU meters; inputs for radio, record player, TV, another tape recorder and microphone; outputs for stereo headphones, speakers and connection with external amplifiers; vertical or horizontal operation; handsome hand-rubbed, oiled walnut cabinet. Requires speakers and power amplifier for playback.

Model GDP-247, 35 lbs. . . no money dn., \$19 mo. **\$199.50**
GDP-247 SPECIFICATIONS—Frequency Response: At 7½ ips 30-20,000 Hz ±3 db, at 3¾ ips 50-15,000 Hz ±3 db. Tape Speeds: 7½ & 3¾ ips. Wow & Flutter: Less than 0.15% @ 7½ ips, less than 0.18% @ 3¾ ips. Signal To Noise Ratio: Better than 50 db. Input Provisions: Stereo auxiliary for radio, record player, TV or other tape recorder, 10,000 ohm microphone. Output Provisions: Stereo line and stereo headphones. Reel Capacity: Up to 7". Dimensions: 20" W x 13½" H x 7" D. Power Requirements: 117 v. AC, 50-60 Hz.

Concord F-100 Monophonic Portable Cartridge Tape Recorder

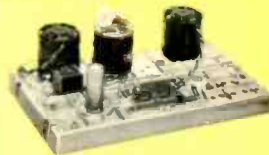
JUST SNAP IN A CARTRIDGE, push the mike button and record anything, anywhere . . . car, beach or home. You can even record your own hi-fi music library from radio, records or any other tape recorder. Reproduces high fidelity sound through its own speaker or through any external amplifier/speaker system. Plays and records up to 2 hours. Easy to carry, too, with its compact 8" x 4¾" x 2¾" size and light 3 lb. weight. DELUXE OPERATING CONVENIENCES. Features instant loading tape cartridge, flux field heads, solid-state electronics, precision mechanism, ultra-reliable servo drive motor, fast wind—both directions, line output jack for playback through any hi-fi system, input jack for direct recording, automatic shut off in both play and fast wind modes. Operates on standard "C" batteries or house current with 117v. adaptor. Includes remote control microphone, mike stand, C-60 tape cartridge hand strap, recording patch cord, playback patch cord and mike pouch.

Model GDP-127, 6 lbs. . . no money dn., \$8 mo. **\$79.50**
GDP-127 SPECIFICATIONS: Tape Speed: 1½ ips. Tape Cartridge: Standard Concord cartridge, interchangeable with most major brands. Recording Time: One hour on standard C-60 cartridge. Two hours on double play cartridge. Playback: Through built-in speaker or hi-fi system. Level Meter: For record level and battery condition. Microphone: Dynamic, professional quality. Remote Control: On microphone. Drive Motor: Instrument quality servo drive motor. Frequency Response: 60-10,000 Hz. Wow and Flutter: 0.25% maximum. Weight: 3 lbs. Dimensions: 8" x 4¾" x 2¾".

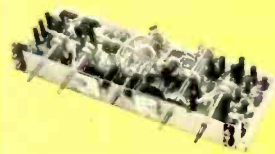




AD-16
\$399⁵⁰
 (deck & electronics)



3 Separate Motors . . . a hysteresis synchronous capstan motor for constant speed, and two permanent split-capacitor types to drive the reels.



All Solid-State Circuitry . . . 21 transistors, 4 diodes for cool instant operation, long trouble-free life.



3 Professional Tape Heads . . . 4-track stereo or mono record and playback—sound-on-sound record—sound-with-sound record—echo effects.

Save Up To \$170 When You Build The Professional Heathkit® /Magnecord® 1020 . . . World's Most Deluxe Tape Recorder Kit

- 4-track stereo or mono record and playback at 7½ & 3¾ ips
- Sound-on-sound, sound-with-sound and echo capabilities • 21-transistor, 4-diode circuit for cool, instant operation, long life
- 3 separate motors . . . hysteresis synchronous capstan motor for constant speed, two split-capacitor torque motors to drive supply and takeup reels • Automatically shuts itself off at end of reel • Two V.U. meters • Digital counter with push button zero reset • Stereo microphone inputs and headphone outputs . . . front panel mounted for easy access • Operates in vertical or horizontal positions • Individual gain controls for each channel • Mount in wall, cabinet, tape drawer or place on shelf with optional walnut base • All push-button controls for operational modes
- Requires amplifier and speakers for playback

ALL GENUINE MAGNECORD FACTORY MADE PARTS. The only difference between this Heathkit version and the original Magnecord 1020 is the money you save . . . you can buy a lot of tape with that. Add to this Magnecord's years of pioneering and developing tape equipment for the broadcast and recording industries, and you have a sophisticated recorder that will give you years of professional quality and reliability. Read what audio experts say about this truly superb machine!

POPULAR ELECTRONICS, DECEMBER '66 ISSUE: "The AD-16 lets you hear everything on the tape just as perfectly as when it was recorded." . . . "the Heath/Magnecord marriage is a happy one." "Since

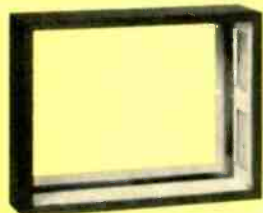
16-18 hours of construction time is about average, you're getting a bonus equal to \$10 per hour for your spare time." . . . the AD-16 cum 1020 is the Rolls-Royce of the tape recording industry. This IS a deluxe tape recorder."

INCLUDES FREE TOOL SET . . . nut driver set with two interchangeable heads, plus 3 Allen wrenches for faster, easier AD-16 assembly.

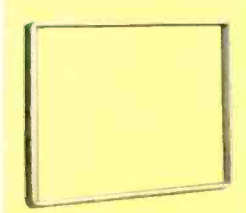


- Kit AD-16, deck & electronics, 45 lbs. \$40 dn., as low as \$23 mo. **\$399.50**
- ADA-16-1, walnut base, 11 lbs. **\$19.95**
- ADA-16-2, adapter ring for cabinet or wall mounting, 2 lbs. **\$4.75**
- ADA-16-3, slides (combine with walnut base for tape drawer), 6 lbs. **\$9.95**

AD-16 SPECIFICATIONS—Tape speeds: 7½ ips and 3¾ ips. Speed accuracy: ±1% at 7½ ips; ±2% at 3¾ ips. Wow and flutter: 0.18% rms at 7½ ips; 0.25% at 3¾ ips. Tape size: ¼" wide; 1.5, 1.0, 0.75 or 0.5 mil thick. Reel size: Standard N.A.B. 5", 7" reels, and 8¼" Magnecord reel. Rewind and hi-fwd time: 1200 ft. in 80 seconds or less. Digital counter: 3-digit counter with zero reset. Heads: ¼ track erase, record and playback. Circuitry: 21 transistors, 4 diodes. Frequency response: ±3 db, 30 to 10,000 Hz at 3.75 ips; ±2 db, 45 to 18,000 Hz at 7.5 ips. Signal-to-noise ratio: 48 db at 3.75 ips; 52 db at 7.5 ips. Inputs per channel: HI-Z microphone, auxiliary. Outputs: Emitter follower, output level at 0 VU .9 V ±.2 V at 400 Hz. Power supplies: Transformer-operated, full-wave rectifier, series regulated—17 volt DC supply. Half-wave rectifier solenoid power supply. Dimensions: Overall, without base, 17½" W x 13½" D x 8¼" H. Minimum Space Required For Cabinet Mounting: 15½" H x 18¼" W x 8½" D; allow 19½" W when using 8¼" reels. For wall or shelf mounting using adaptor ring, allow 17½" from ring front to recorder front; allow 6¼" from ring rear surface to rear of recorder. Power requirements: 110-130 v. AC, 60 Hz, 140 watts.



OPTIONAL WALNUT BASE . . . measures 19¼" W x 14¾" D x 6½" H. Ideal when mounting the AD-16 out in the open on a shelf or bookcase. Converts to a tape drawer for installation in a hi-fi equipment cabinet when combined with optional ADA-16-3 slides (opposite).
 ADA-16-1, 11 lbs. . . **\$19.95**



ADAPTER RING . . . use when mounting in a cabinet or wall. Provides sturdy support of AD-16, and makes an attractive cover for "rough cuts". Hand-some brushed extruded aluminum.
 ADA-16-2, 2 lbs. . . **\$4.75**



1968

Garrard



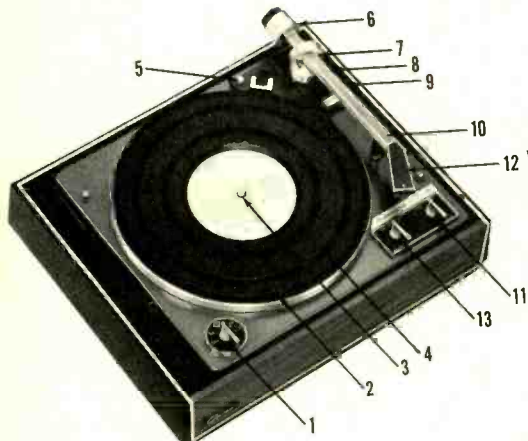
New Gyroscopic Gimbal Pivots for minimal tone arm friction.

New Ultra-Low Mass Tone Arm. Lightweight aluminum combines with Afrormosia wood insert for low resonance damping.



ADP-47 with 1c cartridge
\$129⁵¹
 (less base)

1c Cartridge Offers!
 limit one per turntable order



New Garrard SL-95 3-Speed Automatic Stereo Transcription Turntable With Revolutionary Synchronous-Lab Motor

- Synchro-lab motor for precision turntable speed • 3-speed (78, 33 $\frac{1}{3}$ & 45 rpm) automatic or mono play • Retractable record platform "pops-out" for multi-record play . . . disappears for single play • Single play spindle rotates with record . . . telescopes out of unit for multiplay operation • 12" aluminum turntable with anti-static mat and safety grooves • Adjustable counterweight isolated with rubber • Gyroscopic gimbaled pivots for minimal friction • Adjustable anti-skating control, calibrated in $\frac{1}{2}$ grams, infinitely variable • Stylus force adjustment dial, detent stops at $\frac{1}{4}$ grams and visual markings in $\frac{1}{2}$ gram increments, 0 to 5 grams • Ultra-low mass dynamically balanced tone arm • Automatic control lever functions play 6 records in sequence • Interchangeable cartridge clip eliminates need for plug-in shells • Combined manual and cueing controls • Combined record size and speed selector • Rubber encased springs for shock and vibration "damping"

- ADP-47, turntable, 13 lbs. . . no money dn., \$12 mo. \$129.50
- ADA-57-3, Power-Matic base, 3 lbs. \$15.95
- ADA-57-1, walnut-vinyl-covered plastic base, 3 lbs. \$5.95
- ADA-57-4, smoked styrene "playing" dust cover, 1 lb. \$5.95
- ADA-57-2, Garrard LRS25 45 rpm spindle, 1 lb. \$3.80

1. Combined record size and speed selector 2. 12" turntable 3. Single play spindle 4. Anti-static mat 5. Retractable Record platform 6. Adjustable counterweight 7. Gyroscopic gimbaled pivots 8. Adjustable anti-skate control 9. Stylus force adjustment 10. Ultra-low mass tone arm 11. Automatic control lever functions 12. Interchangeable cartridge clip 13. Combined manual & cueing controls

ADP-47 SPECIFICATIONS—Speeds: 78, 45 & 33 $\frac{1}{3}$ rpm. Motor: Synchro-Lab. Tracking: Tracks per cartridge specifications. Color: Iridescent charcoal gray. 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- $\frac{5}{8}$ " D. x 4 $\frac{1}{8}$ " above, 3" below motor board.

New Garrard SL-65 4-Speed Automatic Stereo Turntable . . . Precision Speed Synchro-Lab Motor

- Same advanced features and performance as Garrard's famous 60 Mk II, plus new Synchro-Lab motor
- 4-speed automatic or mono play
- Cueing and pause control • Automatic anti-skating • Counterbalance weight • Stylus pressure adjustment • Tubular, dynamically balanced tone arm • Over-sized, over-cast turntable • Interchangeable spindles • Lightweight, cutaway cartridge shell

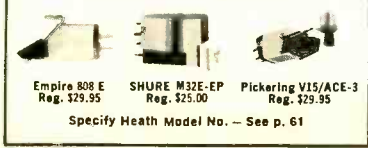
- ADP-67, turntable only, 13 lbs. no money dn., \$8 mo. \$79.50
- ADA-67-3, Power-Matic base, 3 lbs. \$14.95
- ADA-67-1, walnut vinyl covered plastic base, 3 lbs. \$4.95
- ADA-67-4, smoked styrene "playing" dust cover, 1 lb. \$4.95
- ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. \$3.80

ADP-67 SPECIFICATIONS—Same as ADP-47 except for Speeds: 78, 45, 33 $\frac{1}{3}$ & 16 $\frac{2}{3}$ rpm, and Dimensions: 15 $\frac{3}{8}$ " W. x 13 $\frac{1}{8}$ " D. x 4 $\frac{1}{4}$ " above, 2 $\frac{1}{8}$ " below motor board.



ADP-67
 With 1c cartridge
\$79⁵¹
 (less base)

1c Cartridge Offers!
 limit one per turntable order

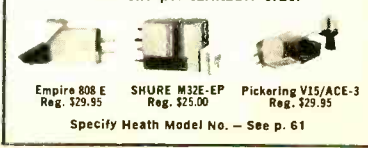


New Garrard SL-55 4-Speed



ADP-77
 with 1c cartridge
\$59⁵¹
 (less base)

1c Cartridge Offers!
 limit one per turntable order



Synchro-Lab Turntables

Revolutionary Synchro-Lab Motor combines the advantages of synchronous and induction types providing high starting torque and perfect speed accuracy unaffected by line voltage variations.



New Combined Manual & Cueing Control. Turn a single lever to start turntable, activate cueing, lift lower arm gently.



New Adjustable Anti-Skating Control. Simple, patented lever type, calibrated in 1/2 grams and infinitely variable.



Optional Power-Matic Base available for all Garrard Synchro-Lab series turntables. Automatically turns off amplifier after last record has played.

1c Cartridge Offers!
limit one per turntable order

Empire 888E Reg. \$39.95 SHURE M31E-EP Reg. \$27.50 Pickering V15/ATE-3 Reg. \$39.95

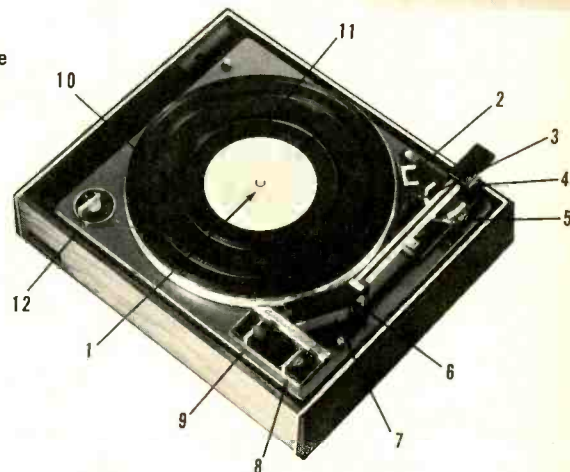
Specify Heath Model No. — See p. 61

ADP-57
with 1c cartridge
\$109⁵¹
(less base)

New Garrard SL-75 3-Speed Automatic Stereo Transcription Turntable . . . Unique Synchro-Lab Motor For Precision Speed

- Revolutionary Synchro-Lab motor for precision turntable speed • 3 speed (33 1/3, 45 & 78 rpm) automatic or mono play • Retractable record platform "pops-out" for multi-record play, disappears for single play • Single play spindle rotates with record . . . telescopes out of unit for multi-play operation • 12" aluminum turntable with anti-static mat and safety grooves • Counterweight adjustable on knurled lead screw • Adjustable anti-skating control, calibrated in 1/2 grams, infinitely variable • Adjustable stylus force assembly, precision rotating "optical" knob marked 0 to 5 grams in 1/4 gram increments • Low mass dynamically balanced tone arm, twin-braced aluminum for extra rigidity, freedom from resonance • Interchangeable cartridge clip eliminates need for plug-in shells • Automatic control lever functions • Combined manual & cueing control • Rubber encased springs for shock and vibration damping • Record size and speed selector

- ADP-57, turntable only, 13 lbs. . . no money dn., \$11 mo. \$109.50
- ADA-57-3, Power-Matic base, 3 lbs. \$15.95
- ADA-57-1, walnut vinyl-covered plastic base, 3 lbs. \$5.95
- ADA-57-4, smoked styrene "playing" dust cover, 1 lb. \$5.95
- ADA-57-2, Garrard LRS25 45 rpm spindle, 1 lb. \$3.80



1. Single play spindle. 2. Retractable record platform. 3. Adjustable anti-skating control. 4. Adjustable counterweight. 5. Stylus pressure adjustment. 6. Low mass tone arm. 7. Interchangeable cartridge clip. 8. Automatic control lever functions. 9. Combined manual and cueing controls. 10. 12" Turntable. 11. Anti-static mat. 12. Combined record size and speed selector.

ADP-57 SPECIFICATIONS—Same as ADP-47 opposite, except for dimensions which are 16-1/16" W. x 14-9/16" D. x 4 3/4" above, 3" below motor board.

Automatic Stereo Turntable . . . Synchro-Lab Motor For Smooth Synchronous Speed

- Same superb features and performance as Garrard's famous 50 Mk II, plus new Synchro-Lab motor • Manual cueing and pause control • Automatic and manual 4-speed play • Oversize turntable • Resiliently mounted counter balance weight • Stylus pressure adjustment with gram markings • Two spindles . . . automatic intermix operation when desired • Lightweight tubular dynamically balanced arm • Cutaway cartridge shell

- ADP-77, turntable only, 11 lbs. \$59.50
- no money dn., \$6 mo. \$59.50
- ADA-67-3, Power-matic base, 3 lbs. \$14.95
- ADA-67-1, walnut vinyl covered plastic base, 3 lbs. \$4.95
- ADA-67-4, smoked styrene "playing" dust cover, 1 lb. \$4.95
- ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. \$3.80

ADP-77 SPECIFICATIONS—Same as ADP-67 except for Dimensions: 14 7/8" W. x 12 3/4" D. x 4 3/4" above, 2 7/8" below motor board.



ADP-46
with 1c cartridge
\$44⁵¹
(less base)

1c Cartridge Offer!
limit one per turntable order

Empire 808 Reg. \$19.95 Shure M44-7 Reg. \$19.95

Specify Heath Model No. — See p. 61

Popular Garrard 40 Mk II Automatic Stereo Turntable

- Plays all four speeds automatically or manually • Automatically mixes records of different size • Oversize turntable and attractive mat cover for better record support • Counterweighted cast aluminum tone arm with adjustable stylus tracks high quality cartridges • Super-sensitive DuPont® Delrin "frictionless" trip mechanism • Compact size . . . completely assembled

- ADP-46, turntable, 11 lbs. \$44.50
- no money dn., \$5 mo. \$44.50
- ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. \$3.80
- ADA-67-1, matching base, 3 lbs. \$4.50
- ADA-67-4, smoked styrene "playing" dust cover, 1 lb. \$4.95

ADP-46 SPECIFICATIONS—Speeds: 16 2/3, 33 1/3, 45 & 78 rpm. Motor: 4-pole, hum shielded. Tracking: Tracks per cartridge specifications. Color: Gray and silver. Wiring: Stereo, ampk plug. Cables furnished. Line cord and 2 audio. Power requirements: 110-130 volts, 60 hertz AC. Dimensions: 14 1/4" W x 12 1/2" D x 4 3/8" above and 2 7/8" below top of motor board.



Famous Dual® Turntables

For The Perfectionist . . . Dual's Finest . . .

1019 Auto/Professional Turntable

- Variable pitch control on all 4 speeds—6% range • Automatic tone-arm tracks below 1/2 gram, yet trips at zero • Direct dial, continuously variable anti-skating compensation • Feather-touch cue-control for manual & automatic play • 7 1/2 lb. die-cast dynamically-balanced platter • Single-play spindle that rotates with your records • Automatically shuts off amplifier after play • Can be started manually while record is rotating or at a standstill • Plays up to 10 records with less than 2/10 gram stylus force increase from first to last record • Continuously variable numerical gram scale in 1/2 gram steps for tracking pressure • Magnesium cartridge holder adjusts for optimum stylus overhang • Die-cast trim

MATCHES OR SURPASSES STANDARDS OF PERFORMANCE associated with the costliest professional turntables. With the direct dial, continuously variable anti-skating compensation you can actually balance stylus force in the groove. Result? Elimination of distortion from unbalanced tracking at the program source. Even more important, an end to uneven wear. Take advantage of the special cartridge offers.

Model ADP-55, turntable only, 19 lbs. . . no money down, \$12 month. \$129.50
 ADA-24W, oiled solid walnut base, 3 lbs. \$11.95
 ADA-24-1, 45 rpm spindle, 1 lb. \$4.80
 ADA-37-4, polystyrene "playing" dust cover, 2 lbs. \$8.95
ADP-55 SPECIFICATIONS: Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Variable over 6% range. Motor: High torque continuous pole induction. Tracking: Less than 0.2 gram variation from 1st to 10th record. Turntable: 7 1/2 lb. dynamically balanced. Color: Black/Silver. Cables furnished: Line cord, 2 audio. Power requirements: 100-130 volts, 60 Hertz. Dimensions: Required mounting space; 11 3/4" x 12 3/4" x 6" above and 3" below motor board.

Dual 1009SK Auto/Professional Turntable . . .

Tracks & Trips At 1/2 Gram!

- New direct dial continuously variable anti-skating compensation to balance stylus force in the groove • New feather-touch cue control for automatic and manual play • New single play spindle rotates with record exactly like single-play turntables • 4 lb. non-ferrous, die-cast dynamically balanced platter • New continuously variable numerical gram scale in 1/2 gram steps for tracking pressure • New modern designer styling • Automatic tone-arm tracks below 1/2 gram, yet trips at zero • Permits almost 90° tilt without spilling a note • Automatically shuts off amplifier after play • Can be started manually while record is rotating or at a standstill • Continuous-Pole® motor maintains speed accuracy within 0.1% • Tracking error below 0.4%/inch

COMPARE THESE ADDITIONAL FEATURES. A tone resonance that's barely measurable at 6 or 7 hertz . . . a feather-touch slide switch that permits soft-spring footing to isolate chassis from shock & acoustic feedback . . . vertical tracking angle that increases less than 6° . . . gram scale.

ADP-116, turntable only, 15 lbs. . . no money down, \$11 month. \$109.50
 ADA-24W, oiled walnut base, 3 lbs. \$11.95
 ADA-24-1, 45 rpm spindle, 1 lb. \$4.80
 ADA-37-4, polystyrene "playing" dust cover, 2 lbs. \$8.95
ADP-116 SPECIFICATIONS—Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Turntable speed: All 4 speeds accurate within 0.1% with one to ten records. Motor type: 4-pole induction shock and vibration shielded. Type of drive: Friction. Tracking force variation: Less than 0.2 grams from 1st to 10th record. Record capacity: Up to 10 records. Record sizes: 7", 10", 12". Control functions: Manual Speed Selector; Manual Record Size Selector; Stop/Start Manual/Automatic switch. Dimensions: 11 3/4" x 12 3/4" x 6" clearance above, 3" below. Power requirements: 117 VAC, 60 Hertz.

New! Dual 1015 Auto/Professional Turntable

- Dynamically balanced low mass tone arm tracks as low as 1/2 gram yet trips at zero • Direct dial, anti-skating compensation to balance stylus force in the groove • Auto/manual feather-touch cueing system for stylus placement on any groove of the record • "Hi-Torque" motor holds speed constant within 0.1% even when voltage varies ±10% • 4 lb. die cast platter • Automatic and manual play of all 4 speeds • Adjustable stylus overhang for minimum tracking error • Single play spindle rotates with record • "Elevator-Action" spindle for conversion to changer play • Record size selector

Model ADP-37, turntable only, 14 lbs. . . no money dn., \$9 mo. \$89.50
 ADA-24W, oiled solid walnut base, 3 lbs. \$11.95
 ADA-24-1, 45 rpm spindle, 1 lb. \$4.80
 ADA-37-4, polystyrene "playing" dust cover, 2 lbs. \$8.95
ADP-37 SPECIFICATIONS—Same as Model ADP-147 below.

Lowest Cost Dual 1010S Auto/Standard Turntable

- Plays all 4 speeds automatically or manually • 3 lb. platter • Convenient, precise stylus force adjusts with 0.5 gram click stops • Tone arm tracks flawlessly as low as 2 grams • Magnesium cartridge holder has provision for adjusting stylus overhang for minimum tracking error • Famous Dual Continuous-Pole® motor maintains speed accuracy within 0.1% even when line voltage varies beyond 10% • Feather touch slide switch permits soft-sprung footing to isolate chassis from shock and acoustic feedback • Vertical tracking angle increases less than 6° . . . even less than variations from cartridge to cartridge • Feather-touch cue control for manual & automatic play • Optional walnut base & 45 rpm spindle

ADP-147, turntable only, 16 lbs. . . no money dn., \$7 mo. \$69.50
 ADA-24W, oiled solid walnut base, 3 lbs. \$11.95
 ADA-24-1, 45 rpm spindle, 1 lb. \$4.80
 ADA-37-4, polystyrene "playing" dust cover, 2 lbs. \$8.95
ADP-147 SPECIFICATIONS—Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Turntable speed: All 4 speeds accurate within 0.1% with one to ten records. Motor type: 4-pole induction, shack & vibration shielded. Type of drive: Friction. Tracking force variations: Less than 0.2 grams from 1st to 10th record. Record capacity: Up to 10 records. Record sizes: 7", 10", 12". Control functions: Manual Speed Selector; Manual Record Size Selector; Stop/Start Manual/Automatic switch. Cue control. Dimensions: 11 3/4" x 12 3/4" x 6" clearance above, 3" below. Power requirements: 117 VAC, 60 Hertz.



ADP-55
with 1c cartridge
\$129⁵¹
(less base)

1c Cartridge Offers!
limit one per turntable order

Emoire 888E Reg. \$39.95 SHURE M31E-EP Reg. \$27.50 Pickering V15/ATE-3 Reg. \$39.95
Specify Heath Model No. — See p. 61



ADP-116
with 1c cartridge
\$109⁵¹
(less base)



ADP-37
with 1c cartridge
\$89⁵¹
(less base)

1c Cartridge Offers!
limit one per turntable order

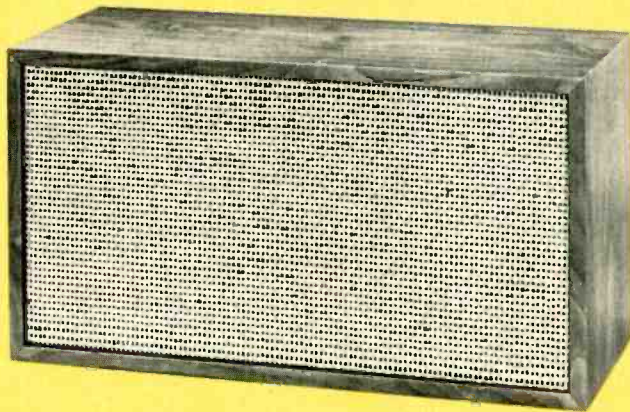
Emoire 808 E Reg. \$29.95 SHURE M32E-EP Reg. \$25.00 Pickering V15/ACE-3 Reg. \$29.95
Specify Heath Model No. — See p. 61



ADP-147
with 1c cartridge
\$69⁵¹
(less base)

Save Up To 50% With Heath Do-It-Yourself Electronic Kits

Acoustic Suspension Speakers



AS-16 **\$49⁹⁵**



AS-10U **\$59⁹⁵**

Miniature 2-Way Acoustic Suspension System . . . Electro-Voice® Speakers

• 8" acoustic suspension woofer • 3½" tweeters with 4.8 oz. magnet • Wide frequency response—45 to 20,000 Hz • Handles 10 to 25 watts of program material • High frequency level control • Handsome walnut veneer cabinet with scratchproof vinyl covering • Compact 10" H x 19" W x 8¼" D.

SPACE-SAVING SIZE . . . ROOM-FILLING PERFORMANCE. Don't let its pint size fool you. Features an 8" acoustic suspension woofer with a 6.8 oz. magnet that literally rides on air to recreate rich, full-bodied bass down to 45 Hz without distortion . . . a 3½" high frequency tweeter with 4.8 oz. magnet to reproduce crystal-clear highs up to 20,000 Hz. You hear everything from the high-pitched voice of a clarinet to the full impact of a kettle drum . . . with an astounding authenticity you never dreamed possible in a system this size. Even has a level control to balance the "highs."

BUILD IN 1 TO 2 HOURS . . . PRACTICAL DESIGNER STYLING. Both speakers are already cabinet-mounted . . . you just wire the 1500 Hz crossover network. You'll like the rich looks of the walnut cabinet, too . . . it's protected against scratches and spills by a special clear vinyl covering. Buy two for stereo.

Kit AS-16, 22 lbs., no money dn., \$5 mo. **\$49.95**

AS-16 SPECIFICATIONS—Recommended Amplifiers: AR-13A, pg. 45; AR-14, pg. 48; AA-22, pg. 45; AA-21D, pg. 51; AA-23, pg. 53; AA-13, pg. 53. **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" Electro-Voice 6.8 oz. Magnet. High frequency—3½" Electro-Voice 4.8 oz. magnet. Adjustable high frequency level control. **Dimensions:** 10" H x 19" W x 8¼" D.

Versatile Acoustic Suspension System . . . 30 To 15,000 Hz Response

• 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

FEATURES THE EXTENDED BASS RESPONSE, smooth high frequency response and substantially lower distortion that has made this type of system a favorite of audio-philis the world over. And it's yours to enjoy in a space-saving enclosure that needs only 10 watts to drive yet handles up to 40 watts of program material.

PLENTY OF CLEAN, DISTORTION-FREE SOUND. The speaker cone is mounted with a very free suspension for maximum cone travel. The principle restoring force is provided by the pneumatic "spring" of air enclosed within the cabinet. The cone literally "rides on air" instead of mechanical springs, thus reducing harmonic distortion. Includes a high frequency level control and L-C crossover network. Cabinet can be installed horizontally or vertically . . . available in walnut or unfinished white hardwood. Order 2 for stereo.

Kit AS-10U, unfinished, 43 lbs. . . . no money down, \$6 mo. **\$59.95**
Kit AS-10W, walnut, 42 lbs. . . . no money down, \$7 mo. **\$64.95**

AS-10 SPECIFICATIONS—Recommended amplifiers: AA-21D, pg. 51; AA-22, pg. 45; AA-13 & AA-23, pg. 53; AR-13A, pg. 45; AR-15, pg. 42-43. **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. **Dimension:** 90° horizontal. **Cabinet:** Factory assembled ¾" furniture grade plywood. **Dimensions:** 13½" H x 24" W x 11½" D.

Choose One Of These Famous Cartridges For Only 1c More With Changer Order!



Shure M44-15 Dynatic
AD-85B MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. Output: 11 mv per channel. Separation: More than 25 db at 1 kHz. Load impedance: 47,000 ohms per channel. Stylus: 0.7 mil diamond. Compliance: 20x10⁻⁴ cm/dyne. Tracking force: 1½ to 3 grams. Model AD-85B, 1 lb. . . . **\$19.95**



Pickering V15ATE-3
"Magnetic"—With Lint Brush
AD-36N MANUFACTURER'S SPECIFICATIONS—Frequency response: 10 to 25,000 Hz. Output: 6.0 mv. Separation: 35 db. Load impedance: 47,000 ohms. Stylus: elliptical diamond. Tracking force: 2 to 5 grams. Vertical tracking angle: 15°. Model AD-36N, 1 lb. . . . with lint brush. **\$39.95**



Shure M32E-EP Magnetic
AD-97K MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. Output: 9 mv per channel at 1000 Hz. Separation: 20 db at 1000 Hz. Load impedance: 47,000 ohms per channel. Stylus: 0.4 x 0.7 mil elliptical diamond. Compliance: 10 x 10⁻⁴ cm/dyne. Tracking force: 2½ to 5 grams. Tracking angle: 15°. Model AD-97K, 1 lb. . . . **\$25.00**



Pickering V-15(ACE)-3 Dustomatic
AD-117W MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. Output: 6.9 mv. Separation: 30 db. Load impedance: 47,000 ohms per channel. Stylus: 4 x .9 mil elliptical diamond. Compliance: 10 x 10⁻⁴ cm/dyne. Tracking force: 3 to 5 grams. Model AD-117W, 1 lb. . . . **\$29.95**



Empire 888E Magnetic
AD-96H MANUFACTURER'S SPECIFICATIONS—Frequency response: 10 to 30,000 Hz. Output: 8 mv per channel. Separation: 30 db. Load impedance: 47,000 ohms. Stylus: 4 x .9 mil elliptical diamond. Compliance: 12 x 10⁻⁴ cm/dyne. Tracking force: ¾ to 6 grams. Vertical tracking angle: 15°. Model AD-96H, 1 lb. . . . **\$39.95**



Empire 808E Elliptical
AD-127T MANUFACTURER'S SPECIFICATIONS—Frequency Response: 10 to 25,000 Hz. Output: 8 mv per channel. Separation: More than 30 db. Load Impedance: 47,000 ohms. Stylus: 4 x .9 mil elliptical diamond. Compliance: 12 x 10⁻⁴ cm/dyne. Tracking force: 1 to 4 grams. Tracking angle: 15°. Model AD-127T, 1 lb. . . . **\$29.95**



Shure M31E-EP Magnetic
AD-107L MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 18,500 Hz. Output: 10 mv at 1 kHz. Separation: 20 db at 1,000 Hz. Load impedance: 47,000 ohms per channel. Stylus: 0.2 x 0.7 mil elliptical diamond. Compliance: 15 x 10⁻⁴ cm/dyne. Tracking force: 1 to 2 grams. Tracking angle: 15°. Model AD-107L, 1 lb. . . . **\$27.50**



Empire 808 Magnetic
AD-87E MANUFACTURER'S SPECIFICATIONS—Frequency response: 10 to 20,000 Hz. Output: 8 mv per channel. Separation: more than 30 db. Load Impedance: 47,000 ohms per channel. Stylus: 0.7 mil diamond. Compliance: 8 x 10⁻⁴ cm/dyne. Tracking force: 1 to 5 grams. Tracking angle: 15°. Model AD-87E, 1 lb. . . . **\$19.95**

Use "No Money Down" Heath Time Pay—See Order Blank For Details



Exclusive Speaker "Separates"

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

EASILY HANDLES UP TO 40 WATTS PROGRAM MATERIAL, 80 watts peak power. Features true 3-way 12" unitary speaker with woofer, compression mid-range and a horn-loaded compression super tweeter that cover the extremely wide range of 20 to well past 20,000 Hz. The mid-range unit fires directly through the center magnet structure with outer section formed by curved cone of low-frequency radiator.

HIGHEST QUALITY COMPONENTS FOR FINEST PERFORMANCE. Like a heavy die-cast frame for greater rigidity, and precision alignment of all elements . . . high energy ferrite woofer magnet for extra power handling capability . . . 1½" and 1" voice coils . . . 600 Hz and 4000 Hz crossover points . . . special level control to balance both the mid and high frequencies together . . . color-coded binding post terminals for easy phasing . . . and 2-tone tan & cinnamon color styling. 8 ohm impedance. Includes 1-year guarantee and cabinet recommendations. Order a pair for stereo.

Model AS-27, 14 lbs. . . no money dn., \$7 mo. \$69.50
 Model AS-27-2, 28 lbs. . . no money dn., \$14 mo. Pair \$132.00

AS-27 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 40 watts. Frequency response: 20-20,000 Hz. Cone resonance: 30 Hz. Magnet Weights: 1 lb., 6.4 oz., 4.6 oz. Voice coil sizes: 1½" and 1".

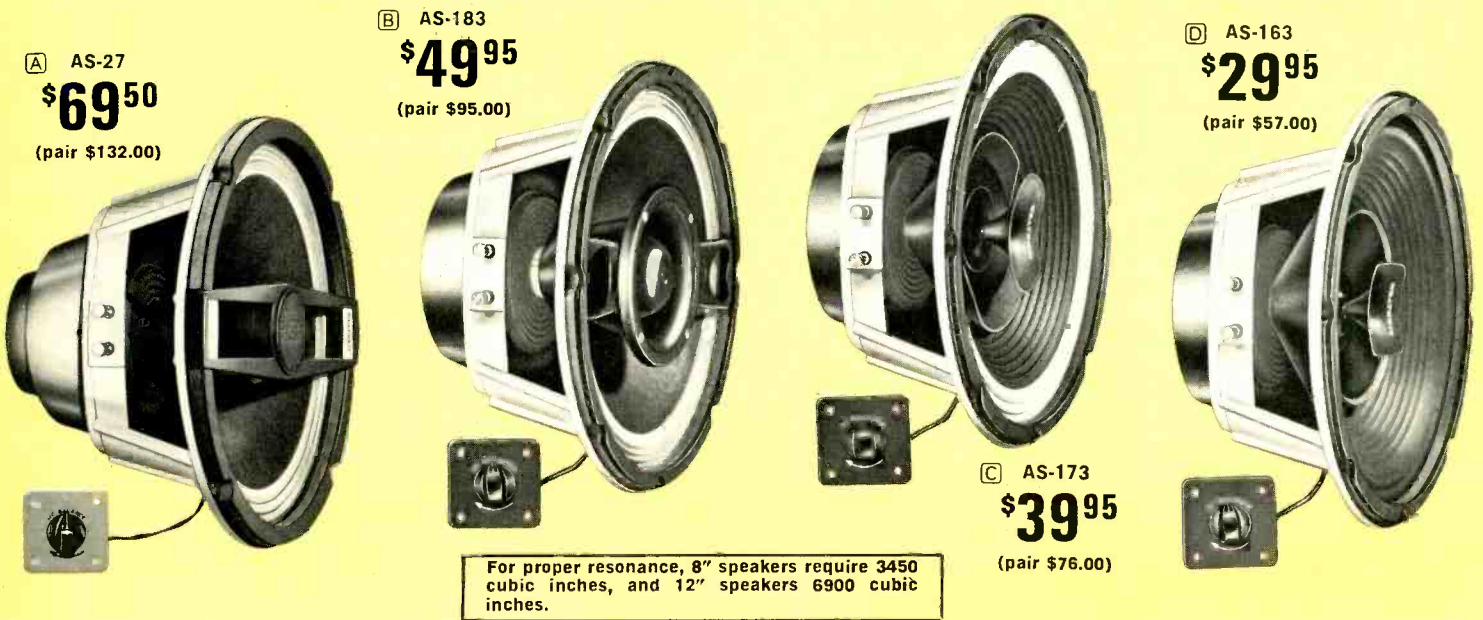
B Deluxe 12" Two-Way High Compliance, Edge-Damped Hi-Fi Speaker . . . Covers The Wide 20 to 15,000 Hz Frequency Range

HANDLES UP TO 30 WATTS OF PROGRAM MATERIAL. A high compliance, edge-damped woofer cone, low crossover frequency and a reflexed horn high frequency unit combine to bring you an extremely wide 20 to 15,000 Hz response with astounding realism.

YEARS OF FLAWLESS REPRODUCTION are assured with the heavy, die-cast frame for precision alignment of all elements, high efficiency 1¾ lb. ceramic ring magnet and highest quality materials. Additional features include 1½" and 1" voice coils . . . separate high frequency level control . . . polarized speaker terminals to insure proper phasing . . . attractive 2-tone cinnamon and tan color styling. Includes a full 1-year guarantee and cabinet recommendations. For a sound that will delight the most critical ear, choose this masterfully-crafted speaker now. Buy two for superb stereo.

Model AS-183, 15 lbs. . . no money dn., \$5 mo. \$49.95
 Model AS-183-2, 29 lbs. . . no money dn., \$10 mo. Pair \$95.00

AS-183 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 30 watts. Frequency response: 20-15,000 Hz. Cone resonance: 25 Hz. Magnet weights: 1¾ lbs., 4.65 oz.



C 12" 3-Way High Compliance, Edge-Damped Hi-Fi Speaker . . . Covers 35-15,000 Hz

25 WATT PROGRAM MATERIAL CAPABILITY. Features a high compliance edge-damped woofer cone for rich, deep bass . . . high frequency cone for mid-range realism and presence . . . and a special Heath designed tweeter for crystal-clear highs.

BOASTS SEPARATE HIGH FREQUENCY LEVEL CONTROL for balancing the highs to suit room acoustics . . . built-in crossover networks . . . heavy die-cast metal frame for years of faithful service . . . 1½" and 1" voice coils . . . 1¾ lb. ceramic annular ring magnet . . . 2-tone cinnamon and tan color styling. Includes cabinet recommendations and 1-year guarantee. This speaker will fill virtually every hi-fi listening need, and provide full range sound . . . at a low price. Choose a pair for stereo . . . and extra savings.

Model AS-173, 14 lbs. . . no money dn., \$5 mo. \$39.95
 Model AS-173-2, 28 lbs. . . no money dn., \$8 mo. Pair \$76.00

AS-173 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 25 watts. Frequency response: 35-15,000 Hz. Cone resonance: 40 Hz. Magnet weights: 1¾ lbs., 2½ oz.

D 12" 3-Way Coaxial Hi-Fi Speaker . . . Covers 40-15,000 Hz Range

SUPERBLY ENGINEERED. Features true coaxial design with 3 separate radiating elements . . . woofer, tweeter and a specially-designed horn tweeter. Boasts heavy, die-cast frame construction for precise alignment of speaker elements, and high efficiency ceramic annular-ring magnet to assure dependable, trouble-free performance. Handles up to 20 watts. Mechanical and electrical cross-over networks provide smooth sound transition. Polarized and color-dot coded speaker terminals assure proper phasing with your system. Cinnamon and tan color styling . . . separate high frequency level control . . . cabinet recommendations . . . 1-year guarantee. Order two for stereo.

Model AS-163, 12 lbs. . . no money dn., \$5 mo. \$29.95
 Model AS-163-2, 24 lbs. . . no money dn., \$6 mo. Pair \$57.00

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: 1½" and 1".

...Buy A Pair For Extra Savings!

E 12" Two-Way Coaxial Hi-Fi Speaker . . . Exceptional Value

AN AMAZING VALUE IN A QUALITY-BUILT COAXIAL SPEAKER! Accommodates up to 15 watts . . . covers 50-15,000 Hz. True coaxial design, features separate woofer and tweeter with a built-in capacitive crossover network. High frequency level control permits balancing "highs" and "lows" to fit room acoustics. Rigid die-cast frame maintains precise alignment of all speaker elements. Includes polarized binding posts for proper phasing and easy connection to amplifying system . . . 2-tone cinnamon and tan color styling . . . cabinet recommendations . . . and 1-year guarantee. Pick a pair for extra savings.

Model AS-153, 10 lbs. \$19.95
 Model AS-153-2, 20 lbs. no money dn.,
 \$5 mo. Pair \$38.00

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 3/16".

F Ideal For Small Enclosures . . . 8" Two-Way Coaxial Hi-Fi Speaker

TOP VALUE IN AN 8" SPEAKER. Handles up to 12 watts of program material . . . covers 50 to 14,000 Hz. Boasts a separate woofer and tweeter for true coaxial performance, plus built-in crossover network. Has separate high frequency level control . . . 10 oz. annular-ring magnet for extra power handling capability . . . die-cast metal frame . . . cinnamon and tan color styling . . . color-dot coded binding post terminals for easy phasing.

MEASURES ONLY 3 5/8" DEEP . . . Ideal for limited spaces. Complete with multi-speaker instructions and recommended cabinet recommendations. Guaranteed 1 full year.

Model AS-133, 6 lbs. \$14.95
 Model AS-133-2, 12 lbs. no money down,
 \$5 mo. Pair \$28.50

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 3/16".

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

SLIM 3 1/2" DEPTH IDEAL FOR IN-WALL MOUNTING . . . or any other small enclosures such as shallow cabinets, ceilings, etc. Handles up to 12 watts, covers 50-12,000 Hz. Features husky, die-cast metal frame for extra rigidity of speaker elements, plus a dual-cone design for wide-range. In addition there's a 10 oz. annular-ring magnet, and color-coded binding post terminals for proper phasing. Comes complete with multi-speaker connection instructions, and 1-year guarantee. Enjoy extra savings by ordering a pair!

Model AS-123, 5 lbs. \$9.95
 Model AS-123-2, 10 lbs. Pair \$19.00

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"



E AS-153
\$19.95
 (pair \$38.00)

F AS-133
\$14.95
 (pair \$28.50)

G AS-123
\$9.95
 (pair \$19.00)



H ADP-135
\$15.95

I ADP-92
\$23.92

J ADP-137
\$49.00

K AC-17
\$7.95

H Telex "Adjustatone" Stereo Headset

3 1/2" speakers. "Forward Sound" acoustic effect or "in-head" stereo by reversing headphones. Foam cushion.

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.

I Telex ST-11 Stereo Headset

Soft rubber muffs, excellent bass response, wide range. Stainless steel headband and yoke.

Model ADP-92, 2 lbs. \$23.92

ADP-92 SPECIFICATIONS—Driver element: 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.

J KOSS "Pro" Stereo Headset

Fluid-filled, contoured, washable cushions, ultra-sensitive; wide-range; steel headband.

Model ADP-137, 2 lbs. no money dn.,
 \$5 mo. \$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.

K New Heathkit Stereo Headphone Control Unit

Here's a convenient way to connect headphones

to any listening source. Control unit with 20' cable permits selection of speakers or headphones, control of volume and balance from your favorite chair. Works with mono or stereo amplifiers, tube or transistor, as well as recorders, phonos, radios and TV. Accepts 2 sets of stereo headphones (4-wire, 3 connector types) or 2 sets of mono headphones (2-connector types). Compact metal case, color styled in beige, can be hand-held or set in any desired location. Includes complete information for connecting to any system. Easy to assemble in one or two hours.

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 2 1/4" H. including control knobs.



World's Best Hi-Fi "Voices"...

A 4 Special Design Speakers For Custom Or Heath Cabinet Mounting

• 12" high compliance, low resonance woofer • Two special design 2" direct radiator dome-type mid-range speakers • Special design 1" direct radiator dome-type ultra-high frequency tweeter • Frequency response 40 to 20,000 Hz • Big voice coils • Heavy ceramic ring magnets • 3-way crossover networks, LC and RC type • High and mid-frequency attenuators • Includes cabinet recommendations and pre-cut and fitted speaker mounting baffle

ADVANCED SPEAKER DESIGN. 12" high compliance woofer features a 1½" voice coil and 1 lb. 11 oz. ceramic ring magnet, with free air resonance of 25 Hz. Both mid-range units have 6¼" frames with 4½" ceramic ring magnets weighing 1 lb. and 2" dome radiators driven by 1½" voice coils. The ultra-high frequency tweeter has a 4¼" frame with a 2¼" 6 oz. ceramic ring magnet. Its 1" radiating surface is driven by a 1" voice coil. Handles 5 to 50 watts.

3-WAY CROSSOVER NETWORKS . . . LC and RC types with 1000 Hz and 10,000 Hz crossover points. Separate high and mid-frequency attenuators that range from full to cutoff.

HANDSOME FLOOR MODEL CABINET OPTIONAL. Buy the 4 speakers separately, or order with a handsome walnut-finish enclosure that measures 18½" W x 19" D x 32¾" H. Cabinet is a tube vented, bass reflex design, and is factory assembled of ¾" solids and veneers. Enjoy extra savings when you buy a pair for stereo.

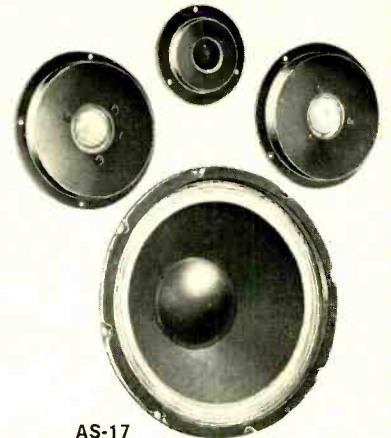
Kit AS-17, 4 speakers & mounting board, 31 lbs. . . no money dn., \$9 mo. **\$89.50**

Kit AS-17-2, 62 lbs. . . no money dn., \$17 mo. **Special Pair Price \$170.00**

Kit AS-15, 4 speakers & assembled cabinet, 82 lbs. . . (REA express or motor frt. only) no money dn., \$14 mo. **\$134.95**

Kit AS-15-2, 164 lbs. . . no money dn., \$24 mo. . . (REA express or motor frt. only) **Special Pair Price \$259.00**

AS-15 SPECIFICATIONS—Recommended Amplifiers: AR-15, pg. 42-43; AR-13A, pg. 44-45; AR-14, pg. 48-49; AA-21D, pg. 51; AA-22, pg. 45; AA-32, pg. 53; AA-13 & AA-23, pg. 52-53; AA-14, pg. 48. Frequency response: 40 Hz to 20 kHz. Crossover frequencies: Low 1000 Hz to high frequency 10 kHz. Power rating: 50 watts of program material. Nominal Impedance: 8 ohms. Speakers: (1) 12", high compliance, low resonance, low frequency; (2) 2" direct radiator dome-type mid-frequency; (1) 1" direct radiator dome-type ultra high frequency speaker. Crossover network: three channel: Low frequency, low pass LC type; Mid-frequency bandpass LC type; High frequency, high pass RC type filter. Cabinet: Walnut finished, tube vented type. Dimensions: Overall, 18½" W x 19" D x 32¾" H.



AS-17
Speakers,
Crossover Parts,
Mounting Baffle,
Grille Cloth **\$89.50**

4 Special Speakers . . . 12" high compliance woofer, plus 3 speakers of the direct radiator type—two mid-range 2" dome-type, and 1" dome-type for the highs. Supplied with crossover parts, mounting baffle and grille cloth (model AS-17) for custom installation.

B Introducing The Fourth Generation Of This Famous Heathkit Speaker System . . .

With Improved Speakers And Cabinetry . . . All At The Original 1955 Price Of Just \$39.95

• New special design speaker . . . 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

Thousands have bought the preceding models of this fine speaker system series . . . a series always outstanding in performance and value. And now, this new model AS-37 has improved components and cabinetry yet it costs no more than the original 1955 model!

IMPROVED TECHNOLOGY . . . in magnet types and polyester covered woods . . . improve the product, yet keep costs down. The woofer now uses a ceramic type magnet to produce the same good response of preceding models. The cabinet now uses a polyester covering . . . a

durable, fade-free finish with a walnut grain that resists abrasion and ordinary wear, is stain and heat resistant. No more experimenting with wood finishing, no more variations in finish tone.

EASY TO BUILD. The cabinet is factory assembled and finished. Just mount the two speakers, the crossover network and tweeter balance control . . . you should finish in two hours or less!

ORDER A PAIR FOR STEREO . . . they are exceptional values.

Kit AS-37, 27 lbs., no money dn., \$5 mo. **\$39.95**

AS-37 SPECIFICATIONS—Recommended amplifiers: AR-14, pg. 48; AR-17 & AR-27, pg. 50; AA-14, pg. 48; AA-32, pg. 53; AR-13A, pg. 45; AA-21D, pg. 51; AA-22, pg. 45; AA-13 & AA-23, pg. 53. 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. Shipping weight: 27 lbs.

C Ideal For A Variety Of Installations . . . Low Cost Hi-Fi Speaker System

• 6" x 9" extended range dual-cone speaker • Easy assembly • Preassembled unfinished or walnut finish cabinets

COVERS 70 TO 12,000 Hz. Place in an extra room, use as an extension speaker to other rooms, and as a center fill-in for a stereo system. Handles up to 12 watts of program material. Compact in size and price. Choose two for stereo.

Kit AS-41U, unfinished, 8 lbs. **\$10.95**
Kit AS-41W, walnut, 8 lbs. **\$12.95**

AS-41 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 48; AA-32, pg. 53; AA-13, pg. 52 & 53; AR-14, pg. 48 & 49. 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.

D Have A Space Problem? Choose This Miniature 2-Way Speaker System

• 6" high compliance, mass-loaded woofer • 3" closed back tweeter • Fast, easy assembly • Preassembled unfinished or walnut finish cabinets

COMPACT SIZE, WIDE 70-12,000 Hz RANGE! High compliance type 6" woofer features a mass-loaded cone that's matched to the enclosure for good base response. Closed-back, cone-type tweeter prevents speaker interaction. Assembles in a couple of hours. Order two for stereo.

Kit AS-81U, unfinished, 10 lbs. **\$17.50**
Kit AS-81W, walnut, 10 lbs. **\$19.95**

AS-81 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 48; AA-32, pg. 53; AA-13, pg. 52-53; AR-14, pg. 48-49. 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: 10¾" W x 6½" H x 6¾" 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.

Heathkit® Speaker Systems



A AS-15
4 Speakers
& Assembled Cabinet
\$134⁹⁵



B AS-37
\$39⁹⁵



C AS-41U
\$10⁹⁵



D AS-81U
\$17⁵⁰



MEDITERRANEAN
Complete Ensemble

\$299⁰⁰



CONTEMPORARY
Complete Ensemble

\$244⁰⁰



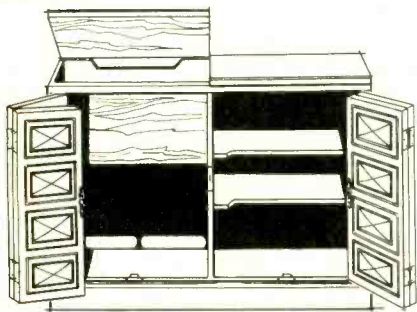
EARLY AMERICAN
Complete Ensemble

\$264⁰⁰

New! Deluxe Stereo/Hi-Fi Furniture



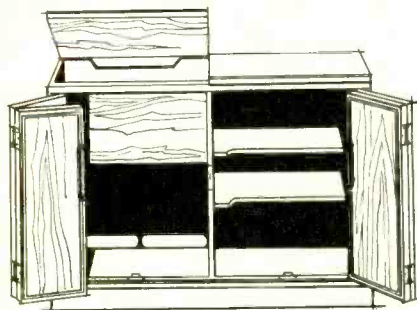
Now The Latest Motif . . . With An Exciting Spanish Flair . . . New Heathkit Mediterranean Pecan Stereo/Hi-Fi Cabinet Ensemble . . . Completely Factory Assembled And Finished



- 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

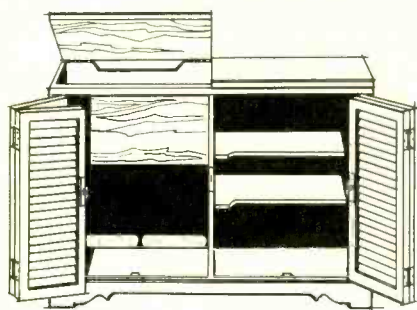
New! Heathkit Contemporary Walnut Ensemble Complements Modern Furnishings . . . Completely Factory Assembled And Finished



- 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 New 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, 110 lbs. . . no money dn., \$14 mo. \$150.00

AE-57 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19 3/4" 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. Also features a 3 3/8" x 10 1/2" slot for a horn tweeter. 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, 64 lbs. . . no money dn., \$8 mo. each \$74.50

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, 103 lbs. . . no money dn., \$12 mo. \$125.00

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 1/2" 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 1/2" D. x 15 3/4" H. **Shelf Compartment:** Overall interior dimensions, 19" W. x 16 1/2" D. x 24 3/4" 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. Features a 3 3/8" x 10 1/2" slot with removable cover for a horn tweeter. 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, 64 lbs. . . no money dn., \$6 mo. each \$59.50

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, 98 lbs. . . no money dn., \$13 mo. \$135.00

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 3/4" 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.

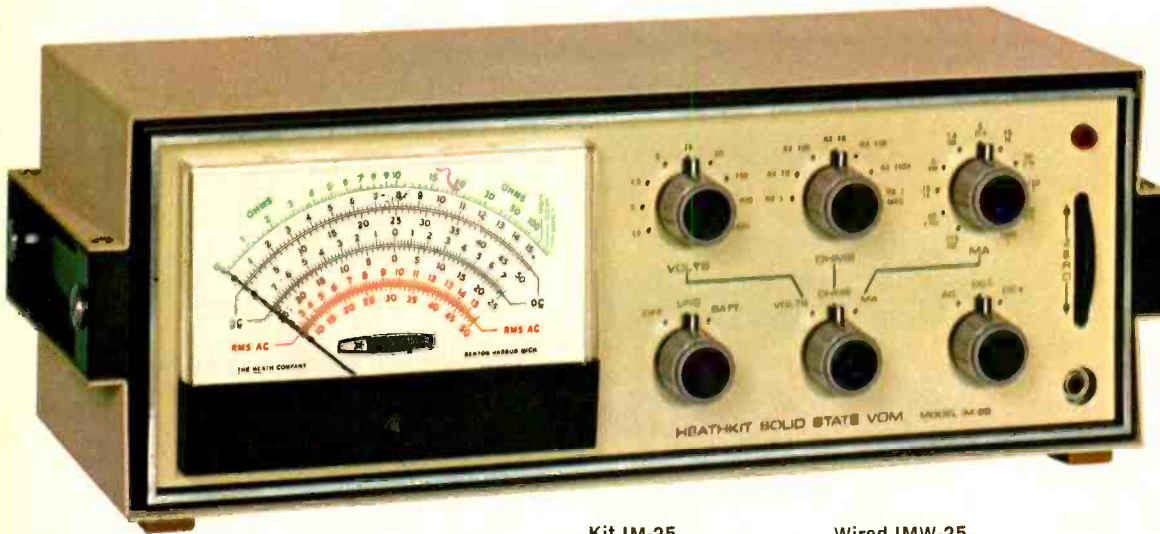
Matching Speaker Cabinet . . . features tubular-duct reflex design so you can easily match it to any 8" or 12" speaker for perfect resonance with the instruction sheet included. Has 3 3/8" x 10 1/2" slot for a horn tweeter. Handsome wood spindle grille. Completely assembled and finished to match the AE-47 equipment cabinet. Measures 18" W. x 19" D. x 28 3/8" H. Order a pair for stereo.

AEA-47-1, speaker cabinet, 64 lbs. . . no money dn., \$7 mo. each \$64.50



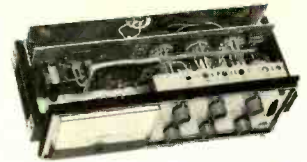
Heathkit Innovations In Test

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

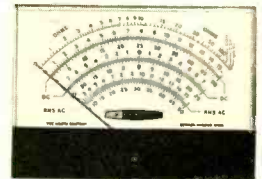


Kit IM-25
\$80⁰⁰

Wired IMW-25
\$115⁰⁰



Unitized Construction. Circuit board mounts within the main frame. Cabinet shells are removable for convenient access to calibration controls and battery holders.



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



Improved Probe. Finger-tip switch for convenience... flip to measure DC volts or Ohms-mA-AC volts. Threaded point accepts alligator clip for clip-on, hands-free monitoring.

Never Before Has An Instrument With These Features And Performance Been Available At Less Than \$195

- 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 • 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

NOW AN INSTRUMENT ESPECIALLY DESIGNED FOR THE ANALYSIS OF MODERN TRANSISTORIZED CIRCUITRY . . . extra low current and voltage ranges enable the IM-25 solid-state VOM to do all the measurement jobs normally required in either tube or transistor circuit development and service. And it does them with the low-loading, high impedance input of a VTVM, the convenience and versatility of a VOM, and the precision and sensitivity of separate lab instruments.

THE IM-25 IS DESIGNED FOR UTILITY IN APPLICATION . . . For example, the input of the IM-25 "floats," isolating the circuit ground from the cabinet . . . and the cabinet can be grounded through the three-wire line cord. The sometimes-troublesome ground loops due to coupling to the 60 Hz line can be easily eliminated by setting the switch to internal battery operation and disconnecting the line cord. Double Zener-diode regulation reduces the zero drift to a bare minimum when changing from line to battery operation, DC voltage measurements required only a shorted input check of meter zero for maximum specified accuracy. And zero settings are really precise with the ten-turn thumbwheel control.

OHMS SCALE CALIBRATION IS A SET-AND-FORGET ADJUSTMENT. The voltage applied to the circuit under test is less than 100 millivolts from a constant-current source, avoiding the possibility of erroneous readings or circuitry damage. And, the FET's used in the IM-25 all-transistor circuit provide the high accuracy, high impedance input characteristics normally found only in VTVM's.

CHOOSE THE KIT MODEL IM-25 FOR GREATER SAVINGS . . . and as an added bonus you'll find it far easier to build than any other kit meter we've ever offered. Most components mount on just one circuit board . . . even the switches. And point-to-point connections are easy with the special wiring harness provided.

UNITIZED CONSTRUCTION . . . the IM-25, with its die-cast panel bezel, ties both the front and rear panels together with the circuit board supported within the frame. This permits removal of the top and bottom cabinet shells without impairing the operation of the instrument. The new push-on knobs have spring loaded inserts to end slipping. Carrying handles are recessed in each of the cabinet shell mounting strips.

Whether you choose the factory assembled model or the kit version, we believe you will find the IM-25 a significant step forward in design and value . . . capable of creditable service in any application.

Kit IM-25, 10 lbs., no money dn., \$8 mo. \$80.00
Assembled IMW-25, 10 lbs., no money dn., \$11 mo. \$115.00

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 (0.15 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 (0.15 mA). **Accuracy:** $\pm 5\%$ of full scale. **OHMMETER—7 Ranges:** 10 ohm center scale x1, x10, x100, x1k, x10k, x100k, x1 meg. **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 [EIN mercury cell]. **Amplifier circuit:** 18 volts. **Battery operation:** "C" cells. **Line operation:** Transformer operated $\frac{1}{2}$ 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.

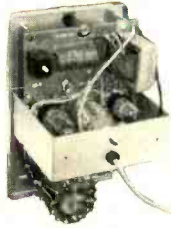
Instruments Set A New "State-Of-The-Art"

Heathkit IM-11 . . . The World's Most Popular VTVM



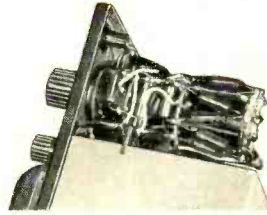
SINGLE PROBE CONVENIENCE

Slim, all-purpose probe with switch for all functions and unique clip-action for hands-free connections.



CIRCUIT BOARD ASSEMBLY

For uniformity and stability, as well as easy construction, the Heathkit IM-11 uses a printed circuit board for minimum component wiring.



PRECISION RESISTORS

The IM-11 voltage divider networks use precision (1%) resistors to provide high instrument accuracy.



Price Is Only One Of The Many Reasons For The Popularity Of The IM-11 VTVM

- Proven through experience to have the most popular size—the most popular features • 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 • Costs only \$2.45 more than its predecessor of 17 years ago

THE WORLD-FAMOUS HEATHKIT IM-11 VTVM HAS UNDOUBTEDLY CONTRIBUTED MORE TO THE FIELD OF ELECTRONICS THAN ANY OTHER BASIC SERVICE INSTRUMENT. Thousands have been sold. IM-11's are found in home workshops, service shops, electronics and engineering laboratories, and scientific laboratories the world over. They are used as basic instrumentation for many high school, college, and vocational courses in electronics. And only recently the IM-11 was chosen to be part of the Heath Instrumentation Group for the Berkeley Physics Laboratory . . . a sophisticated college-level course, using up-to-date electronic instrumentation for teaching the fundamental principles of physics.

EXAMINE THE IM-11 MORE CLOSELY. In addition to the improved features mentioned, functions include AC volts (RMS), AC volts (peak-to-peak), DC volts, resistance and decibel measurements. Precision 1% resistors and the high, 11 megohm input resistance assure high accuracy by minimizing circuit loading of the unit under test. Front panel controls include a rotary function switch (with DC polarity reversing position to eliminate lead changing when alternately measuring positive & negative voltages), a rotary range selector, and Zero Adjust & Ohms Adjust controls.

WHAT'S MORE, THE SINGLE, SIMPLE PLUG-IN CONNECTOR FROM TEST LEADS TO METER IS DESIGNED WITH YOU IN MIND . . . helps avoid tangled test leads . . . saves you time in changing

Kit IM-11
\$26⁹⁵
Wired IMW-11
\$44⁹⁵

from standard to RF or High Voltage probes. The slim, all-purpose test probe supplied with the IM-11 permits switch-selection of AC, Ohms, & DC functions, and is equipped with a miniature "hook" permitting the probe to be clipped to component leads for "hands-free" circuit testing.

CHECK THE IM-11 SPECIFICATIONS. You'll agree that for all-around performance in the electronics industry, there's not a better buy than the Heathkit VTVM.

Kit IM-11, 5 lbs., no money dn., \$5 mo. \$26.95
Assembled IMW-11, 5 lbs., no money dn., \$5 mo. \$44.95
Export model available for 115/230 VAC, 50-60 Hz.

IM-11 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 meg-ohms. Meter: 4½" 200 µA 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 volt 50/60 Hz AC, 10 watts. Dimensions: 7½" H x 4¼" W x 4¼" D.

Etched Circuit RF Probe Kit

This handy Heathkit RF probe may be used with any 11 megohm DC input VTVM, transistorized VOM, or solid-state version of the VTVM. It enables RF measurements up to 250 MHz. A convenient and useful accessory for hams and professional transmitter-station engineers. 500 volts DC maximum at probe tip. 30 volts RF maximum. The 309-C features a miniature circuit board for compact, easy assembly.

Kit 309-C, 1 lb. \$4.00
Assembled 309W-C, 1 lb. \$5.00



30,000 Volt DC High Voltage Probe Kit

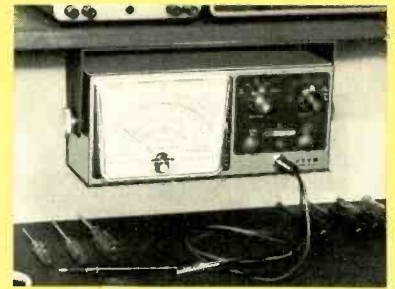
Invaluable for work where extremely high voltages are measured. Sleek red & black plastic body provides plenty of insulation for safety. The multiplication factor is 100 on the DC ranges of any 11 megohm input meter . . . provides a useful 1100 megohm input for measuring voltages as low as 50 volts in very high impedance circuits.

Kit 336, 1 lb. \$5.50
Assembled 336W, 1 lb. \$6.50

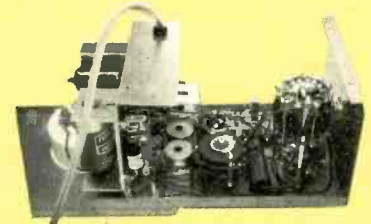
Heath Offers You Incomparable "Extra" Customer Service



Heathkit® Test Instruments – Value



Space Saving Gimbal Mounting . . . securely holds the IM-13 above, below, or in front of your most convenient mounting surface . . . permits direct view of meter face.



Neat, Open Parts Layout . . . makes the point-to-point wiring easy. Also "ohms" battery is easy to replace when necessary.

Kit IM-13
\$34⁹⁵

Wired IMW-13
\$52⁹⁵

Heathkit "Service Bench" VTVM Accurate—Easy To Read—Quick To Use

- 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 HEATHKIT IM-13 FEATURES THE SAME PERFORMANCE SPECIFICATIONS AS THE IM-11 . . . 1% precision resistors, response to 1 MHz, and more . . . but it also has the extra-large 6" meter face, additional low-voltage AC scales, gimbal mounting bracket, and "service bench" styling for added convenience, accuracy, and ease of use in the shop and laboratory. Its compact cabinet is attractively and practically styled for mounting over, on-top-of, under, or in-front-of almost any sturdy mounting surface within your line-of-sight. The gimbal mounting with thumbwheel pivoting allows the meter to be tilted to the optimum viewing angle. And the large multi-colored meter scales with separate 1.5 & 5 volt scales for AC measurements show at a glance the proper scale and indicated value. Here is an instrument especially designed for use at the laboratory test bench crowded with other instrumentation.

NO MORE CONFUSING TANGLE OF TEST LEADS . . . only a single plug for test leads goes into the IM-13 . . . and one probe does the whole job—a miniature switch in the probe body lets you measure AC volts & ohms in one position or DC volts in the other. An alligator clip is used on the ground lead for maximum convenience. And both the ground and test leads go into the single plug. Here is real

convenience. What's more, the test leads are included with your IM-13.

THE HEATHKIT IM-13 IS EASY TO OPERATE TOO . . . just a function selector, a range selector, and two ten-turn adjust controls. Set the function switch to the desired measurement, "AC Volts", "DC-", "DC+", or "Ohms", and choose the range. The clearly marked meter scales show you at a glance your measured value.

CALIBRATING IS EASY . . . a "set-and-forget" procedure that you can re-check anytime, since all calibrate controls are screwdriver adjustable from the front panel. No need to remove the instrument from its case for calibration. And each control is clearly identified.

KIT OR ASSEMBLED . . . your kit IM-13 goes together easily and you enjoy a big savings over comparable units. The assembled IMW-13 is already to go . . . just install an internal "ohms scale" battery and mount the instrument on your bench. When you choose a VTVM for your shop, choose wisely . . . choose the Heathkit IM-13.

Kit IM-13, 7 lbs. no money dn., \$5 mo. **\$34.95**
Assembled IMW-13, 7 lbs. . . . no money down, \$6 mo. **\$52.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-13 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 μ A 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 $\pm 3\%$, AC $\pm 5\%$ 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 volts 50/60 Hz. AC 10 watts. **Dimensions:** 5" H x 12 $\frac{1}{8}$ " W x 4 $\frac{1}{4}$ " D.



IB-2A
\$69⁹⁵

Heathkit Impedance Bridge

- Measures resistance, capacitance, low Q and high Q inductance with four separate bridge circuits • Slanted control panel for easy reading & operation • Built-in generator & detector amplifier • Battery-type vacuum tube circuitry for fast warmup • 1/2% precision resistors and silver-mica capacitors

Dependable Laboratory Accuracy Is Assured Through Use Of Precision Components. The four bridge circuits assembled in this instrument are: a Wheatstone bridge for measuring resistance, a Capacitance Comparison Bridge for capacitance, a Maxwell Bridge for low Q inductance, and a Hay Bridge for high Q inductance.

Kit IB-2A, 11 lbs. . . . No money down, \$7 mo. **\$69.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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

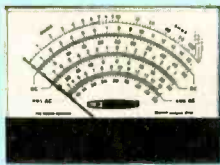
There's A Heathkit For Every Interest, Every Purpose, Every Budget

Standards For Over Two Decades

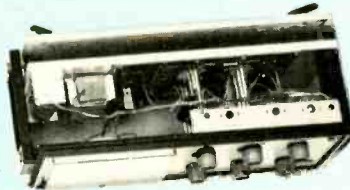


IM-16
\$44.95

Wired IMW-16
\$64.95



Ultra-Readable, Large, 6" Meter . . . Here are meter scales that can be read from across the work bench . . . easily over the entire distance most test leads will reach. Numerals are bold, scales are quick to read, divisions are convenient for interpolation.



Modern, Stable, Easy-To-Follow Circuit Board Construction . . . puts most components on a single circuit board, eliminates the maze of point-to-point voltage divider resistors, makes assembly easy.



A Single Probe With Finger-Tip Flip Switch . . . makes all measurements . . . selects AC/Ohms or DC voltage function. Threaded tip takes alligator clip to give you an "extra hand." Both probe lead and ground lead go to a single plug.

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

- All solid-state circuitry • 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 ohmmeter 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 120/240 V, 50/60 Hz AC line voltage • 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 • Circuit board assembly • 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—handsome beige & black finish

THE MODERN, SOLID-STATE VERSION OF THE VTVM. Now you can get the high-impedance input characteristics of the VTVM and the stability and virtually unlimited life of transistorized circuitry in a smartly styled bench-top instrument. The 11 megohm input of the IM-16 assures you accurate readings . . . you can use your trusty 336 Heathkit high voltage probe with this instrument . . . the IM-16 comes with a Heathkit standard probe with a finger-tip flip switch for going from AC/ohms to DC measurements. Fasten the special alligator clip to this probe for truly secure, hands-free voltage checks.

SOLID-STATE CIRCUITRY PROVIDES UNPARALLELED DEPENDABILITY . . . LONG-TERM DRIFT-FREE ZERO SETTINGS. The IM-16 operates from 120/240 V, 50/60 Hz AC line voltage . . . or its own internal batteries, thanks to the minimal power demands of transistorized electronics. Zener-diode regulation allows quick change from external to internal power with only a brief "touch-up" of zero adjust. And once it is set, zero adjust is essentially drift free even between range settings.

MULTIPLE CONTROL KNOBS MEAN LESS TIME CONSUMED BY STUDYING SWITCH SYMBOLS. Go rapidly from DC Volts to AC Volts to Ohms, and change polarity with a flip of a switch. Multiple controls provide a greater number of possible ranges without filling the front panel with a complex maze of figures . . . keep separate functions isolated from one another . . . let you go at a glance to the proper function, range, or polarity.

THE NEW "LOOK" . . . an innovation from Heath for up-to-date appearance, easier & more convenient use, stable construction, and easier assembly. The new Heathkit instrumentation styling makes instruments far easier to build than ever before. Cabinet top and bottom shells remove easily to completely expose components and circuitry . . . helps in final checkout of your newly assembled kit. And there's more . . . control knobs offer a sure grasp . . . pointers are quick to note . . . top and bottom are flat so instruments can be stacked . . . and frame side pieces form natural lifting handles with carrying handles recessed for extra convenience. Order an IM-16 and discover a new generation of test instruments.

Kit IM-16, 10 lbs., no money dn., \$5 mo. \$44.95
Assembled IMW-16, 10 lbs., no money dn., \$7 mo. \$64.95

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:** ±3% of full scale. **AC VOLTMETER—8 Ranges:** 0.5, 1.5, 5, 15, 50, 150, 500, 1500 volts. **Input resistance:** 1 megohm. **Accuracy:** ±5% full scale. **OHMMETER—7 Ranges:** x1 (10 ohm center scale), x10, x100, x1k, x10k, x100k, x1 megohm. **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 µA (100° movement). **Transistor & diode complement:** (1) Field effect transistor; (6) 2N3393 silicon transistors; (1) 6.8 V. zener diode; (4) silicon diodes. **Dimensions:** 16 3/8" L x 7 3/4" D x 5 7/8" H. **Net weight:** 7 1/2 lbs. (with batteries).



Heathkit® Test Instruments...

Improved Heathkit Laboratory Transistor Tester For Detailed Analysis Of Transistors

NEW HEATHKIT IM-36 BRINGS YOU UP-TO-DATE FACILITIES FOR TRANSISTOR ANALYSIS... enables complete laboratory DC analysis of transistor and diode characteristics, including base current, gain, collector current, collector voltage, diode or collector-to-emitter leakage (I_{ceo}), and collector-to-base leakage (I_{cbo}). Ideal for comparing transistor characteristics in electronics R & D, perfect for the classroom or college electronics laboratory where design characteristics are examined and discussed.

THE COMPLETE ANALYSIS IS QUICK, SIMPLE, & ACCURATE. Four lever switches select the desired test on any transistor or diode after the initial setting of voltage and current range switches is made. Tests under a wide variety of conditions are feasible since there are separate voltage and current range switches for both Gain and Leakage settings. Beta, the DC gain of the transistor is read directly from the calibrated dial scale when the panel meter is nulled. Scale calibrations are 0 to 200 and 200 to 400. Stable, accurate readings are assured through the use of a precise wire-wound potentiometer for this control. Divider resistors for current ranges are 1% precision. The high-quality, easy-to-read, zero-center meter features a 10 microampere movement for maximum sensitivity for all measurements.

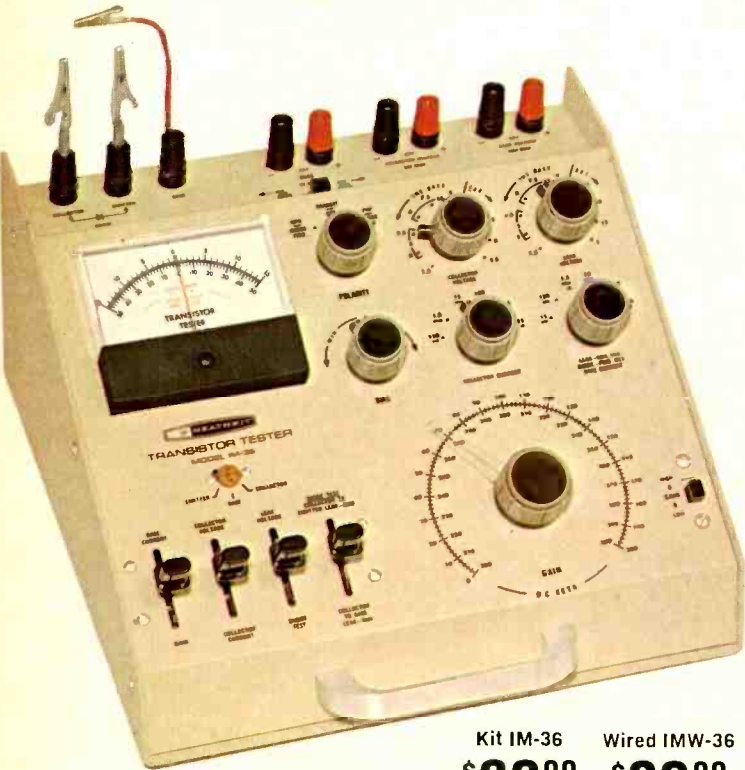
SELF-CONTAINED BATTERY POWER SUPPLY... enables complete portable operation. Internal battery container is separate and independent from the instrument... can be conveniently removed with the power cable still connected and batteries in place to clear the way for checkout of the instrument after assembly or for service requirements.

INTERNAL POWER PROVIDES ALL NECESSARY TEST VOLTAGES... up to 9 volts in 1.5 volt steps. Tests virtually all commonly used transistors. High voltage or high power transistors may be analyzed completely through the use of external power. IM-36 features appropriate meter ranges for these tests. A variable bias control allows the setting of collector current to any desired value up to 15 amperes for gain tests.

THE NEW "LOOK" OF MODERN HEATHKIT INSTRUMENTATION. Control knobs are easy to grip. Knob pointers are vivid, show knob positions at a glance. Beige and tan color styling looks smart... like an up-to-date instrument should. And the sloping front panel of the IM-36 permits convenient, easy reading of the meter and dial scales. The IM-36 is truly an unmatched value in transistor testing instrumentation. Less batteries.

Kit IM-36, 9 lbs., no money dn., \$6 mo. \$60.00
Assembled IMW-36, 10 lbs., no money dn., \$9 mo. \$90.00

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 μA, 150 μA, 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 μA 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 Voltages 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.



Kit IM-36 Wired IMW-36
\$60⁰⁰ **\$90⁰⁰**

- New features & styling • Measures current gain (Beta) up to 400 • Features the new "look" of Heathkit instrumentation • Unmatched in performance, quality, and price • Ideal for servicing, design work, incoming inspection, production testing, etc. • Provides complete DC analysis of PNP & NPN transistors • DC gain (Beta) is read directly on calibrated scales • 15 μA basic range for leakage (I_{cbo}, I_{ceo}) tests • Four lever switches for fast, easy test selection • Carrying handle for convenience in the shop and out on a job

Fast Test Selection
Four lever switches provide simple selection of any test available after initial setting of the current and voltage range switches. Binding post terminals are provided for transistors that do not fit tester socket.



Handy, Portable Heathkit Transistor/Diode Checker . . . Saves Time In Servicing . . . Features The New Heathkit "Look"

- 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

PROVIDES ALL NECESSARY SERVICING CHECKS . . . the tremendous advances in transistor technology and the great number of transistorized units on the market today call for a simple, reliable tester that will speed servicing and testing. The compact size and versatile operation of the IT-27 make it the ideal instrument for use on the service bench or on calls . . . fits easily into tool box, glove compartment, or satchel of test gear. Ready to serve in an instant. No external power required . . . operates on two standard size, 1.5 volt "C" flashlight batteries (not supplied).

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-L, Leakage-Gain. **Power supply:** Self-contained, two 1.5 volt size "C" flashlight cells (not supplied). **Dimensions:** 3 1/8" H x 3 1/8" W x 3 3/4" D.



IT-27
\$6⁹⁵

Look To Heath For The Newest, The Finest In Electronic Kits

Modern Engineering... Priced For Savings

Every Man's Meter! New Portable Solid-State VOM . . . A Thousand And One Uses . . . Lowest Cost

- Solid-state circuit—FET input, 4 silicon transistor, 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 uA meter • Battery powered • Rugged polypropylene case with self cover & handle includes storage space for test leads • Easy-to-build circuit board construction

JUST RIGHT FOR HOMEOWNERS, hobbyists, boaters, model builders, CBer's, hams . . . even sophisticated enough for radio & TV servicing.

DOES HUNDREDS OF EVERYDAY MEASUREMENTS AT LOWEST COST. Features four ranges on AC and DC volts that measure 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. And there's an extra jack to connect accessory probes to extend its basic capabilities.

BATTERY POWERED TO WORK ANYWHERE . . . runs on a "C" cell and 8.4 v. mercury cell (same as used in transistor radios). Housed in a rugged, black, textured, polypropylene case with molded-in cover and handle with plenty of space for the three built-in test leads. Also features zero-adjust and ohms-adjust controls, a DC polarity reversing switch to eliminate switching leads, plus a continuous rotation 12-position function switch. Build in 3-4 hours.

Kit IM-17, 4 lbs. \$19.95

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 1MHz. OHM-METER: Four Ranges: Rx1, x100, x10K, x1 meg. POWER SUPPLIES: Ohms circuit: 1.5V "C" Cell. Amplifier circuit: 8.4V. mercury cell (NEDA #1611). GENERAL: Meter: 4½" x 200 uA, 100° movement. Dimensions: 8½" W x 4½" H x 7½" D.

Heathkit Handy Portable Volt-Ohm-Milliammeter

- 20,000 ohms/volt meter movement • 4½ inch meter face with 2-color scale for maximum readability • 1% precision multiplier resistors for high accuracy and stability • Polarity reversing switch—eliminates transferring test leads • Bar-knob rotary range switch is easy to flick to desired range • Recessed test jacks for safety • Carrying handle for maximum portability

A LOW-COST, PRACTICAL METER FOR ALL-AROUND SERVICE APPLICATIONS . . . measures AC volts full scale 1.5 to 5000, DC volts full scale 1.5 to 5000, direct current full scale 150 microamperes to 15 amperes, and resistance mid-scale from 15 ohms to 150,000. The self-contained Heathkit MM-1 is designed especially for versatility, those on-the-spot field checks, for testing permanently installed or awkward-to-move equipment, and for general use right on your service bench.

AN ACCURATE, DEPENDABLE TEST INSTRUMENT . . . 1% precision resistors and the selection of quality components assures you of maximum accuracy, stability, and value. The large 4½" meter with 50 microampere movement has the sensitivity you need for low voltage measurements—on the 1.5 volt scale a single volt produces a meter deflection of 2½ inches.

Kit MM-1, 5 lbs., no money dn., \$5 mo. \$29.95

MM-1 SPECIFICATIONS—Sensitivity: 20,000 ohms/volt DC, 5,000 ohms/volt AC. Ranges—AC & DC volts: Full scale, 1.5, 5, 150, 500, 1500, 5000. Direct current: 150 microamperes, 15, 150, 500 milliamperes, 15 amperes. Ohmmeter: Mid-scale, 15 ohms to 150,000 ohms 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 penlight cells. Dimensions: 7½" x 5½" x 4".

Heathkit 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 measurements • VU-type ballistic meter damping

A COMPACT INSTRUMENT FOR AUDIO DESIGN & DEVELOPMENT, LABORATORY ANALYSIS, OR GENERAL SERVICING . . . features the same practical-size as the Heathkit IM-11 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 FOR ACCURATE, DEPENDABLE MEASUREMENTS . . . utilizes the high input impedance characteristics of the cathode follower circuit. Cathode follower input applies only 10 megohms to circuits under test. Total meter amplifier includes two stages with 19 dB of negative feedback for high stability and linearity. The amplifier filament voltage is supplied from a transformer winding balanced to ground to keep AC noise to a minimum. The DC power supply features a modern silicon rectifier.

Kit IM-21, 5 lbs., no money dn., \$5 mo. \$37.50

Assembled IMW-21, 5 lbs., no money dn., \$6 mo. \$52.95

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-21 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) 6AW8, (1) 6EJ7/EF184. Accuracy: Within 5% of full scale. Power requirements: 105-125 volts, AC, 50-60 Hz, 10 watts. Dimensions: 7½" H x 4½" W x 4½" D.



IM-17
\$19.95

Self-Contained Portable Case . . . ready to go where you go. Holds everything in place, even the three 3½" test leads . . . black lead with clip for ground, two leads with probes for DC volts, AC and ohms.



MM-1
\$29.95



Kit IM-21
\$37.50

Wired IMW-21
\$52.95



Heathkit® Signal Generators...



IG-42
\$59⁰⁰



IG-82
\$53⁹⁵

Heathkit Laboratory RF Generator Provides Precision-Attenuated RF Signals

- 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, \$6 mo.....**\$59.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-42 SPECIFICATIONS—Frequency ranges: 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, 100,000 microvolts 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, 0B2. **Power requirements:** 105-125 V, 50/60 Hz. **Dimensions:** 13" W x 8½" H x 7" D.

Heathkit Sine-Square Wave Generator With Continuous Coverage From 20 Hz to 1 MHz

- Covers 20 Hz to 1 MHz in 5 ranges... from low limit audio to halfway through the broadcast band • Less than 0.25% sine wave distortion • Less than 0.15 microsecond square wave rise time • Sine and square wave outputs are independent and available simultaneously

PROVIDES A WIDE FREQUENCY RANGE OF SINE & SQUARE WAVE SIGNALS... Sine waves have less than 0.25% distortion... square waves are clean, free from spurious spikes, and have rise times better than 0.15 microseconds. Separate output terminals and attenuators permit independent control. Attenuators operate in steps of 10, 1, and 0.1 volts for both sine and square wave output... sine wave output has an additional 0.01 volt step.

CLEAN-CUT MECHANICAL AND ELECTRICAL DESIGN... oscillator circuits are well shielded, and a special control compensates for differences in tube characteristics during initial calibration to assure an absolute minimum of distortion. A precise frequency calibrating method insures proper tracking across the entire span of the dial. Sine-wave output impedance is 600 ohms except for "Hi-Z" 10 volt range. Square wave output impedance is 52 ohms at all settings except "Hi-Z" 10 volt range.

Kit IG-82, 14 lbs...no money down, \$6 mo.....**\$53.95**
Assembled model IGW-47, 14 lbs... (REA Express or Motor Frt. only) no money down, \$10 mo.....**\$94.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-82 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 8½" H x 7" D.

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.....**\$22.50**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IT-12 SPECIFICATIONS—Power supply: Transformer operated. Power requirements: 117 volts 50/60 Hz AC, 25 watts. Tube complement: 12AX7, 12CA5, 1629. Speaker: 3½" PM. Probe and test leads: 4' input lead for RF and audio with switch on probe body, 2-3' ponel test leads with alligator clips. Dimensions: 4½" W x 7½" H x 4" D.



IT-12
\$22⁵⁰

Used In Countless Applications The World Over



Kit IG-102
\$29⁹⁵

Wired IGW-102
\$54⁹⁵



Kit IG-72
\$44⁵⁰

Wired IGW-72
\$64⁹⁵

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.

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.

WIRED BERKELEY PHYSICS LABORATORY VERSION (IGW-102S) . . . 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.

Kit IG-102, 7 lbs., no money dn., \$5 mo. \$29.95
Assembled IGW-102, 7 lbs., no money dn., \$6 mo. \$54.95
IGW-102S, Assembled Educational Model, 7 lbs. \$60.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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 V 50/60 Hz AC, 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.

Kit IG-72, 8 lbs., no money dn., \$5 mo. \$44.50
Assembled IGW-72, 9 lbs., no money dn., \$7 mo. \$64.95
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 volts AC, 50/60 Hz, 40 watts. Dimensions: 9 1/2" W x 6 1/2" H x 5" D.

Heathkit Capacitor Checker Provides Complete Capacitor Analysis

- 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 μ F • 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

QUICK, EFFICIENT, ACCURATE . . . provides all the data you need for circuit design, production testing, or servicing requirements. Unique "leakage" test switch automatically discharges capacitors after test.

Kit IT-11, 7 lbs., no money down, \$5 mo. \$29.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IT-11 SPECIFICATIONS—Test circuit: AC bridge, powered through special bridge transformer by an internal 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 μ F; .001 μ F to .5 μ F; .1 μ F to 50 μ F; 20 μ F to 1000 μ F. Capacitor leakage: DC test voltages from 3 to 600 volts in 16 steps. Resistance, 3 ranges: 5 ohms to 5000 ohms; to 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 volts AC, 50/60 Hz, 30 watts. Dimensions: 9 1/2" high x 6 1/2" wide x 5" deep.



IT-11
\$29⁹⁵





Save Up To 50% On Instruments

New Heathkit Solid-State Crystal-Controlled Post Marker Generator . . .

The Most Important Instrument You Can Own For Color TV & FM Alignment

- 15 crystal-controlled marker frequencies • Switch-select picture and sound IF frequencies, color bandpass and trap frequencies, 6 dB points, plus FM IF center frequency and 100 kHz points • Use up to six markers simultaneously for faster TV alignment • Birdie-type markers • Trace and Marker amplifiers and size controls • 400 Hz modulator • Variable bias supply • All solid-state, 22 transistors, 4 diodes • Circuit boards

FAST, ACCURATE COLOR ALIGNMENT. Speed and accuracy are important in today's service work...important to your customers, important to your profits. Speed and accuracy are what the new Heathkit IG-14 gives you...plus features usually costing five to ten times as much.

JUST PUSH A BUTTON. That's all it takes to set a frequency...no dial to twiddle, no searching, no resetting problems. Fifteen switch selected crystal-controlled markers. Nothing could be easier or more accurate. The IG-14 has input and output connections so that it can be used with any sweep generator and scope. Also an external marker input. BNC connectors are used throughout.

NO TRACE DISTORTION. One of the big values to using a post marker generator like the IG-14 is that markers are injected after the sweep signal passes through the set being tested, thereby eliminating the 'scope trace distortion usually found when injection or absorption type marker generators are used.

CRYSTAL-CONTROLLED MARKERS FOR ANY TV ALIGNMENT TASK. Four marker frequencies are provided for setting color bandpass, one marker for TV sound, eight at the IF frequencies between 39.75 and 47.25 MHz, and markers for channel 4 and channel 10 picture and sound carriers for checking tuner RF response. With the ability to use up to six markers at once, such as picture and color carriers at 6 dB points, corner marker and trap frequencies, alignment is fast and precise. Trap alignment

is just a matter of selecting the appropriate trap frequency, applying the 400 Hz modulation, and tuning the trap for minimum audio on a scope or meter.

EASY FM IF AND DISCRIMINATOR ALIGNMENT. The IG-14 provides visible markers at the 10.7 MHz center frequency plus 100 kHz markers on each side...visible because they are applied to the trace after detection and so are not attenuated by the discriminator. Use of harmonics, fully explained in the manual, provide tracking markers as well.

TRACE AND MARKER AMPLITUDE CONTROLS... on the front panel permit using a regular service type 'scope instead of a wide-band, ultra-sensitive model...and stage by stage alignment is easier.

VARIABLE BIAS SUPPLY... 0 to 15 VDC @ 10 milliamps is isolated from chassis so you can use positive or negative bias.

NEW LOOK...CIRCUIT BOARD CONSTRUCTION. Handsome low profile, "stackable" cabinets in the new look of Heath instruments... finished in beige and black. Easy-to-build layout with two circuit boards.

SAVE HUNDREDS OF DOLLARS. Until now, an instrument with these features cost much more. Order the IG-14 now...it's the best investment in alignment facilities you can make.

Kit IG-14, 8 lbs., no money dn., \$10 mo. \$99.95

IG-14 SPECIFICATIONS—Crystal Marker Frequencies: 3.08, 3.58, 4.08, 4.5, and 10.7 MHz @ .01%; 39.750, 41.250, 42.170, 42.500, 42.750, 45.000, 45.750, 47.250, 67.250, and 193.250 MHz @ .005%. **FM Bandwidth Marker:** 100 kHz. **Modulation:** 400 Hz. **Input Impedance:** External sweep, 75 ohm; External marker, 75 ohm; Demodulation input, 220K ohm. **Output Impedance:** RF output, 75 ohm; Scope output, 22K ohm. **Bias Output Voltage:** Variable from 0 to 15 VDC @ 10 MA. Isolated from chassis for either negative or positive bias. **Type of Marker:** "Birdie." **Controls:** Bias voltage with AC on/off; Trace size; Marker amplitude; RF output; Modulation on/off; Markers, individual switches for each frequency. **Semiconductors:** Transistors: (16) 2N3692; (6) 2N3395; (3) Silicon diodes; (1) Zener diode, 13.6-V. **Power requirements:** 105-125 volts, 50/60 Hz AC @ 7.5 watts. **Net weight:** 8 lbs.

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

- New, more compact, easy-to-use styling • New space-saving profile • New cabinet with chassis & frame independent of cabinet shells • Trouble-free circuit proven in thousands of hours total service fills every FM alignment need • 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 (± 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 ± 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

A "COMPLETE" INSTRUMENT IN NEW COMPACT SIZE . . . SERVICE-PROVEN CIRCUITRY FOR DEPENDABLE PERFORMANCE. The IG-37 provides all the signals you need for fast, easy alignment of FM and FM stereo equipment. There's an audio or composite stereo signal for multiplex adapter adjustments... an RF carrier modulated by these signals for tuner and receiver adjustments... a "phase test" function for accurate adjustment of sub-carrier transformers... a variable level crystal-controlled 19 kHz (± 2 Hz) pilot signal to check the lock-in range of stereo receivers... and built-in sweep and marker signals for overall RF and IF alignment. Carrier signal is adjustable up to 2 MHz above or below its normal frequency to

permit alignment on a clear portion of the FM band.

NEW FRONT PANEL & 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 TEST LEADS.

Kit IG-37, 12 lbs., no money dn., \$8 mo. \$79.95

IG-37 SPECIFICATIONS—RF Signal frequency: 100 MHz adjustable by approx. ± 2 MHz. **Pilot modulating frequency:** 19 kHz ± 2 Hz. **FM Modulation:** Left channel (stereo), right channel (stereo), Phase Test (left plus right channel in phase), Monophonic FM. **Deviation:** Adjustable to 75 kHz. **Sweep rate:** (used for RF and IF alignment) 60 Hz. **Sweep width:** (used for RF and IF alignment) Adjustable to 750 kHz. **RF Attenuator range:** 60 dB in 20 dB steps. **Crystal-controlled markers:** 10.7, 90.95, 96.30, 101.65, & 107 MHz. **Composite Signal output:** Left channel (stereo); Right channel (stereo). **Phase test** (left plus right channels in phase). **Audio output:** 400, 1000 & 5000 Hz; 19 kHz (± 2 Hz); 38 kHz & SCA (65 or 67 kHz). **Distortion:** (At 400, 1000 & 5000 Hz) Less than 5%. **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; 6AU8—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 1/2" H x 9" D x 13 1/2" W.

Heathkit Harmonic Distortion Meter—Kit Or Wired

- 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 to assemble and operate • Manual includes full instructions

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-12 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.

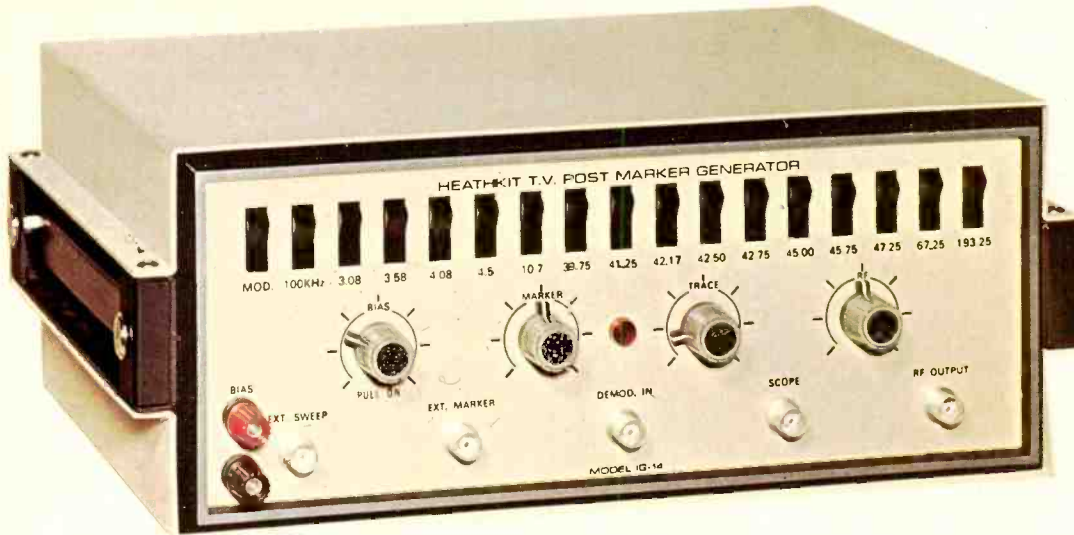
Kit IM-12, 13 lbs., no money down, \$6 mo. \$60.00
Assembled IMW-12, 13 lbs., no money dn., \$11 mo. \$115.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-12 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. **Tube complement:** OA2, 6X4, 5879, 12AT7, 12AX7, 12BY7. **Power requirement:** 105-125 V, 50/60 Hz AC, 30 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

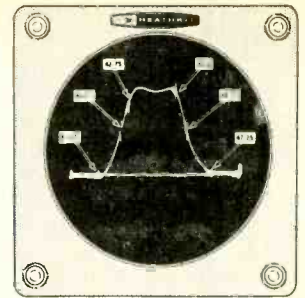


Kit IM-12 Wired IMW-12
\$60.00 \$115.00

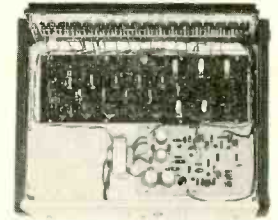
For Alignment & Trouble-Shooting



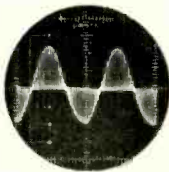
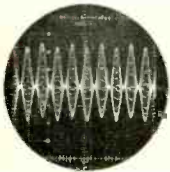
IG-14
\$99⁹⁵



SIX MARKERS SIMULTANEOUSLY. The scope trace above shows how six markers can appear at the same time. Note the trap markers, 6 dB points, and picture and sound carriers . . . all on one trace with the IG-14.

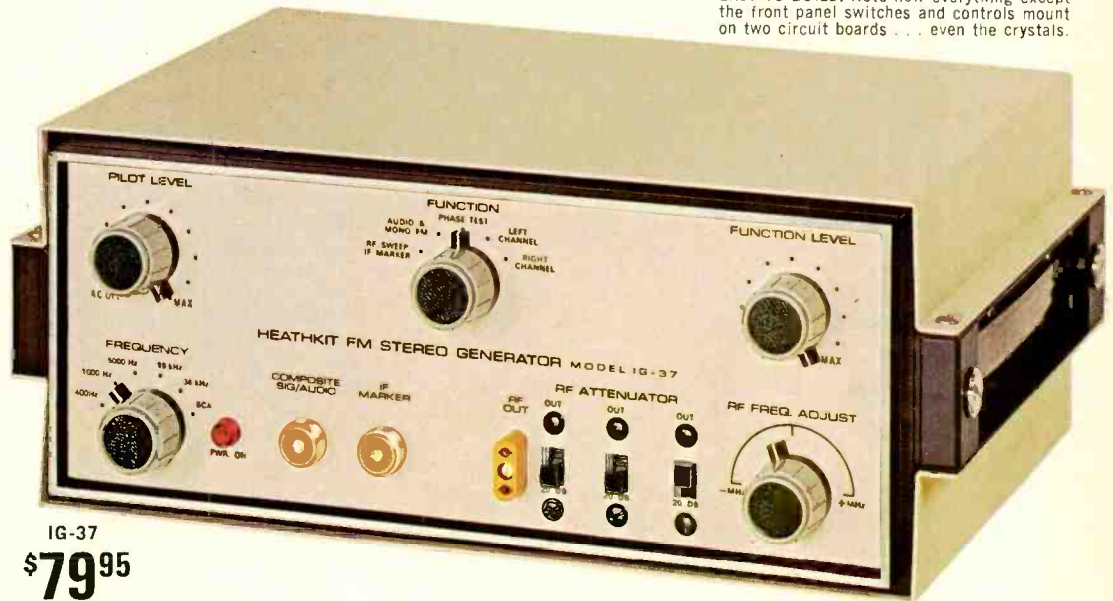


EASY TO BUILD. Note how everything except the front panel switches and controls mount on two circuit boards . . . even the crystals.



It's Easy To Align This Generator
Scope photo shows one of the waveforms produced by the generator during initial generator alignment. This and other photos are included in the manual so that no equipment other than a low-cost oscilloscope and AC VTVM are required to align the generator for accurate results.

Composite Stereo Waveform
Actual scope pattern photo shows the composite stereo waveform produced by the generator for use in adjusting FM stereo tuners and receivers for equal left and right channel output. This waveform also allows adjustment of sub-carrier transformers, balance & phase controls, etc.

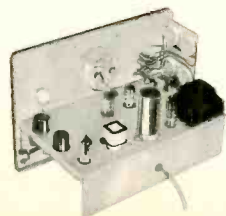


IG-37
\$79⁹⁵



IM-22
\$59⁰⁰

Efficient placement of components provides open panel layout, even with three instruments in one. VTVM, Wattmeter, IM Analyzer. Switching circuits combine functions internally.



Heathkit Audio Intermodulation Analyzer

- Efficiently combines the functions 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

THREE AUDIO TEST INSTRUMENTS IN ONE . . . performs complete intermodulation distortion analysis on monaural or stereo high fidelity equipment. Eliminates a bench-top 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-22, 13 lbs. . . no money down, \$6 mo. \$59.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-22 SPECIFICATIONS—Frequency response—AC VTVM: 10 Hz to 100 kHz ± 1 dB. Wattmeter: 10 Hz to 50kHz ± 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. Range AC VTVM: .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, 1.5mW, 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 volts 50/60 Hz 20 watts. Dimensions: 13" W x 8 1/2" H x 7" D.



Heathkit® Tube Testers



IT-17
\$49⁹⁵

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

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 figure 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 are 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 dn., \$5 mo. \$49.95

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, local, 10-pin miniature, 9-pin novar, 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, thumbwheel operation, illuminated. **Filament voltage:** .63, 1.4, 2, 2.35, 2.5, 3.15, 4.2, 4.7, 5, 6.3, 7.5, 9.45, 12.6, 19.6, 25, 32, 50, 70, 110 V AC. **Element test voltages:** 30, 100, 250 V AC. **Power requirements:** 105-125 V AC, 50/60 Hz. **Dimensions:** 13" W x 8½" H x 5½" D.

NEW SUBSCRIPTION SERVICE FOR REPLACEMENT TUBE DATA ROLL CHARTS

Updated replacement roll charts for all Heathkit tube testers can be purchased either singly or on a subscription basis which assures a new roll chart plus two supplements per year. Prices are \$3.00 per chart; \$4.50 for the new chart plus two supplements during the following year. Write to: Heath Tube Data Service, P.O. 377, Hewlett, Long Island, New York 11557.



TT-1A
\$160⁰⁰

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 carrying case.

NO FINER TUBE TESTER IN KIT FORM ANYWHERE. Versatile switching facilities accommodate all tube types, regardless of base-pin connections . . . 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 voltage for tubes drawing a wide range of heater currents. 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., \$15 mo. \$160.00

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: ½ 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, local, 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]: 17½" W x 13½" H x 8" D. Panel & chassis: 17" W x 12¼" H x 5½" D.



IN-17
\$26⁹⁵



IN-27
\$17⁹⁵



IN-37
\$6⁹⁵



IN-47
\$6⁵⁰

New Heathkit Decade Resistance Box

FEATURES THE NEW "LOOK" OF HEATHKIT TEST INSTRUMENTATION . . . plus the assurance of quality components. "New look" control knobs are more positive to grasp . . . pointers quick to spot. And one-half percent resistors in six decades provide extremely accurate values in 1 ohm steps from 1 ohm to 999,999 ohms. Ideal for use as an arm for AC and DC bridges. Range switches has new silver-alloy, make-before-break, contacts for smooth switching action without opening or shorting the circuit, long life, and very low resistance. Here is a quality resistance decade especially for laboratory use.

Kit IN-17, 3 lbs., no money dn., \$5 mo. \$26.95

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 3/4" D.

New Heathkit Decade Capacitance Box

PROVIDES ACCURATE CAPACITANCE VALUES FROM 100 pF TO 0.111 uF IN 100 pF STEPS. The use of 1% silver mica capacitors assures accuracy of the indicated values. Ideal for use in substitution tests, or in comparison bridge circuits where high accuracy is desired. This precision, laboratory instrument features high-quality ceramic wafer switches with positive detent action. New Heathkit instrumentation styling adds the extra attribute of "human engineering" . . . newly styled control knobs; clear, distinct dial calibration; and a color scheme that makes the instruments easy to identify on a crowded service bench.

Kit IN-27, 3 lbs. \$17.95

IN-27 SPECIFICATIONS—Range: 100 pF to 0.111 uF 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.

Heathkit Resistor Substitution Box With New Styling

PROVIDES CONVENIENT SUBSTITUTION OF COMMON VALUES OF RESISTORS . . . a handy tool for servicing, a valuable addition to the shop. A quick, easy way for replacing unknown or badly burned resistors. Ideal too for classroom study on the effects of varying circuit parameters. Provides switch selection of any one of 36 E.I.A. standard 10% 1-watt resistors, ranging in value from 15 ohms to 10 megohms. A slide switch selects high or low resistance ranges. Case measures 5 3/8" L x 3 1/8" W x 3" H.

Kit IN-37, 2 lbs. \$6.95

Heathkit Capacitor Substitution Box With New Styling

NEW "HEATHKIT INSTRUMENTATION" BEIGE & BLACK. Not only sharp in appearance but a handy kit too. An 18-position switch selects any one of 18 popular E.I.A. standard capacitor values from 0.0001 uf to 0.22 uf. All capacitors are rated at 600 volts except the three lowest values and the two highest values which are rated at 500 and 400 volts respectively. High-quality silver-mica and molded tubular capacitors are used throughout. 18 inch test leads with alligator clips are included. Case measures 5 3/8" L x 3 1/8" W x 3" H.

Kit IN-47, 2 lbs. \$6.50

Scope Demodulator Probe Kit

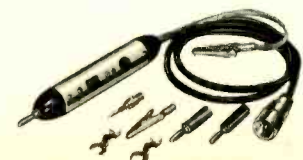
AN ADVANTAGE IN BOTH RADIO & TV SERVICING . . . for distortion checks and observation of modulation envelopes of RF and IF signals. Functions as an AM detector. Voltage limits are 30 volts RMS, 500 volts DC.

Kit 337-C, 1 lb. \$4.00
Assembled 337W-C, 1 lb. \$5.00

Low Capacitance Scope Probe Kit

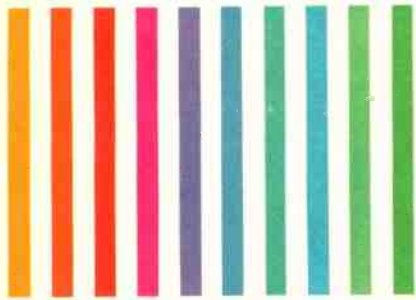
An essential aid in high frequency circuit investigations . . . minimizes loss of gain, circuit loading or distortion due to overloading of scope input. A switch on the probe body provides direct or x10 attenuated operation and an adjustable trimmer capacitor provides proper match to scope input. Wiring options permit impedance match to IO-12 (3.3 megohms) or IO-14 (1 megohm) input.

Kit PK-1, 1 lb. \$4.95

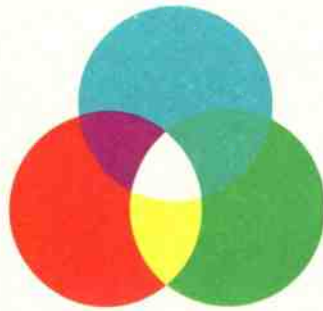




Heathkit® Test Instruments Are



IG-62 generates ten vertical color bars, using a crystal-controlled offset carrier method. Assembly manual discusses the operation of the IG-62. Heathkit Color TV Manuals (GR-180 & GR-295...\$2.00 ea.) contain excellent color alignment procedures... both for the nontechnical kit builder and for the experienced technician who owns test equipment such as the IG-62.



IG-62
\$67⁵⁰



Heathkit Color Bar & Dot Generator Unsurpassed In Performance And Price

- No other color bar and dot generator on the market today offers such an array of features, performance, and quality at so low a price
- Produces six different patterns for picture adjustment
- 10 vertical color bars—includes a special shading bar pattern
- Crystal controlled for exceptional accuracy & stability
- Both RF and Video output for maximum versatility

THE HEATHKIT IG-62 IS THE INSTRUMENT WHICH SET A NEW PRECEDENT FOR THE INDUSTRY. No other color bar & dot generator offers these features and value. Patterns include: white dots, cross-hatch, vertical bars, horizontal bars, 10 vertical color bars, and a special shading bar pattern to adjust for proper gray-scale tracking. Color bars produced by this offset carrier method allow AFC, phase, and matrix alignment, and feature a white leading edge and a black trailing edge to check color fit. An adjustable video output permits check of color hue and sync at different signal levels.

CRYSTAL-CONTROLLED ACCURACY. Internal sync pulses, crystal-controlled to the same frame-rate as the TV station, lock the patterns

firmly on the screen without jitter or crawl... no external sync leads required! One simple connection to the antenna terminals of the TV set is all that is required, and any pattern may be selected without further adjustment to the receiver or generator after initial setting. A crystal-controlled sound-carrier with on/off switch permits fine-tuning control adjustments.

COMPLETE WITH CRYSTALS, TEST LEADS, AND COMPREHENSIVE ASSEMBLY & OPERATION MANUAL. Order the IG-62 for true performance and value.

Kit IG-62, 13 lbs... no money down, \$7 mo. \$67.50
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-62 SPECIFICATIONS—RF output frequency range: TV channels 2 through 6. **Output voltage:** Variable from 100 to 100,000 microvolts. **Sound carrier:** Crystal controlled, unmodulated, 4.5 MHz away from picture carrier; off-on switch provided. **Video output:** Positive or negative output variable from 0-10 volts peak-to-peak open circuit. **Modulation:** White dot pattern, cross hatch pattern, horizontal bars, vertical bars, 10 vertical color bars, shading bar pattern. **Tube complement:** 6-12AT7, 4-12AU7, 1-6BQ7, 1-6CS6, 1-OB2. **Power requirements:** 117 VAC, 50/60 Hz, 70 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.



IG-52
\$69⁹⁵

- Complete Kit FM & TV coverage—sweep oscillator covers 3.6 MHz to 220 MHz with 0-42 MHz maximum sweep width
- Stable, all-electronic sweep circuit features unique trouble-free controllable inductor
- Built-in marker oscillators—4.5 MHz crystal & 19 to 60 MHz variable (57 to 180 MHz on harmonics)
- Comprehensive manual fully discusses operation

Heathkit TV Alignment Generator . . . For TV & FM "Front End" & IF Alignment

UNIQUE DESIGN FEATURES. Used with an oscilloscope, such as the Heathkit IO-12 or IO-14, the IG-52 provides all the signal source requirements you need for alignment of FM and TV receivers (TV front end channels 2 through 13). A controllable inductor featured in the IG-52 produces wide-range sweeps with excellent linearity and stability. Frequency is varied by magnetic—not mechanical—means for consistent, reliable performance. The sweep circuit operates on fundamentals (3.6 to 220 MHz) eliminating troublesome beats and parasitics such as those often encountered in beat-frequency type generators. Sweep is smoothly controlled from 0 to as high as 42 MHz (depending upon the center frequency).

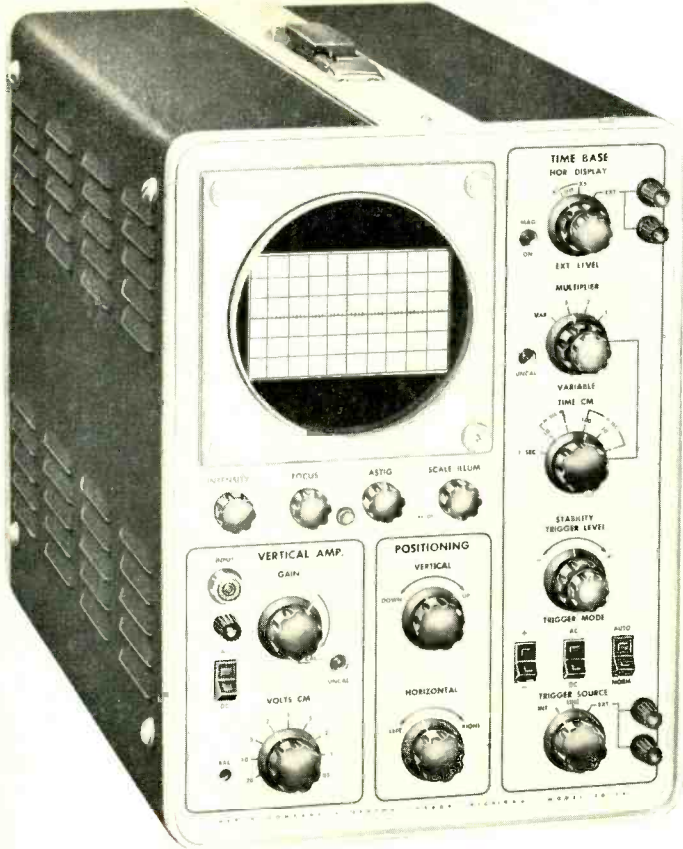
FIXED-STEP AND VARIABLE ATTENUATORS. Full control of RF output enables "cold" alignment of tuned circuits and capability of aligning high-gain stages without danger of overloading.

THESE AND MANY MORE FEATURES CAN INCREASE YOUR TV SERVICE PROFITS NOW . . . Order the IG-52 for accurate, dependable test facilities.

Kit IG-52, 14 lbs... no money down, \$7 mo. \$69.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-52 SPECIFICATIONS—Output impedance: 50 ohms terminated at both ends of cable. **Sweep deviation:** Continuously variable from 0-4 MHz lowest max. deviation to 0-42 MHz highest max. deviation (depending on base frequency). **Crystal marker:** 4.5 MHz and multiples thereof. **Variable marker:** 19 MHz to 60 MHz on fundamentals, 57 MHz to 180 MHz on harmonics. **External marker terminals:** Provided on panel. **Attenuators:** Step-switch controls sweep and marker oscillators together, plus variable controls for each output. **Blanking:** Converts return trace into zero reference line, phasing control also provided. **Cables:** 3 supplied, output, scope horizontal, scope vertical. **Power requirements:** 105-125 VAC, 60 Hz, 50 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

World Famous For Quality & Value



Kit IO-14
\$259⁰⁰

Wired IO-14
\$399⁰⁰

Heathkit IO-14 Triggered-Sweep, Delay Line DC Scope . . . The New Standard For Performance And Value

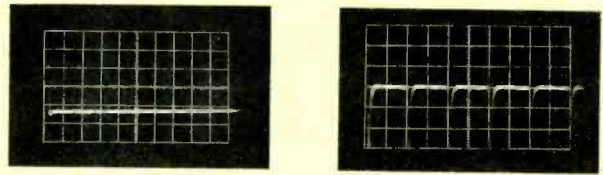
- A high stability 5" DC oscilloscope with triggered sweep • DC to 8 MHz bandwidth and 40 nanosecond rise time • Vertical signal delay through high linearity delay lines • Calibrated vertical attenuation • Calibrated time base • Forced air cooling • Input for Z axis modulation • Input for direct access to vertical deflection plates • Easy circuit board construction & wiring harness assembly • Components are packaged separately for each phase of construction • Easy to align • 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

HERE IS A TRULY SOPHISTICATED INSTRUMENT . . . designed with modern circuitry, engineered with high quality, precision-tolerance components, and 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.

COMPARE THE SPECIFICATIONS. Send for a FREE "spec." sheet—gives full specs and complete schematic. Study the circuit diagram, compare the specifications . . . you'll agree the IO-14 sets a new precedent for performance and value.

THE IO-14 PROVIDES FEATURES YOU EXPECT ONLY IN HIGH PRICED OSCILLOSCOPES. 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 SMALL PARTS ARE USED THROUGHOUT. Switches are quality, ball-detent type. All major control potentiometers are precision,



Here Actual Signal Waveforms Indicate Scope Quality. The waveform on the left (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 right (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 Tequipment® Type C-1 scope calibrator. Scope sensitivity for both waveforms is 0.2 volts/cm.

high-quality sealed components. All critical resistors are 1% precision. And circuit boards are low-loss fiber glass laminate.

BUILT FOR CONTINUOUS USE . . . the IO-14's cabinet is heavy gauge aluminum. The chassis and compartments are well supported structurally. The CR tube is shielded against stray magnetic fields, and forced air ventilation allows the IO-14 to be operated continuously under the demands of industrial use. Here is a scope that's built to "take it."

FOR PHYSIOLOGICAL OR BIOLOGICAL STUDY . . . the IO-14 is available in assembled form with a long-persistence CRT (P7 phosphor)—the IO-14S. Low sweep rates, very low noise levels, and stable triggering circuitry make this an ideal scope for critical research in physiology. High-gain, low-noise biological-type pre-amplifiers which provide the additional gain required are available from several sources. Heath recommends Phipps & Bird, Inc. (Richmond, Va.) preamplifier No. 7092-620 with power supply No. 7092-630.

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.

Kit IO-14, 53 lbs., Express or Motor Freight, no money dn., \$24 mo. Was \$299.00, Now Only \$259.00
Assembled IO-14, 47 lbs., Express or Motor Freight, \$40 dn., as low as \$23 mo. \$399.00
Assembled IO-14S, (with P7 phosphor), 47 lbs., Express or Motor Freight. \$410.00

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.

New Factory Assembled Low Capacitance Scope Probe

NEW 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.



PKW-2
\$12⁰⁰

Wired PKW-2, 1 lb. \$12.00

Heathkit® Oscilloscopes For Accuracy,



Introducing The New 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 x50 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

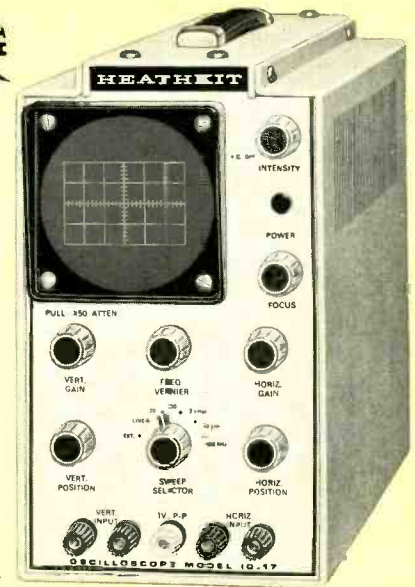
Destined To Set The Value Pace . . . the new Heathkit IO-17 with its superior response and sensitivity . . . its professional features . . . compactness . . . handsome new styling . . . and low cost . . . will find its way into shops and labs the world over. The TV service man will find its extended 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 x50 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 9½" high, 5½" wide, and 14½" 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, 17 lbs., no money dn., \$8 mo. \$79.95

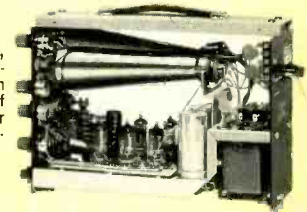
IO-17 SPECIFICATIONS—VERTICAL CHANNEL: Input impedance: 1 megohm shunted by 25 pF; x50 attenuator position 1 megohm shunted by 15 pF. Sensitivity: 30mV P-P/div. (uncalibrated). Frequency response: 5Hz to 5MHz ±3 dB. **HORIZONTAL CHANNEL:** Input impedance: 10 megohm shunted by 15 pF. Sensitivity: 300 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. Synchronization: Automatic type. **GENERAL:** Tube complement: (1) 3RPI cathode ray tube, medium persistence. (3) 12AU7; (1) 12AX7; (1) 6GH8; (1) 6BH6; (1) 6BQ7. Power requirements: 105-125 volts 50/60 Hz or 210-250 volts 50/60 Hz. Power consumption: 60 watts. Overall dimension: 9½" H x 5½" W x 14½" L. (Dimensions include handle, knobs, etc.). Net weight: 12 lbs.



IO-17
\$79.95

no money dn., \$8 mo.

IO-17 Inside . . . clean, uncluttered, thanks to circuit board construction and thoughtful layout of power supply and other components. Note completely shielded CRT.



Heathkit "Extra Duty" Wide-Band 5" Oscilloscope Chosen For The College Physics Lab & For TV Trouble-shooting

- 5 MHz bandwidth for TV signal analysis • Heath patented sweep circuit—10 Hz to 500 kHz • Two extra sweep positions which may be adjusted to often-used sweep rates • Built-in peak-to-peak calibration reference • Z-axis input • Combination circuit board and wiring harness construction speeds assembly • Up to 50% savings over equivalent oscilloscopes

HEATHKIT IO-12 HAS PROVEN ITSELF TO BE OF UNMATCHED VALUE . . . it is found in service shops, professional and educational laboratories, industries, and home test benches all over the world.

CHOSEN FOR THE BERKELEY PHYSICS LABORATORY. Factory assembled version IO-12S 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-12.

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-12 ideal for many specialized as well as general investigations. The two "pre-set" sweep frequency choices are an invaluable 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-12, 24 lbs. . . no money down, \$9 mo. \$81.95

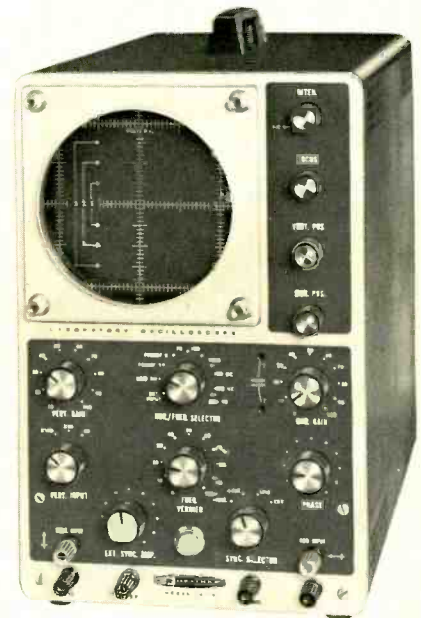
Assembled IO-12, 23 lbs. . . no money down, \$13 mo. \$137.50

Assembled IO-12S, Wired Berkeley Physics Version, 24 lbs. \$137.50

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

See Page 26 for comb. offer with EF-2 Applications Course. **EF-2-4. \$89.95**

IO-12 SPECIFICATIONS—Vertical Sensitivity: 0.025 volts RMS 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 x1, 3.3 megohms at x10 and x100. Horizontal sensitivity: 0.3 volts RMS 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 AC 50/60 Hz at 80 watts, fused. Dimensions: 14½" H x 8¾" W x 16" D.



Kit IO-12
\$81.95

Wired IO-12
\$137.50



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., \$10 mo. \$99.95

Assembled IOW-10, 16 lbs. . . no money dn., \$16 mo. \$169.00

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 3/4" H x 4 3/4" W x 13" D.

Kit IO-10
\$99.95

Wired IOW-10
\$169.00



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, \$7 mo. \$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.

IO-21
\$61.95



Heathkit Electronic Switch . . . For Dual-Trace Scope Display

- Provides dual-trace scope presentation — permitting display of two separate signals on CRT screen • Displays signal levels as low as 0.1 volt • ±1 db, 0-100 kHz response • Separate gain controls for each channel
- All-electronic switching • Four switching rates — 150, 500, 1500, and 5000 Hz • Sync output to control scope sweep

LETS YOU VIEW TWO SIGNALS AT ONCE. For example, simultaneously observe a signal or waveform at both the input and output of an amplifier. A position control adjusts the separation of the two presentations—allows the two signals to be superimposed for comparison purposes. Just connect the signal source test leads to the ID-22 input terminals and the ID-22 output and sync out to the oscilloscope. Both signals are then shown alternately at any one of four switching rates, appearing simultaneously through persistence of the CRT phosphor.

Kit ID-22, 7 lbs. no money dn., \$5 mo. \$25.95

ID-22
\$25.95

Heathkit® Power Supplies... World Famous In

New! Heathkit IP-17 Variable Regulated High Voltage Power Supply . . . New Styling . . . New Features . . . Easier To Assemble

- New Heathkit instrumentation styling—knobs easier to grasp—pointers easier to see—meters easier to read—compact size—“end-on” carrying handles—unitized construction with all components mounted within a “main frame” and separate, removable cabinet shells • New circuitboard construction and wiring harness for stability and ease of assembly • New 6 V and 12V AC filament voltages • Furnishes B+ from 0 to 400 volts DC, Bias from 0 to -100 volts DC, and filament voltages • Separate panel meters monitor B+ output voltage & current • Voltmeter switched to read C- volts • Output terminals isolated for safety • High voltage and bias may be switched “off” with filaments still “on” for maximum efficiency in testing—maximum safety

NEW IP-17 UP-DATES THE HEATHKIT VARIABLE VOLTAGE REGULATED POWER SUPPLY . . . with new styling, new features, and more. Here is an instrument that fulfills hundreds of requirements for the experimenter, repair man, physics & chemistry lab student or technician, and electronics engineer. Choose the IP-17 for electrophoresis experiments, or for powering your Berkeley Physics course. Whatever your application, the IP-17 will supply 0 to 400 volts DC with better than 1% regulation at current loads up to 100 milliamperes.

0 to -100 volts bias at 1 milliamperes max., and both 6 and 12 volts AC at 4 amperes and 2 amperes maximum, respectively . . . or any combination up to a maximum of 25 volt-amperes AC load.

INCLUDES TIME & EXPERIENCE PROVEN FEATURES FOR MAXIMUM VERSATILITY. Separate filament and high voltage transformers permit switching all high voltages “off” while test circuit changes are made. Separate panel meters permit simultaneous observation of output voltage and current. AC & DC outputs isolated from each other mean extra convenience (terminals are spaced for ¾” dual banana plugs). All outputs are isolated from chassis ground. These features and more spell real performance. Choose the IP-17 for the finest high voltage laboratory power supply Heath has ever offered.

Kit IP-17, 17 lbs., no money dn., \$6 mo. \$59.95
Assembled IPW-17, 18 lbs., no money dn., \$9 mo. \$89.95

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 ±10 V change at 117 V AC input. **Ripple:** Less than 10 millivolts RMS, ripple, [filter 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 1/4” H x 13 1/4” W x 11” D.

New! Heathkit “Solid-State” Regulated Low Voltage Power Supply With New Zener Reference And Improved Immunity To Transients

- New Heathkit instrumentation styling—easy-to-read meter—easier-to-grasp knobs—unitized construction with all components mounted within the “main frame” permitting separate, removable cabinet shells • New Zener reference-voltage power supply • New—all calibration controls accessible from “outside” the instrument • New up-dated circuitry that is virtually immune to overload from exotic transients • All-transistor solid-state circuitry • Relay protected against short circuit & overload • Provides 0.5 to 50 volts DC with better than ±15 millivolts regulation • Four current ranges: 50 mA, 150 mA, 500 mA, & 1.5 amperes • Adjustable current limiter: 30 to 100% on all ranges • Panel meter shows output voltage or current • “Pin-ball” lights indicate “current” or “voltage” meter reading • Wiring harness construction speeds assembly

safety factor for equipment undergoing testing or development.

NEW CONSTRUCTION TECHNIQUES SPEED ASSEMBLY—ASSURE DEPENDABLE PERFORMANCE. New “unitized” construction puts all components on a chassis suspended between the front and rear panels and frame side pieces. The frame side pieces also contain recessed carrying handles, and serve as a mounting surface for the top and bottom cabinet shells. This new technique of construction allows complete freedom for removal of the top and bottom shells for accessibility to the circuitry and components. This instrument truly illustrates the ingenuity and uncompromising thoroughness of Heath engineering.

Kit IP-27, 16 lbs., no money dn., \$8 mo. \$76.95
Assembled IPW-27, 17 lbs., no money dn., \$11 mo. \$119.95

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:** ±15 millivolts, can be adjusted for no change. **Line regulation:** [105 to 125 VAC]: Less than .005% change. **Ripple & noise:** Less than 150 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”, 1mA, 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 1/4” H x 13 1/4” W x 9” D.

NOW HEATH HAS IMPROVED ON THE FAMOUS IP-20 . . . new Heathkit instrumentation styling, calibrate controls available on the back panel, and improved immunity to transient loads make the IP-27 even better than “a tremendous value in a DC supply.” The IP-27 will deliver from 0.5 to 50 volts DC with excellent voltage regulation under current loads ranging from 0 to 1.5 amperes! Current can be limited from 30 to 100% on each of four ranges 50 mA to 1.5 amperes, as a

Heathkit Battery Eliminator . . . Variable Voltage Control Makes This A Remarkably Versatile Low-Voltage Supply

- 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

less than .3% for exceptionally smooth DC. This feature is a necessary requirement for use in servicing transistor and hybrid radios which can tolerate only a small amount of “hum-producing” AC ripple.

MANY APPLICATIONS IN SERVICING. The Heathkit IP-12 is ideal for use in servicing transistor and hybrid automobile radios, portables, citizen's band two-way radio equipment, portable tape recorders, portable record players, mobile P.A. systems and many more.

DOUBLES AS A CONVENIENT BATTERY CHARGER. The IP-12 can be used as a trickle-charger for auto and boat batteries to keep them in peak operating condition and also serves as a handy charger for rechargeable wet-cells such as used in radio-controlled hobby equipment. Easy to build with complete instructions supplied.

Kit IP-12, 18 lbs. . . no money down, \$5 mo. \$49.50
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.

A RELIABLE SOURCE OF 6 OR 12 VOLT POWER . . . The IP-12 is a modern power supply with silicon diode rectifiers and up-to-date circuitry. It is an ideal power source for servicing transistor or hybrid electronic equipment. The variable voltage control permits a wide range of uses as a general purpose low-voltage supply, as well. It eliminates the need for troublesome storage batteries in your shop.

OUTPUT VOLTAGE IS VARIABLE IN TWO RANGES; 0-8 VOLTS & 0-16 VOLTS. And for added convenience, both the output voltage and current are continuously monitored on two panel meters.

SPECIAL RIPPLE-FILTER CIRCUIT. Separate terminals are provided for normal output where high current is required, such as in charging batteries, plus a highly-filtered output that holds AC ripple to

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Labs, Service Shops, & Classrooms

Kit IP-17
\$59⁹⁵

Wired IPW-17
\$89⁹⁵



Kit IP-27
\$76⁹⁵

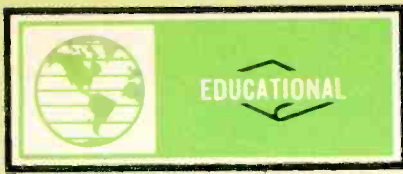
Wired IPW-27
\$119⁹⁵



Kit IP-12
\$49⁵⁰



Husky silicon diode rectifiers maintain a minimum of internal voltage drop—a maximum of efficiency and dependability.



Heath Instruments & Components



Now You Can Outfit Your Entire Berkeley Physics Laboratory Program — Parts A, B, & C With Heath Instruments and Components

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 . . . models which are truer descriptions of the concepts under investigation than were ever possible from classically chosen apparatus. Now college physics has been brought up to date. Here is a modern course that has put aside the cut-and-dried cookbook exercises with their over-simplifications . . . it stimulates the students' intuition and mathematical ability with problems which are equivalent to modern research and investigation. The Berkeley Physics Laboratory truly prepares students for the advanced courses that follow in undergraduate and graduate physics.

UNIQUE HEATH INSTRUMENTATION MANUALS ARE AN INVALUABLE REFERENCE . . . contain full descriptions and specifications of Heath instruments and components . . . include procedures for checkout and adjustment of the basic instruments . . . plus side-by-side schematic and pictorial wiring diagrams showing the setups for the Berkeley experiments—a real aid for making quick comparison checkouts of the students' lab 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 just 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. If you intend to teach the entire Berkeley Physics Laboratory program, you will need the Basic Instrument Group plus the three Component Sets for Parts A, B and C for each two-student laboratory station in your classroom.

Heath Basic Instrument Group— For Berkeley Parts A, B, & C

(All Instruments Factory Assembled & Tested)

A	IMW-11, Vacuum Tube Voltmeter, see page 69	\$44.95
B	IGW-47, Sine-Square Wave Generator, see EUW-27 page 90	\$94.00
C	10W-12S, Laboratory 5" Oscilloscope, see page 82	\$137.50
D	IGW-102S, R.F. Signal Generator, see page 75	\$60.00
E	IPW-17, Regulated Power Supply, see page 85	\$89.95
	EPW-100G, Basic Instrument Group	\$426.40

HEATH COMPONENTS FOR PART A

EPW-14, Experiment Chassis and Small Parts	\$ 60.00
EUW-17, Transistor Power Supply	20.00
EPW-24, Cathode-Ray Tube & Deflection Coil Set	120.00
EPA-10-1, Battery Set	6.50
	\$206.50

GROUP PRICE, PART A, Components plus instruments above.

Wired EPW-100A \$565.00

HEATH COMPONENTS FOR PART B

EPW-25, Microwave Transmitter & Receiver Set	\$115.00
EPW-15, Experiment Chassis & Accessories	125.00
EPA-10-2, Battery Set	5.00
	\$245.00

GROUP PRICE, PART B, Components plus instruments above.

Wired EPW-100B \$599.00

HEATH COMPONENTS FOR PART C

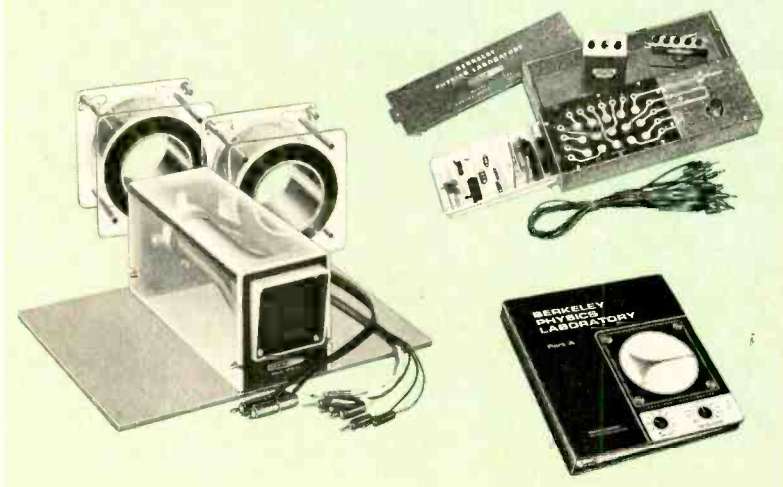
EPW-16, Experiment Chassis & Accessories	\$135.00
EPW-26, Optical Components Set	180.00
EPA-10-2, Battery Set	5.00
EUW-17, Transistor Power Supply	20.00
	\$340.00

GROUP PRICE, PART C, Components plus instruments above.

Wired EPW-100C \$699.00

For The Berkeley Physics Laboratory

Heath Components For Part A



CATHODE-RAY TUBE AND DEFLECTION COIL SET—EPW-24. Specifically designed for Berkeley Physics by Heath engineers, the cathode-ray tube enclosure allows students to examine the tube, perform all experiments, disassemble the components for experimentation or inspection; yet it provides complete protection during storage and initial experiments when students are unfamiliar with the relatively fragile CR tube. The graticule rulings are clear, well-defined, and accurate. The bezel reduces the glare from room lighting. 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. Heath Test Chassis for the Berkeley Physics Laboratory simulates actual construction techniques . . . small parts are the same as those used in actual circuit construction . . . no special mounting lugs . . . any standard parts bin supplies replacements. This unique feature permits "open-ended" laboratory sessions in which additional experiments can be devised or in which the "standard" experiments can be modified to assure that students fully perceive the effects of varying circuit parameters. The Experiment Chassis also provides storage space. 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, $-22\frac{1}{2}$, -45 volt and one 0, $-1\frac{1}{2}$, -3 , $-4\frac{1}{2}$, -6 , $-7\frac{1}{2}$ volt battery.

Heath Components For Part B



MICROWAVE TRANSMITTER & RECEIVER SET—EPW-25. The X-band klystron transmitter is designed and engineered for high RF gain, maximum utility in student use, and optimum availability of replacement components. The dimensions of the horn antenna achieve an excellent compromise between the factors of RF gain and convenient size. The tunable klystron chosen by Heath is readily available from commercial sources should replacement become necessary. Both the microwave transmitter and the receiver are supplied with pre-assembled connecting cables, and all hook-up connections are clearly illustrated in the Heath (Part B) Instrumentation Manual. Includes: X-band klystron transmitter, microwave receiver, microwave interference & diffraction accessories, and hardwood meter stick, lab and instrumentation manuals.

EXPERIMENT CHASSIS & ACCESSORIES—EPW-15. Although Heath Experiment Chassis for the Berkeley Physics Laboratory are produced specifically for the course requirements, the resistors, capacitors, and other small parts are commonly available and may be re-stocked easily from your local electronics supply house. No special connectors are required. Includes: Experiment chassis, small parts, 15-section delay line, 40 kHz transducers, 100 MHz $\frac{3}{4}$ wavelength transmission line, and all necessary interconnecting wires. Lab and instrumentation manuals.

BATTERY PACK—EPA-10-2. (Two) 0, $-1\frac{1}{2}$, -3 , $-4\frac{1}{2}$, -6 , $-7\frac{1}{2}$ volt batteries.

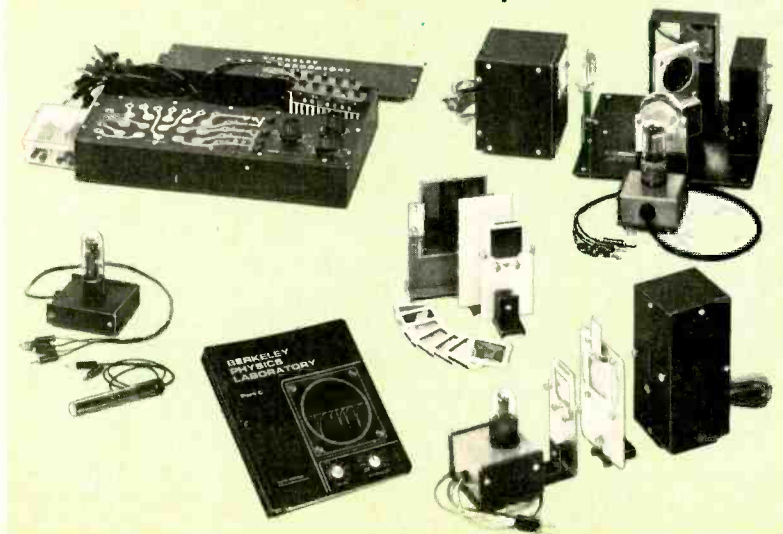
OPTICAL COMPONENTS SET—EPW-26. Heath optical components illustrate the principles of interference and diffraction, yet are low in cost. The Michelson Interferometer is a unique, low-cost, open teaching system . . . the mirrors may be removed . . . filters or polarizers may be inserted . . . and the mirrors may be rotated 180° to allow alternative positioning of the light source. The diffraction experiment sources, bases, and holders may be used with a meter stick reference-base for measurement or without the base for demonstrations or additional experimentation. 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. Experiment chassis includes same open-ended features as Parts A & B. The guard-ring diode allows easy examination of the physical processes associated with the operation of thermionic vacuum diodes. The G/M probe permits easy examination of basic principles of radioactivity and counting statistics. All necessary information is included for safe use of the radioactive samples. 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.

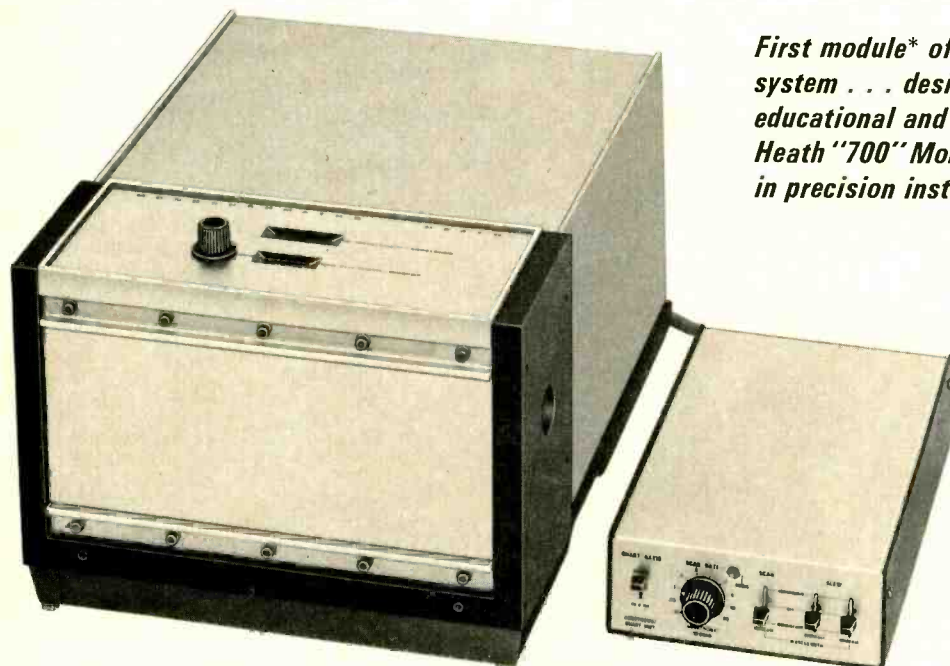
BATTERY SET—EPA-10-2. Provides the necessary battery voltages for Part C experiments . . . (two) 0, $-1\frac{1}{2}$, -3 , $-4\frac{1}{2}$, -6 , & $-7\frac{1}{2}$ volt batteries.

Heath Components For Part C



Use Heath's Technical Consultant Service—Just Drop Them A Line On Any Kit Subject

New Heath/Malmstadt-Enke "700" Scanning Monochromator



First module of a versatile high-quality spectroscopy system . . . designed to fulfill the requirements of educational and research laboratories . . . the Heath "700" Monochromator sets a new value standard in precision instruments . . . its price only \$1195*

**others coming in 1968*

- UV-VIS Light Source Module
- Cell Compartment Module
- Photomultiplier Module
- Log-Liner Module for Chart Recorder
- Photographic Module
- Atomic Absorption/Emission/
Fluorescence Module

Here's how the Heath/Malmstadt-Enke design philosophy yields more performance per dollar invested...

DIGITAL OPERATION . . . through unique digital scanning system, wavelength drive of the "700" is easily programmed and synchronized to chart recorder, all from a remote location.

MODULAR VERSATILITY . . . the "700" is one of the basic building blocks of an integrated series of modules for spectroscopic techniques . . . each features open-ended design for your modifications.

OPTIMUM PERFORMANCE . . . precision where it counts in optics, mechanics, electronics . . . example: the "700" has better than one angstrom resolution and \pm one angstrom tracking accuracy.

Here are features of the first module, the new Heath "700" Scanning Monochromator . . .

Precision Optics; Czerny-Turner type, 350 mm, f/7, 1180 lines/mm grating, blaze wavelength 2500 angstroms, UV-VIS, range zero order to 10,000 angstroms first order; ground, coated mirrors; 1 angstrom resolution.

Electronic Scanning Control; remote control unit; 9 fixed rates in two ranges; variable from external sources; integrated-circuit digital pulses control wavelength drive in 0.1 angstrom steps; bi-directional slewing at 5,000 angstroms/min.

Recorder Readout; "700" synchronizing pulses electronically lock Heath Chart Recorder to wavelength drive for direct readout at the exact angstrom/inch ratio selected.

High Mechanical Stability; precision base castings; tracking \pm one angstrom; exact alignment.

Variable Slit Width; bilateral slits of unique design; entrance and exit slits ganged to single control; readout directly in microns on 4-digit counter.

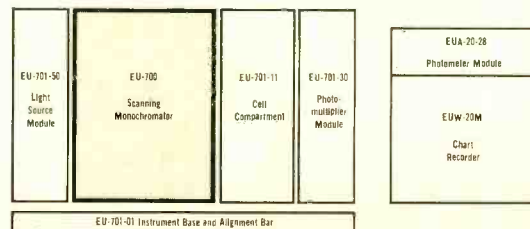
Purgable with dry nitrogen; extends range below 1800 angstroms in UV region.

Versatile; precision face plates each side accept sources, cell compartments, other modules.

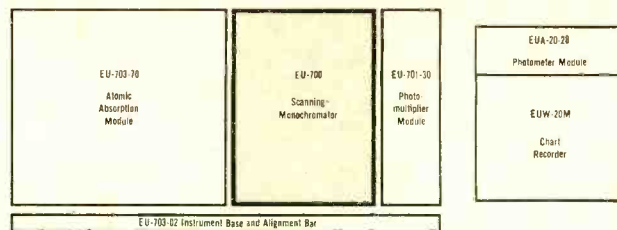
Auxiliary Programming; accessory limit switches can program scanning to desired ranges.

Low Cost; cost per use ratio so low that multiple installations are easily justified; the "700" costs just \$1195; accessory modules are proportionately low in cost.

Here are examples of Heath's Modular Design . . .



Single Beam Spectrophotometer

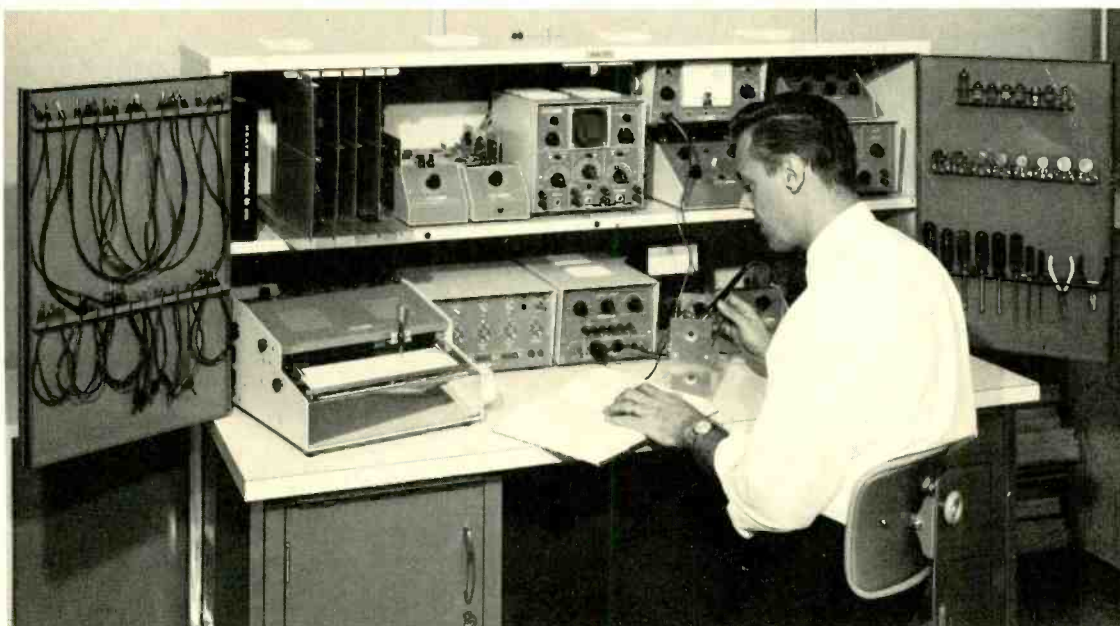


Atomic Absorption, Fluorescence & Flame Emission Spectrophotometer

The Heath/Malmstadt-Enke "700" Monochromator is a basic module of these and a whole series of future instruments. Accessories shown will be available in 1968. The EUW-20M recorder is available now. This modular design assures research-quality performance, low cost, state-of-the-art equipment, and encourages modification to your exact needs.

For Complete Details, write on your school or company letterhead for your free copy of the new Heath Instrumentation Catalog. Assembled EU-700, Monochromator and Control Unit, 66 lbs. \$1195.00

Heath Factory-Assembled Instrumentation



The Heath Malmstadt-Enke Instrumentation Philosophy exemplified in this Basic Laboratory Station is expanded in additional instrumentation for pH measurement (see page 94), polarography (see page 95), and critical experimentation employing the EUW-19B Operational Amplifier (see page 89). New, more sophisticated, instrumentation for chemistry, physics, electronics research, and education is on the horizon.

Heath Malmstadt-Enke Instrumentation Laboratory Factory Assembled Instruments, Accessories, And Text For Education In Electronic Instrumentation

- A complete electronics lab for scientists & engineers • All equipment factory wired & tested • Ideal for teaching electronics to both graduate and undergraduate scientists • Perfect for every day use in research labs • "Solderless" spring-clip connectors in experimental parts groups allow fast, easy circuit changes • Authoritative Malmstadt-Enke textbook "Electronics For Scientists" • Multi-purpose units with features not matched at any price

A COMPLETE COORDINATED ELECTRONICS LABORATORY FOR EDUCATION IN MODERN INSTRUMENTATION. Consists of special experimental chassis and parts, factory-assembled & tested laboratory test instruments, and the famous, comprehensive text, "Electronics For Scientists." The text authors, Drs. H. V. Malmstadt and C. G. Enke also conceived and supervised the engineering of the special instrumentation. Here is a system of instruments and materials specifically designed to fulfill the needs of contemporary scientists. Heath Malmstadt-Enke Instrumentation Laboratories are in use in thousands of scientific, educational, and research organizations and institutions providing both formal instruction in the electronics of laboratory instrumentation and the facilities for innovating, testing, and evaluating research instrumentation.

FOR ALL SCIENCES. Provides chemists, physicists, engineers, medical scientists, biologists, physiologists, students, and research workers with a firm working knowledge of the complexities of the modern complex instrumentation they use in their work.

SPECIAL-PURPOSE INSTRUMENTS. Many units within the EU-100A station serve multi-purpose applications. For example, the EUW-20A Servo-Chart Recorder is useful in learning about servo systems and null-point recorders . . . recording pressure, speed, temperature, strain, light radiation, etc., in research or development labs when used with suitable transducers . . . and can be modified with a simple plug-in adapter to provide a sensitive and accurate pH meter for research & control labs.

INSTRUMENTS ARE AVAILABLE SEPARATELY OR AS A COMPLETE LABORATORY STATION. An all-steel desk top cabinet holds all instruments and components (of the basic lab). Everything is in sight. Ten power outlets are controlled by a single on/off switch with pilot lamp. See special group pricing.

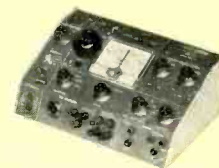
SPECIAL BOOK COMBINATION OFFER. Discover the many practical uses of the famous Malmstadt-Enke Lab Series. Order both the EUA-11 manual and EUP-11 text, "Electronics For Scientists," and get the manual FREE!

Basic circuits can be constructed, tested, and modified in a fraction of the time required for conventional soldered circuits.



pH module and the capabilities of the Heath pH Recorder/Electrometer are fully described on page 94.

The Polarography Module and the capabilities of the Heath Polarography Laboratory are described on page 95.



Buy The Complete M-E Station And Save!

EUA-11 Manual	\$ 2.50
EUP-11 Text, "Electronics for Scientists"	\$ 11.50
EU-13A Universal Experimental Chassis & Parts	\$ 177.00
EU-14A Special Experimental Chassis & Parts	\$ 64.00
EUW-15 Assembled Universal Power Supply	\$ 75.00
EUW-16 Assembled Voltage Reference Source	\$ 65.00
EUW-17 Assembled Transistorized Power Supply	\$ 20.00
EUW-18 Assembled Lab Meter With Shunts	\$ 22.00
EUW-19B Assembled Operational Amplifier System	\$ 135.00
EUW-20M Assembled Multi-Speed Servo Chart-Recorder	\$ 295.00
EUW-24 Assembled VTVM	\$ 62.00
EUW-25 Assembled DC Oscilloscope	\$ 168.00
EUP-26 Assembled Weston 980 VOM	\$ 55.00
EUW-27 Assembled Sine & Square Wave Generator	\$ 94.00
EUW-28 Assembled Resistance Substitution Box	\$ 16.00
EUW-29 Assembled Capacitance Substitution Box	\$ 14.00
EUW-30 Assembled Decade Resistance	\$ 40.00
GH-25 Deluxe Tool Set	\$ 16.95
Total	\$1332.95
EU-100A, Special Group Price with Single-Speed Chart Recorder	\$1095.00
EU-100M, Special Group Price with Multi-Speed Chart Recorder	\$1185.00
Export models available for 115/230 VAC, 50-60 Hz; write for prices.	
EUP-22A, All-steel desk top cabinet	\$130.00

Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog

Heath Malmstadt-Enke Lab Instruments . . .

EUW-15 Universal 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. \$75.00

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 1/2" W x 6 1/2" H x 12 1/2" D.

EUW-16A Voltage Reference Source

- 0-100 volts DC output—Zener stabilized • Accuracy 1% or 0.1 mv whichever is larger • Direct reading—potentiometer type operation • Polarity reversal & push-button zero switches • Signal input position • Fully assembled & tested

EUW-16A, 6 lbs. \$65.00

EUW-16A SPECIFICATIONS—Output voltage: 0-100 volts DC. **Resolution:** .1 mv on X1 range; 1 mv on X10 range; 10 mv on X100 range; 100 mv on X1000 range. **Accuracy:** $\pm 1\%$ for coarse switch setting and $\pm 2\%$ for fine control setting. **Readout:** Directly on three dials; Coarse Voltage, Fine Voltage, Range. **Power requirements:** 25 watts, 117 v. AC, 50/60 Hz. **Dimensions:** 5 1/4" H x 8 1/4" W x 8" D.

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. \$55.00

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. **Ohmmeters:** 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 3/4" high x 3 1/4" 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. . . (REA Express or Motor Frt. only) \$94.00

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. \$62.00

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-25 3" DC Oscilloscope

- Identical vertical & horizontal AC or DC coupled amplifiers • DC to 400 kHz bandwidth • Rise time, less than 1.5 microsecond • Recurrent sweep generator, 5 Hz to 50 kHz in four ranges • External capacity binding posts for slower sweep rates • Factory assembled and tested • Terminals for Z-axis modulation and direct connection to deflection plates

EUW-25, 18 lbs. (REA Express or Motor Frt. only) \$168.00

EUW-25 SPECIFICATIONS—(Vertical and horizontal channels identical): Bandwidth: DC to 400 kHz (3 db point). **Sensitivity:** 0.1 V (peak-to-peak) per 1/4" (uncalibrated). **Attenuator:** 3-position, compensated type. **Gain control:** Continuously variable. **Input impedance:** 3.6 megohms shunted by 35 mmf. **Coupling:** Either AC or DC, switch-selected. **Relative phase shift between channels:** Less than 5°. **Sweep generator (recurrent type):** Linear saw-toothed produced by multivibrator type generator covering 5 Hz to 50 kHz in four overlapping ranges. "External capacity" 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:** 9 3/4" H x 9 3/4" W x 11 1/4" D.

EUW-15
\$75.00



EUW-16A
\$65.00



EUP-26
\$55.00



EUW-27
\$94.00



EUW-24
\$62.00



EUW-25
\$168.00

Individually Or As A Lab Station

EUW-19B
\$135⁰⁰



Improved Heath EUW-19B Operational Amplifier System

- Improved circuitry plus forced air ventilation for extra long-period stability • Coarse & fine balancing controls on front panel for more precise amplifier balance • Four high-gain operational amplifiers with wide-range signal voltage capability • Booster amplifier for driving read-out instruments • Amplifier terminals are standard 5-pin connectors accessible on front panel & with Operational Amplifier symbols to identify pin connections • Optional modular chassis plug directly on front-panel connectors providing control, input, & feed-back circuitry • A complete self-contained unit with power supplies built-in • Fully assembled & tested

INPUT, FEEDBACK, AND OTHER CONTROL CIRCUITS ARE ASSEMBLED IN MODULAR CHASSIS AND PLUG ON. Two blank, modular, accessory chassis are available. EUA-19-1, similar to the chassis of the EUA-19-2 Polarography Module, covers the entire lower half of the Operational Amplifier System front panel, and connects to all five built-in amplifiers

EUA-19-4
\$160⁰⁰



Heath Operational Amplifier Stabilizer

- Connectors on both front and back panels enable simple, direct plug-on connection intermediate between Heath Operational Amplifier System and the plug-on-chassis modular control circuitry • Provides high stability—better than ± 0.1 mV/day • Increases open-loop gain by a factor of 1000 • Factory assembled and tested—includes complete manual with operating procedure and circuit analysis

and the power terminals. Amplifier balance controls are accessible on the remaining exposed Operational Amplifier System front panel. The EUA-19-3 modular chassis is 1/5th size of the chassis just described, and plugs onto only a single amplifier. Called "individual amplifier" plug on chassis, the 1/5 size units can be ganged in a group of up to 5.

SOLVES A WIDE RANGE OF PRECISION ELECTRICAL MEASUREMENT AND CONTROL PROBLEMS . . . through circuits for summation, differentiation, integration, and through the use of components to simulate linear, logarithmic, or transcendental functions.

EUW-19B, Operational Amplifier, 20 lbs., (REA Express or Motor Frt. only) \$135.00
EUA-19-1, Plug-on Chassis includes all 5 amplifiers, 3 lbs. \$9.00
EUA-19-3, 5 individual amplifier plug-on chassis, 4 lbs. \$15.00

EUW-19B SPECIFICATIONS—OPERATIONAL AMPLIFIERS: DC Gain, open loop: 21,000 (87 \pm 1 db). Frequency response: to 100 kHz. Voltage range: -50 V. DC to $+50$ V. DC output. Output current: -1 ma to $+1$ ma with 50 K ohm load. Output impedance: Less than 1.5 ohms. Rise time: 12 microseconds. Drift: Less than ± 5 mV/8 hr. day referred to the input under controlled room temperature and line voltage conditions after 48 hours, or more, aging period. Amplifier 1 bias only: May be switched for follower or inverter operation. **BOOSTER AMPLIFIER:** Maximum output: 20 ma at ± 50 V. DC. Gain: Approx. 0.8. Output Impedance: Less than 0.2 ohms. **POWER REQUIREMENTS:** AC INPUT: 105-125 volts, 50/60 Hz. Filament power only: 44 watts. Total power required: 94 watts at quiescent operating conditions. Fuses: One $\frac{1}{4}$ ampere slow-blow fuse; for the filament circuits, and one ampere slow blow fuse for the DC+ and DC- supplies. **AUXILIARY POWER CONNECTOR:** Location: Octal socket on rear of unit. Power available: $+300$ volts at 20 ma and -300 volts at 20 ma with unit in operation; $+300$ volts at 60 ma and -300 volts at 60 ma when all amplifier tubes are removed. Balance resistors: Available at auxiliary connector to balance power supplies and adjust output voltages. **GENERAL:** Dimensions: $11\frac{1}{4}$ " W x $6\frac{1}{8}$ " H x $12\frac{1}{2}$ " D.

INCREASES THE ± 5 mV/DAY STABILITY OF THE HEATH OPERATIONAL AMPLIFIER SYSTEM TO BETTER THAN ± 0.1 mV/DAY. When experimental work requires long period or exceedingly high stability (such as highly critical examinations or analysis for special effects in polarography), the Heath EUA-19-4 Operational Amplifier Stabilizer Module can be plugged-in intermediate between the Heath Operational Amplifier System and the Modular Control Chassis. The four operational amplifiers are "stabilized" and no longer require balancing. The Booster Amplifier runs "straight through." This increases the open-loop gain of each of the 4 operational amplifiers by a factor of 1000 to approximately 21,000,000. The frequency response remains 0 to 100 kHz (with unity gain), and the average noise level is held to a minimum 1 millivolt peak-to-peak value (at unity gain).

EUA-19-4, 6 lbs. \$160.00



A EUW-18 Lab Meter With Shunts

- 1 MA, 50 ohm meter movement • Two scales 0-15 & 0-50 • Four ranges with shunts 1.5, 5, 15, 50 MA • Sturdy aluminum case • 5-way binding posts for easy connection • Fully assembled and tested

EUW-18, 2 lbs. \$22.00

EUW-18 SPECIFICATIONS—METER SENSITIVITY: 1 ma (millimeter) full scale. Accuracy: $\pm 2\%$ of full scale. Meter resistance: 50 ohm. Shunt resistors: 1.02 ohm $\pm 1\%$ for 50 ma range; 2 ft. resistance wire at 9.99 ohm/ft. for 15 ma and 5 ma ranges; 100 ohm $\pm 1\%$ for 1.5 ma range.

B EUW-28 Resistance Substitution Box

- Selects each of 36 resistors—15 ohms to 10 megohms • Resistors E.I.A. standard 10%—1 watt • Two-position switch for high and low range • Terminals space for $\frac{3}{4}$ " dual banana plug

EUW-28, 2 lbs. \$16.00

EUW-28 SPECIFICATIONS—Resistance values: 15, 22, 33, 47, 68, & 100 ohms x1, x10, x100, x1K, x10K, & x100K with 15 to 10K ohms in low range and 15K to 10 megohms in high range.

C EUW-17 Transistorized Power Supply

- Output voltage variable from 0-35 volts DC • Current output to 200 ma • Solid-state circuitry and electronic filter • Dependable silicon rectifiers • Fully assembled & tested

EUW-17, 3 lbs. \$20.00

EUW-17 SPECIFICATIONS—Output voltage: 0-25 volts at maximum current (200 ma). 0-35 volts with no current output. Output resistance: Less than 50 ohms. Ripple: Less than .1% at full load. Circuit type: Full-wave rectifier. Control: Voltage, with on/off switch. Power requirements: 105-125 volts AC, 50/60 Hz, 9 watts. Includes 3-wire line cord.

EUW-17
\$20⁰⁰



EUW-29
\$14⁰⁰



D EUW-29 Capacitance Substitution Box

- Selects each of 18 capacitors 0.0001 mfd to 0.22 mfd • Matches dual banana plug with $\frac{3}{4}$ " spacing

SELECTS STANDARD CAPACITOR VALUES . . . with voltage ratings of 500 volts for the three smallest capacitors, 400 volts for the two largest, and 600 volts for all remaining capacitors.

EUW-29, 2 lbs. \$14.00

E EU-13A Universal Experimental Chassis & Components

- Four separate chassis • Small parts including potentiometers, resistors, capacitors, tube sockets, and many other typical components • 73 test leads • Over 400 separate components

EU-13A IS A REAL BREAKTHROUGH FOR RESEARCH AND EDUCATIONAL LABS! . . . enables on-the-spot experimental setups of test circuits for research, instrumentation, and educational purposes. Additional spring-clips available separately . . . write for details.

EU-13A, Universal Experimental Parts, 18 lbs. \$177.00

EU-14A SPECIAL EXPERIMENTAL CHASSIS AND PARTS . . . includes tubes, transistors, diodes, earphone, chopper, transformer, parts for utility amplifier, and more . . . for performing experiments in course "Electronics for Scientists," described on page 67.

EU-14A, Special Experimental Chassis & Parts, 5 lbs. \$64.00

EUA-14-1, Additional Utility Amplifier Parts, 2 lbs. \$7.50

F EUW-30 Six-Decade Resistance Box

- Selects values from 1 ohm to 999,999 ohms in 1 ohm increments • $\frac{1}{2}$ of 1% accuracy • Make before break switches

PROVIDES EXCELLENT RESISTANCE ARM FOR DC OR AC BRIDGES. Precision resistors assure accuracy to 0.5%. $\frac{3}{4}$ " terminal spacing for dual banana plugs. $7\frac{1}{4}$ " W x 5" H x $6\frac{3}{8}$ " D.

EUW-30, 4 lbs. \$40.00

EU-13A
\$177⁰⁰



Over 400 components

EUW-30
\$40⁰⁰





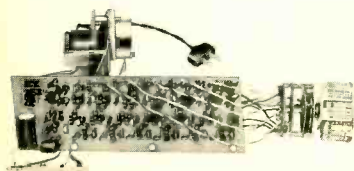
Heath Malmstadt-Enke Servo

Heath Malmstadt-Enke Single-Speed (EUW-20A) And Multi-Speed (EUW-20M) Servo Chart Recorders Up-Date The Value Standards For The Industry

• Nowhere else can you obtain such high performance recorders for so low a cost • Five ranges on 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 (EUW-20A) with additional chart motors available or multi-speed version (EUW-20M) 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, practical cartridge pen • Completely factory assembled and tested

HEATH SERVO-CHART RECORDERS OFFER PRECISION RECORDING FACILITIES AT LOW COST. They are precision 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. The characteristic Heath Malmstadt-Enke design concept emphasizes functional performance and utilitarian value rather than expensive styling or unnecessary sophisticated and expensive components. A secondary, but no less 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 EUW-20A and EUW-20M Recorders provide chemists, physicists, engineers, and other 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.

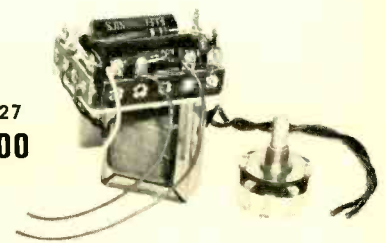
MODULAR PLUG-ON ADAPTER CHASSIS AVAILABLE. The blank chassis EUA-20-1 plugs onto the rear of the Heath recorders for adding modular circuitry of your own design, such as special electrometer inputs, logarithmic amplifiers, and integrating amplifiers. Heath supplies a factory-assembled module for converting the recorder to a recording pH meter and millivolt electrometer... see the EUA-20-11 and EUW-301 & EUW-301M on page 94.



EUA-20-26
\$95.00



EUA-20-27
\$20.00



Multi-Speed Chart Drive Unit For Installation In EUW-20A Recorders

• Instantaneous selection of 21 accurate speeds from 5 seconds to 2 hours per inch (12 inches/minute to 0.5 inches/hr.) when using internal line frequency signal • Unlimited variation in speeds up to 12 inches per minute when using an external chart drive signal • Chart-Speed Switch Scale Calibration: in sec./inch, inch/min., inch/hour, min./inch & hours/inch • All chart speeds as accurate as 60 Hz AC

line frequency, when using internal drive signal • Auxiliary input terminals enable the chart motor to be programmed by external signals • Output signal for synchronizing related events or other recorders • Install in any Heath EUW-20A Servo-Chart Recorder or EUW-301 Recording pH Meter/Electrometer • Includes complete, detailed instruction manual • Factory wired and tested

EUA-20-26, Multi-Speed Chart Drive for installation in Heath EUW-20A Recorders & EUW-301 pH Recorders, 4 lbs. **\$95.00**

EUA-20-26 SPECIFICATIONS—Chart Speeds: 5 seconds to 2 hours per inch in 21 speeds, with internal signal. Any speed up to 5 seconds per inch with external signal. **External input:** Input terminals for external chart drive signals. **External signal requirements:** Sine Wave: 22 volts P-P min., 15-100 Hz; 3 volts P-P min., 100 Hz—10 kHz. Square Wave: 3 volts P-P min., 0-10 kHz with 20 usec max rise & fall time. **Pulses:** 0-10,000 pulses per second—with minimum amplitude dependent on pulse duration. **Auxiliary output signal:** 4 v. P-P square wave, 20 usec rise time & 0.2 usec fall. **Auxiliary output impedance:** 68 ohms. **Controls:** 21 position Chart Speed Switch & External-Internal signal switch. **Chart-Speed Switch Scale Calibration:** Calibrated in sec./inch, inch/min., inch/hour, min./inch & hours/inch. Calibrated speeds are: 5, 10, 15, 20, 30, 50, 60, 100, 120, 200, 300, 500, 600, 900, 1000, 1200, 1800, 3000, 3600, 6000 & 7200 seconds/inch—with additional calibration: 12, 6, 4, 3, 2, 1, 0.5, 0.02 & 0.01 inch/min.; and 36, 18, 12, 6, 4, 3, 2, 1, & 0.5 inches/hour, plus intermediate rates expressed in min./inch and hours/inch. **Components:** 32 diodes & 29 silicon transistors. **Power requirements:** 105-125 VAC 60 Hz 7 watts.

FULL-FEATURED PERFORMANCE. Uses standard, easily-obtained 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. Other features include a convenient pen lift, rapid chart advance, paper tear-off guide and a special standby circuit to prolong the operation of limited-life components, such as the mercury reference cell and 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 EUW-20A recorders. Easy access to motor mounts permits fast, easy change to other speeds. Model EUW-20M 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 (Y coordinate) to experimental parameters or events. The Multi-Speed Chart Drive is described separately on this page. Send for the free brochure, which includes a block-diagram type of discussion on the operation of this unit.

ORDER THE HEATH EUW-20M MULTI-SPEED SERVO-CHART RECORDER... for outstanding versatility and accuracy, for the ultimate in functional design—all at the lowest cost.

EUA-20A, Single-Speed Chart Recorder, 23 lbs., (REA Express or Motor Frt. only) **\$209.00**

EUW-20M, Multi-Speed Servo-Chart Recorder, 26 lbs., (REA Express or Motor Frt. only) **\$295.00**
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 EUW-20A Recorders.

Wt. 1 lb. Price ea. **\$13.00**

EUA-20-2	.1 inch/min.	EUA-20-5	1.0 inch/min.
EUA-20-3	.2 inch/min.	EUA-20-9	12.0 inch/min.
EUA-20-4	.5 inch/min.	EUA-20-10	2.0 inch/hour

EUW-20M 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 EUA-20-26 specifications.) Model EUW-20A 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 ohm. **Reference System:** Mercury cell. **Reference Cell Life:** 300 hours (approx.). **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.

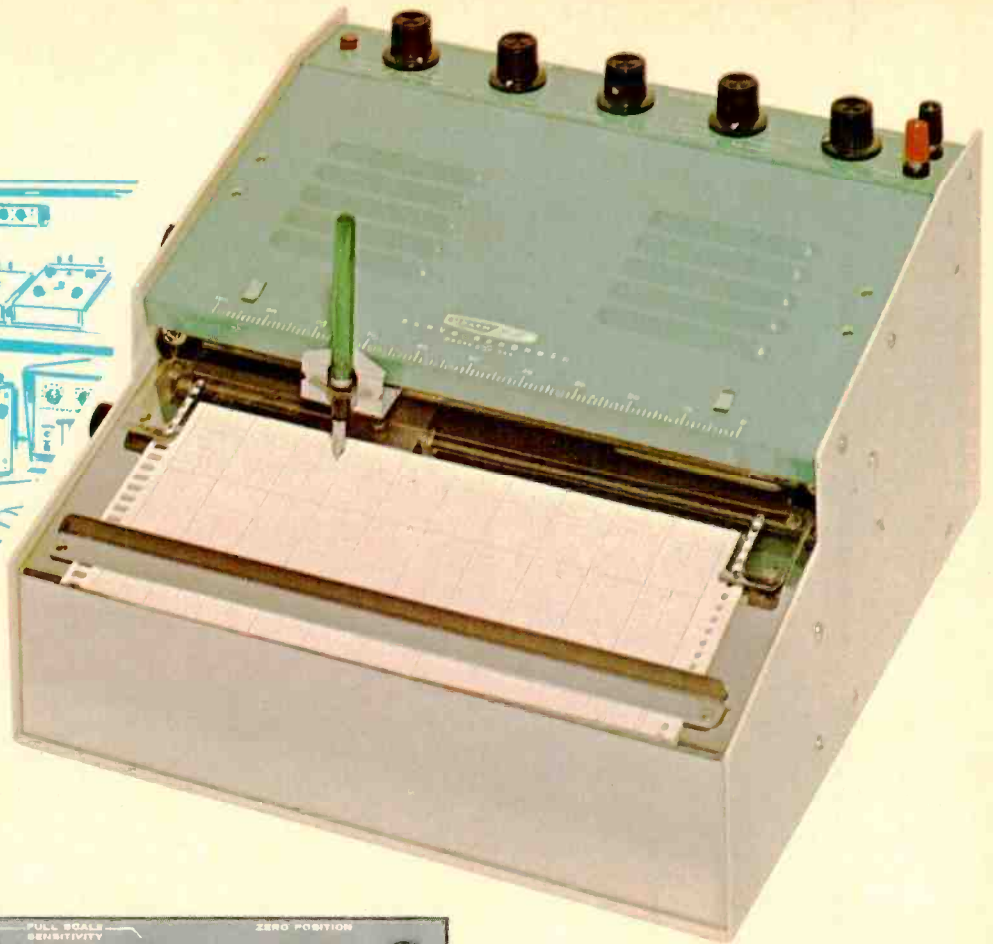
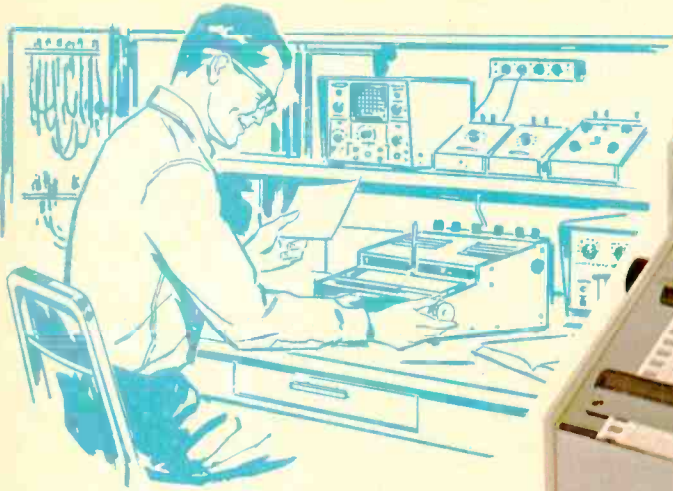
Factory Assembled Zener Supply Replaces Mercury Cell In Heath Recorders

THE NEW 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 Heath recorders... not intended for general use.

EUA-20-27, reference supply plus control, 2 lbs. **\$20.00**

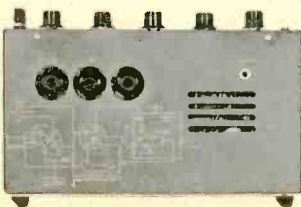
EUA-20-27 SPECIFICATIONS—Load Current: 4.1 ma for optimum voltage stability. **Output Voltage Stability:** with 300 ohm load, regulation 0.1% from 100-130 VAC. **Temperature Stability:** essentially that of a zener diode, 0.005% per degree centigrade 0 to 70 degrees centigrade. **Power Requirements:** 105-125 volts AC, 50-60 Hz, 2.5 watt. **Size:** 2 1/2" H x 2 1/4" W x 1 1/4" D.

Chart Recorders

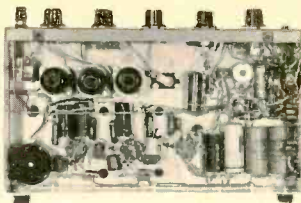


Single Speed Recorder
E UW-20A
\$209⁰⁰

All Operating Controls Are On One Panel, Providing A Simple And Yet Complete Control Center.

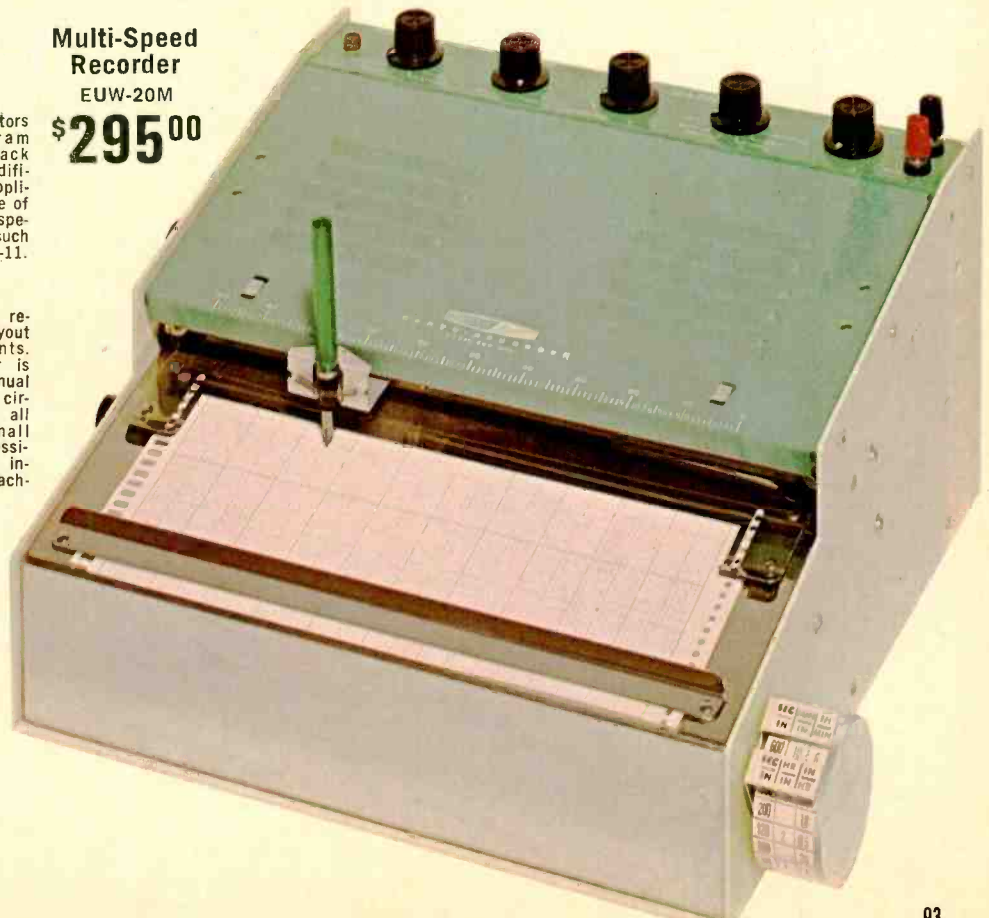


Standard 5-pin connectors and circuit diagram screened on the back panel permit easy modification for versatile applications . . . permit use of plug-in modules for specific requirements, such as pH module EUA-20-11.



Back View with cover removed shows neat layout of circuit components. Every Heath recorder is supplied with a manual which describes this circuitry in detail. Since all components and small parts are readily accessible, this is an ideal instrument for use in teaching servo design.

Multi-Speed Recorder
E UW-20M
\$295⁰⁰

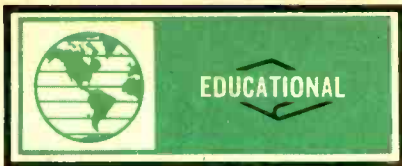


E UW-20 CHART PAPER PRICES (EUA-445-8)

Quan.	Price ea.
1-9 rolls	\$4.50
10-24 rolls	\$4.25
25-99 rolls	\$3.75
100-199 rolls	\$3.25
200-500 rolls	\$2.75

Write for prices on orders exceeding 500 rolls.

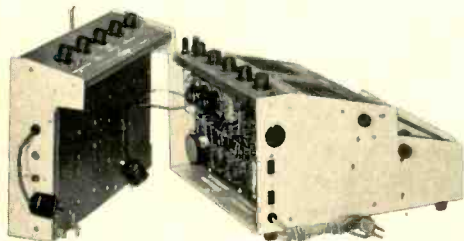
Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog



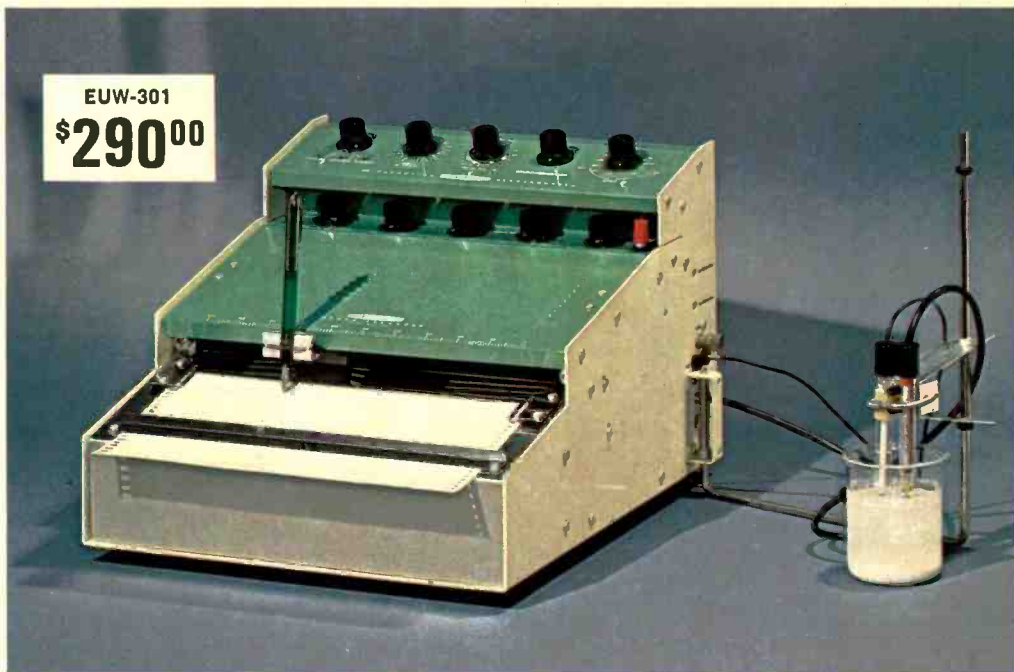
Heath Malmstadt-Enke



pH Module Controls Complete, easy to operate. Regular controls on Chart Recorder are inactivated when pH module is connected.



EUW-301
\$290⁰⁰



Heath Recording pH Meter/Recording Millivolt Electrometer . . . Single-Speed Or Multi-Speed Models

- Highly versatile—a general purpose pH meter in the "measure" mode of operation—a recording pH meter in the "record" mode—an indicating or recording electrometer in the "millivolt" mode
- Operates as a null-point device with electrometer input in all modes
- Performs with transducers with impedances as high as 1000 megohms
- Provides acid-base titration curves, reaction-rate curves, oxidation-reduction titration curves, stability curves, and data readout from a multitude of laboratory apparatus

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 recorder chart.
- **MULTI MV RANGES!** Full-scale millivolt spans of $\pm 50, 100, 200, 500, 1000$ 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.

EUA-20-15 Reference Electrode . . . \$30.00
Beckman #39170 fiber junction calomel electrode. Lead length 30".

EUA-20-14 Glass Electrode . . . \$37.00
Beckman #41263 general purpose electrode covering a range of 0-11 pH and 5-80° C. Lead length 30".

EUA-20-16 Temperature Probe . . . \$18.00
Provides automatic temperature compensation of the EUW-301 Recording pH Electrometer. Simple plug-in connection.



EUA-20-17 Buffer Assortment . . . \$10.50
Buffer solutions by Mallinckrodt. Includes one pint each of pH 4.01, 7.00, and 10.00 buffers plus a 150 ML bottle of saturated KCl solution for refilling reference electrodes. In unbreakable plastic bottles.

EUA-20-23 Combination pH Electrode . . . \$52.00
Sargent S-30070-10 includes both pH electrode and reference electrode in single miniature glass envelope. 0-14 pH. 0-80° C.

EUA-20-12 pH Test Box . . . \$33.00
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. Tests temperature compensation of pH meter. Checks for leakage currents in input circuitry of meter. Provides voltages for setting recording electrometers. Provides zero suppression voltages for use with potentiometric recording circuits. Test box simulates voltages from pH electrodes with 0 volts asymmetry potential.



- **MULTI-SPEED MODEL WITH 21 ELECTRONICALLY SYNCHRONIZED RECORDING SPEEDS.** The EUW-301M 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. Single-speed model (EUW-301) features a standard chart speed of 2"/min. with extra chart motors available (See page 92 for motor selection).

- **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 0.5% 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 1000 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 EUW-20M Recorder accepts EUA-20-11 pH Module without modification.

EUW-301M, pH Recording Electrometer with Multi-Speed Chart Drive . . . 34 lbs. (REA Express or Motor Frt. Only) . . . \$385.00

EUW-301, pH Recording Electrometer with interchangeable chart drive motor (2"/min. provided) . . . 32 lbs. (REA Express or Motor Frt.) . \$290.00

EUA-20-11, pH Module only, 12 lbs. (converts Heath EUW-20A or EUW-20M to pH Recording Electrometer) . . . \$135.00

EUA-301-1, Parts Kit, 2 lbs. (chopper kit converts EUW-301 or EUW-301M recorder portion to standard EUW-20A or EUW-20M Servo Chart Recorder) . . . \$30.00

Instrumentation For Chemistry

Heath Malmstadt-Enke Polarography Laboratory

Capabilities Of The Polarography Laboratory

• 3-electrode controlled potential polarography • 2-electrode polarography • Manual polarography • Controlled potential electrolysis • Controlled current electrolysis • Chronopotentiometry • Amperometric titrations • And other similar electro-chemical processes requiring the Dropping Mercury Electrode, highly versatile electronic instrumentation, and direct or strip-chart readout

Capabilities Of The Laboratory In Combination With Suitable Accessories (Supplied By The Customer)

• Coulometry (with external coulometer) • Cyclic polarography (with triangle generator and X-Y recorder readout) • AC polarography (with sine wave generator & tuned AC amplifier) • Oscillographic, harmonic, & phase polarography (with triangle or sine wave generator, the necessary amplifier, and an oscilloscope for displaying readout) • Oxygen analysis (with suitable oxygen electrodes) • Pulse-type polarography and other variations of the above techniques when the required generators, amplifiers, etc. are chosen

A COMPLETE LABORATORY FOR CONTROLLED POTENTIAL POLAROGRAPHY . . . developed by Dr. Chris Enke of Michigan State University. The Heath EUW-402 Polarography Laboratory provides exact qualitative and accurate quantitative electrochemical analysis for oxidizable or reducible ions in organic or inorganic solutions. It consists of a highly versatile Dropping Mercury Electrode Apparatus, a Polarography Module and Operational Amplifier for producing the required electronic functions, and a Servo-Chart Recorder for displaying the read-out data.

ELECTRONIC INSTRUMENTATION included in the combination of the Polarography Module (EUA-19-2) and the Operational Amplifier (EUW-19B) . . . provides an electronic sweep potential in six 1%-calibrated rates from 0.05 to 2 volts/min. and the capability for measuring d.m.e. currents from 0.5 to 1000 microamperes full scale. Five degrees of damping can be applied to the readout waveform. The 0.5%-calibrated initial potential is continuously variable — ± 3 volts. And full capabilities are included for adjustable electrode current suppression and adjustable charging current suppression. All equipment supplied factory assembled.

EUA-19-6 DROPPING MERCURY ELECTRODE APPARATUS SPECIFICATIONS—Includes all electrodes for 3-electrode controlled potential polarography dropping mercury electrode (less Hg⁰), calomel reference electrode, platinum counter electrode • Easy to set up • Simple to operate • Teflon® stop cock on mercury supply • Adjustable mercury height • Mercury head scale adjusts to read height directly in mm. • Spring loaded cell holder for quick change of samples—usable with a wide variety of sample containers • Complete facilities for nitrogen purging—includes micrometer nitrogen flow valve • High mechanical stability • Built-in plumb for rapid leveling • Built from heavy gauge aluminum with enamel finish to resist corrosion • Upper section (less base) can be removed and attached to any standard laboratory rack • Includes all cables and connectors (preassembled) for operation with the Heath Malmstadt/Enke EUW-401 Polarography System.

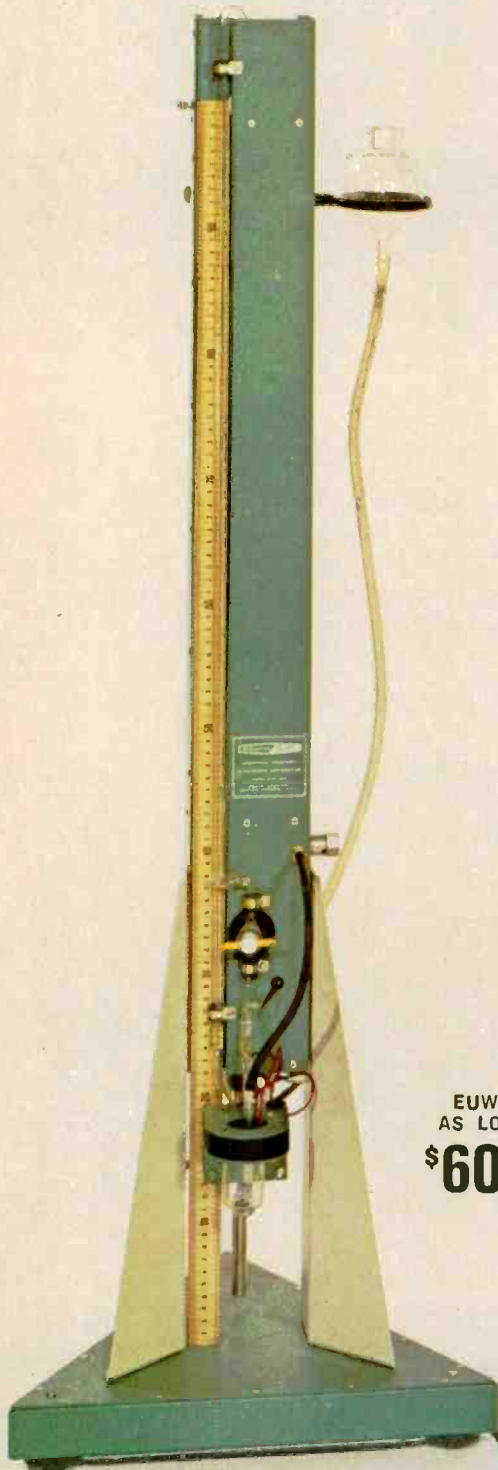
EUA-19-2 POLAROGRAPHY MODULE SPECIFICATIONS*—Potential control: Max. output voltage: ± 50 v.; current: ± 1 ma. Stability: ± 10 mv after warm-up. Noise: 1 mv p-p or less at electrode potential output jack. Input resistance: approx. 100M ohms at reference electrode input. Electrode potential meter range: ± 3 v. Electrode potential output resistance: 22 ohms. Initial potential source: Range: ± 3 v. Accuracy: 0.5%. Repeatability of adjustments: ± 5 mv. External control voltage inputs: Input impedance: 100K. Frequency response: down 3 db at 10 KHz, 30 microsecond rise time. Sweep generator: Calibrated sweep rates: 0.05, 0.10, 0.20, 0.50, 1.0, 2.0 volts/min., plus or minus. Accuracy: $\pm 1\%$, individually calibratable to 0.1%. Linearity: better than 1% for 1 volt sweep. Range: ± 5 v. Holds will hold at any potential ± 5 mv for 1 min. or more. Current measurement: Calibrated ranges: 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 microamperes. Outputs: 10 v full scale and 100 mv full scale. Accuracy: $\pm 1\%$ at output jacks, $\pm 2\%$ on meter. Damping time constants: off, 0.1, 0.35, 0.7, 1.3, 2.5 sec. on 100 mv output only. Current suppression: up to ± 90 microamperes in 2 ranges. Charging current suppression: up to 1 microampere volt of sweep.

*Plugged on front of Heath EUW-19B Operational Amplifier System and using 3-electrode cell and dropping mercury electrode.

EUA-19-2, Polarography Module . . . 8 lbs.	\$185.00
EUW-19B, Operational Amplifier . . . 22 lbs.	\$135.00
EUA-19-4, Optional Operational Amplifier Stabilizer, 6 lbs.	\$160.00
EUW-20A, Single-Speed Servo-Chart Recorder, 23 lbs.	\$209.00
EUW-20M, Multi-Speed Servo-Chart Recorder . . . 26 lbs.	\$295.00
EUW-401, Electronic Polarography Instrumentation (EUA-19-2, EUW-19B, EUW-20A) . . . 53 lbs.	\$490.00
EUA-19-6, Dropping Mercury Electrode Apparatus . . . 20 lbs.	\$149.00
EUW-402, Complete Polarography Laboratory with Single-Speed Recorder Readout (EUA-19-2, EUW-19B, EUW-20A & EUA-19-6), 73 lbs.	\$609.00
EUW-402M, Complete Polarography Laboratory with Multi-Speed Recorder Readout (EUA-19-2, EUW-19B, EUW-20M & EUA-19-6) . . . 79 lbs.	\$700.00

All Express or Motor Freight Only, Except EUA-19-2

Includes Dropping Mercury Electrode Apparatus,
Operational Amplifier System
Polarography Module,
and Servo Chart Recorder



EUW-402
AS LOW AS
\$609⁰⁰



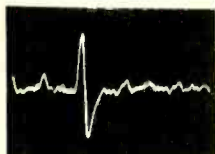
Heathkit® Instruments For Education And Laboratory Investigations



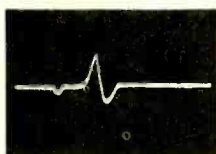
Wired EVW-3
\$280⁰⁰

Heathkit IMPScope . . . A Biological Oscilloscope . . . Lets Students "See" Physiological Phenomena

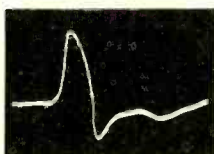
- Clearly shows electrical "signals" of biological organisms
- Demonstrates the electrical response of muscles and nerves to stimuli
- Shows human EKG and the EKG's of other organisms
- Accessories include nerve chamber for demonstration of frog sciatic nerve impulse
- Accessories for plethysmographic display
- Brings the most recent physiological instrumentation techniques to the student in the classroom
- A complete teaching package consisting of a high-gain oscilloscope with built-in stimulator, laboratory sourcebook, and many accessories
- Priced for multiple lab usage in biology & physiology courses in both general science and medical curriculums
- Instruments and techniques developed under Project IMPSc, funded by the NSF and sponsored by the University of California, Berkeley
- Ideal laboratory adjunct to classroom material created by the BSCS program
- Instruments and accessories factory assembled & tested
- Complete set of human EKG electrodes and EKG paste supplied
- Not intended for medical diagnostic use



Frog EKG. IMPScope accessories include electrodes for EKG's of frogs and other organisms.



Muscle Potentials. IMPScope shows nerve and muscle action potentials (frog gastrocnemius muscle).



Bioelectric. IMPScope shows bioelectric phenomena in plants (175 mv action potential of Nitella internode).

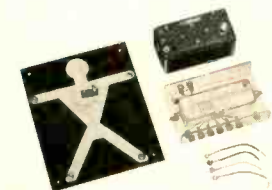
IMPScopes BRINGS MODERN INSTRUMENTATION INTO YOUR CLASSROOM . . . fulfills a vital need in the teaching of life sciences. Already in use in thousands of schools, the IMPScope has proven itself easily understood—even by junior-high school students!



Included With IMPScope
• Input termination and calibrator
• Human EKG electrodes • EKG paste • Connecting leads

Assembled EVW-3, 28 lbs. . . no money dn., \$26 mo. \$280.00

EV-3 SPECIFICATIONS—VERTICAL AMPLIFIER: Sensitivity: Switch selected; 200 microvolt, 1 millivolt, and 5 millivolts per centimeter. Variable from 200 microvolts to 5 millivolts per centimeter. Bandwidth: ± 3 db from 0.25 to 2500 Hz. Input: Balanced. HORIZONTAL: Sweep frequency (rate per centimeter): Slow, 0.15 to 5 sec. Medium, 7.5 milliseconds to 0.2 sec. Fast, 0.5 to 1.0 milliseconds. Stimulator: Rate: 6 to 30 stimuli per second. Recurrent stimulus or single stimulus with pushbutton—indicator light on front panel. Stimulus duration: 0.25 to 6 milliseconds. May be increased with an external capacitor—jack provided. Power requirements: 70 watts, 105-125 volts, 50/60 Hz A.C. Dimensions: Overall, 11 1/2" W x 7 1/2" H x 19 1/2" D. Net weight: 17 1/2 lbs.



IMPScopes Accessories

EVW-3-1 **\$50⁰⁰**

Accessory Package
• Plethysmograph • Nerve chamber • EKG vector dolly • Frog EKG electrodes

EVW-3-1, Factory Assembled Accessory Package: Includes nerve chamber, vector dolly, plethysmograph, frog electrodes & manual of instructions. 3 lbs. \$50.00

Heathkit Educational Analog Computer . . . The Ideal Training Device . . . Frees More Advanced Computers For Sophisticated Problem Solving

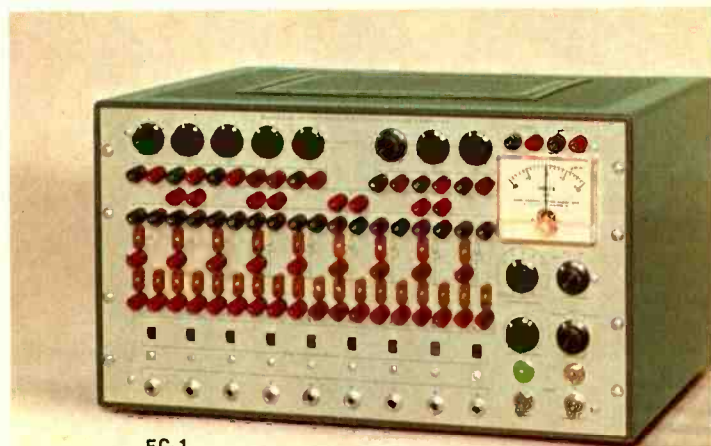
- Excellent teaching aid for a course in computer electronics
- Vividly illustrates the electronic analogies to mathematical problems
- Handles problems as complex as fluid flow, damped harmonic motion, and flight of a projectile in a viscous medium
- 9 DC operational amplifiers
- Switching allows amplifier 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

INCLUDES OPERATIONS MANUAL . . . discusses many problems, including second order differential equations for the flight of a projectile:

$$\frac{d^2x}{dt^2} + \frac{C}{M} \frac{dx}{dt} = 0 \text{ and } \frac{d^2y}{dt^2} + \frac{C}{M} \frac{dy}{dt} + g = 0.$$

The problem of the bouncing ball is discussed. The problem setup permits coefficients and parameters such as gravity, mass, viscosity of the medium, elasticity of the ball, flattening of the ball on impact, and drop height to be varied to show their effects on the flight path, change of momentum, etc.

THE EC-1 IS A HIGHLY VERSATILE EDUCATIONAL INSTRUMENT. Problem solutions may be sampled from each of the operational amplifiers and read on the built-in panel meter or observed on an external readout instrument such as a DC oscilloscope or chart recorder. Thus, the effects of varying mathematical parameters can be dramatically illustrated. EC-1 is easy to assemble and operate. Complete instructions are supplied.



EC-1
\$215⁰⁰

Kit EC-1, 48 lbs. \$215.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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 μ a movement. Power requirements: 105-125 volts, 50/60 Hz, 100 watts. Dimensions: 19 1/2" W x 11 1/2" H x 15" D.

Large ES-Computer and individual components still available. Address your inquiries to Heathkit, Cooksville, Ontario, Canada.



New Heathkit Single-Banders Look Better, Have New Features, Cost Less

- Fixed or mobile operation with the appropriate power supply (HP-23 or HP-13)
- Electronically stable, easy-to-assemble circuit board construction
- Time-saving wiring-harness cable assemblies
- New durable wrinkle finish
- Now Upper Or Lower sideband operation on all Single Banders
- Choose 80, 40, or 20 meter model
- Improved styling
- More convenient control locations
- 200 watts P.E.P. input
- Single knob tuning with 2 kHz dial calibration
- New ALC input for use with external linear amplifiers
- Excellent exciters for operation on the band of your choice with the KW Kompact or SB-200 Linear Amplifiers
- Now with improved audio and 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. An added function switch position controls the optional HRA-10-1 crystal calibrator. New 11 pin power plug is compatible with SB Series power supply connections. The receiver is a 10-tube superheterodyne 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 from 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—four 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. Alignment is easy. The only other gear you need to get on the air are microphone, antenna, power supply, and speaker.

- Kit HW-12A: 80-meter, 15 lbs. . . no money down, \$10 mo. . . . \$99.95
- Kit HW-22A: 40-meter, 15 lbs. . . no money down, \$11 mo. . . . \$104.95
- Kit HW-32A: 20-meter, 15 lbs. . . no money down, \$11 mo. . . . \$104.95
- GH-12, Push-to-talk and VOX microphone. . . 2 lbs. . . . \$6.95
- Kit HRA-10-1, Plug-in 100 kHz crystal calibrator. . . 1 lb. . . . \$8.95
- Kit HP-13, DC Power Supply (Mobile), 7 lbs. . . . \$64.95
- no money dn., \$5 mo. . . . \$49.95
- Kit HP-23, AC Power Supply (Fixed station), 19 lbs. . . . \$49.95
- no money dn., \$5 mo. . . . \$7.00
- Kit HS-24, Mobile Speaker, 4 lbs. . . . \$7.00

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 μ v 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) 6EA8's, mic. amp., VOX relay amp., IF amp., RF amp., Recvr. mixer; (5) 6AU6's, VFO, VOX amp., IF amps., Xmitr. 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

- 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
- Optional power supply available for mobile operation

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., \$5 mo. \$44.95
- Kit HW-30 (2 meter), 9 lbs., no money dn., \$5 mo. \$44.95
- Kit GP-11, Mobile Power Supply, 6 lbs. \$17.95



Mobile DC Power Supply For "Lunch Boxes"

- Compact size
- Operates from 6 or 12 volts DC
- Dependable silicon diode rectifiers
- Easy to install
- Provides remote on/off switching
- Heathkit green color styling

- Kit GP-11, 6 lbs. . . . \$17.95

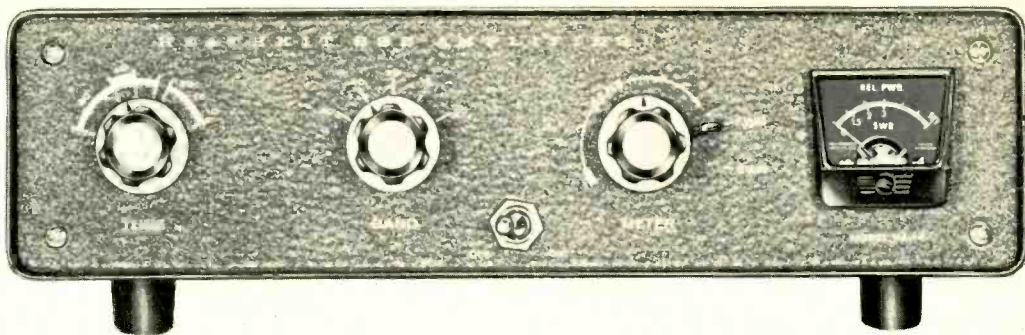
GP-11 SPECIFICATIONS—Power requirements: 6.3 VDC @ 6.5 amperes or 12.6 VDC @ 3 amperes for rated output. Power output: 250 VDC @ 100 mg. ICAS. Power rectifier: Two silicon diodes in voltage doubler circuit. Vibrator: Mallory type 1610 or equivalent. Vibrator frequency: Approximately 115 Hz. Overall dimensions: 4 1/4" H x 6 1/2" W x 4 1/4" D.



The World's Largest Selection Of

Mobile KW System
HAS-1
NOW ONLY
\$155
Includes HA-14 & HP-24 You Save \$24.90

"Fixed" KW System
HAS-2
NOW ONLY
\$130
Includes HA-14 & HP-14 You Save \$19.90



Heathkit "KW Kompact" For Fixed Or Mobile Rigs

• 1000 watts P.E.P. • Tunes 80 through 10 meters • ALC output to exciter • Built-in antenna change-over relay • Built-in SWR meter aids antenna adjustments on the road & monitors for maximum efficiency • Pretuned broad-band input circuit requires no tuning • Engineered with a pair of rugged tubes ideally suited to mobile operation (527-B's or T-160-L's) • Full provision for control of "remotely" located AC or DC power supply

CONSIDER A KILOWATT IN A CAR . . . REAL SOCK FOR MOBILE OR EMERGENCY COMMUNICATIONS! And the Heathkit KW Kompact can be installed under the dash of nearly every model of car with plenty of room to spare—room enough in most cars to allow it to be stacked with your transceiver, providing a complete under-the-dash mobile kilowatt station. Or picture the KW Kompact on your desk top . . . its ultramodern low profile and handsome styling merits your pride in owning the world's smallest kw SSB linear. Here's a new dimension in amateur radio . . . 1000 watts x 1 foot wide x \$99.95 . . . truly new standards for size and price.

THE PERFECT FINAL FOR THAT SINGLE-BANDER OR SB-101. The KW Kompact gives the value you expect from Heathkit Amateur Radio Equipment . . . matches the high performance standards designed into the Single-Banders and SB-Series equipment. And the KW Kompact's full line of features makes it as versatile as linears many times its size. A panel

mounted SWR meter enables on-the-spot antenna checks and adjustments, allowing continuous peak performance over the entire range of tuning. The antenna change-over relay is built-in, and provides "barefoot" operation when the linear is off. Input circuitry is pre-tuned.

ULTRAMODERN IN SIZE & STYLING . . . STATE-OF-THE-ART IN ENGINEERING TOO. To assure you a dependable 1000 watts P.E.P. input SSB under rugged mobile conditions, Heath chose a pair of husky 572-B's or T-160-L's (the two types are equivalent with replacements always available from Heath) operating in parallel. The result is dependability, and a clean signal with third order distortion products 30 db down or better at the full 1000 watts P.E.P. input. The matching power supplies (HP-14 for mobile & HP-24 for fixed) are completely remote controlled and circuit breaker protected.

Kit HA-14, 10 lbs. . . no money down, \$10 mo. \$99.95
Kit HP-14, DC Power Supply, 10 lbs. no money dn., \$8 mo. . . . \$79.95
Kit HP-24, AC Power Supply, 22 lbs., no money dn., \$5 mo. . . . \$49.95

HA-14 SPECIFICATIONS—Band coverage: 80, 40, 20, 15, and 10 meters. Maximum power input: SSB, 1000 watts P.E.P. Driving power required: 100 watts P.E.P. Duty cycle: 50% (SSB voice modulation). Third order distortion: —30 db or better at 1000 watts P.E.P. Output impedance: Fixed 52 ohms unbalanced. SWR not to exceed 2:1. Input impedance: 52 ohms unbalanced; broad-band pretuned input circuit. Meter functions: 0-6 relative power & 1:1 to 3:1 SWR. Front panel controls: Tuning, band switch, relative power sensitivity control, meter switch (FWD & SWR), power switch (off, on). Tube complement: Two 572-B or two T160-L in parallel. Power requirements: 2000 VDC at 500 ma SSB peak, —110 VDC at 60 ma, and 12.6 V. AC or DC at 4 amperes. Recommended for 12 v. neg. ground, alternator equipped cars only. Cabinet Size: 12 3/4" W x 3 3/4" H x 10" D.



A Heathkit HP-14 KW-Kompact Mobile Power Supply—New Lower Price

PROVIDES ALL NECESSARY HIGH VOLTAGE & BIAS FOR THE KW KOMPACT . . . from 12 volt, alternator equipped, negative ground automobile electrical systems. Operates "remote" for most convenient installation. Circuit breaker protected. All cables included.

Kit HP-14, 10 lbs. . . no money down, \$8 mo. \$79.95

HP-14 SPECIFICATIONS—Input voltage: 12 to 14.5 v. DC (negative ground). Input current: 25 amperes average, 50 amperes peak (depends on input drive power to companion linear amplifier and voice characteristics). Allowable ambient temperature: —10° F. to 122° F. High voltage output: 2300 v. DC at no load, 2000 v. DC at 500 ma peak (approx. 170 ma average). Bias voltage: —130 v. DC no load, —110 v. DC @ 60 ma. Duty cycle: SSB, 50% (normal voice modulation). Switching frequency: 1500 Hz approx. Dimensions: 8 3/4" W x 7 3/4" L x 2 3/4" D.

B Heathkit HP-24 KW-Kompact Fixed-Station Power Supply

PROVIDES HIGH VOLTAGE, BIAS, AND FILAMENT VOLTAGE FOR THE KW KOMPACT . . . with full provisions for "remote" installation. Circuit breaker protected. Cables included.

Kit HP-24, 22 lbs. . . no money down, \$5 mo. \$49.95

HP-24 SPECIFICATIONS—High voltage: 2500 v. max. with no load; 2000 v. DC at 300 ma; 1900 v. DC min. at 500 ma. Effective output capacitance: 21 ufd. Ripple: Less than 1% @ 500 ma. Duty cycle: SSB—50% @ 500 ma. peak; normal voice operation. CW—33% @ 500 ma; normal telegraphy operation. Bias voltage: —150 v. DC with no load; —100 v. DC @ 60 ma. Duty cycle: Continuous @ 40 ma. ALC Threshold voltage: Approximately 6 v. DC. Filament voltage: 13 v. AC @ 4 amperes. Power requirements: 120 v., 50-60 Hz @ 16 amperes (max.); 240 v., 50-60 Hz AC @ 8 amperes (max.). Dimensions: 9" L x 4 3/4" W x 6 3/4" H.

C Heathkit Mobile Speaker

Features a rugged steel cabinet with tough wrinkle finish and gimbal mounting bracket. 8 ohm speaker. Matches Heathkit gear. Dimensions—6-11/32" W x 4 3/4" H x 2 1/2" D.

Kit HS-24, 4 lbs. \$7.00

D Push-To-Talk Mobile Mike

Featuring a special "shaped" response for voice frequencies, the GH-12's 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. Complete with cable, less connector.

Model GH-12, 2 lbs. \$6.95

E Handy Heathkit RF Power Meter

Use the PM-2 for a quick check on ham, marine, commercial, or CB transmitters 100 kHz to 250 MHz. 0.3 volts RMS at meter antenna gives full scale reading. Convenient magnetic base. No power connection or battery required.

Kit PM-2, 2 lbs. \$12.95

F Heathkit Solid-State Mobile Power Supply For SSB Rigs

ESPECIALLY DESIGNED FOR MOBILE OPERATION OF "SINGLE-BANDERS," THE SB-101, AND SB-110. Full provisions are included for "remote" mobile operation. Primary and filament lines are circuit breaker protected.

Kit HP-13, DC Supply, 7 lbs. . . no money dn., \$7 mo. \$64.95

Assembled HPW-13, 8 lbs. no money dn., \$9 mo. \$89.95

HP-13 SPECIFICATIONS—Input voltage: 12 to 14.5 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 3/4" L x 2 3/4" D. All voltages referenced at 13 VDC input.

G Heathkit Fixed-Station Power Supply For SSB Transceivers

PROVIDES HIGH VOLTAGE, BIAS, AND FILAMENT POWER FOR FIXED-STATION INSTALLATIONS OF "SINGLE-BANDERS," THE SB-101, AND SB-110. Excellent dynamic regulation. Can be installed inside SB-600 speaker enclosure.

Kit HP-23 AC Supply, 19 lbs. . . no money dn., \$5 mo. \$49.95

Assembled HPW-23, 18 lbs., no money dn., \$7 mo. \$64.95

Export model available for 115/230 VAC, 50-60 Hz; write for prices.

HP-23 SPECIFICATIONS—Power requirements: 120 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.

Amateur Radio Equipment

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 only, negative 105 volts @ 35 ma. maximum

Kit HD-10, 6 lbs., no money dn., \$5 mo. \$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 SWR Meter . . . Shows Antenna/Transmission Line Match**

• 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 • Easy to assemble

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 3¼" W x 2½" H.

C **Heathkit Phone Patch . . . Full Facilities For An Efficient "Patch"**

• Features individual gain controls for receiver-to-line & line-to-transmitter audio level • VU meter to monitor audio levels • Operates with VOX or PTT • Convenient one-switch operation

Kit HD-15, 3 lbs., no money dn., \$5 mo. \$24.95

HD-15 SPECIFICATIONS—Circuit: Telephone hybrid circuit. Allows voice control or manual operation. Single switch places unit in full operation. Telephone Line Input Impedance: Approximately 600 ohm. Meter: Standard VU meter for constant output monitoring and null depth indication. Null Depth: At least 30 db isolation between transmit and receive circuits. Receiver Impedance: Effective match from 3 to 16 ohm. Transmitter Impedance: 600 ohm or high impedance output. Cabinet Size: 9¼" L x 3¾" W x 2¾" H.

D **Heathkit 100 kHz Crystal Calibrator**

Produces signal every 100 kHz up to 54 MHz. Can be tuned with trimmer against WWV. Uses 9v. battery, not included.

Kit HD-20, 1 lb. \$14.95

E **Heathkit Solid-State "Tunnel Dipper"**

• Up-to-date, solid-state equivalent to the grid-dip meter • 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. no money down, \$5 mo. \$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) 11363 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: 5½" L x 2½" W x 4¼" H (cover closed).

F **Radio Amateur's Handbook**

LATEST EDITION OF THIS MOST POPULAR REFERENCE BOOK! Covers all phases of theory, construction, and operating 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. \$4.00

G **Heathkit Solid-State Code Practice Oscillator**

NEW 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 1 "C" flashlight cell.

Kit HD-16, 2 lbs. \$8.95

H **Complete Amateur Radio License Course**

OBTAIN YOUR FCC HAM LICENSE FAST! . . . Course includes 4 American Radio Relay League handbooks: "How To Become A Radio Amateur"; "Radio Amateur's License Manual"; "Learning The Radio-Telegraph Code"; and "Operating An Amateur Radio Station"; plus a 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. \$16.95

HDP-32, Code Records Only, 2 lbs. \$9.50

HDP-42, ARRL Books Only (4), 2 lbs. \$2.00

Kit HD-16, Oscillator plus Key only (See description above.) 2 lbs. \$8.95



B HM-15
\$14.95



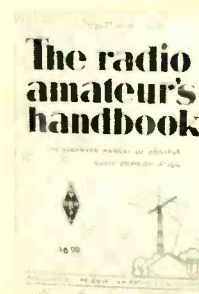
C HD-15
\$24.95



D HD-20
\$14.95



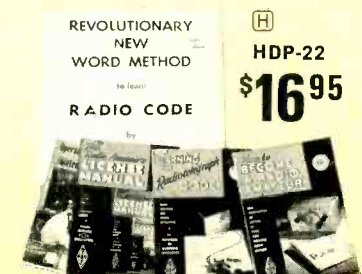
E HM-10A
\$29.95



F HDP-293
\$4.00



HD-16
\$8.95



H HDP-22
\$16.95



Look To Heath For Unsurpassed Values In Amateur Radio

A **Heathkit HR-10B Amateur Band Receiver** *New Styling & High Standard Performance*

- New deep forest-green cabinet and pale gray-green panel matches Single-Banders and new HW-16 • "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 super-heterodyne circuit • RF amplifier for extra sensitivity—high image rejection • Pre-built, pre-aligned tuning unit for easy assembly

THE HR-10B IS A QUALITY RECEIVER ANY HAM WOULD BE PROUD TO OWN . . . perfect for the novice or beginning general class ham who wants the capability of tuning AM, CW, and SSB. You'll enjoy the easy step-by-step construction, the handsome styling of the completed receiver, and the pleasure of operating a rig you've built yourself that has the performance and "feel" of expensive equipment. It features the solid stability you need for tuning SSB and CW. 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 noise limiter, and provisions for the optional HRA-10-1 plug-in 100 kHz crystal calibrator add the convenience you'll demand. Whatever your test for quality the HR-10B will prove itself a fine performer.

Kit HR-10B, 20 lbs., no money dn., \$8 mo. \$79.95
Kit HRA-10-1, Plug-in 100 kHz crystal calibrator, 1 lb. \$8.95
Export model available for 115/230 VAC, 50-60 Hz.

HR-10B SPECIFICATIONS—Frequency coverage: 80 through 10 meters. IF frequency: 1.681 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) 6EA8, 6BA6, 6BJ7, 6EB8, 6X4. Power requirements: 117 volts 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 Novice & General Class Operation*

- New color styling—deep forest-green cabinet & pale gray-green panel • 90 watts phone or CW on 80 through 10 meters • Neutralized 6146 final amplifier for stable, dependable operation on all bands • Built-in low-pass filter to eliminate TVI problems • Grid-block keying—keys beautifully with the HD-10 Electronic Keyer • Easy access to the four crystal sockets • Full provisions for operation with the matching Heathkit HG-10B VFO • Operates at reduced power for Novice Class • Performance and styling mate to the HR-10B • No other transmitter in this price range will offer you more

YOU GET MORE FOR YOUR TRANSMITTER DOLLAR WITH THE DX-60B. Quality, well-rated components, thoughtful circuit layout, clean open construction, and attractive styling make it an ideal low power transmitter. 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 get your general class license. 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, \$8 mo. \$79.95
GH-12, PTT Mike, 2 lbs. \$6.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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 V., 50-60 Hz, 225 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.

C **New Color Styling For HG-10B VFO** *Matches DX-60B, HR-10B, & 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, \$5 mo. \$37.95

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 3/8" W x 6 1/2" H x 9 3/8" D.

D **New 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. It's a rig you'll be proud of, and want to show to your friends. The assembly manual leads you carefully, step-by-step through the assembly and checkout procedures. Checkout requires only a VTVM, dummy load, and crystals for the bands in which you intend to operate. 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., \$10 mo. \$99.50
GD-396, Headphones (not a kit), 1 lb. \$3.50
Kit HS-24, Speaker, 4 lbs. \$7.00
Kit HD-10, Electronic Keyer, 6 lbs. . . . no money dn., \$5 mo. . . . \$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, 6EA8 Heterodyne Mixer-Oscillator, 6EA8 VFO Mixer-Oscillator, 6EW6 1F Amplifier, 12AX7 Product Detector-Oscillator, 6HF8 1st Audio and Audio Output. Transistor complement: 2N1274 muting circuit. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.



A HR-10B
\$79⁹⁵



C HG-10B
\$37⁹⁵

B DX-60B
\$79⁹⁵

Transceiver Performance Or "Separates" Versatility



D HW-16
\$99⁵⁰





SB-101 80-10 Meter SSB Transceiver Now Kit Or Assembled!

- 180 watts input P.E.P. SSB—170 watts input CW on five bands, 80-10 meters • Switch selection of Upper or Lower sideband or CW • Built-in CW sidetone • Operates PTT or VOX • Transceiver tuning with Heath SB-Series LMO (Linear Master Oscillator); features 1 kHz dial calibration or crystal-control transmit with VFO receive or crystal-control transceiver • Separate offset CW carrier crystal • Triple Action Level Control • Built-in 100 kHz crystal calibrator • Quiet, enclosed relays • Fixed or mobile operation with appropriate power supply • Fast assembly with circuit boards and wiring harnesses • Now kit or assembled • Now with panel switch selection of USB/LSB filter or optional CW filter • New simplified assembly for kit version • New "unlocked" transmitter frequency control with SB-640 External LMO • Simple alignment—requires only a VTVM or VOM, a dummy load and a broadcast receiver

WITH NEW FEATURES & PERFORMANCE THE SB-101 MOVES OUT—FAR AHEAD OF THE FIELD—SURPASSES EVERY OTHER MAKE OF SSB TRANSCEIVER . . . REGARDLESS OF PRICE! A strong claim? . . . Sure! We not only invite you to make the comparison . . . we'll provide you with the complete SB-101 specifications and schematic too. NEW! . . . THE ONLY SSB-CW TRANSCEIVER ON THE MARKET WITH FRONT PANEL SELECTION OF SSB OR CW FILTERS. The SB-101 features full provisions for installation and switch selection of either the standard USB/LSB 2.1 kHz SSB filter or the optional SBA-301-2 400 Hz CW filter. The new CW filter provides a symmetrical pass band of 400 Hz at the 6 db points.

VERSATILE "LOCKED" OR "UNLOCKED" OPERATION. When operated with the new SB-640 External LMO, a front panel switch permits selection of transceiver or transmitter/receiver frequency control.

ORDER THE SB-101 FOR THE BEST VALUE IN SSB TRANSCEIVERS . . . REGARDLESS! The SB-101 features the famous Heath pre-built LMO (Linear Master Oscillator) for superior tuning characteristics, USB/LSB selection, TALC, built-in VOX and calibrator, low cost power supplies, plus all the other proven features and performance already established by the SB-100.

Kit SB-101, 23 lbs., \$37 dn., as low as \$22 mo. \$370.00
 Assembled SBW-101, 23 lbs., \$54 dn., as low as \$32 mo. \$540.00
 SBA-301-2, Optional 400 Hz CW crystal filter, 1 lb. \$20.95
 Kit HP-13, DC Power Supply, 7 lbs., no money dn., \$7 mo. \$64.95
 Kit HP-23, AC Power Supply, 19 lbs., no money dn., \$5 mo. \$49.95

SB-101 SPECIFICATIONS—RECEIVER SECTION: Sensitivity: Less than 1 microvolt for 15 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 nonreactive load). Output impedances: 50 ohms to 75 ohms with less than 2:1 SWR. Oscillator feedthrough 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

World's Most Advanced

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 20 minutes warm-up from normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variations. Modes of operation: Selectable upper or lower sideband (suppressed carrier) and CW. Dial accuracy—"resetability": Within 200 Hz on all bands. Electrical dial accuracy: Within 400 Hz after calibration at nearest 100 kHz point. Dial mechanism backlash: Less than 50 Hz. Calibration: 100 kHz crystal. Audio frequency response: 350 to 2450 Hz ± 3 db. Phone patch impedance: 8 ohm or 600 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; Antenna switch; Receiver Antenna. Power requirements: 700 to 800 volts at 250 ma; 300 volts at 150 ma; —110 volts at 10 ma; 12 volts at 4.76 amps. Cabinet dimensions: 14 1/4" W x 6 1/2" H x 13 1/2" D.

New! SB-640 External Linear Master Oscillator For Versatile Frequency Control of Heathkit SB-101 SSB/CW Transceivers

- Features the same precise calibration and smooth dial mechanism already famous in the SB-101 • SB-Series styling • Same cabinet size as SB-600, SB-610, SB-620, & SB-630 • Red panel light indicates whenever SB-640 is in control of frequency • Includes provisions for two crystal-controlled frequencies • For operation with SB-101 model transceivers only

FEATURES FOUR MODES OF OPERATION—

1. LOCKED NORMAL—SB-101 internal LMO controls both transmitting and receiving frequency (true transceiving).
2. LOCKED AUXILIARY—SB-640 LMO controls both transmitting and receiving frequency (transceiving with SB-640 control).
3. UNLOCKED AUXILIARY—SB-101 LMO controls the receiving frequency—SB-640 LMO controls the transmitting frequency.
4. CRYSTAL CONTROLLED AUXILIARY—With SB-640 in its XTAL mode of operation, either of two crystals may be used for control of the SB-101 transceiver (LOCKED AUX.) or transmitter (UNLOCKED AUX.) frequency.

Kit SB-640, 9 lbs., no money dn., \$10 mo. \$99.00

SB-640 SPECIFICATIONS—Frequency output, LMO: 5 to 5.5 MHz. Frequency output, crystal: 4.975 to 5.525 MHz. Frequency stability: Less than 100 Hz per hour after 20 minutes warmup from normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variations. Visual dial accuracy: 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 Hz. Front panel controls: Main (LMO) Tuning dial; LMO/XTAL switch; Crystal Selector switch—XTAL 1/XTAL 2. Panel light: ON when transmitting or transceiving frequency is controlled by External LMO. Rear apron facilities: Connector to SB-101. Frequency Adjust trimmers XTAL 1 and XTAL 2. Power requirements (from SB-101 Transceiver): 150 VDC at 5 ma. 12.6 VAC at 450 ma. Dimensions: 6 1/2" H. (plus feet) x 10" W x 11 1/2" D. (including knobs).



SB-110
\$299⁰⁰
 (less mike)

Amateur Band SSB Transceivers

Heathkit SB-110... The Only "No Compromise" Six Meter SSB Transceiver

- The only truly high-performance SSB transceiver on six meters
- Uncompromised engineering—the SB-110 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 transceiver 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

GET UNEQUALLED PERFORMANCE ON 6 METERS . . . FIXED OR MOBILE. Get "low band" stability, plus PTT & VOX control, single knob tuning. Switch select modes for either crystal controlled transceiver or crystal controlled transmit with variable-tuning receiver, and operate CW or cross-mode . . . A real advantage for working DX contests or nets.

TRULY UNCOMPROMISED ENGINEERING. The SB-110 provides full 6 meter transceiver operation with the same selectivity, stability, calibration, performance, and value already made famous by the Heathkit SB-Series equipment for operation on 80-10 meters. Enjoy operating features that cannot be found in any other comparable transceiver on the market today! Discover the satisfaction of having a high-performance rig on six that you have assembled yourself. Choose the SB-110.

- Kit SB-110, 23 lbs. . . no money dn., \$28 mo. \$299.00
- Kit HP-13, DC Power Supply, 7 lbs. . . no money dn., \$7 mo. \$64.95
- Kit HP-23, AC Power Supply, 19 lbs. . . no money dn., \$5 mo. \$49.95
- Kit SBA-100-1, Mobile Mounting Kit, 6 lbs. \$14.95

SB-110 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 Sidetone: 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 Operation: 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 1/2" W x 6 5/8" H x 13 3/8" D.

Special SSB "Ham Radio" Microphone With Desk Stand



HDP-21A
\$29⁴⁰

NEW, MODERN STYLING TO MATCH THE PACE SET BY THE SB-SERIES EQUIPMENT . . . this high impedance dynamic mike by EV is recommended for use with SB-Series gear for clear, sharp SSB communications. Mike stand has grip-to-talk switch with lock position. Complete with wiring diagrams. Cables included. HDP-21A, 4 lbs., no money dn., \$5 mo. **\$29.40**

SBA-100-1
\$14⁹⁵



Universal Mobile Mounting Bracket For SB-110 & SB-101

GO MOBILE WITH THE SSB-110 OR SSB-101. The SBA-101 permits easy installation of either transceiver on the transmission hump or under the dash. Heath-Engineered cantilever suspension provides firm support . . . allows quick plug-in of entire transceiver in your car for easy change from fixed to mobile operation. Supporting rods are concealed behind the mounting base when the transceiver is not installed. Finish matches SB series.

Kit SBA-100-1, 6 lbs. \$14.95



SB-301
\$260⁰⁰



Kit SB-600 \$18⁹⁵
Wired SBW-600 \$24⁹⁵

Heathkit® SB-Series Sets "The-State-Of-The-

Heathkit SB-301 Amateur Band Receiver With Pace-Setting Extra-Performance Features

- Increased sensitivity—better than 0.3 uv • 80 through 10 meter amateur band coverage with all crystals furnished • 15 to 15.3 MHz coverage for WWV reception • Front-panel switching for control of six and two-meter plug-in converters—enables complete coverage from eighty through two meters with front panel control • Crystal-controlled front-end for same rate tuning on all bands • 1 kHz dial calibrations—100 kHz per dial revolution • Bandsread equal to 10 feet per megahertz • Tuning knob to dial ratio approximately 4:1 • Pre-built, pre-aligned Linear Master Oscillator (LMO) for truly linear tuning, high stability • Provision for transceiver operation in conjunction with matching SB-401 Transmitter • RTTY position on mode switch—SB-301 is a fully capable RTTY receiver • Built-in switch-selected ANL (Automatic Noise Limiter) • Improved product detector and audio circuitry for better reception • Circuit board & wiring harness construction for electronic stability & ease of assembly • Simplified assembly procedure with new "subpack" packaging & assembly techniques • 500 kHz coverage per bandswitch position

THE SB-301 SETS HIGH STANDARDS FOR THE INDUSTRY . . . with features such as the Heath pre-built LMO for smooth tuning, maximum stability and precise frequency readout, full capability for AM, CW, RTTY and SSB reception, standard coverage 80 through 10 meters plus optional plug-in converters for six and two, famous Heath crystal-lattice filters for superior pass-band characteristics, and better than 0.3 uv sensitivity for a 10 dB signal-plus-noise to noise ratio. The extra tuning range from 15 to 15.3 MHz offers the convenience of WWV tuning. And the famous Heath SB-Series styling gives you the satisfaction of owning gear that's as professional in appearance as it is in performance.

COMPARE! SEND TO HEATH FOR FREE "SPEC" SHEET . . . includes a complete schematic diagram . . . so you can compare the Heathkit SB-301 with any other amateur band receiver you choose. Choose the Heathkit SB-301 for value unmatched in amateur radio communications receivers.

Kit SB-301, less speaker, 23 lbs. . . no money dn., \$23 mo. . . . \$260.00
SBA-301-1 Optional AM crystal filter (3.75 kHz), 1 lb. . . . \$20.95

6 & 2 Meter Plug-In Converters For The SB-301

NOW YOU CAN HAVE 80 THROUGH 2 METER BAND COVERAGE AT THE TWIST OF A KNOB! Either the 6 or 2 meter converter may be switch selected from the front panel of the new SB-301 receiver. The 6-meter model covers 48 to 54 MHz (50 to 52 MHz with crystal supplied) and the 2-meter model extends receiver coverage from 142 to 150 MHz (144 to 146 MHz with crystal supplied). These low-noise, high-sensitivity converters exhibit wide-range signal level capabilities through built-in AGC provisions. They extend true SB-Series performance to 6 & 2 meters . . . may also be used with any other receiver providing necessary power and having 10 meter coverage.

SBA-300-3 (6 meter), 2 lbs. . . . \$19.95
SBA-300-4 (2 meter), 2 lbs. . . . \$19.95

SBA-301-2 Optional CW crystal filter (400 Hz), 1 lb. . . . \$20.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

SB-301 SPECIFICATIONS—Frequency range (megahertz): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 15.0 to 15.3, 21.0 to 21.5, 28.0 to 28.5, 28.5 to 29.0, 29.0 to 29.5, 29.5 to 30. Intermediate frequency: 3.395 megahertz. Frequency stability: Less than 100 Hz per hour after 20 min. warmup under normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variation. Visual dial accuracy: Within 200 Hz on all bands. Electric dial accuracy: Within 400 Hz on all bands after calibration at nearest 100 kHz point. Backlash: No more than 50 Hz. Sensitivity: Less than 0.3 microvolt for 10 db signal-plus-noise to noise ratio for SSB operation. Modes of operation: Switch selected; LSB, USB, CW, AM, RTTY. Selectivity: RTTY; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). SSB; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). AM; 3.75 kHz at 6 db down, 10 kHz at 60 db down (crystal filter available as accessory). CW; 400 Hz at 6 db down, 2.0 kHz at 60 db down (crystal filter available as accessory). Spurious response: Image and IF rejection better than 50 db. Internal spurious signals below equivalent antenna input of 1 microvolt. Audio response: SSB; 350 to 2450 Hz nominal at 6 db. AM; 200 to 3500 Hz nominal at 6 db. CW; 800 to 1200 Hz nominal at 6 db. Audio output impedance: Unbalanced nominal 8 ohm speaker and high impedance headphone. Audio output power: 1 watt with less than 8% distortion. Antenna input impedance: 50 ohms nominal. Muting: Open external ground at Mute socket. Crystal calibrator: 100 kHz crystal. Front panel controls: Main tuning dial; function switch; mode switch; AGC switch; band switch; AF gain control; RF gain control; preselector; connector & ANL switch; phone jack. Rear apron connections: Accessory power plug; HF antenna; VHF #1 antenna; VHF #2 antenna; mute; spare; anti-trip; 500 ohm; 8 ohm speaker; line cord socket; heterodyne oscillator output; LMO output; BFO output; VHF converter switch. Tube complement: (1) 6BZ6 RF amplifier (1) 6AU6 Heterodyne mixer; (1) 6AB4 Heterodyne oscillator; (1) 6AU6 LMO osc.; (1) 6AU6 LMO mixer; (2) 6BA6 IF amplifier; (1) 6AU6 Crystal calibrator; (1) 6HF8 1st audio, audio output; (1) 6AS11 Product Detector, BFO, BFO Amplifier. Power supply: Transformer operated with silicon diode rectifiers. Power requirements: 120 volts AC, 50/60 Hz, 50 watts. Dimensions: 14 $\frac{1}{8}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{1}{8}$ " D. Net weight: 17 lbs.

Heathkit SB-Series Communications Speaker

Choose Kit Or Assembled Models

OFFERS FIXED-STATION "SPEAKER" FACILITIES IN HAND-SOME 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 6 $\frac{1}{2}$ " H x 10 $\frac{1}{2}$ " D. Assembled SBW-600, 6 lbs. . . no money dn., \$5 mo. . . . \$24.95
Kit SB-600, 6 lbs. . . . \$18.95

SBA-300-3 SPECIFICATIONS—Sensitivity (signal-plus-noise to noise in db): AM, less than 0.1 uv for 6 db @ 3750 Hz bandwidth; SSB, less than 0.1 uv for 10 db @ 2100 Hz bandwidth; CW, less than 0.1 uv for 15 db @ 400 Hz bandwidth. Noise figure: 5 db or less. Frequency: Input, 48 to 54 MHz (50 to 52 MHz with crystal supplied). Output, 28 to 30 MHz. Bandpass: Essentially flat over any 2 MHz segment from 142 to 150 MHz. Image rejection: 50 db or better @ 6 MHz. IF rejection: 40 db or better @ 28 MHz. Crystal: 22 MHz $\pm 0.005\%$, 3rd overtone. Tube complement: 6DJ8 cascode RF amplifier, 6EA8 oscillator-mixer. Power requirements: 120 v. @ 12.5 milliamperes, 6.3 v. AC @ 815 milliamperes. Dimensions: Overall, 2 $\frac{1}{2}$ " W x 5 $\frac{1}{4}$ " L x 3 $\frac{3}{4}$ " H.

SBA-300-4 SPECIFICATIONS—Sensitivity (signal plus noise-to-noise in db) AM, less than 0.2 uv for 6 db @ 3750 Hz bandwidth; SSB, less than 0.2 uv for 12 db @ 2100 Hz bandwidth; CW less than 0.2 uv for 20 db @ 400 Hz bandwidth. Noise figure: 7 db or less. Frequency: Input, 142 to 150 MHz (144 to 146 MHz with crystal supplied); output, 28 to 30 MHz. Bandpass: Essentially flat over any 2 MHz segment from 142 to 150 MHz. Image rejection: 80 db or better at 88 MHz. IF rejection: 50 db or better at 29 MHz. Crystal: 38.67 MHz $\pm 0.03\%$, 3rd overtone. Tube complement: 6DJ8 cascode RF amplifier, 6EA8 oscillator-triplier-mixer. Power requirements: 130 V. DC @ 12.5 milliamperes, 6.3 V. AC @ 815 milliamperes. Dimensions: Overall, 2 $\frac{1}{2}$ " W x 5 $\frac{1}{4}$ " L x 3 $\frac{3}{4}$ " H.



SB-401
\$285⁰⁰



Kit SB-200 Wired SBW-200
\$220⁰⁰ \$320⁰⁰

Art" For Engineering, Performance & Value

Heathkit SB-401 Amateur Band Transmitter Operates USB/LSB & CW. . . "Separate" Or "Transceive"

- Single panel switch selects transceiver or independent operation of SB-401 and SB-301 (or SB-300) 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

PERFORMANCE COMPANION TO THE SB-301. The Heathkit SB-401 provides full transceive operation with the SB-301 or SB-300 . . . 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 the SB-301 or SB-300 . . . eliminates redundant circuitry! Include the SBA-401-1 crystal pack for complete, independent transmitter operation with receivers other than the SB-301 or SB-300.

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, 34 lbs. . . no money down, \$27 mo. \$285.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

SBA-401-1 Crystal Pack, 1 lb. . . no money down, \$5 mo. \$29.95
(Required for SB-401 operation without the SB-301 or SB-300 Receiver)

HDP-21A SSB "Ham" Microphone—See Pg. 103 for details.
4 lbs., no money dn., \$5 mo. \$29.40

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 ±3 db. **Power requirements:** 80 watts STBY, 260 watts key down @ 120 V AC line. **Dimensions:** 14 7/8" W x 6 5/8" H x 13 3/4" D.

Heathkit SB-200 Linear—Now Kit Or Wired 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

NOW AVAILABLE KIT OR WIRED . . . 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 power.

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.

Assembled SBW-200, 41 lbs., \$32 dn., \$27 mo. \$320.00
Kit SB-200, 41 lbs., no money dn., \$21 mo. \$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 7/8" W x 6 5/8" 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. \$9.95



SB-Series Accessories



A SB-620
\$119⁹⁵

B SB-630
\$74⁹⁵

C SB-610
\$69⁹⁵

A New Heathkit SB-620 "Scanalyzer" Spectrum Monitor And Analyzer

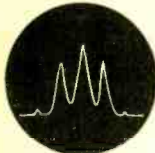
- New narrow sweep widths with crystal filter for single signal analysis—10 kHz, 50 kHz; variable width to 500 kHz • Increased sweep width capability for monitoring larger band segments—up to 500 kHz for IF's above 455 kHz, and up to 100 kHz for 455 kHz IF's • Matches SB-Series in style and performance
- 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 • New improved voltage doubler power supply • Mu-metal fully shielded CRT
- Simple connection to receiver • Plus all of the versatile performance and operating features already made famous by the HO-13 Spectrum Monitor

NEW "SCANALYZER" IS THE MOST MODERN, CAPABLE AMATEUR RADIO SPECTRUM ANALYZER ON THE MARKET TODAY. Provides quality instrumentation for the amateur radio station. The scanalyzer displays up to 500 kHz of the spectrum for wideband scanning function (250 kHz either side of center tuned frequency) . . . allows you to easily spot band openings without going through the tedious hunt-and-tune procedure. A 10 kHz sweep width plus a switched 20 db pad aids in accurate signal-quality reports or when used with a R.F. signal generator, permits measurement of carrier unwanted sideband, and distortion product suppression in your transmitter down to 60 db. Operates with practically all receivers . . . see specifications below.

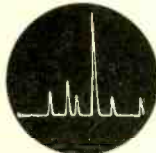
Kit SB-620, 15 lbs. . . no money dn., \$11 mo. **\$119.95**

SB-620 SPECIFICATIONS—RF AMPLIFIER: Input frequencies (Receiver IF): 455, 1000, 1600 to 1680, 2075, 2215, 2445, 3000, 3055, 3395, 5000 to 6000 kHz. **Frequency response:** +0.5 db at 50 kHz from receiver IF. **IF frequency:** 350 kHz. **Sensitivity:** Approximately 10 uv input signal provides a visible signal (40 DB mark) at full pip gain setting. **HORIZONTAL DEFLECTION:** Horizontal sweep generator: Sawtooth sweep produced by neon lamp oscillator. **Sweep rate:** 0.5 Hz approx. at 10 kHz preset; 2 Hz to 2.5 Hz approx. at 50 kHz preset; 5 Hz to 15 Hz approx. variable. **Sweep width:** Preset 10 kHz; preset 50 kHz; Variable from 10 kHz to 100 kHz at 455 kHz IF frequency; 50 kHz to 500 kHz at 1000, 1600, 1685, 2075, 2215, 2445 kHz IF frequencies; 100 kHz to 500 kHz at 3000, 3055, 3395, 5200, 6000 kHz IF frequencies. (These sweep widths are minimum values. Actual sweep width ranges will be greater than those listed depending on the input IF that the unit is wired for.) **Resolution:** 1 kHz. **Amplitude scales:** LINEAR (10:1 or 20 DB range); LOG (100:1 or 40 DB range). **POWER SUPPLY:** Type: Transformer operated, fused at 1/2 ampere. **Low voltage:** Full-wave voltage doubler circuit, using four silicon diodes. **High voltage:** Full-wave voltage doubler circuit, using two selenium diodes. **Bias voltage:** Bridge circuit, using four silicon diodes. **Power requirements:** 120 or 240 volts AC, 50/60 Hz, 40 watts. **GENERAL:** Cabinet dimensions: 6 1/2" H x 10" W x 10 1/2" D. **Net weight:** 10 lbs.

Scanning Function—approximately 250 kHz sweep width—indicates two signals below and three above the received signal, the strongest signal about 30 kHz up the band.



Analyzing Function—10 kHz preset sweep width—indicate carrier 100% modulated by 2 kHz time-log scale.



B New Amateur Station Console Four Control-Monitor Units In One

- Includes 24-hour clock with digital readout—calibrated in hours, minutes, and seconds • Built-in S.W.R. meter 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 signaling and continuous re-cycle provision • Handsome styling to match the Heathkit SB-Series Amateur Radio gear

106

SHOWS SIGN-IN AND SIGN-OUT TIMES IN DIGITS . . . right in front of you . . . handy to jot into your log. Phone patch and SWR meter right where you need them . . . integral with your station. And the push-button, resettable 10-minute timer is a real convenience, especially during rag-chews. Red "identify" sign lights up to signal end of time interval—buzzer may be switched on or off.

Kit SB-630, 10 lbs. . . no money dn., \$8 mo. **\$74.95**

C New SB-610 Signal Monitor . . . Displays Transmitted & Received Signals

- Features new versatility—operates with transmitters 160 through 6 meters, 15 watts through 1 KW—operates with receiver IF's through 6 MHz—includes full capability for displaying RTTY signals • Designed & styled to operate with Heath SB-Series equipment • Provisions to operate with virtually any other equipment on the market • Displays signal envelope, AF & RF trapezoid patterns • Fully mu-metal shielded CR tube
- Improved two-tone audio test oscillator with separate balance and output level controls • New improved voltage doubler power supply • Easier and faster assembly • Simple to connect and operate • Shows the quality of signals you transmit & receive
- Manual includes instructions for interpreting waveforms

NOW YOU CAN GET A SIGNAL MONITOR SCOPE MATCHING THE FAMOUS HEATH SB-SERIES IN BOTH APPEARANCE AND PERFORMANCE. The new SB-610 Signal Monitor is designed to operate without modification with your SB-Series amateur equipment, providing the ultimate in performance for amateur radio signal monitors . . . plus, it features all the necessary circuit provisions for operation with virtually any other gear on the market today. Use it for checking AM, CW, RTTY, and SSB signals.

Kit SB-610, 14 lbs. . . no money dn., \$7 mo. **\$69.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

SB-610 SPECIFICATIONS—Receiver IF's: Up to 455, 1600 to 1680, 2075, 2215, 2475, 3000, 3055, 3395, and 5000 to 6000 kHz. **VERTICAL AMPLIFIER:** Vertical response (for 1 inch deflection): Untuned: RTTY, 1 volt nominal; 20 kHz-455 kHz, less than 500 mv. Tuned: 455 kHz, 70 mv nominal; 1600-2500 kHz, less than 200 mv; 3000-3400 kHz, less than 500 mv; 5000-6000 kHz, less than 700 mv. **Input resistance:** 100 k ohm. **HORIZONTAL AMPLIFIER:** Horizontal response: ±3 db from 3 Hz to 15 kHz. **Sensitivity:** 800 mv per inch deflection. **Input resistance:** 1 megohm. **Sweep generator:** Recurrent type, sawtooth 15 to 200 Hz (variable). **Tone oscillators:** Approximately 1500 & 1950 Hz with 100 mv (nominal) output. **GENERAL:** Frequency coverage: 160—6 meters (50-75 ohm coaxial input). **Power limits:** 15 watts to 1 kilowatt (with special instructions for CB power levels). **Front panel controls:** Function Selector, Sweep Frequency, Tone Generator, Horizontal Gain, Horizontal Position, Vertical Position, Vertical Gain, Focus, Intensity/Off. **Rear control:** Xmtr. Atten. Attenuates 0 to 24 db at approximately 8 db per step. **Power supply:** Transformer operated, fused 1/2 amp. **Power requirements:** 120 VAC 50/60 Hz, 35 watts. **Dimensions:** 6" H x 10" W x 11 1/8" D (including knobs).

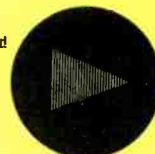
Displays Actual Signal Waveforms

These and other transmitter envelope patterns are shown in the SB-610 manual. Aid immeasurably in proper tune-up and troubleshooting.

SSB signal voice input correctly adjusted.



RF trapezoid Good linearity. Desirable pattern.



Never Built A Kit Before?

Start With A Recommended "Beginner's" Kit!

DISCOVER THE FUN OF KIT-BUILDING . . . join the millions of people who enjoy this satisfying space-age hobby. People with little or no knowledge of electronics. People whose mechanical skills end with using a screwdriver. Yet these people successfully build kits. The reasons behind their success are the famous Heathkit non-technical step-by-step instructions and giant "exploded" diagrams that show exactly where each part goes and how to install it. Even shows you how to solder. Special tools? All you need are a screwdriver, long-nosed pliers, soldering iron (there are some good ones on pg. 11). It's easy fun.

To prove our point, we recommend you start with one of the kits on this page. They're all top quality products that represent a small investment, and take only a short time to build. A good way to prove to yourself that you can build a kit. Give it a try . . . order one now!



Solid-State FM Stereo Tuner, pg. 49 . . . Build In 4-6 Hours



4-Speed Solid-State Stereo Portable Phonograph, pg. 20 . . . Finish In 4 Hours



"Ham" Code Practice Oscillator, pg. 99 . . . Build In 2 Hours



6-Transistor AM Portable, pg. 23 . . . Finish In An Evening



Heathkit Jr. 4-Speed Transistor Portable Phonograph, pg. 27 . . . Assembles In 2 Hours

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HEATHKIT WORLDWIDE—

Wherever You Are In The Free World, Heathkit Equipment Is Available Nearby:

Daystrom Ltd.
1480 Dundas Highway E.
Cooksville, Ontario, Canada

Schlumberger Svenska A.B.
Vesslevagen 2-4
Lidingo 1 Sweden.

Daystrom Ltd.
Bristol Road
Gloucester, England

Schlumberger Overseas G.m.b.H.
Tivoligasse 74
Vienna, Austria

Schlumberger
Instrumentation S.A.
8 Avenue de Frontenex
Geneva, Switzerland

Schlumberger Messgeräte A. G.
Badenerstrasse 333
8040 Zürich,
Switzerland

Heathkit-Geräte G.m.b.H.
P.O. Box 220
6079 Sprenndlingen,
West Germany

Société d'Instrumentation
Schlumberger
Département Heathkit
B.P. 47
92 - Bagneux, France

For the names of authorized distributors elsewhere, contact:

Heath Company, International Division
Benton Harbor, Michigan

All prices quoted are Net F.O.B. Benton Harbor, Michigan and apply to United States and Possessions only. Prices and Special Offers herein effective January 1, 1968. All prices and specifications subject to change without notice. Dealers and export prices slightly higher. Printed in U.S.A.

The Story of Heath

When Edward Bayard Heath founded the Heath Aeroplane Company during the early 1900's, little did he realize what would eventually evolve from his small "airplane trading post" as it was commonly called. Before he died, Mr. Heath was able to see the fruition of his early dreams. In 1926, he produced an airplane in kit form—the famous Heath "Parasol." For years this light aircraft was a favorite in the flying fraternity. Mr. Heath was killed during a test flight in 1931, marking a tragic end to a brilliant career. From that point through World War II, the Heath Company remained in the aircraft and replacement part business.

But it wasn't until shortly after World War II, that the character of the Heath Company changed. It was then that an ambitious engineer named Howard Anthony, who had purchased the Heath Company in 1935, took a calculated gamble. The ingenious Mr. Anthony bought a large stock of surplus wartime electronic parts, designed and "mail order marketed" an oscilloscope for \$39.50.

Mr. Anthony based the success of his idea on the premise that anyone, regardless of technical knowledge or skills could assemble a kit himself, and save up to 50% over comparable factory-built models. All that would be required were a few simple hand tools and some spare time.

Orders poured in for the oscilloscope kit, and the foundation for the Heath Company as it exists today was established. Mr. Anthony expanded his test instrument line and soon added amateur radio and hi-fi component kits.

The key to the kit-builder's, and consequently Mr. Anthony's, success was the instruction manual. Its contents still guide the Heath Company today. It contains simple, non-technical instructions and large "exploded" diagrams that take the builder through each and every step . . . show him exactly what to do and how to do it. Proof that every Heathkit is designed to be "beginner-built" can be found in the cards and letters Heath receives daily from people of all ages and from all walks of life expressing their delight and satisfaction.

Tragedy struck again in 1954 when Howard Anthony was also killed in an airplane crash. Daystrom, Inc. then acquired the Heath Company. In 1962 Daystrom, Inc. was purchased by Schlumberger Limited, a leader in the development of electronic techniques for oil exploration.

Since 1954, more kit products have been added until at present Heath boasts 11 different product lines, consisting of over 300 kits . . . the world's largest selection. Whatever your interest, you'll find a kit to match it in this 108 pg. catalog.

In order to produce the vast array of Heathkit equipment a modern 205,000 sq. ft. plant was constructed in 1958 on the shores of Lake Michigan in St. Joseph, Mich. And recently another 156,000 sq. ft. of engineering and manufacturing facilities were added, bringing the total space to 361,000 sq. ft. If you are planning a visit to Michigan, we invite you to stop in and pay us a visit. We're located on Hilltop Rd. just off Business I-94, south of St. Joseph.

H E A T H C O M P A N Y

Benton Harbor, Michigan 49022 / Plant Location: St. Joseph, Michigan